Z1500084COMP

City of Spokane

Planning Services Department

Notification Map

Application

DESCRIPTION OF PROPOSAL:

This proposal requests changes to the land use designation of the Comprehensive Plan from R4-10 designation to partially R15-30 and R10-20 designations, and change the current RSF zone classification to RMF and RTF classification for 286 single family parcels and related tracts.

ADDRESS OF SITE OF PROPOSAL: (if not assigned yet, obtain address from Public Works before submitting application)

The proposal affects 288 parcels within the Windhaven First Addition PUD within the North Indian Trail neighborhood. Addresses are between the W. 5400 and W. 6000 blocks of Youngstown Ln., Yorktown Ln., Morgantown Ln., Georgetown Ln., and Jamestown Ln.

APPLICANT:

Name: Morningside Investments, LLC

Address: 815 E. Rosewood Avenue, Spokane, WA 99208

Phone (home): N/A **Phone (work):** (509) 489-4260

Email address: N/A

RECEIVED
OCT 28 2015
PLANNING & DEVELOPMENT

PROPERTY OWNER:

Name: Morningside Investments, LLC

Address: 815 E. Rosewood Avenue, Spokane, WA 99208

Phone (home): N/A **Phone (work):** (509) 489-4260

Email address: N/A

AGENT:

Name: J.R. Bonnett Engineering, ATTN: Jay Bonnett

Address: 803 E. 3rd Avenue, Spokane, WA 99202

Phone (home): N/A **Phone (work):** (509) 534-3929

Email address: jbonnett@jrbonnett.com

ASSESSOR'S PARCEL NUMBERS:

All parcels and tracts within the Windhaven First Addition, PUD

LEGAL DESCRIPTION OF SITE:

Replat of Blocks 274, 275, 312, 313, 338, 339, 376, 377 and a portion of Blocks 273, 314, 337, & 378 of the Final Plat Prosperity Acres. Located in the NW 1/3 Sec. 22, T26N, R42 E.W.M., City of Spokane, WA.

SIZE OF PROPERTY:

49.5 acres

LIST SPECIFIC PERMITS REQUESTED IN THIS APPLICATION:

Comprehensive Plan/Land Use Amendment. Change the existing R4-10 designation to become partially R15-30 and R10-20 designations. Rezone. Change the existing RSF Classifications to RMF and RTF.

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OCT 28 2015
PLANNING & DEVELOPMENT

SUBMITTED BY:

Jay Bonnett

☐ Applicant ☐ Property Owner ☐ Property Purchaser ☒ Agent

In the case of discretionary permits (administrative, hearing examiner, landmarks commission or plan commission), if the applicant is not the property owner, the owner must provide the following acknowledgement:

I, Moraingside Investments LLC By Doyle P.O.A. For Harley, owner of the above-described property do hereby authorize Jay Bonnett to represent me and my interests in all matters regarding this application.

ACKNOWLEDGMENT:

STATE OF WASHINGTON)
) ss.
COUNTY OF SPOKANE)

On this 23 day of October, 2015, before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared Harley C. Douglass, to me known to be the individual that executed the foregoing instrument and acknowledged the said instrument to be free and his/her free and voluntary act and deed, for the uses and purposes therein mentioned.

Witness my hand and official seal hereto affixed the day and year first above written.

SUSAN M ANDERSON
NOTARY PUBLIC
STATE OF WASHINGTON
COMMISSION EXPIRES
OCT. 25, 2016

Susan M Anderson

Notary Public in and for the State of Washington,
residing at Spokane

Z1500084COMP

City of Spokane

Planning Services Department

General Application

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Email address: N/A

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PLANNING & DEVELOPMENT

SUBMITTED BY:

Jay Bonnett

☐ Applicant ☐ Property Owner ☐ Property Purchaser ☒ Agent

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I, Morningside Investments LLC By Harley Douglass, owner of the above-described property do hereby authorize Jay Bonnett to represent me and my interests in all matters regarding this application.

ACKNOWLEDGMENT:

STATE OF WASHINGTON)
) ss.
COUNTY OF SPOKANE)

On this 23 day of October, 2015, before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared Harley C. Douglass, to me known to be the individual that executed the foregoing instrument and acknowledged the said instrument to be free and his/her free and voluntary act and deed, for the uses and purposes therein mentioned.

Witness my hand and official seal hereto affixed the day and year first above written.

SUSAN M ANDERSON
NOTARY PUBLIC
STATE OF WASHINGTON
COMMISSION EXPIRES OCT. 25, 2016

Susan M Anderson

Notary Public in and for the State of Washington,
residing at Spokane

City of Spokane

Planning Services Department

Comprehensive Plan or Land Use Code Amendment

Pre-Application

DESCRIPTION OF THE PROPOSED AMENDMENT Please check the appropriate box(es):

☐ Comprehensive Plan Text Change **X** Land Use Designation Change

☐ Regulatory Code Text Change ☐ Area-wide Rezone

Please respond to these questions on a separate piece of paper. Incomplete answers may jeopardize your application's chances of being reviewed during this amendment cycle.

1. Summarize the general nature of the proposed amendment.

This amendment proposes to change to the subject property's Land Use designation from an R4-10 designation and an R10-20 designation to an R15-30 designation, and change the current RSF and RTF zone classification to an RMF zone classification. The subject property currently consists of 286 platted lots on approximately 49.48 acres.

2. Why do you feel this change is needed?

The subject property is located within close proximity to an existing shopping center within a CC Core Land Use designation and a CC2-NC zone classification. It is also directly adjacent to an existing multi-family housing facility within an R15-30 Land Use designation and an RMF zone classification. According to Chapter 3 of the Comprehensive Plan, the Neighborhood Center (NC) designation encourages greater intensity of development to promote Land Use efficiency. The most dense housing should be located within or around the Neighborhood Center to provide economic support to the businesses within the Center. Furthermore, housing density within the Neighborhood Center should be about 32-units/acre at the core and up to 22-units/acre at the perimeter. Currently, there are no housing units within the designated CC2-NC zone boundaries and the RMF housing developments directly adjacent to the Neighborhood center is underutilized and does not meet the density goal of the comprehensive plan. This amendment promotes efficient use of land by offering increased density at the core boundary.

3. In what way(s) is your proposal similar to or different from the fundamental concepts contained in comprehensive plan?

The subject property implements the concepts and goals of the comprehensive plan by providing increased density near the core of the Neighborhood Center. The higher density will provide needed support to the businesses located within the Neighborhood Center that will allow further growth of the Center that will enhance quality of life and help attract higher incomes to this area.

4. For text amendments: What goals, policies, regulations or other documents might be changed by your proposal?

Not Applicable.

5. For map amendments:

a. What is the current Land Use designation and zoning for each affected parcel?

The current Land Use designation for all affected parcels is R4-10 and R10-20.

b. What is the requested Land Use designation and zoning for each affected parcel?

The requested Land Use designation is R15-30.

c. Describe the land uses surrounding the proposed amendment site(s); e.g., land use type, vacant/ occupied, etc.

The property to the East has been developed into multi-family apartments within an RMF zone. The properties to the North and West have been developed into single family homes within an RSF zone. The majority of the properties to the South have been developed into a mixture of single family homes within an RSF zone and duplex units within an RTF and/or RMF zone. There are also zero lot-line duplex and 4-plex units within an RMF zone.

6. Do you know of any existing studies, plans or other documents that specifically relate to or support your proposal?

No.

7. Why did you decide to pursue a comprehensive plan amendment rather than address your concern through some other aspect of the Planning Services department's work program (e.g., neighborhood planning, public input on new regulations, etc.)?

The conclusion reached after many meetings and discussions with City staff was that there was no effective process other than pursuing a comprehensive plan amendment that could change the zoning to a higher density.

8. Has there been a previous attempt to address this concern through a comprehensive plan amendment?

☐ Yes **X** No

If yes, please answer the following questions:

a. When was the amendment proposal submitted?

b. Was it submitted as a consistent amendment or an inconsistent amendment?

c. What were the Plan Commission recommendation and City Council decision at that time?

d. Describe any ways that this amendment proposal varies from the previously considered version.

Windhaven First Addition P.U.D.
Comprehensive Plan Amendment
Application

1. GENERAL QUESTIONS

1a. Describe the nature of proposed amendment and explain why the change is necessary.

This amendment proposes to change to the subject property's Land Use designation from an R4-10 designation to a partial R10-20 designation and an R15-30 designation, and change the current RSF zone classification to a partial RTF and RMF zone classification. The subject property currently consists of 286 platted lots on approximately 49.48 acres. (See attached EXISTING AND PROPOSED LAND USE DESIGNATIONS map).

The subject property is located within close proximity to an existing shopping center within a CC Core Land Use designation and a CC2-NC zone classification. It is also directly adjacent to an existing multi-family housing facility within an R15-30 Land Use designation and an RMF zone classification. According to Chapter 3 of the Comprehensive Plan, the Neighborhood Center (NC) designation encourages greater intensity of development to promote Land Use efficiency. The most dense housing should be located within or around the Neighborhood Center to provide economic support to the businesses within the Center. Furthermore, housing density within the Neighborhood Center should be about 32-units/acre at the core and up to 22-units/acre at the perimeter. Currently, there are no housing units within the designated CC2-NC zone boundaries (the core) and the RMF housing developments directly adjacent to the Neighborhood center are underutilized and do not meet the density goal of the comprehensive plan . This amendment promotes efficient use of land by offering increased density at the core boundary.

1b. How will the proposed change provide a substantial benefit to the public?

A primary goal of the Comprehensive Plan is to reverse the increasing decline in personal income and property valuations relative to unincorporated Spokane County. Its policies attempt to increase disposable income by creating employment opportunities within neighborhoods and employment centers. To this end, a Neighborhood Center was planned within the North Indian Trail neighborhood to create an urban area with the goal of attracting livable wage jobs. Success of the Neighborhood Center would be dependent on the promotion of high-density urban development on lands nearest the center to create a pedestrian-friendly community and avoid leapfrog development and segregated land uses.

Since most of the land surrounding the Neighborhood Center has already been developed in relatively low-density housing, this amendment would contribute to the quality of life in this area by supplementing the existing underutilized multi-family housing developments in the area and providing a significant population growth mechanism within walking distance of the existing Neighborhood Center. The increased population would help support the Neighborhood Center and would have a positive influence on increasing investment and tax revenues as deemed necessary by the Comprehensive Plan to attract higher incomes to the neighborhood.

1c. Is this application consistent or inconsistent with the Comprehensive Plan goals, objectives and policies?

Yes, the proposal is consistent with the applicable goals and policies of the Comprehensive Plan.

1d. Is this application consistent or inconsistent with the goals and policies of state and federal legislation, such as the Growth Management Act (GMA) or environmental regulations?

Yes, development alternatives related to this proposal are consistent with the applicable planning goals and policies of the GMA, RCW 36.70a.020. The following GMA planning goals are supported:

Goal (1) Urban Growth - It provides for development in an urban area that has adequate public facilities and services.
Goal (2) Reduce Urban Sprawl – This project would develop vacant land near the perimeter of a designated Neighborhood Center where higher density housing is desired and therefore, would not contribute to urban sprawl.
Goal (3) Transportation – This development would support and likely increase ridership of the existing public transit system along Indian Trail Road. Public transit bus stops are within walking distance of the development. The project is located along designated pedestrian and bicycle routes and supports the goals of the regional Metropolitan Transportation Plan of having efficient intermodal transportation service with safe routes to and from transit stops. The Plan supports development near town centers to encourage walking and biking to work and on errands as opposed to driving.
Goal (4) Housing - This proposal will provide affordable housing to various economic segments of the population, promote a variety of multi-family housing types, and will not displace existing housing stock.
Goal (5) Economic Development - Economic development is consistent with the adopted Comprehensive Plan by providing opportunities for expansion of existing businesses and recruitment of new businesses.
Goal (6) Property Rights – Private property will not be taken for public uses as it relates to the development of this property.
Goal (7) Permits – This planning goal relates to processing state and local permits in a timely and fair manner.
Goal (8) Natural Resource Industries – No natural resources or related industries will be adversely affected by this proposal. This property does not produce agricultural or timber products.
Goal (9) Open Space and Recreation – The subject property is surrounded by developed land. Currently, paved streets, sidewalks and public utilities consistent with urban housing developments exist on the property. As such, no wildlife habitat will be adversely affected. No designated open spaces or recreational areas will be displaced by this proposal. Two city parks (Pacific Park and Meadowglen Park), an elementary school with playgrounds, School District 81 ball fields and Meadowglen Conservation Area are in close proximity to the property.
Goal (10) Environment – Groundwater will be protected through stormwater control and treatment measures in accordance with all local and state regulations. Air quality impacts will be consistent with normal residential levels of emissions. All qualifying vehicles within the city must be inspected and tested to ensure compliance with federal clean air act requirements and to protect human health and the environment.
Goal (11) Citizen Participation – The North Indian Trail Neighborhood Council is purposed to improve and preserve the quality of life in North Indian Trail Neighborhood. To that end, they were involved in the planning process of the Neighborhood Center and other surrounding land use designations of the comprehensive plan. Since many of the properties with high density housing designations were developed with no residential units or lesser density than allowed, the neighborhood should be in favor of this development to supplement lost residential opportunities near the core of the Center that is essential for its economic health.
Goal (12) Public Facilities – Appropriate assessments of the public utilities will be made during design phases of the development. Development will proceed only upon gaining approval from the City of Spokane for adequate water, sewer and transportation facilities.
Goal (13) Historic Preservation – No historic or archaeologic significance has been associated with this property, therefore, no adverse impacts are anticipated.
Goal (14) Shorelines – The subject site is not within close proximity to any bodies of water, therefore, this proposal will not have adverse effects to shorelines.

The GMA puts an emphasis on: Urban Growth, "Encourage development in urban areas where adequate public facilities and services exist or can be provided in an efficient manner"; and, Reduce Sprawl, "Reduce the inappropriate conversion of undeveloped land into sprawling, low density development." Available land in and around the Neighborhood Center and opportunities for higher density development is rapidly disappearing.

1e. Is this application consistent with the Countywide Planning Policies (CWPP), the comprehensive plans of neighboring jurisdictions, applicable capital facilities or special district plans, the Regional Transportation Improvement District, and official population growth forecasts?

Yes, the proposal is consistent with Countywide Planning Policies by using land efficiently and does not conflict with the comprehensive plans of neighboring jurisdictions. No known capital facilities, special district or regional transportation projects will be adversely effected by this amendment.

1f. Are there any infrastructure implications that will require financial commitments reflected in the Six-Year Capital Improvement Plan?

According to the Citywide Capital Improvement Program, no six-year capital projects were identified in the area of the subject property. Standard GFC and impact fees will be collected from the developer at the time of permit application. Impact fees are commonly used to aid in meeting capacity related Growth Management Act concurrency requirements. These fees are assessed to developments to pay proportionate costs associated with the service area-wide water, sewer and transportation needs for new improvements created by the new development. It is anticipated that several million dollars of GFC and Impact fees will be collected from the developer to pay for infrastructure upgrades. No other City financial commitments are anticipated.

1g. Will this proposal require an amendment to any supporting documents, such as development regulations, Capital Facilities Program, Shoreline Master Program, Downtown Plan, critical areas regulations, any neighborhood planning documents, or the Parks Plan?

No amendments to development regulations, Capital Facilities Program, Shoreline Master Program, Downtown Plan, critical areas regulations or the Parks Plan are anticipated. Planning documents for the North Indian Trail Neighborhood plan may need to be updated to include this proposed zoning change.

1h. If this area is to modify an Urban Growth Area (UGA) boundary, please provide a density and population growth trend analysis.

Not Applicable. This proposal is entirely within the UGA and does not intend to modify the boundary.

2. FOR TEXT AMENDMENTS

Not Applicable

3. FOR MAP CHANGE PROPOSALS

3a. Attach a map of the proposed amendment site/area, showing all parcels and parcel numbers.

Please see the attached Parcel Map 1 and Parcel Map 2 of the subject site.

3b. What is the current land use designation?

The current land use designations are as follows:

R10-20 along portions of the south boundary along Barnes Road.
R4-10 for the remaining area within the property boundaries.

3c. What is the requested land use designation?

The requested land use designations for the site are R10-20 and R15-30.

3d. Describe the land uses surrounding the proposed amendment site (land use type, vacant/occupied, etc.)

Land to the west, north and south of the subject property is designated as R4-10 and is currently occupied by mostly single-family residences with some pockets of two-family duplexes.
Portions of the land to the south of the subject property are designated as R10-20 and are currently occupied by mostly two-family duplexes with pockets of small multi-family units.
Land to the southeast of the subject property is designated as Center and Corridor Core (CC Core) and is currently occupied by commercial uses, such as, grocery stores, retail stores, restaurants, banks, etc. No residential living units have been developed within the designated CC-Core area.
Land to the east of the subject property is designated as R15-30 and is currently occupied by multi-family dwellings.

Most of the developed land designated as R10-20 and R15-30 in this area is underutilized. Land designated for high density housing (approximately 14.2 acres) within the Neighborhood Center has already been developed into commercial uses, therefore, leaving no future opportunities for increased density. Similarly, at the perimeter of the Neighborhood Core, much of the land designated for higher density housing has already been developed to density levels much lower than allowed by the zoning regulations and anticipated for support of the Neighborhood Center.

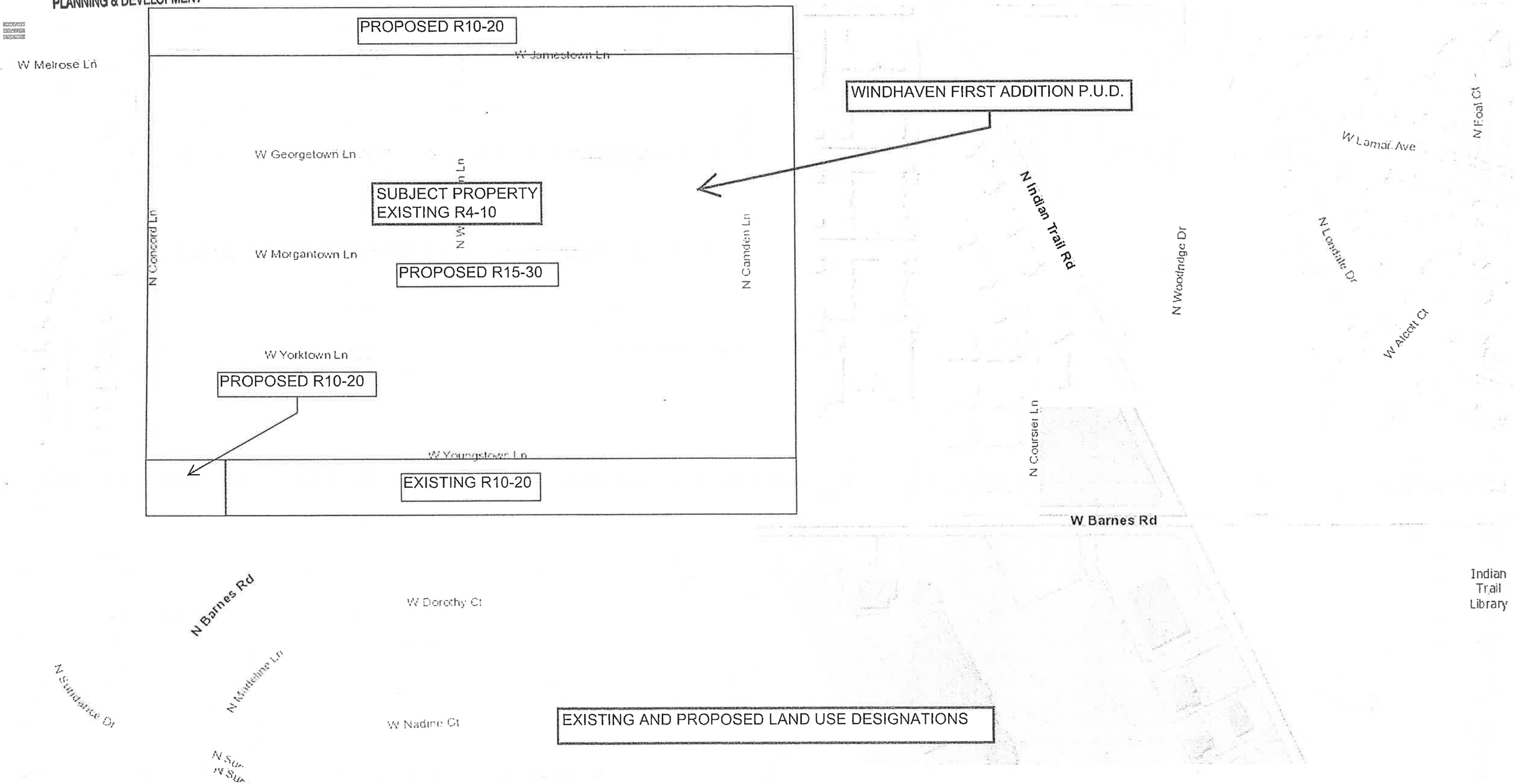
Windhaven First Addition, P.U.D Comprehensive Plan Amendment Application

General Question 1c. Is this application consistent or inconsistent with the Comprehensive Plan goals, objectives and policies?

Spokane Comprehensive Plan Goals, Objectives and Policies	Application Discussion
LU 1.1 Neighborhoods	The developed project could include a variety of multi-housing types including townhomes, zero lot-line and apartments. The project is located within a short walking distance of an elementary school, parks, public library, shopping, and public transit system.
LU 1.3 Single Family Residential Areas	Developable land in the Indian Trail area is significantly diminishing. Opportunities for additional multi-family projects near the center are few. Single-family residential neighborhoods are protected when placing higher intensity land uses near centers.
LU 1.4 Higher Density Residential Uses	This project is adjacent to an existing neighborhood center that does not contain any multi-family housing within its core. The proposed higher density housing supplements underutilized developed land within and around the core and is a critical component of a center. The target density near the boundaries of the center is 15-30 units per acre.
LU 1.12 Public Facilities and Services	Prior to development of the property, public facilities, including fire protection, police protection, parks and recreation, libraries, public sewer, public water, solid waste disposal and recycling, transportation and schools will meet the City's level of service standards.
LU 2.1 Public Realm Features	It is envisioned that the project will be developed in a similar fashion to other specific projects by this developer within the city that are aesthetically pleasing and blend in to the adjacent developments. Regularly maintained, attractive landscaping, pedestrian walks, recreational amenities and connections to public and private places will be provided.
LU 2.2 Performance Standards	Development of the project will be in accordance with all local, state and federal design standards that ensure compatibility with the surrounding land uses.
LU 3.1 Coordinated and Efficient Land Use	This project offers land use efficiency in an area where adequate services and facilities are located.
LU 3.2 Centers and Corridors	This project is located at the perimeter of the designated neighborhood center around which growth is focused. It is presumed that the neighborhood center was a result of neighborhood planning that would rely upon residents living in variety of housing types including multi-family dwellings. The most dense housing should be focused in and around the neighborhood center. Density of housing within the core should be 32-units per acre and up to 22-units per acre at the perimeter.

LU 3.3 Planned Neighborhood Centers / LU 3.4 Planning for Centers and Corridors/ LU 3.6 Designate the Seven Neighborhood Centers	The location of the Indian Trail and Barnes neighborhood center (one of seven neighborhood centers within the city) was chosen based on: existing and planned density; amount of commercial land needed to serve the neighborhood; and transportation capabilities including public transit. While the majority of the land within and around the center has been developed, no multi-family housing exists within the core and other designated multi-family housing developments at the perimeter do not meet target densities - resulting in a need for more near the core.
LU 3.11 Compact Residential Patterns	The goal is to allow more compact, affordable housing in all neighborhoods, including townhouses and rowhouses. These dwellings could mark a transition between the large single family lots and the proposed multi-family dwellings.
LU 4.1 Land Use and Transportation/ LU 4.2 Land Uses That Support Travel Options/ LU 4.4 Connections	The project is located near an existing public transit stop, designated bicycle routes and pedestrian paths. The project will provide easy access to support alternative transportation modes. Multi-family housing located near the neighborhood center provides opportunities for people to walk to work, shopping, dining, and other services to reduce automobile trips.
LU 5.1 Built and Natural Environment/ LU 5.2 Environmental Quality Enhancement	Development related to this project will not adversely impact the environmental quality of the area beyond normal residential-type noises and emissions. All parking areas will be paved and undeveloped areas will be attractively landscaped, therefore minimizing any dust related air quality concerns. Stormwater will be properly contained and disposed of in accordance with all local, state and federal regulations, therefore minimizing groundwater quality concerns. The property is located near a major arterial with only commercial and multi-family developments in between. Also, on-site parking will be provided throughout the project. The existing single family developments in the area should not be negatively impacted by project-related traffic or parking within the neighborhoods.
LU 5.3 Off-Site Impacts	The property is located near a major arterial with only commercial and multi-family developments in between. Also, on-site parking will be provided throughout the project. The existing single family developments in the area should not be negatively impacted by project-related traffic or parking within their immediate neighborhoods.
LU 5.4 Natural Features and Habitats	The property within this development has already been developed with streets, sidewalks, lighting and utilities. As such, no environmentally significant natural features or wildlife habitat will be disrupted by this proposal.
LU 6.5 Elementary School Location	The subject site is within safe walking distance of Woodridge Elementary school.

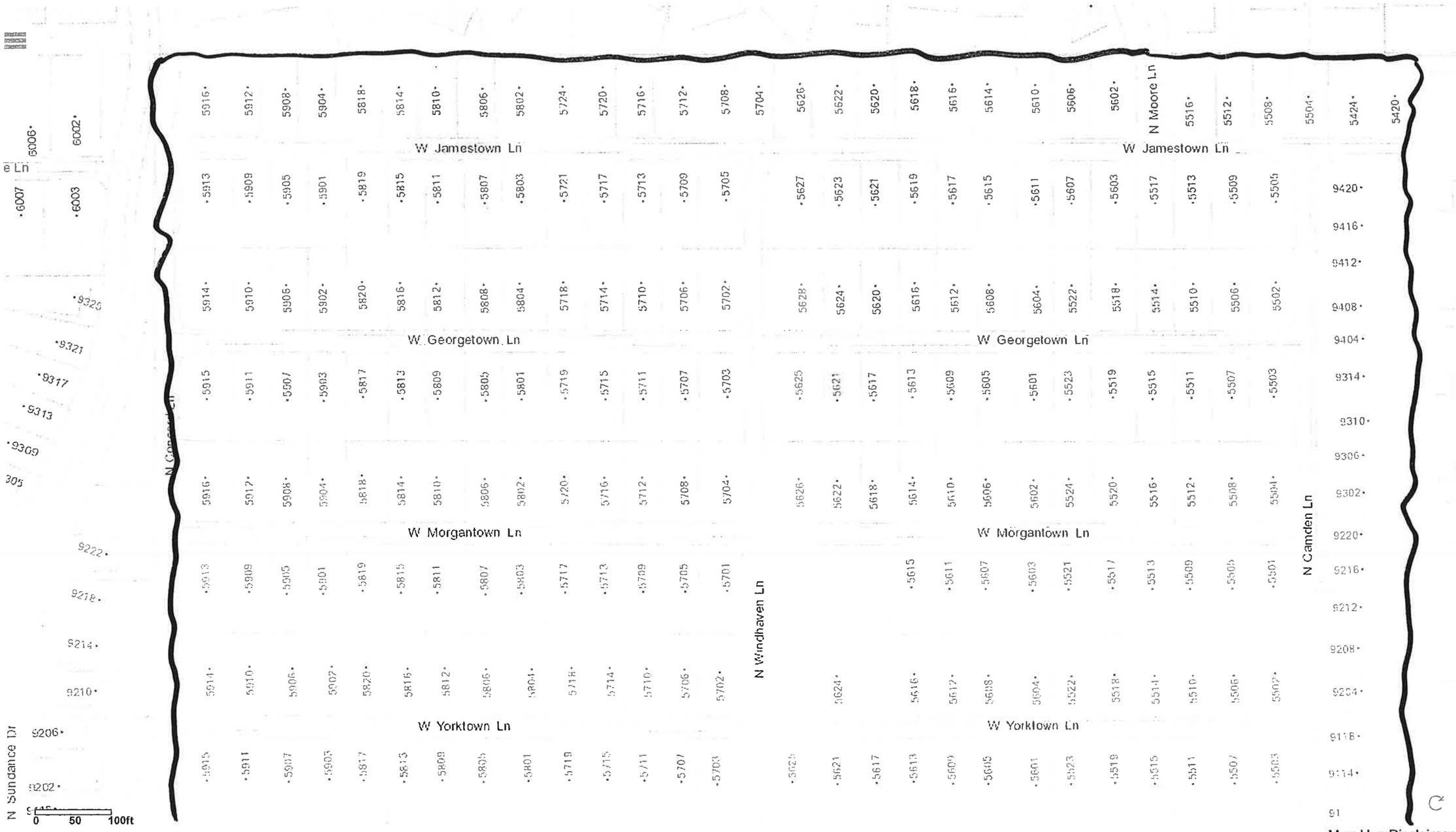
TR 1 Overall Transportation	This proposal supports the overall goal of promoting alternative modes of transportation and reducing dependency on automobiles. By locating higher density housing near Neighborhood Centers, the likelihood of pedestrian and bicycle travel will increase. The increased density will also support the existing public transit system that averaged only 10 and 6 boardings per day at the two nearest stops in 2014.
TR3.1 Transportation and Development Patterns	This proposal would utilize the City's existing transportation system and infrastructure and would reduce sprawl.
TR3.2 Transportation and Development Patterns	As previously discussed, the proximity of this development creates opportunities for the residents to walk or bicycle to the Neighborhood Center for their daily needs. The intent of the Neighborhood Center is to attract neighborhood residents, not to draw people from outside the neighborhood.
TR3.4 Increased Residential Densities	The higher density of this development would promote the efficiency of alternative transportation modes.
TR3.5 Healthy Commercial Centers	The increased population near the Neighborhood Center would help keep it financially healthy and maintain or increase the City's commercial tax base. The additional residents would also help attract new businesses that would provide beneficial services and employment opportunities to all the residents in the Indian Trail neighborhood.
TR4.4 Arterial Location and Design	This project is located near and would utilize the existing arterial street system. No new roadways would be constructed.
TR4.6 Internal Connections	The multi-family community would be provided with efficient transportation circulation with multiple connections to the public streets, school routes, pedestrian and bicycle routes.
TR5.2 Neighborhood Transportation Options	This project would promote the desired transportation alternatives within the neighborhood.
TR 6 Environmental Protection	Development of this proposed property would increase density on land that has already been developed for single family use. All stormwater runoff will be contained and disposed of on site without any adverse impact to the surrounding environment. No new paved roadways will be created by this proposal. The site will be well vegetated after construction to minimize negative environmental impacts of transportation.



EXISTING AND PROPOSED LAND USE DESIGNATIONS

MapSpokane

Search Basemap Measure



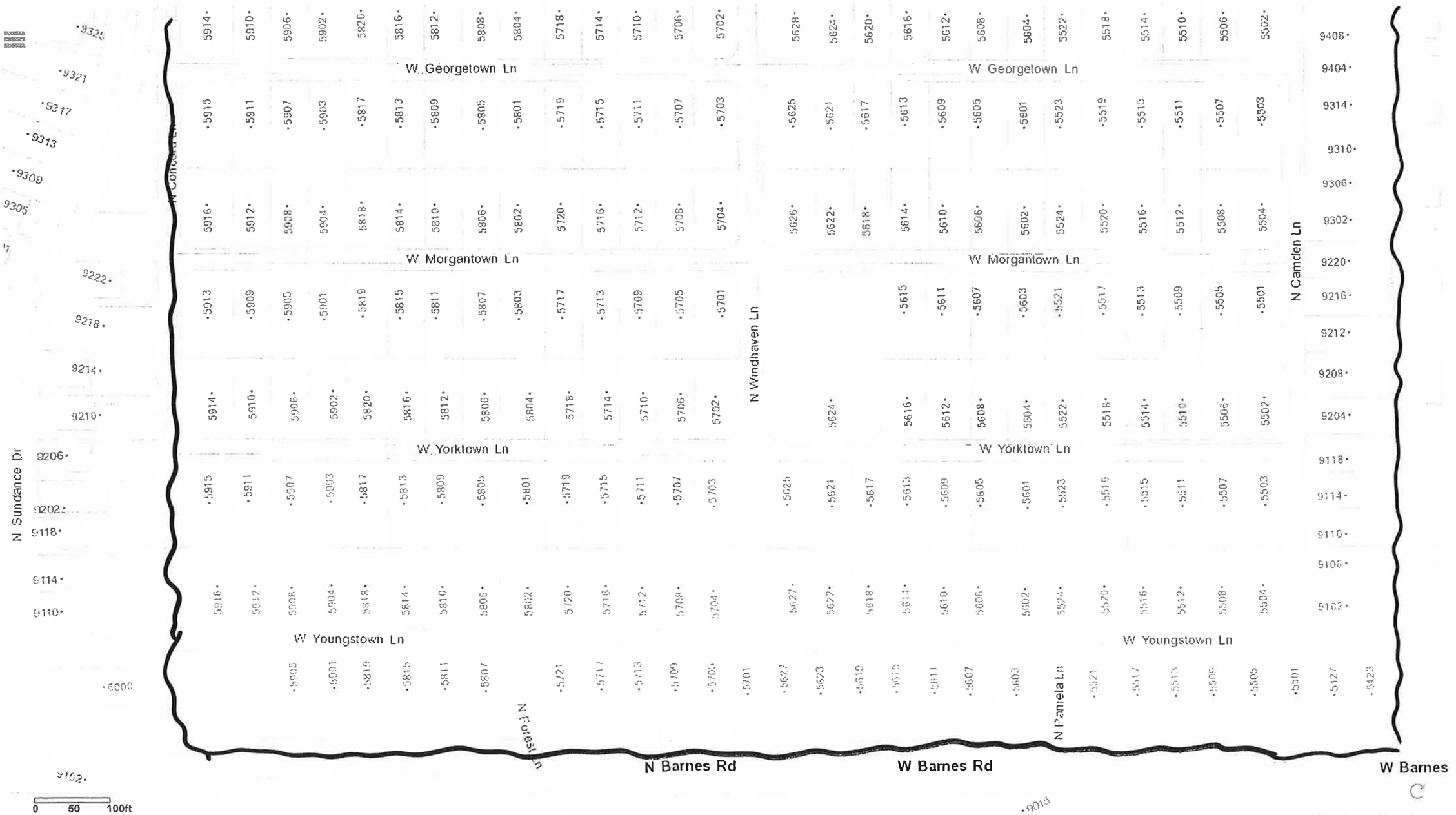
http://maps.spokanecity.org/#

October 28, 2015

PARCEL MAP 1

MapSpokane

Search Basemap Measure



http://maps.spokanecity.org/#

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October 28, 2015

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OCT 28 2015

PLANNING & DEVELOPMENT

PARCEL MAP 2

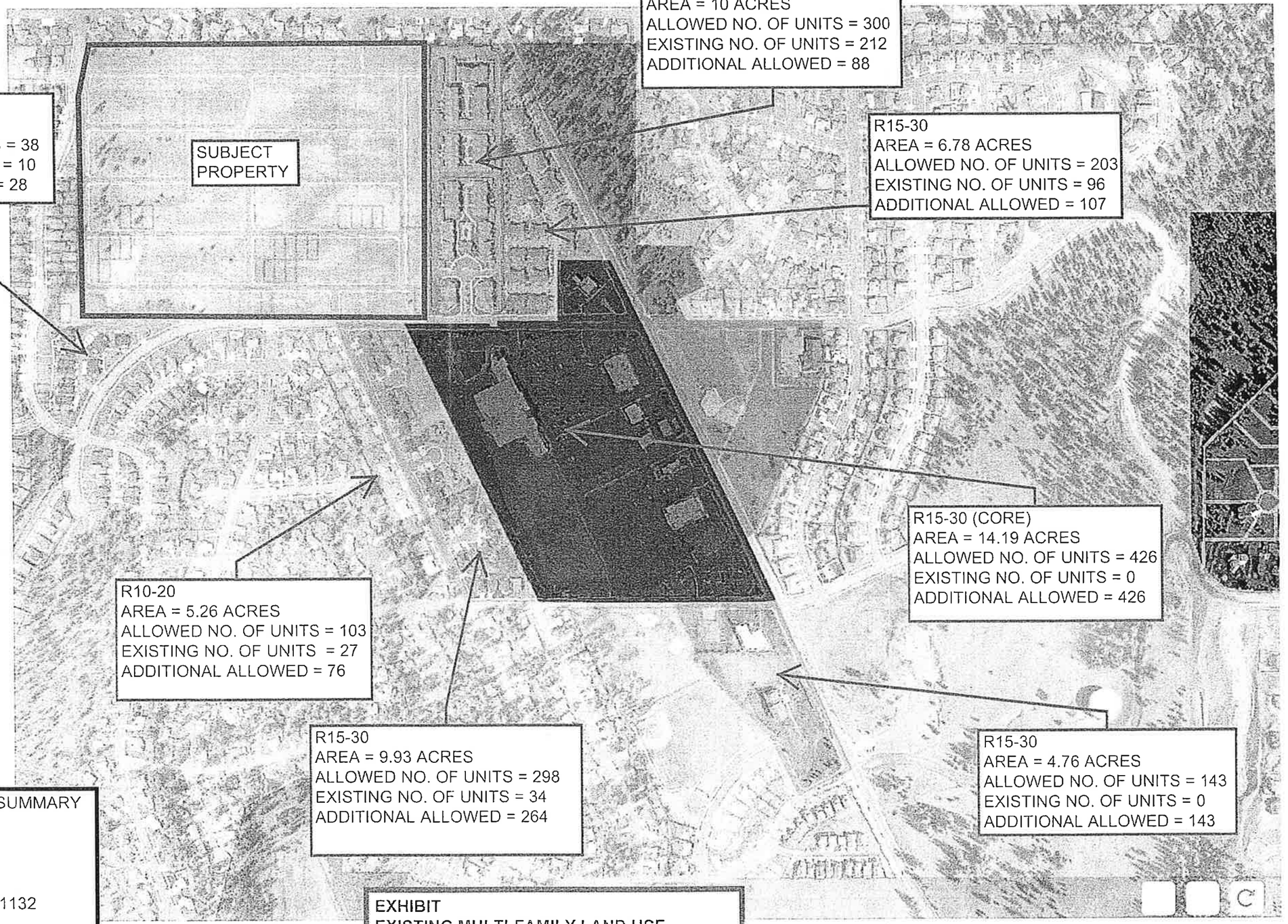
Contents

Search Basemap Measure

Layers | **Legend**

Property
- Parcel

Planning
- Landuse Plan
  - Conservation Open Space
  - Potential Open Space
  - Open Space
  - Agriculture
  - Residential 4-10
  - Residential 10-20
  - Residential 15-30
  - Residential 15+
  - Office
  - CC Core
  - CC Transition
  - Neighborhood Retail
  - Mini Center
  - General Commercial
  - Downtown
  - Light Industrial
  - Heavy Industrial
  - Institutional
  - Mining



MULTI-FAMILY LAND USE UTILIZATION SUMMARY

TOTAL AREA = 52.8 ACRES
TOTAL ALLOWED UNITS = 1511
TOTAL EXISTING UNITS = 379
TOTAL ADDITIONAL ALLOWED UNITS = 1132

EXHIBIT
EXISTING MULTI-FAMILY LAND USE UTILIZATION @ NEIGHBORHOOD CENTER

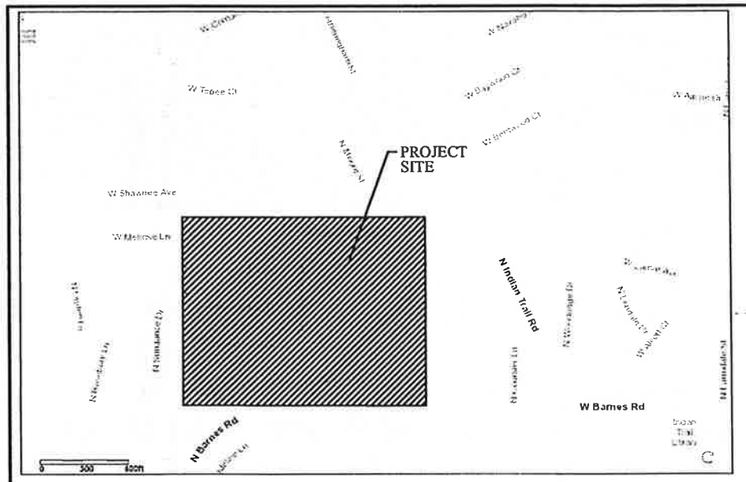
Map Use Disclaimer

COVER SHEET
FOR

WINDHAVEN FIRST ADDITION, PUD

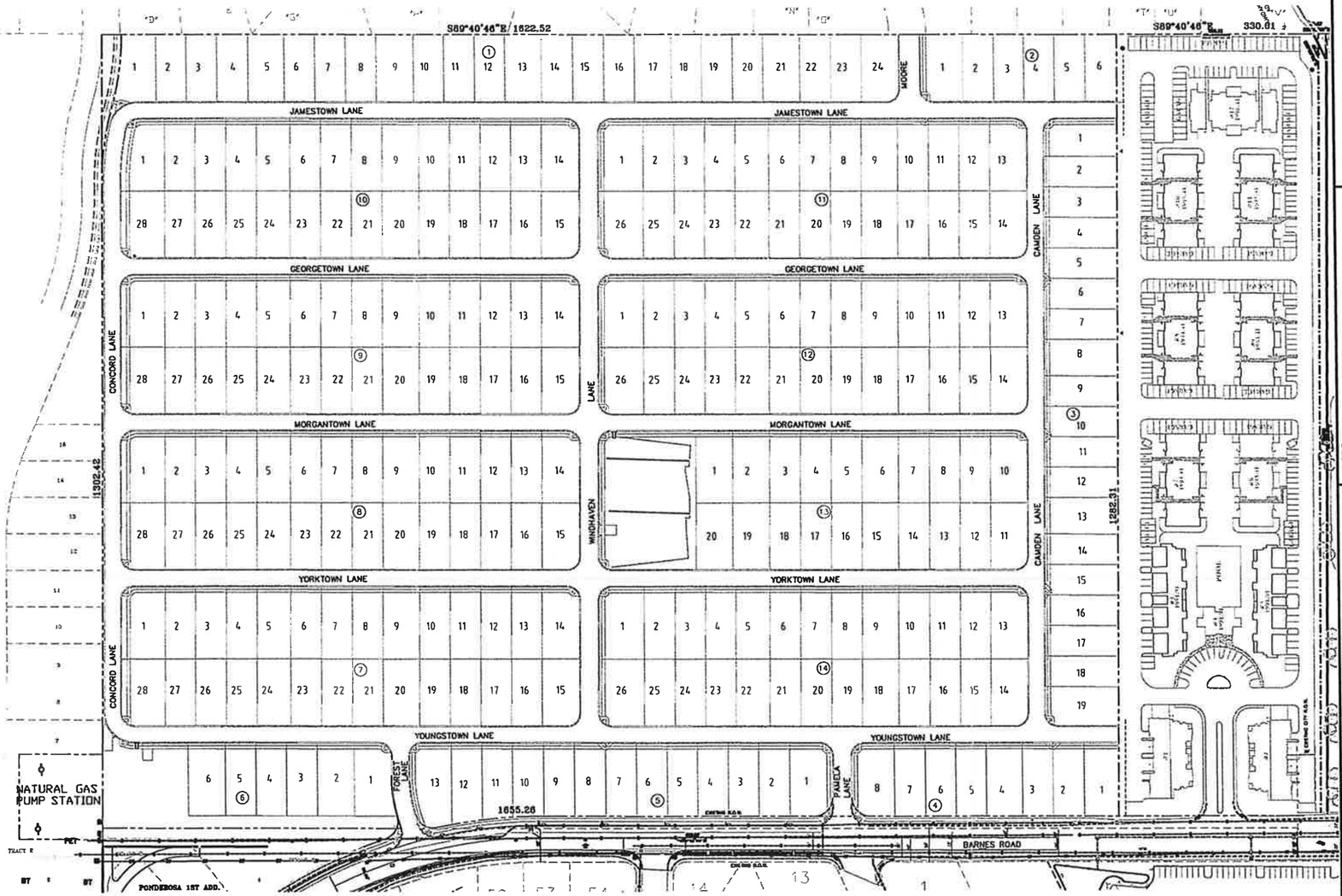
COMPREHENSIVE PLAN MAP AMENDMENT

NW 1/4 SEC. 22, T. 26 N., R. 42 E.W.M.



VICINITY MAP

N.T.S.



GRAPHIC SCALE
100 0 50 100 200
(IN FEET)
1 inch = 100 ft.

LEGAL DESCRIPTION:
A PLANNED UNIT DEVELOPMENT BEING A REPLAT OF BLOCKS 274, 275, 312, 313, 338, 339, 376, 377 AND A PORTION OF BLOCKS 273, 314, 337, & 378 OF THE FINAL PLAT OF PROSPERITY ACRES.
LOCATED IN THE NW¼ SEC. 22, T26N, R42 E.W.M.
CITY OF SPOKANE, WASHINGTON

ISSUED 10/28/15

REV.	DATE	BY	DESCRIPTION

APPLICANT:
MORNINGSIDE INVESTMENTS, LLC
815 E. ROSEWOOD AVE.
SPOKANE, WA 99208

AGENT:
J.R. BONNETT ENGINEERING, PLLC
803 E. 3RD AVENUE
SPOKANE, WA 99202
509-534-3929
JAY BONNETT, P.E.
PHONE: 509-534-3929
E-MAIL: jbonnett@jrbonnett.com

UNDERGROUND SERVICE ALERT
ONE-CALL NUMBER
811
CALL TWO BUSINESS DAYS BEFORE YOU DIG

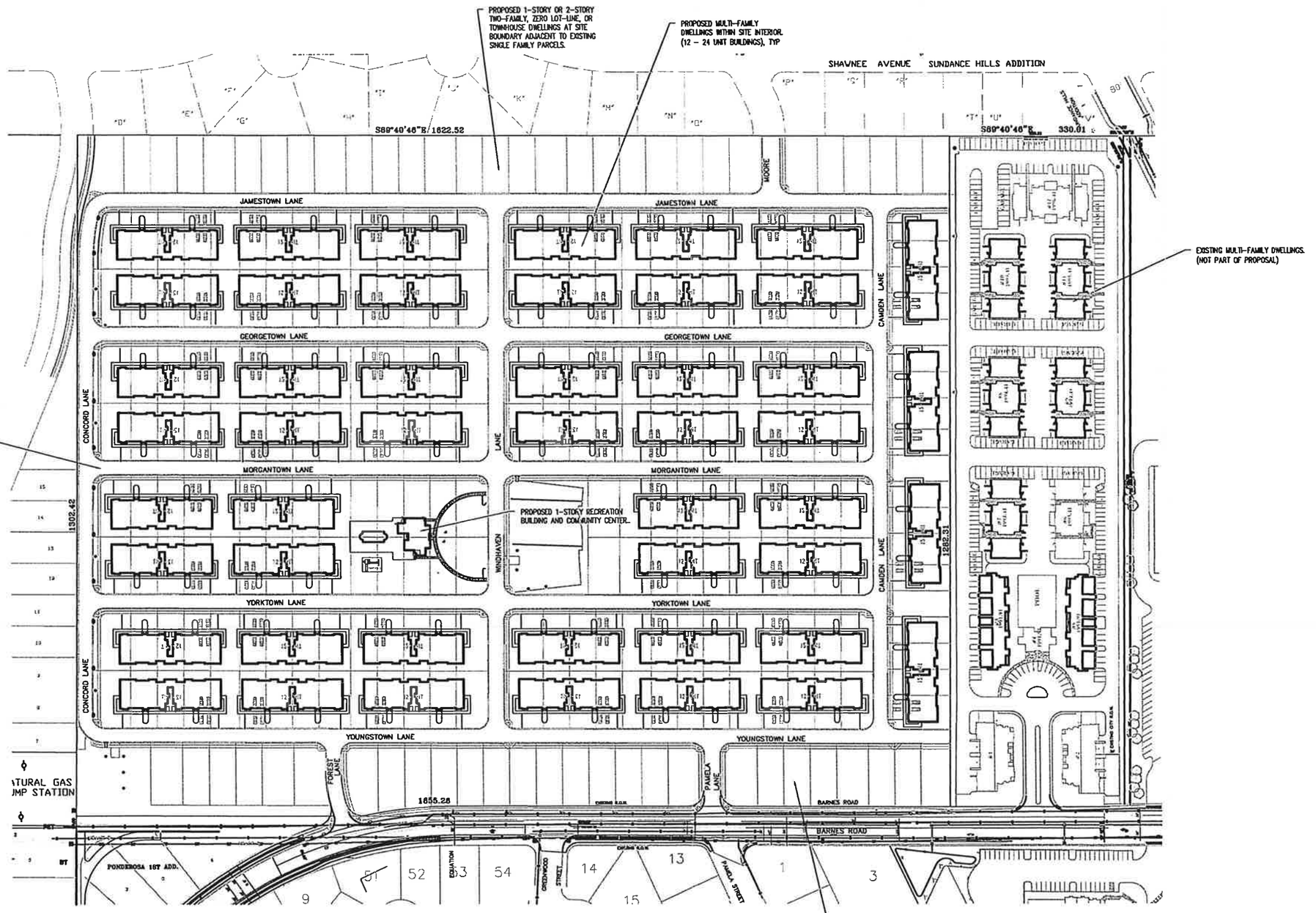
J.R. BONNETT ENGINEERING
CIVIL AND STRUCTURAL CONSULTING AND DESIGN
803 E. 3RD AVENUE
SPOKANE, WASHINGTON 99202
(509) 534-3929 / FAX (509) 534-4014

JOB TITLE: WINDHAVEN FIRST ADD. COMP. PLAN AMENDMENT — BARNES ROAD — SPOKANE, WA

SHEET TITLE: COVER SHEET

10/28/15

DATE	OCT. 2015
DRAWN BY	JRB
DESIGN BY	JRB
JOB NO.	13-071.10
SHEET NO.	EX0.0



CONCEPTUAL SITE PLAN

SCALE: 1" = 100'

RECEIVED
OCT 28 2015
PLANNING & DEVELOPMENT

UNDERGROUND SERVICE ALERT
ONE-CALL NUMBER
811
CALL TWO BUSINESS DAYS BEFORE YOU DIG

NOTE:
THE INFORMATION PRESENTED ON THIS DRAWING IS FOR INFORMATIONAL PURPOSES ONLY AND MAY BE SUBJECT TO CHANGE. FINAL RESIDENTIAL DENSITY, SITE LAYOUT AND BUILDING CONFIGURATIONS HAVE NOT BEEN DETERMINED.

ISSUED 10/28/15

REV.	DATE	BY	DESCRIPTION

J.R. BONNETT ENGINEERING
CIVIL AND STRUCTURAL CONSULTING AND DESIGN
803 E. 3RD AVENUE
SPOKANE, WASHINGTON 99202
(509) 534-3929 / FAX (509) 534-4014

JOB TITLE: WINDHAVEN FIRST ADD. COMP. PLAN AMENDMENT — BARNES ROAD — SPOKANE, WA

SHEET TITLE: CONCEPTUAL SITE PLAN

10/28/15

DATE: OCT, 2015
DRAWN BY: JRB
DESIGN BY: JRB
JOB NO.: 13-071.10
SHEET NO.: EX1.1

WAC 197-11-960: Environmental checklist.

SEPA
ENVIRONMENTAL CHECKLIST

Purpose of checklist:

The State Environmental Policy Act (SEPA), chapter 43.21C RCW, requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. An environmental impact statement (EIS) must be prepared for all proposals with probable significant adverse impacts on the quality of the environment. The purpose of this checklist is to provide information to help you and the agency identify impacts from your proposal (and to reduce or avoid impacts from the proposal, if it can be done) and to help the agency decide whether an EIS is required.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Governmental agencies use this checklist to determine whether the environmental impacts of your proposal are significant, requiring preparation of an EIS. Answer the questions briefly, with the most precise information known, or give the best description you can.

You must answer each question accurately and carefully, to the best of your knowledge. In most cases, you should be able to answer the questions from your own observations or project plans without the need to hire experts. If you really do not know the answer, or if a question does not apply to your proposal, write "do not know" or "does not apply." Complete answers to the questions now may avoid unnecessary delays later.

Some questions ask about governmental regulations, such as zoning, shoreline, and landmark designations. Answer these questions if you can. If you have problems, the governmental agencies can assist you.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Use of checklist for nonproject proposals:

Complete this checklist for nonproject proposals, even though questions may be answered "does not apply." IN ADDITION, complete the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D).

For nonproject actions, the references in the checklist to the words "project," "applicant," and "property or site" should be read as "proposal," "proposer," and "affected geographic area," respectively.

A. BACKGROUND

1. Name of proposed project, if applicable: **Windhaven First Addition, P.U.D. Comprehensive Plan Amendment**

2. Name of applicant: **Morningside Investments, LLC – J.R. Bonnett Engineering, PLLC (agent)**

3. Address and phone number of applicant and contact person:

   815 E. Rosewood Avenue

   Spokane, WA 99208

   (509) 489-4260

   Contact: Jay Bonnett

   (509) 534-3929

4. Date checklist prepared: **October 14, 2015.** **(Amended May 4, 2016)**

5. Agency requesting checklist: **City of Spokane**

6. Proposed timing or schedule (including phasing, if applicable):

   To be determined

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

No planning or construction documents have been prepared relating to this proposal as of this date. The property will likely be developed into a multi-family living community upon securing all applicable permits.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

Infrastucture, including roadways, water, sewer, storm drainage, electrical, gas, and phone has already been installed throughout the site. Geotechnical reports relating to stormwater disposal and street pavement design may have been prepared in support of the construction work. No buildings were constructed on the site. No critical areas exist on the site. No wetlands or other environmentally sensitive areas exist on the site. Stormwater drainage reports (WCE No. 2009-678) dated November 2009 and July 2011, were prepared by Whipple Consulting Engineers. These reports were prepared in support of a supplemental parking lot addition along the northeast boundary of the property for the existing Lusitano Apartments directly east of the subject property. The parking lot was never constructed. The WCE drainage reports referenced a geotechnical study dated April 19, 2005, prepared by Allwest in 2005 that supported the use of drywells for stormwater disposal purposes in the Windhaven PUD.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

We anticipate submitting applications to the City of Spokane for the purpose of acquiring development permits. We are not aware of any applications that are or may be pending government approvals for this property.

10. List any government approvals or permits that will be needed for your proposal, if known.

This proposal requests approval of changing the land use designation in the City's Comprehensive Plan from R4-10 ~~and R10-20~~ to R10-20 and R15-30. It also requests approval of changing the City's zone designation from RSF ~~and~~ to RTF ~~to~~ and RMD. Standard development and construction permits will be secured for building multi-family dwellings.

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

This project is intended to place multiple multi-family dwellings on approximately 49.5 acres of land. The site infrastructure, including paved private streets, water piping networks, sewer systems, stormwater control facilities and all dry utilities have been constructed throughout the site to accommodate 286 single family dwellings. The intent is to construct wood-framed, multi-family buildings in lieu of the single family dwellings within the confinements of the existing private street system with as little disruption to the existing facilities as possible. The requested land use designation would provide for a housing density of approximately 15 ~~15-30~~ units per acre, yielding up to 750 ~~742 – 1485~~ units. ~~It is likely the actual unit count will be closer to the lower end of this range~~.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of

area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The subject property is located on the north side of Barnes Avenue, approximately 320 yard west of Indian Trail Road within the city limits of Spokane, WA. It is directly west of the existing Lusitano Apartment community.

13. Does the proposed action lie within the aquifer sensitive area (ASA)? The General Sewer Service area? The Priority Sewer Service Area? The City of Spokane?

Yes

14. The following questions supplement Part A.

a. Critical Aquifer Recharge Area (CARA) / Aquifer Sensitive Area (ASA)

(1) Describe any systems, other than those designed for the disposal of sanitary waste, installed for the purpose of discharging fluids below the ground surface (includes systems such as those for the disposal of stormwater or drainage from floor drains). Describe the type of system, the amount of material to be disposed of through the system and the types of material likely to be disposed of (including materials which may enter the system inadvertently through spills or as a result of firefighting activities).

Development of this property related to this proposal would consist of multi-family dwellings that will be served by public water and sewer. No fluids are anticipated to be discharged below the ground surface.

(2) Will any chemicals (especially organic solvents or petroleum fuels) be stored in aboveground or underground storage tanks?

No.

(3) What protective measures will be taken to insure that leaks or spills of any chemicals stored or used on site will not be allowed to percolate to groundwater? This includes measures to keep chemicals out of disposal systems.

It is not expected that significant quantities of chemicals will be used on the site. Household detergents, cleaning solutions, soaps, etc. consistent with normal residential products are anticipated. No leaks or spills of any chemicals are anticipated.

(4) Will any chemicals be stored, handled or used on the site in a location where a spill or leak will drain to surface or groundwater or to a stormwater disposal system discharging to surface or groundwater?

Chemicals beyond those contained in normal household products purchased by the occupants will not be stored, handled or used on the site.

b. Stormwater

(1) What are the depths on the site to groundwater and bedrock (if known)?

Unknown.

TO BE COMPLETED BY APPLICANT | EVALUATION FOR AGENCY USE ONLY

B. ENVIRONMENTAL ELEMENTS

1. **Earth**

a. General description of the site (circle one): **Gently Sloped, Relatively Flat** ~~, rolling, hilly, steep slopes, mountainous,~~
other . . . . . .

b. What is the steepest slope on the site (approximate percent slope)?

The site generally slopes uniformly down from the east end to the west end. The average grade across the site is approximately 3%. The steepest grades are approximately 6%.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

According to the Windhaven PUD geotechnical report the site soils consist of Marble loamy coarse sand (MbC). No farmlands exists on this site.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

We did not encounter any surface conditions or history of unstable soils in the immediate vicinity.

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

Minimal filling and grading is anticipated. Minor excavation work is anticipated for placement of new building foundations. Minor grading is anticipated at the new driveways and approaches to the buildings from the street. Approximate quantities of soil for filling and grading will be determined during the site design phase. The site excavations will likely be balanced, so no import or export of soil is anticipated.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Erosion could possibly occur as a result of construction activity or use. Temporary erosion and sediment control best management practices will be used to mitigate potential erosion impacts to the offsite areas. Permanent landscaping that includes ground covering vegetation will be placed at the completion of the project and therefore no erosion is anticipated upon project completion.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

We estimate that approximately 60% of the site will be covered with impervious surfaces upon project completion.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

Since the site is relatively flat, it is unlikely that erosion will occur as a result of any clearing. Mass excavation activities are not anticipated, since the streets and underground utilities have already been constructed. Temporary erosion and sediment control best management practices during construction will be used to mitigate potential erosion impacts to the offsite areas. Permanent landscaping that includes ground covering vegetation will be placed at the completion of the project and therefore no erosion is anticipated upon project completion.

a. **Air**

a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

Emissions generated on-site would occur during the following: Short term dust and emissions construction equipment; automobile emissions and dust (on and off site). Upon project completion, dust from construction activities will not exist and automobile emissions will likely return to expected levels contributory to multi-family housing.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

Methods to reduce or control dust and vehicle emissions include the following: Keep construction access routes adequately moistened with water. Cover loads; etc. The subject property is in close proximity to an existing Neighborhood Center where pedestrian and bicycle travel would likely reduce automobile trips. The subject site is in close proximity to a public transit system and would likely be used by residents of this community, which would reduce automobile trips.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

3. **Water**

a. Surface:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

No

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

The project will not require any work over, in, or adjacent to such waters.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

None

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

The proposal does not require surface water withdrawals or diversions.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

The proposal does not lie within a 100-year floodplain.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No, the proposal does not involve any discharge of waste materials to surface waters.

b. Ground:

1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.

No ground water will be withdrawn. The existing stormwater system utilizes underground injection wells (drywells) to dispose of runoff. The system was approved by the City of Spokane and is presumed to be in compliance with all local and state regulations. While not anticipated, additional drywells may be installed in accordance with Spokane Regional Stormwater Manual and Washington State Department of Ecology regulations if determined to be necessary to adequately dispose of surface runoff.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

No waste material will be discharged into the ground from septic tanks or other sources.
The subject property is located in the City of Spokane, which provides solid waste disposal service.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

Runoff (including stormwater) from new asphalt-paved areas will be conveyed to adequately designed biofiltration swales for treatment and disposed of through infiltration facilities such as drywells or underground gravel galleries.

2) Could waste materials enter ground or surface waters? If so, generally describe.

No waste materials are anticipated on this site. Contaminants from vehicles will be conveyed to biofiltration swales for treatment prior to disposal through the infiltration facilities.

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

As noted previously, runoff (including stormwater) from new concrete or asphalt-paved areas will be conveyed to adequately designed biofiltration swales for treatment and disposed of through infiltration facilities such as drywells or underground gravel galleries.

4. **Plants**

a. Check or circle types of vegetation found on the site:

- ☐ deciduous tree: alder, maple, aspen, other
- ☐ evergreen tree: fir, cedar, pine, other
- ☐ shrubs
- ☐ grass

——— pasture

——— crop or grain

——— wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other

———— water plants: water lily, eelgrass, milfoil, other
———— other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

The vegetation that exists on the site consists of natural dryland sparse pine young pine trees, grass, weeds, etc., will likely be removed from all areas. The entire site was previously stripped of vegetation during construction of the streets and in preparation of single family dwelling construction. The vegetation that currently exists has naturally emerged since that time.

c. List threatened or endangered species known to be on or near the site.

We have reviewed the Threatened and Endangered Species list as determined by the Washington Department of Fish and Wildlife. None of the species are located within the area proposed for development.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:
Proposed landscaping will be consistent with the adjacent existing landscaping at the Lusitano Apartments in accordance with City of Spokane regulations.

5. **Animals**

a. Circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

birds: hawk, heron, eagle, **songbirds**, other:
mammals: deer, bear, elk, beaver, **other**:
fish: bass, salmon, trout, herring, shellfish, other:

b. List any threatened or endangered species known to be on or near the site.

Based on our review of the Department of Fish & Wildlife's determination, we were not able to identify any threatened or endangered species within this area.

c. Is the site part of a migration route? If so, explain.

The subject site is surrounded by developed land and was recently developed with streets and sidewalks. No evidence of migration routes have been detected.

d. Proposed measures to preserve or enhance wildlife, if any:

Not Applicable

6. **Energy and natural resources**

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Electricity and natural gas will likely be used for energy needs of the community.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

Unknown

c. What kinds of energy conservation features are included in the plans of this proposal?
List other proposed measures to reduce or control energy impacts, if any:

None at this time. All construction and development will be in accordance with local, state and federal regulations, including energy codes.

7. **Environmental health**

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste that could occur as a result of this proposal? If so, describe.

We do not expect to encounter any environmental health hazards.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

1) Describe special emergency services that might be required.

None

2) Proposed measures to reduce or control environmental health hazards, if any:

No environmental health hazards are anticipated.

b. **Noise**

3) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

Existing traffic noise will continue from area residents and those visiting the Neighborhood Center. Temporary construction-related noise will occur during working hours.

4) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)?
Indicate what hours noise would come from the site.

Noise will be created by operation of construction equipment, etc. during normal working hours and on a short-term basis through project completion. Noises associated with a residential community is anticipated in the long-term.

5) Proposed measures to reduce or control noise impacts, if any:

Construction-related noise impacts will generally occur during normal working hours, which will minimize impacts to the surrounding neighborhoods.

8. **Land and shoreline use**

a) What is the current use of the site and adjacent properties?

The site is currently vacant - no structures exist. Streets, sidewalks and street lighting along with all standard residential utility services, including water, sewer, gas, phone and cable have been constructed. The adjacent properties have been developed into single family residential dwellings to the north, west and portions of the south. Multi-family housing exists along the east boundary and portions of the south boundary. A Neighborhood Center exists at the southeast corner of the site.

b. Has the site been used for agriculture? If so, describe.

Unknown

c. Describe any structures on the site.

No structures exist on the site.

d. Will any structures be demolished? If so, what?

No.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

e. What is the current zoning classification of the site?

RSF and RTF

f. What is the current comprehensive plan designation of the site?

R4-10 and R10-20

g. If applicable, what is the current shoreline master program designation of the site?

Not applicable.

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

No

i. Approximately how many people would reside or work in the completed project?

Unknown. The completed project could support ~~between 740 and 1200~~ up to 750 housing units.

j. Approximately how many people would the completed project displace?

None.

k. Proposed measures to avoid or reduce displacement impacts, if any:

No displacement impacts are expected.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

Since most of the land within and surrounding the Neighborhood Center has already been developed in to relatively low-density housing, this proposal would contribute to the quality of life in this area by supplementing the existing underutilized multi-family housing developments in the area and providing increased population within walking distance of the existing Neighborhood Center. The increased population would help support the Neighborhood Center and would have a positive influence on increasing investment and tax revenues as deemed necessary by the Comprehensive Plan to attract higher incomes to the neighborhood. The goal is to amend the land use code as it relates to the subject site to the R15-30 designation to make up for deficient multi-family housing stock in this area.

Multiple properties with multi-family residential land use designations within and around the Neighborhood Center fail to meet density goals of the Comprehensive Plan.

9. **Housing**

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

The completed project could consist of ~~740 – 1485~~ up to 750 units. Middle to high income housing is anticipated.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

No housing units will be eliminated.

c. Proposed measures to reduce or control housing impacts, if any:

None

10. **Aesthetics**

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

To be determined. Building heights will be limited to applicable building and development codes.

b. What views in the immediate vicinity would be altered or obstructed?

Unknown

c. Proposed measures to reduce or control aesthetic impacts, if any:

None

11. **Light and glare**

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Lighting will be used to provide indoor and outdoor lighting needs, which will include parking areas. Minimal glare will likely occur during evening hours, when people are entering or leaving the site.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

The site will be designed to utilize its location. Light and glare will be minimal and should not be a safety hazard or significantly interfere with views.

c. What existing off-site sources of light or glare may affect your proposal?

Existing off-site sources of light and glare generally continue to occur in the surrounding areas. Most of the off-site sources are generated by the surrounding houses and street lights.

d. Proposed measures to reduce or control light and glare impacts, if any:

No measures are proposed.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

12. **Recreation**

a. What designated and informal recreational opportunities are in the immediate vicinity?

The subject property is in close proximity to a Neighborhood Center where shopping, restaurants and other social activities are available. The property is also close to the City's Pacific Park. The property is located along and accessible to a designated pedestrian and bicycle route. The property is also in close proximity to the City's public library and elementary school with a playground.

b. Would the proposed project displace any existing recreational uses? If so, describe.

The proposed project will not displace any existing recreational uses.

c Proposed measures to reduce or control impacts on recreation, including recreational opportunities to be provided by the project or applicant, if any:

Not Applicable

13. **Historic and cultural preservation**

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

We are not aware of any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site.

b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

We are not aware of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

c. Proposed measures to reduce or control impacts, if any:

Not applicable

14. **Transportation**

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

The existing main entrances to the site access Barnes Road. Additionally, access may be provided at the northeast corner of the site at the existing Moore Street.

b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

The nearest public transit stop is approximately ¼-mile from the site on Indian Trail Road.

c. How many parking spaces would the completed project have? How many would the project eliminate?

The number of completed parking spaces will be determined during the design phase of the development. It is anticipated that 2 parking spaces per living unit will be provided. No parking spaces will be eliminated.

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

No new roads or streets are anticipated.

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No, the project will not use water, rail, or air transportation.

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

A traffic impact analysis ~~trip generation analysis~~ estimating the Average Daily Trips and peak volumes will be prepared for the project based on the final living unit count. The number of vehicular average daily trips could be as many as 4,950 ~~range between 4,900 and 7,980~~ according to the ITE Trip Generation Manual.

g. Proposed measures to reduce or control transportation impacts, if any:

Proposed measures to reduce or control transportation impacts include: ride sharing, alternating days & time, utilize the Spokane Transit Authority, etc.

15. **Public services**

a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

It is difficult to determine how the project may, or may not, result in an increased need for public services. The following services should be considered when determining the need of the community:

Fire Protection: Fire Protection is provided through Government funding.
Police Protection: Police Protection is also provided through Government funding.
Health Care: This is based on need and is paid for through the recipient.
Schools: This provides an opportunity for Children to go to School.

Due to the increase in population there may be an increased need for public services. Concurrency must be met. According to the GMA and Comprehensive Plan, the City's capital improvement program must provide adequate public facilities and ensure that the facilities will be in place when development occurs.

b. Proposed measures to reduce or control direct impacts on public services, if any.

Impact fees and GFC's will be assessed to the developer of this project to pay proportionate impacts to public services.

16. **Utilities**

a. Circle utilities currently available at the site:

electricity, natural gas, water, refuse service, telephone, sanitary sewer, cable, ~~septic system~~, other.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

Utilities proposed for the development would consist of standard residential-type utilities described below.

Electricity: Avista
Natural Gas: Avista
Refuse Service: City of Spokane
Water: City of Spokane
Telephone: Centurylink
Sanitary Sewer: City of Spokane

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: .....

Date Submitted: 5/4/2016 .....

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

D. SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (do not use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

The intention of this proposal is to provide the means for increasing the residential density on the property by changing the land use designation. The site is adjacent to an existing CC-Core land use designation and CC2-NC zoning designation that is occupied by various types of businesses. If approved, there would be increased air emissions from vehicles upon completed development compared to the emissions coming from vacant land. There will be no production, storage, or release of toxic or hazardous substances nor will there be any production of noise after construction activities have stopped other than normal residential-type noises.

Proposed measures to avoid or reduce such increases are:

Best management practices relating to erosion and sediment control, dust abatement, etc. will be exercised during construction activities. Construction activity will be limited to normal working hours. All driving surfaces will be paved and undeveloped areas surrounding the buildings and paved areas will be landscaped in a manner to reduce dust.

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

Not Applicable. The site does not contain any endangered plants, animals, fish or marine life.

Proposed measures to protect or conserve plants, animals, fish, or marine life are:

Not Applicable.

3. How would the proposal be likely to deplete energy or natural resources?

No energy or natural resources will be depleted by development of this property.

Proposed measures to protect or conserve energy and natural resources are:

All buildings will be constructed in accordance with all local, state and federal regulations including energy codes.

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

   No adverse effects to environmentally sensitive areas or areas designated for governmental protection is anticipated.

Proposed measures to protect such resources or to avoid or reduce impacts are:

No environmentally sensitive areas exist on or around the site. Therefore, no protection measures are warranted.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

The subject property is not within or near a shoreline area and therefore not subject to shoreline regulations.

Proposed measures to avoid or reduce shoreline and land use impacts are:

No shoreline areas exist on or around the site. Therefore, no protection measures are warranted.

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

Due to the increase in population there may be an increased need for public services. Concurrency must be met. According to the GMA and Comprehensive Plan, the City's capital improvement program must provide adequate public facilities and ensure that the facilities will be in place when development occurs. Traffic on Barnes Road and Indian Trail Road would likely increase. Public water and sewer demands will be evaluated and compared to existing capacities during the design phase. If determined to be warranted, system upgrades will be made as necessary.

Proposed measures to reduce or respond to such demand(s) are:

The intersection of Barnes Road and Indian Trail Road is signalized with designated left and right turn lanes. Public water and sewer demands will be evaluated and compared to existing capacities during the design phase. If determined to be warranted, system upgrades will be made as necessary. Pedestrian and bicycle paths will be provided to the public right-of-way to promote those modes of transportation to the Neighborhood Center, nearby school, library and park. The use of nearby public transportation will be encouraged to all residents.

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

No conflicts with local, state or federal laws or requirements for the protection of the environment are known to exist.

Windhaven First Addition P.U.D. Comprehensive Plan Amendment (Z1500084 Morningside Investment)

Introduction

The purpose of this document is to describe the owner's objectives for developing the subject property and to present justifications for changing the current land use designation and zoning classification on the City's Comprehensive Plan and Zoning Maps from R4-10 to R10-20 and R15-30, and RSF to RTF and RMF.

The need for this amendment is to adjust for multi-family housing growth that has failed to materialize in and around the neighborhood center. The land that was made available for multi-family housing has been under-developed with densities far below the zoning minimums and do not meet the GMA and Comprehensive Plan goals, nor do they meet the neighborhood's expectations for sustaining the neighborhood center.

Background

Existing Property description:

- Property size is approximately 49.5 acres.
- Current land use designation is partially R4-10 (45.5 ac) and partially R10-20 (4 ac) – See Appendix E.
- Current zone classification is partially RSF (residential single-family) and partially RTF (residential two-family)
- Number of existing lots: 260 single-family lots & 26 duplex lots. Total = 286 lots – See Appendix F.
- Total number of units currently able to build = 312.
- All streets, sidewalks, and utilities were constructed nearly a decade ago.
- No housing structures have been erected on any of the lots.

Growth Management Act and Comprehensive Plan:

- In 1990 the state legislature adopted the Growth Management Act (GMA) – RCW 36.70A.

- In July 1993, the City of Spokane began planning under the State's GMA.

- In May 2001, the City Council adopted the Comprehensive Plan based on GMA policies.

- In August 2006, Windhaven First Addition P.U.D. infrastructure was completed, including all private streets, sidewalks, domestic water, sanitary sewer, stormwater conveyance and control facilities, electric, natural gas, phone and cable services.

- In September 2006, Windhaven First Addition P.U.D. Final Plat was approved and recorded.

- In 2007, properties were rezoned, with citizen participation through the Spokane Horizons process, in the area of the Indian Trail shopping center known as Sundance Plaza. City Ordinance C34154 was adopted by the City Council that established current land use designations and zoning classifications.

A key function of the GMA is to identify and protect critical areas and natural resource lands by controlling growth and designating urban growth areas. A key function of the Comprehensive Plan is to implement GMA goals and policies, and to guide future growth and development. Through GMA planning, the urban growth boundary was established. Essentially, most of the areas within Spokane's city limits, including the subject property, lie within the urban growth boundary.

The Comprehensive Plan contains "Centers and Corridors" growth strategies that are intended to direct population growth to specific mixed-use centers and corridors around the city. These "Centers" are designated in the Comprehensive Plan as: Neighborhood Center, District Center, Employment Center, Corridor, Regional Center, CC Core and CC Transition. Currently the City's land use map designates seven neighborhood centers within the City. The area around and including the Sundance Plaza is one of the seven neighborhood centers.

According to the Comprehensive Plan, land in and around the neighborhood center should have a greater intensity of development to support frequent transit service to neighborhoods and to sustain neighborhood businesses. Housing density should decrease as the distance from the neighborhood center increases. The size of the neighborhood center, including the higher density housing surrounding the center, should be 15 to 25 square blocks. The density should be about 32 units per acre in the core of the neighborhood center and may be up to 22 units per acre at the perimeter.

Proposed Action

Change land use designation from R4-10 to partial R10-20 and partial R15-30 (existing RTF to remain)–See Appendix E.

Change zone classification from RSF to partial RTF and partial RMF (existing RTF to remain).

Proposed breakdown of property:

- Existing RTF zone – 26 duplex lots with approximately 52 units. (buffer between Barnes Rd. and RMF)
- Proposed RTF zone – approximately 31 duplex lots with approximately 62 units. (Buffer between RSF & RMF)
- Proposed RMF zone – up to 636 apartment units.
- Proposed total number of units = 750.
- Proposed recreation building with swimming pool, play areas, and other recreational/open areas.
- Proposing to utilize existing streets, sidewalks, and utility mains.
- Overall proposed property density = 15.1 units per acre.

Project Description

The subject property is located within close proximity of the existing Sundance Plaza shopping center that is within a CC Core Land Use designation and a CC2-NC zone classification. It is also directly adjacent to an existing multi-family housing facility within an R15-30 Land Use designation and an RMF zone classification and among other multi-family developments that are located on Barnes Road. As stated earlier, according to Chapter 3 of the Comprehensive Plan, the Neighborhood Center (NC) designation encourages greater intensity of development to promote Land Use efficiency. The most dense housing should be located within or around the Neighborhood Center to provide economic support to the businesses within the Center. Furthermore, housing density within the Neighborhood Center should be about 32-units/acre at the core and up to 22-units/acre at the perimeter.

Currently, there are no housing units within the designated CC2-NC zone boundaries (the core). And the existing RTF and RMF housing developments directly adjacent to the Neighborhood center are underutilized and do not meet the density goal of the comprehensive plan. This amendment promotes efficient use of land and public services by offering increased density at the core boundary.

Housing Units Proposed:

- 3-story multi-family buildings with surface parking.
- 2-story multi-family buildings with tuck-under and surface parking.
- 1 or 2-story duplexes or condominium-type buildings with garages and surface parking.

Project Relevance

A primary goal of the Comprehensive Plan (CP) is to reverse the increasing decline in personal income and property valuations relative to unincorporated Spokane County. Its policies attempt to increase disposable income by creating employment opportunities within neighborhoods and employment centers (CP 1.1). To this end, a Neighborhood Center was planned within the North Indian Trail neighborhood to create an urban area with the goal of attracting livable wage jobs. Success of the Neighborhood Center would be dependent on the promotion of high-density urban development on lands nearest the center to create a pedestrian-friendly community and avoid leapfrog development and segregated land uses.

Since most of the land surrounding the Neighborhood Center has already been developed in relatively low-density housing, this amendment would contribute to the quality of life in this area by supplementing the existing underutilized multi-family housing developments in the area and providing a significant population growth mechanism within walking distance of the existing Neighborhood Center.

The following summarizes the housing potential and utilization on nine properties in and around the neighborhood center having multi-family land use designations - (see appendix H).

Property 1 –
Status – Fully developed
Land use – R15-30
Property Area – 10 acres
Number of developed units – 212
Density – 21.2 units/acre
Minimum required number of units – 150
Maximum allowed number of units – 300
Underutilization – 88 units

Property 2 –
Status – Fully developed
Land use – R15-30
Property Area – 6.78 acres
Number of developed units – 96
Density – 14.1 units/acre
Minimum required number of units – 102
Maximum allowed number of units – 203
Underutilization – 107 units

Property 3A – Neighborhood Center Core
Status – Fully developed
Land use – CC2-NC
Property Area – 21.74 acres
Number of developed units – 0
Density – 0 units/acre (target is 15-32 units/acre)
Minimum required number of units – 326 (15 units/acre)
Maximum allowed number of units – 696 (32 units/acre)
Underutilization – 696 units

Property 3B – Neighborhood Center Core
Status - Undeveloped
Land use – CC2-NC
Property Area – 11.64 acres
Number of developed units – 0
Density – 0 units/acre (target is 32 units/acre)
Minimum required number of units – 175 (15 units/acre)
Maximum allowed number of units – 372 (32 units/acre)
Underutilization – 372 units

Property 4 –
Status – Fully developed (commercial)
Land use – R15-30
Property Area – 6.76 acres
Number of developed units – 0
Density – 0 units/acre
Minimum required number of units – 101
Maximum allowed number of units – 203
Underutilization – 203 units

Property 5 –
Status – Partially developed
Land use – R15-30
Property Area – 9.93 acres
Number of developed units – 34
Density – 3.4 units/acre
Minimum required number of units – 149
Maximum allowed number of units – 298
Underutilization – 264 units

Property 6 –
Status – Fully developed
Land use – R10-20
Property Area – 5.26 acres
Number of developed units – 27
Density – 5.1 units/acre
Minimum required number of units – 53
Maximum allowed number of units – 106
Underutilization – 79 units

Property 7 –
Status – Fully developed
Land use – R10-20
Property Area – 1.9 acres
Number of developed units – 10
Density – 5.3 units/acre
Minimum required number of units – 19
Maximum allowed number of units – 38
Underutilization – 28 units

Property 8 –
Status – Fully developed
Land use – O-35
Property Area – 4.45 acres
Number of developed units – 96
Density – 21.6 units/acre
Minimum required number of units – NA
Maximum allowed number of units – NA
Underutilization – NA

Property 9A –
Status – Fully developed
Land use – R10-20
Property Area – 1.9 acres
Number of developed units – 6
Density – 3.1 units/acre
Minimum required number of units – 19
Maximum allowed number of units – 38
Underutilization – 32 units

Property 9B –
Status – Undeveloped
Land use – R10-20
Property Area – 8.4 acres
Number of developed units – 0
Density – NA
Minimum required number of units – 84
Maximum allowed number of units – 168
Underutilization – NA

Other developed RTF properties exist along Indian Trail Road away from the Neighborhood Center, but were not included in this assessment due to the distance from the center. However, densities associated with these properties were consistent with densities of the developed RTF properties described above – ranging between 3-6 units per acre. In addition, there is an undeveloped, 6.53-acre parcel with an O-35 land use designation that could support multi-family housing along with a variety of commercial uses that also was not included in the assessment.

The analysis above shows that there are a total of 88.8-acres within and around the Neighborhood Center that was originally envisioned to support multi-family housing. Of that total, 67.8-acres have been developed and 21.0-acres remain undeveloped, with 11.6-acres of the undeveloped total being within the center's core. Currently, no housing units

exist within the core. While there is undeveloped land remaining in the core that could be developed in to multi-family housing, the existing development pattern suggests that the remaining land will be developed in to commercial uses. This being the case, only 9.4-acres are currently available for multi-family housing near the center.

In accordance with zoning regulations and comprehensive plan planning goals, there should be a minimum of at least 1,178 multi-family units and a maximum of 2,422 multi-family units located on these properties. Note, the maximum could actually be higher due to no limits placed on the O-35 and CC2-NC properties. It is reasonable to assume that the original planning group planned for densities in accordance with Table LU 2 of the Comprehensive Plan (See Appendix I) that allows for a minimum of 15 and maximum of 22 units per acre at the perimeter of the center on designated multi-family properties (RTF or R15-30), and 15-32 units per acre within the core of the center (CC2-NC). Accordingly, the envisioned number of units on the properties within the core (33.4-acres) would be a minimum of 501 units and maximum of 1,068 units. Moreover, at the perimeter of the core (55.4-acres), there would be a minimum of 677 units and a maximum of 1,354 units.

Currently there are a total of 481 multi-family living units located on these properties – 697 shy of the minimum and 1,941 shy of the maximum envisioned units. Nearly all of the R15-30 properties around the core have been fully developed, leaving only one R10-20 property for future multi-family development. Based on current development patterns for properties with the R10-20 designation, it is likely that only 30 or 40 units will be constructed on this property. Thus, based on the above analyses, there would still be a need of between 657 and 1,911 multi-family units to fulfil the envisioned demand. The current total density of housing on the fully developed multi-family properties in and around the center is 7.1 units per acre. The current total density of housing on the developed multi-family properties at the perimeter of the neighborhood center is 10.5 units per acre. The current total density of housing within the core of center is 0 units per acre.

This proposal intends to provide 750 affordable living units on 49.5 acres at the perimeter of the neighborhood center. At full buildout of all the available multi-family properties around the perimeter including the subject property, the resulting overall multi-family density would increase from the existing 10.5 units per acre to approximately 12.3 units per acre, still below the envisioned 15-22 units per acre as anticipated by comprehensive plan.

The existing Windhaven First Addition P.U.D. development was approved to provide 260 single-family homes and 52 duplex units for a total of 312 units. Thus, the net increase to the area would be 438 units, where the above analysis concludes that a minimum of 1,178 multi-family units would be needed to meet the original planning goals. The net increase would still be less than the minimum number of units needed at the perimeter (677).

The comprehensive plan speaks to the importance of Neighborhood Centers and directing future growth in and around the centers as follows:

The increased population from the additional living units would help support the Neighborhood Center and would have a positive influence on increasing investment and tax revenues as deemed necessary by the Comprehensive Plan to attract higher incomes to the neighborhood.

CP 1.1 states that various types of centers are the key to attracting higher incomes back to the city. The centers have features and characteristics of living environments that attract higher income wage earners. Family demographics have changed where more and more people desire the living intensity and diversity within concentrated centers.

LU 1.3 states that the character of single-family residential neighborhoods are protected by focusing higher intensity land uses in designated centers.

LU 1.4 states that higher density housing of various types is the critical component of a center. It further states, without substantially increasing population in a center's immediate vicinity, there is insufficient market demand for goods and services at a level to sustain neighborhood-scale businesses.

LU 3.1 states that future growth should be directed to locations where adequate services and facilities are available. The centers and corridors are the areas of the city where infill development, redevelopment, and new development should be encouraged.

LU 3.2 states that neighborhood centers require a greater intensity of development than the surrounding residential area. The most dense housing should be focused in and around the neighborhood center. The goal is to provide density that is high enough to enable frequent transit service to a neighborhood center and to sustain neighborhood businesses. The density of housing should be 32 units per acre in the core of the neighborhood center and up to 22 units per acre at the perimeter.

Chapter 3.5 – Center and Corridor Transition – states that multi-family residential areas provide a transition between the Center and Corridor Core designations and the existing residential areas.

This proposed development offers solutions to supplementing population levels of the underdeveloped, multi-family-designated properties that have been deemed necessary by the comprehensive plan to provide economic support to the neighborhood center.

Proposal is consistent with goals and policies of the GMA, the Comprehensive plan, and SEPA

GMA Goals and Policies

The development alternatives related to this proposal are consistent with the applicable planning goals and policies of the GMA, RCW 36.70a.020. The following GMA planning goals are supported:

Goal (1) Urban Growth - It provides for development in an urban area that has adequate public facilities and services.

Goal (2) Reduce Urban Sprawl – This project would develop vacant land near the perimeter of a designated Neighborhood Center where higher density housing is desired and therefore, would not contribute to urban sprawl.

Goal (3) Transportation – This development would support and likely increase ridership of the existing public transit system along Indian Trail Road. Public transit bus stops are within walking distance of the development. The project is located along designated pedestrian and bicycle routes and supports the goals of the regional Metropolitan Transportation Plan of having efficient intermodal transportation service with safe routes to and from transit stops. The Plan supports development near town centers to encourage walking and biking to work and on errands as opposed to driving.

Goal (4) Housing - This proposal will provide affordable housing to various economic segments of the population, promote a variety of multi-family housing types, and will not displace existing housing stock.

Goal (5) Economic Development - Economic development is consistent with the adopted Comprehensive Plan by providing opportunities for expansion of existing businesses and recruitment of new businesses.

Goal (6) Property Rights – Private property will not be taken for public uses as it relates to the development of this property.

Goal (7) Permits – This planning goal relates to processing state and local permits in a timely and fair manner.

Goal (8) Natural Resource Industries – No natural resources or related industries will be adversely affected by this proposal. This property does not produce agricultural or timber products.

Goal (9) Open Space and Recreation – The subject property is surrounded by developed land. Currently, paved streets, sidewalks, and public utilities consistent with urban housing developments exist on the property. As such, no wildlife habitat will be adversely affected. No designated open spaces or recreational areas will be displaced by this proposal. Two city parks (Pacific Park and Meadowglen Park), an elementary school with playgrounds, School District 81 ball fields and Meadowglen Conservation Area are in close proximity to the property.

Goal (10) Environment – Groundwater will be protected through stormwater control and treatment measures in accordance with all local and state regulations. Air quality impacts will be consistent with normal residential levels of emissions. All qualifying vehicles within the city must be inspected and tested to ensure compliance with federal clean air act requirements and to protect human health and the environment.

Goal (11) Citizen Participation – The North Indian Trail Neighborhood Council is purposed to improve and preserve the quality of life in North Indian Trail Neighborhood. To that end, they were involved in the planning process of the Neighborhood Center and other surrounding land use designations of the comprehensive plan.

Since many of the properties with high-density housing designations were developed with no residential units or lesser density than allowed, the neighborhood should be in favor of this development to supplement lost residential opportunities near the core of the Center that is essential for its economic health.

Goal (12) Public Facilities – Appropriate assessments of the public utilities will be made during design phases of the development. Development will proceed only upon gaining approval from the City of Spokane for adequate water, sewer, and transportation facilities. Essential service providers were noticed and were allowed to evaluate related impacts. No unfavorable responses were received. Mitigation solutions have been offered to address traffic impacts.

Goal (13) Historic Preservation – No historic or archaeologic significance has been associated with this property, therefore, no adverse impacts are anticipated.

Goal (14) Shorelines – The subject site is not within close proximity to any bodies of water, therefore, this proposal will not have adverse effects to shorelines.

The GMA puts an emphasis on: Urban Growth, "Encourage development in urban areas where adequate public facilities and services exist or can be provided in an efficient manner"; and, Reduce Sprawl, "Reduce the inappropriate conversion of undeveloped land into sprawling, low density development." Available land in and around the Neighborhood Center and opportunities for higher density development is rapidly disappearing. Adequate public services are present, available, and adequate for serving this development.

Comprehensive Plan Goals and Policies

The development alternatives related to this proposal are consistent with the applicable planning goals and policies of the comprehensive plan. The following main goals and policies are supported:

LU 1.1 Neighborhoods – The developed project could include a variety of multi-housing types including townhomes, zero lot-line, and apartments. The project is located within a short walking distance of an elementary school, parks, public library, shopping, and public transit system.

LU 1.3 Single Family Residential Areas - Developable land in the Indian Trail area is significantly diminishing. Opportunities for additional multi-family projects near the center are few. Single-family residential neighborhoods are protected when placing higher intensity land uses near centers.

LU 1.4 Higher Density Residential Uses - This project is adjacent to an existing neighborhood center that does not contain any multi-family housing within its core. The proposed higher density housing supplements underutilized developed land within and around the core and is a critical component of a center. The target density within the boundary of the center is 15-32 units per acre – the current density is zero. The target density near the boundary of the center is 15-22 units per acre – the current density is 10.5 units per acre. The total density at full build-out of the subject property and all undeveloped multi-family properties around the perimeter would be about 12.3 units per acre.

LU 1.12 Public Facilities and Services - Prior to development of the property, public facilities, including fire protection, police protection, parks and recreation, libraries, public sewer, public water, solid waste disposal and recycling, transportation and schools will meet the City's level of service standards. Accordingly, the existing essential public utilities have been deemed sufficient under the City's required level of service standards to effectively service full development as proposed.

LU 2.1 Public Realm Features - The project will be developed in a similar fashion as other specific projects by this developer within the city that are aesthetically pleasing and blend in to the adjacent developments. Regularly maintained, attractive landscaping, pedestrian walks, recreational amenities, and connections to public and private places will be provided. Sidewalks for pedestrians and bike lanes for cyclists will be provided.

LU 2.2 Performance Standards - Development of the project will be in accordance with all local, state, and federal design standards that ensure compatibility with the surrounding land uses.

LU 3.1 Coordinated and Efficient Land Use - This project offers land use efficiency in an area where adequate services and facilities are located. The subject property is located next to a neighborhood center where infill development, redevelopment, and new development is encouraged in accordance with GMA goals.

LU 3.2 Centers and Corridors - This project is located at the perimeter of the designated neighborhood center around which growth is focused. The neighborhood center was a result of neighborhood planning that would rely upon residents living in variety of housing types including multi-family dwellings. The most dense housing should be focused in and around the neighborhood center. Density of housing within the core should be 32-units per acre and up to 22-units per acre at the perimeter. At full build-out of the subject property and all undeveloped multi-family properties around the perimeter, the density would be about 12.3 units per acre.

LU 3.3, 3.4, 3.6 Neighborhood Centers - The location of the Indian Trail and Barnes neighborhood center (one of seven neighborhood centers within the city) was chosen based on: existing and planned density; amount of commercial land needed to serve the neighborhood; and transportation capabilities including public transit.

While the majority of the land within and around the center has been developed, no multi-family housing exists within the core and other designated multi-family housing developments at the perimeter do not meet target densities - resulting in a need for more near the core.

LU 3.11 Compact Residential Patterns - The goal is to allow more compact, affordable housing in all neighborhoods, including townhouses and row houses. These dwellings mark a transition between the large single-family lots and the proposed multi-family dwellings.

LU 4.1, 4.2, 4.4 Transportation - The subject property is located near an existing public transit stop, designated bicycle routes and pedestrian paths. The project will provide easy access to support alternative transportation modes. Multi-family housing located near the neighborhood center provides opportunities for people to walk to work, shopping, dining, and other services to reduce automobile trips. Pedestrian sidewalks internal to the development will be provided and efforts will be made to coordinate with the street department to add crosswalks across Barnes Road to have safer access to the neighborhood center. Internal bike lanes are envisioned to promote bicycle travel.

LU 5.1, 5.2 Built and Natural Environment/Environmental Quality Enhancement - Development related to this project will not adversely impact the environmental quality of the area beyond normal residential-type noises and emissions. All parking areas will be paved and undeveloped areas will be attractively landscaped, therefore minimizing any dust related air quality concerns. Stormwater will be properly contained and disposed of in accordance with all local, state, and federal regulations, therefore minimizing groundwater quality concerns. The property is located near a major arterial with only commercial and multi-family developments in between. In addition, on-site parking will be provided throughout the project. The existing single family developments in the area should not be negatively impacted by project-related traffic or parking within the neighborhoods.

LU 5.3 Off-site Impacts - The property is located near a major arterial with only commercial and multi-family developments in between. In addition, on-site parking will be provided throughout the project. The existing single family developments in the area should not be negatively impacted by project-related traffic or parking within their immediate neighborhoods.

LU 5.4 Natural Features and Habitats - The property within this development has already been developed with streets, sidewalks, lighting and utilities. As such, no environmentally significant natural features or wildlife habitat will be disrupted by this proposal.

LU 6.5 Elementary School Location - The subject site is within safe walking distance of Woodridge Elementary school. The walking route currently has crosswalks across Indian Trail Road at a signalized intersection. Internal sidewalks will be provided for safe walking routes.

TR 1 Overall Transportation - This proposal supports the overall goal of promoting alternative modes of transportation and reducing dependency on automobiles. By locating higher density housing near Neighborhood Centers, the likelihood of pedestrian and bicycle travel will increase. The increased density will also support the existing public transit system that averaged only 10 and 6 boardings per day at the two nearest stops in 2014.

TR 3.1 Transportation and Development Patterns - This proposal would utilize the City's existing transportation system and infrastructure and would reduce sprawl.

TR 3.2 Reduced Distances to Neighborhood Services - As previously discussed, the proximity of this development creates opportunities for the residents to walk or bicycle to the Neighborhood Center for their daily needs. The intent of the Neighborhood Center is to attract neighborhood residents, not to draw people from

outside the neighborhood.

TR 3.4 Increased Residential Densities - The higher density of this development would promote the efficiency of alternative transportation modes.

TR 3.5 Healthy Commercial Centers - The increased population near the Neighborhood Center would support existing businesses to help keep it financially healthy and maintain, or increase, the City's commercial tax base. The additional residents would also help attract new businesses that would provide beneficial services and employment opportunities to all the residents in the Indian Trail neighborhood.

TR 4.4 Arterial Location and Design - This project is located near and would utilize the existing arterial street system. No new roadways would be constructed.

TR 4.6 Internal Connections - The multi-family community would be provided with efficient transportation circulation with multiple connections to the public streets, school routes, pedestrian and bicycle routes.

TR 5.2 Neighborhood Transportation Options - This project would promote the desired transportation alternatives within the neighborhood.

TR 6 Environmental Protection - Development of this proposed property would increase density on land that has already been developed for single-family use. All stormwater runoff will be contained and disposed of on site without any adverse impact to the surrounding environment. No new paved roadways will be created by this proposal. The site will be well vegetated after construction to minimize negative environmental impacts of transportation.

Spokane Municipal Code

The following is a list of considerations that validate this proposed Comprehensive Plan amendment in accordance with SMC 17G.020.030.

A. Regulatory Changes.
Amendments to the comprehensive plan must be consistent with any recent state or federal legislative actions, or changes to state or federal regulations.

No known regulatory changes have occurred recently that would have an effect or be affected by this proposal.

B. GMA.
The change must be consistent with the goals and purposes of the state Growth Management Act.

This amendment is consistent with applicable goals and policies of the GMA. See above for GMA discussion.

C. Financing.
In keeping with the GMA's requirements for plans to be supported by financing commitments, infrastructure implications of approved comprehensive plan amendments must be reflected in the relevant six-year capital improvement plan(s) approved in the same budget cycle.

With the exception of traffic, comments received from the City's public service and utility providers relating to this amendment indicate that all essential services provided for by capital services and utilities can be accommodated without diminishing or degrading services to existing users. Also, with the exception of Indian Trail Road and the Assembly Street/Francis Avenue intersection, no essential services or utility upgrades have been identified, and are thus, not included in any six-year plan. The Indian Trail Road Widening and Assembly Street/Francis Avenue Intersection projects appear in the Citywide Capital Improvement Program within the Impact Fee Program, but complete funding has not been secured. In addition, the Pavement Maintenance Program lists Indian Trail Road for proposed roadway resurfacing in 2018, 2019, and 2021.

Adverse traffic demands along portions of Indian Trail Road and Francis Avenue were identified in the Traffic Impact Analysis (TIA). While all signalized intersections within the study met the City's Level of Service (LOS) standards, existing lane capacity issues during peak-hour driving periods along sections of Indian Trail Road were identified. In addition, according to the TIA, although the overall intersection's LOS were found to meet concurrency standards, the westbound approach to Maple Street/Francis Avenue intersection was forecast to have an 89-second delay during the PM peak hour, representing a LOS F condition. The acceptable LOS E requires an 85-second delay. Details to mitigate the delay have been included in the TIA.

Impact fees are commonly used to aid in meeting capacity related Growth Management Act concurrency requirements. These fees are assessed to developments to pay proportionate costs associated with the service area-wide water, sewer, and transportation needs for new improvements created by the new developments.

The proposed traffic mitigation includes re-striping and widening Indian Trail Road within the identified bottleneck area. The current resurfacing project will be expanded to include the required restriping and widening work. Additional costs associated with the restriping and widening will be paid in part from traffic impact fees attributable to this project paid upfront along with the developer's private funds. The developer's private funds will be reimbursed from the collection of traffic impact fees on future projects or impact fee credits against future projects sponsored by this developer.

Additional mitigation includes offering free public transit passes to the residents of the new development to lessen traffic impacts.

Please see the TIA for further mitigation discussion.

D. Funding Shortfall
If funding shortfalls suggest the need to scale back on land use objectives and/or service level standards, those decisions must be made with public input as part of this process for amending the comprehensive plan and capital facilities program.

Funding shortfalls are not anticipated since funding has been secured for the road resurfacing project, and the proponent is fronting costs associated with restriping and widening portions of Indian Trail Road.

No requests have been made to reduce the service level standards on any essential services, nor is it warranted.

E. Internal Consistency
The requirement for internal consistency pertains to the comprehensive plan as it relates to all of its supporting documents, such as the development regulations, capital facilities program, shoreline master program, downtown plan, critical areas regulations, and any neighborhood planning documents adopted after 2001. In addition, amendments should strive to be consistent with the parks plan, and vice versa. As appropriate, changes to the map or text of the comprehensive plan must also result in corresponding adjustments to the zoning map and implementation regulations in the Spokane Municipal Code.

This amendment is consistent with the Citywide Capital Facilities Program. With the exception of the Indian Trail Road widening and resurfacing projects, the program has not identified capital facility or service needs in the area. The resurfacing project will be expanded to restripe and widen portions of the Indian Trail Road, but will not affect the existing funding commitments. The Indian Trail Road widening project has been listed in the Impact Fee Program of the Six-Year Comprehensive Street Program, but is not fully funded and, according to the City, is not officially considered to be included in the six-year plan. No other capital needs have been identified. Through the comprehensive plan amendment process, the application has been circulated to the appropriate essential service providers including; emergency medical, fire, law enforcement, libraries, parks, solid waste, streets, wastewater management, water, solid waste, recycling, transit and schools. Responses received indicate that all services can be efficiently provided to satisfy the needs of the proposed development.

The requested land use designations and zoning classifications changes will occur simultaneously and are consistent with the Comprehensive Plan policies. The land use and zoning maps illustrate multi-family zones around the center that create a buffer to the single-family zones. The subject property is contiguous with other multi-family zones, is on land surrounding the neighborhood center, which follows the direction of the comprehensive plan and, therefore, meet the rule of consistency.

F. Regional Consistency.

All changes to the comprehensive plan must be consistent with the countywide planning policies (CWPP), the comprehensive plans of neighboring jurisdictions, applicable capital facilities or special district plan, the regional transportation improvement plan, and official population growth forecasts.

This amendment will not have adverse impacts on the neighboring jurisdiction's essential services, or comprehensive plans, and is generally consistent with the countywide planning policies. Nine key policies are addressed in the CWPP. The following addresses these topics as they relate to this amendment.

- The designation of urban growth areas (UGAs).
  Discussion: Urban growth boundaries have been established and no urban growth boundaries or areas in the city or county will be affected by this amendment.

- Joint Planning within urban growth areas.
  Discussion: This property is not within a joint planning area, therefore, this policy is not applicable.

- Promotion of contiguous and orderly development and provision of urban services.
  Discussion: The subject property is located adjacent to an established neighborhood center where essential services are adequate to meet the demands of the new development without diminishing service to existing users. The center was established in accordance with the Comprehensive Plan and through planning efforts that included citizen involvement. The proposed additional living units will supplement already-developed, underutilized, multi-family properties surrounding the center.

- Parks and Open Spaces.
  Discussion: The subject property is located within walking distance of an established 5-acre city park – Pacific Park, and public school playgrounds at Woodridge Elementary school. In addition, the subject site is located approximately one mile from 14-acre Meadowglen Park and 16-acre Meadowglen Conservation area. Sundance Golf Course, The Spokane River, and Riverside State Park are also nearby.

- Transportation.
  Discussion: Public transportation is available within ¼-mile of the subject site. Existing sidewalks and bike lanes within the development will promote pedestrian and bicycle travel.

- Siting of capital facilities of a countywide or statewide nature.
  Discussion: NA

- Affordable Housing.
  Discussion: Multi-family housing is traditionally more affordable than single-family housing. GMA Housing Planning Goal (RCW 36.70A.020) encourages the availability of affordable housing to all economic segments of the population and promotes a variety of residential housing types while preserving existing housing stock. CP 6.2 states that CWPPs primary focus is to increase the availability of affordable housing for middle and lower-income households. Furthermore, affordable housing should be provided in locations readily accessible to employment centers. No existing housing stock will be displaced by this proposed development.

- Economic Development.
  Discussion: The GMA encourages economic development that is consistent with the comprehensive plan. This amendment is consistent with the comprehensive plan and will provide economic support to existing and future businesses in the neighborhood center.

G. Cumulative Effect.

All amendments must be considered concurrently in order to evaluate their cumulative effect on the comprehensive plan.

There are three proposed map amendments including this one. The other two proposals relate to map amendments on properties located a significant distance from the subject property of this amendment – See Appendix J.

Z1500078COMP – Avista proposes to change 14 properties in the Logan Neighborhood from R15-30 to Light Industrial and zone from RMF to LI. The properties are located more than nine miles from Windhaven. If approved, the project would eliminate the ability to construct up to 83 multi-family housing units within the City, placing greater demand for multi-family properties.

Z1500085COMP - Queen B Radio proposes to change one property in the Southgate Neighborhood at S. Regal and Palouse Highway from open space to Centers and Corridors Core and zone RSF to CC2-DC. The property is located approximately 14 miles from Windhaven.

It is not likely that public service demands from Windhaven will have an adverse impact on either of the above proposals and vice versa.

H. SEPA.

SEPA review must be completed on all amendment proposals.

The proposed amendment is currently under SEPA review by the appropriate agencies. The City of Spokane is the lead agency. The review process will consider related land use types and affected geographic sectors to evaluate the proposal's cumulative impacts. With the exception of minor traffic implication, no cumulative adverse impacts are anticipated. A single threshold determination will result for related proposals.

Traffic impact mitigation has been proposed, including restriping and widening portions of Indian Trail Road, and offering free bus passes to some of the future residents of Windhaven to lessen traffic impacts on Indian Trail Road and Francis Avenue.

I. Adequate Public Facilities.

The amendment must not adversely affect the City's ability to provide the full range of urban public facilities and services citywide at the planned level of service, or consume public resources otherwise needed to support comprehensive plan implementation strategies.

This amendment application was circulated by the City to agencies providing essential services to the local residents to assess the effects on service capacity. This is to ensure that services required by the proposed development do not degrade or diminish services to existing users. The comprehensive plan and GMA stress the importance of providing capital facilities and utilities efficiently. One of the most important principles of the GMA requires that public facilities and services be provided concurrent with development. As such, concurrency standards were established to measure level of service. The project will satisfy all concurrency standards for essential services including; streets and sidewalks, road lighting systems, traffic signals, domestic water systems, stormwater management, sanitary sewer systems, solid waste disposal, recycling, fire, police, park, and recreation facilities, schools, and libraries.

While the neighborhood groups have expressed their opposition of this proposal, citing inadequate water,

emergency response, parks, school capacity, etc., no agencies have indicated that such services are lacking capacity. To the contrary, comments received from the providers indicate that all services can be adequately provided so support the development's needs. The project's TIA has identified a lane capacity issue along a portion of Indian Trail Road, but mitigation measures have been offered in response. In addition, standard GFC and impact fees will be collected from the developer at the time of development to pay proportionate costs of affected services.

Impact fees are commonly used to aid in meeting capacity related Growth Management Act concurrency requirements. These fees are assessed to developments to pay proportionate costs associated with the service area-wide water, sewer, and transportation needs for new improvements created by the new development.

J. UGA.
Amendments to the UGA boundary may only be proposed by the city council or the mayor of Spokane.

No alterations to the UGA are being requested.

K. Consistent Amendments – Map Changes.
Changes to the land use plan map may only be approved if the proponent has demonstrated that all of the following are true:

- *a. The designation is in conformance with the appropriate location criteria identified in the comprehensive plan;*
- *b. The map amendment or site is suitable for the proposed designation;*
- *c. The map amendment implements applicable comprehensive plan policies better than the current map designation.*

This amendment to the comprehensive plan is an adjustment to the land use map and zoning around the existing neighborhood center that was envisioned by the city and neighborhood in 2007. Zoning in and around the North Indian Trail neighborhood center was established and adopted by the city council through city ordinance C34154 following a center planning process that included significant public participation. The center planning process was created in the 2007 budget to accomplish center/corridor and sub-area planning. The process amended the land use map and zoning map to implement the center and corridors concepts of the comprehensive plan and to ensure development in the neighborhood center was driven by the desires of the directly affected citizens. City planning services staff and the North Indian Trail stakeholder's team conducted five neighborhood meetings and an open house. Changes to the comprehensive plan relating to the center were consistent with GMA planning goals for urban growth (RCW 36.70A.020) which states: "encourage development in urban areas where adequate public facilities and services exist or can be provided in an efficient manner". In addition, the amendment was consistent with GMA planning goals for housing which states: "encourage the availability of affordable housing to all economic segments of the population of this state, promote a variety of residential densities and housing types, and encourage the preservation of existing housing stock".

The need for this amendment is to adjust for multi-family housing growth that has failed to materialize in and around the neighborhood center. The land that was made available for multi-family housing has been under-developed with densities far below the zoning minimums and do not meet the comprehensive plan's goals and neighborhood's expectations for sustaining the neighborhood center.

It has been suggested by the North Indian Trail Neighborhood Council, Five Mile Prairie Neighborhood Association and others that approval of this amendment would be in violation of the sub-area plan that was adopted for the Indian Trail center by the passing of ordinance C34154. When in fact quite the opposite is true. This amendment supports the spirit of the envisioned plan by providing supplemental multi-family housing at the center that never materialized on the properties that were designated for such housing. Furthermore, this amendment should be approved because:

1. The proposed multi-family designation conforms to appropriate location criteria;
2. The site is suitable for the multi-family designation;
3. This amendment implements applicable comprehensive plan policies better than the current single-family designation.

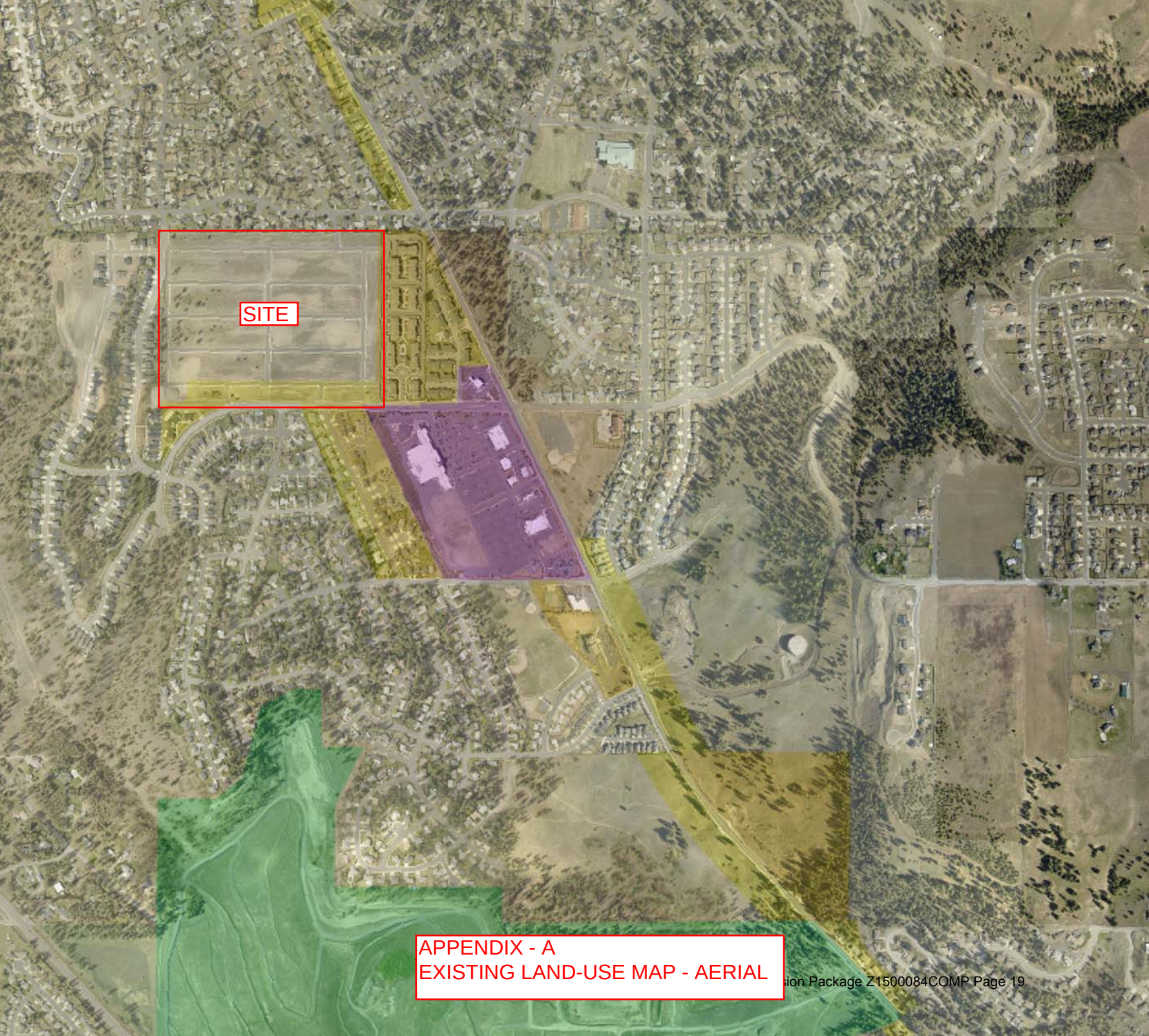
L. Inconsistent Amendments.
Review Cycle, Adequate Documentation of Need for Change, Overall Consistency.

This amendment is consistent with the comprehensive plan. There is a need for multi-family housing in and around the neighborhood center as well as around the Spokane area in general as stated in the Spokesman Review article dated 7/6/16 – See Appendix K.

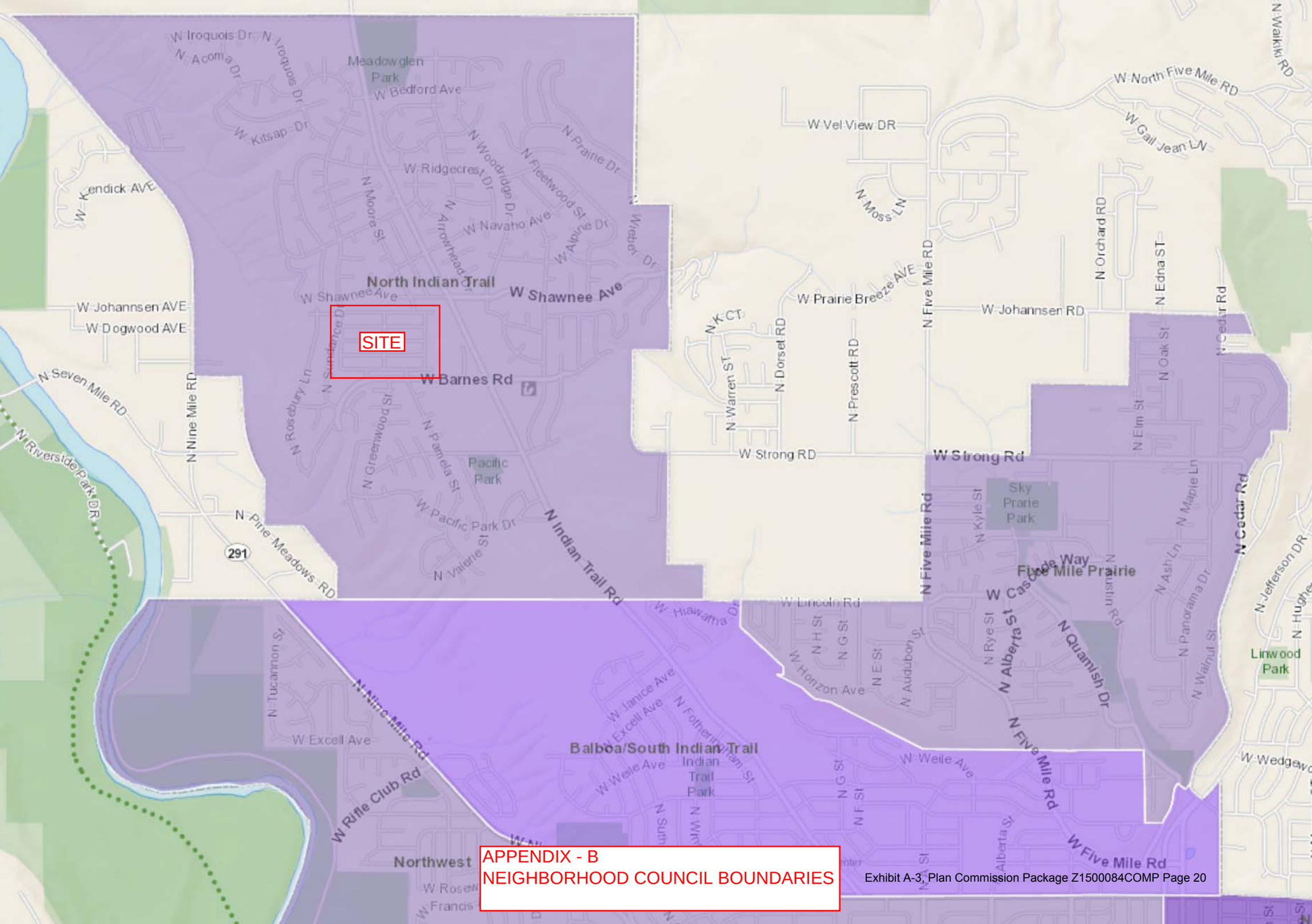
The article references a report prepared by Washington Center for Real Estate Research (See Appendix K-1, Runstad Center for Real Estate Studies/ University of Washington) that found Spokane's apartment vacancy rate is currently at a near-historic low of 1.3 percent. It further states that a healthy rental market should typically be around 5 percent. The article states that rental shortages are due to economic effects from the Great Recession of 2007 and 2008 and demographic shifts that have increased the number of people looking for rentals. Furthermore, home values plummeted and many people lost their homes to foreclosure. Credit ratings were severely impacted and many people today are unable to qualify for a mortgage. Others are wary of becoming homeowners as a result of the real estate crash. Younger people tend to prefer apartments to owning a home.

As stated above, there is also a need for multi-family housing at the neighborhood center to support the economic needs of the businesses within the center and to supplement envisioned multi-family housing.

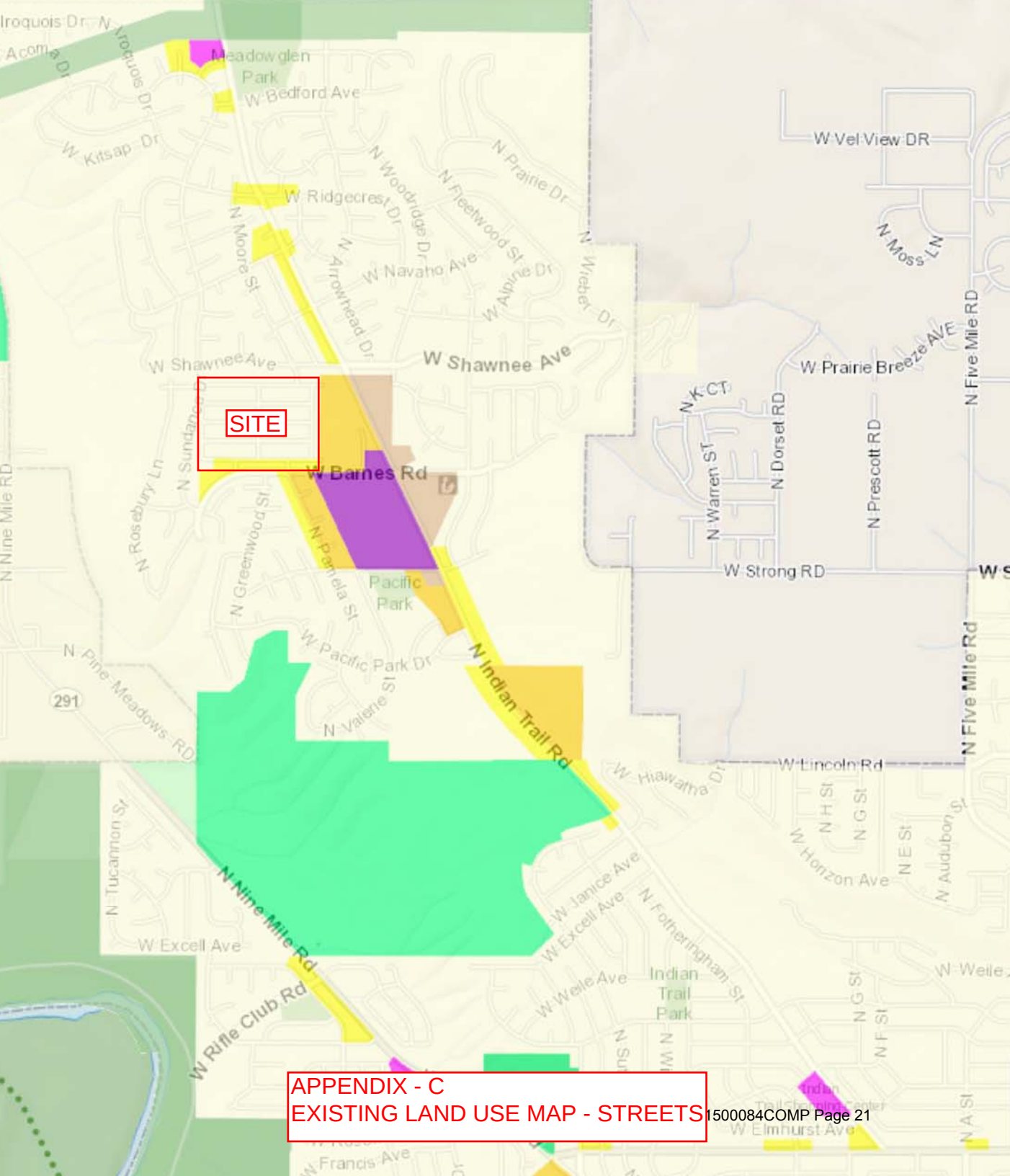
The amendment is overall consistent with the comprehensive plan, as described above.



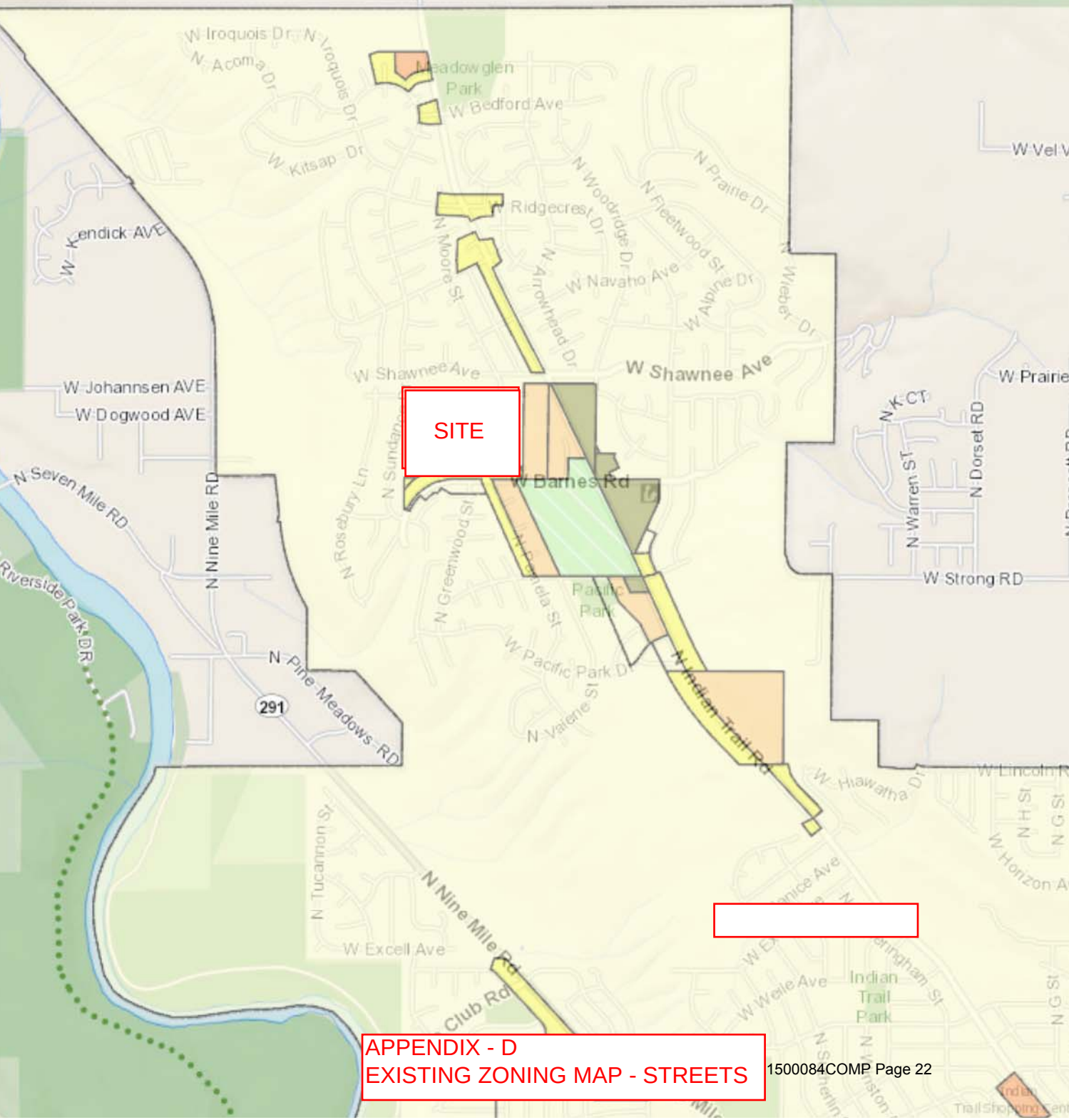
APPENDIX - A
EXISTING LAND-USE MAP - AERIAL



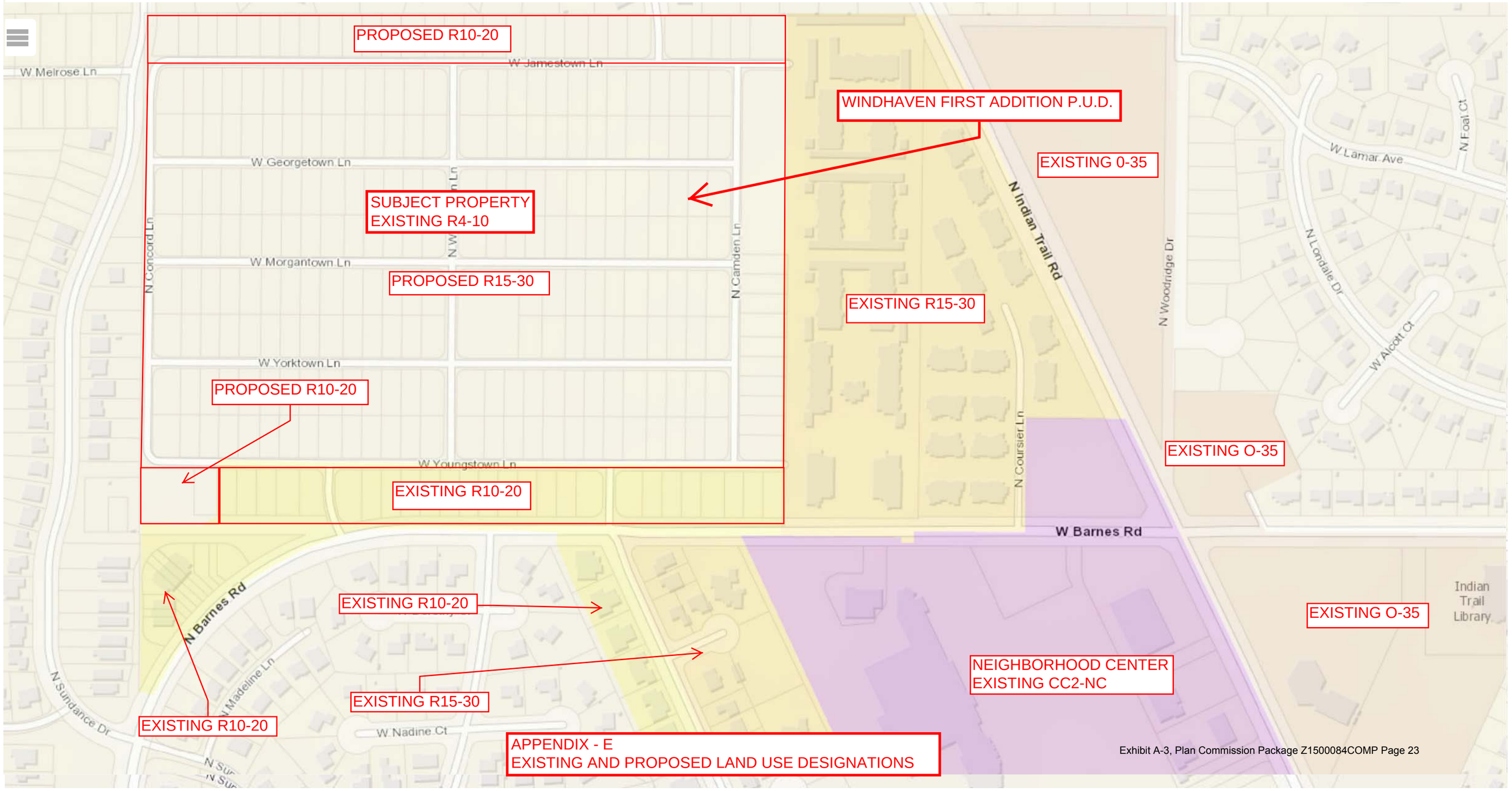
APPENDIX - B
NEIGHBORHOOD COUNCIL BOUNDARIES

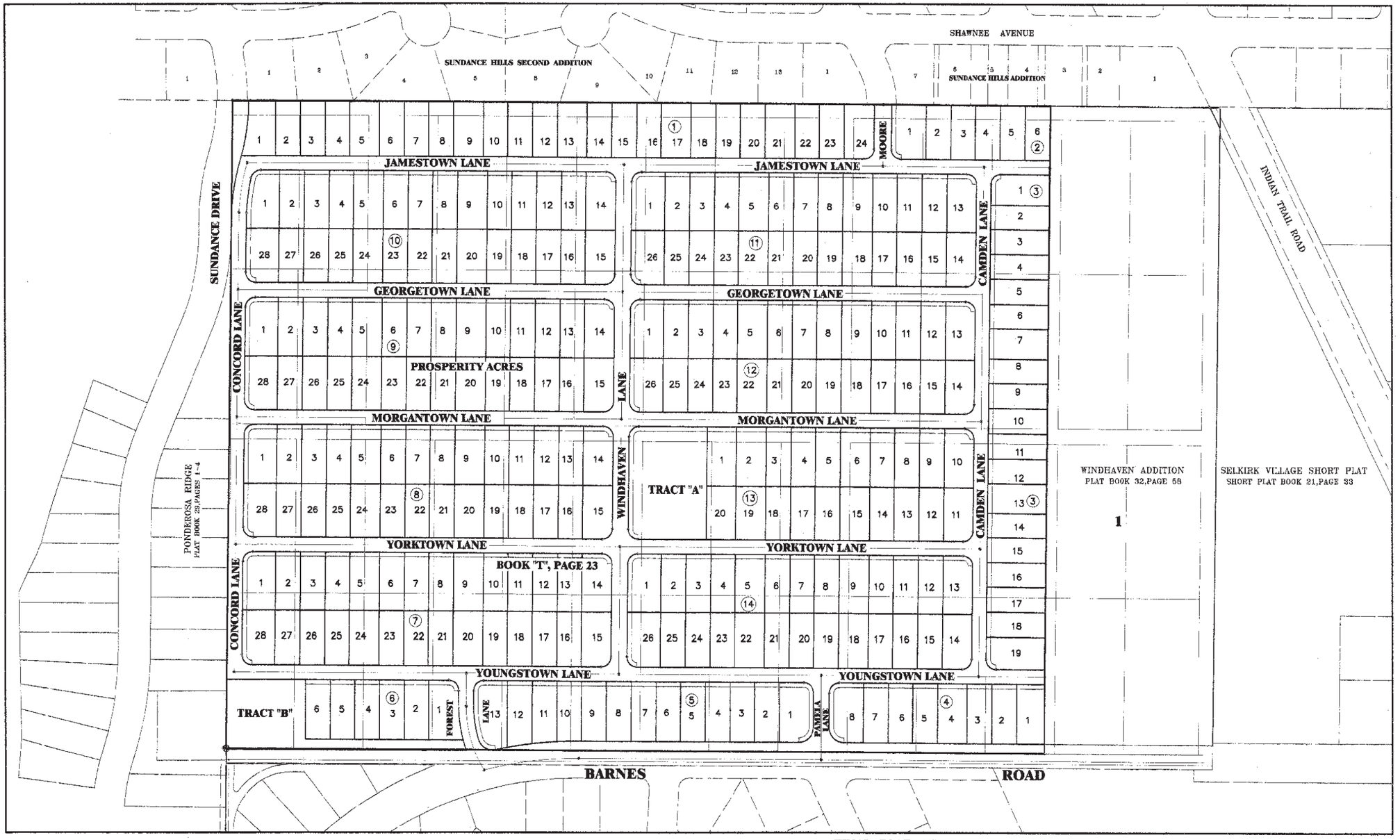


APPENDIX - C
EXISTING LAND USE MAP - STREETS



APPENDIX - D
EXISTING ZONING MAP - STREETS


PROPOSED R10-20
W Jamestown Ln
W Melrose Ln
WINDHAVEN FIRST ADDITION P.U.D.
EXISTING 0-35
W Georgetown Ln
SUBJECT PROPERTY
EXISTING R4-10
N Concord Ln
N Camden Ln
N Indian Trail Rd
N Woodridge Dr
W Lamar Ave
N Foal Ct
N Londale Dr
W Alcott Ct
W Morgantown Ln
PROPOSED R15-30
EXISTING R15-30
W Yorktown Ln
PROPOSED R10-20
N Coursier Ln
EXISTING O-35
W Youngstown Ln
EXISTING R10-20
W Barnes Rd
N Barnes Rd
EXISTING R10-20
Indian Trail Library
EXISTING O-35
N Madeline Ln
NEIGHBORHOOD CENTER
EXISTING CC2-NC
N Sundance Dr
EXISTING R15-30
W Nadine Ct
EXISTING R10-20
APPENDIX - E
EXISTING AND PROPOSED LAND USE DESIGNATIONS



FINAL PLAT OF

Windhaven First Addition

A PLANNED UNIT DEVELOPMENT

BEING A REPLAT OF BLOCKS 274,275,312,313,338,339,376,377 AND A PORTION OF BLOCKS 273,314,337 & 378 OF THE FINAL PLAT OF PROSPERITY ACRES. LOCATED IN THE N.W.1/4 SEC.22,T26N,R42E.W.M.,

CITY OF SPOKANE, WASHINGTON

CLIFFORD E. CAMERON — STATE OF WASHINGTON — 22840 — REGISTERED PROFESSIONAL LAND SURVEYOR — EXPIRES: 11-11-2006

9/5/06

PAGE 2 OF 6

Cameron & Associates

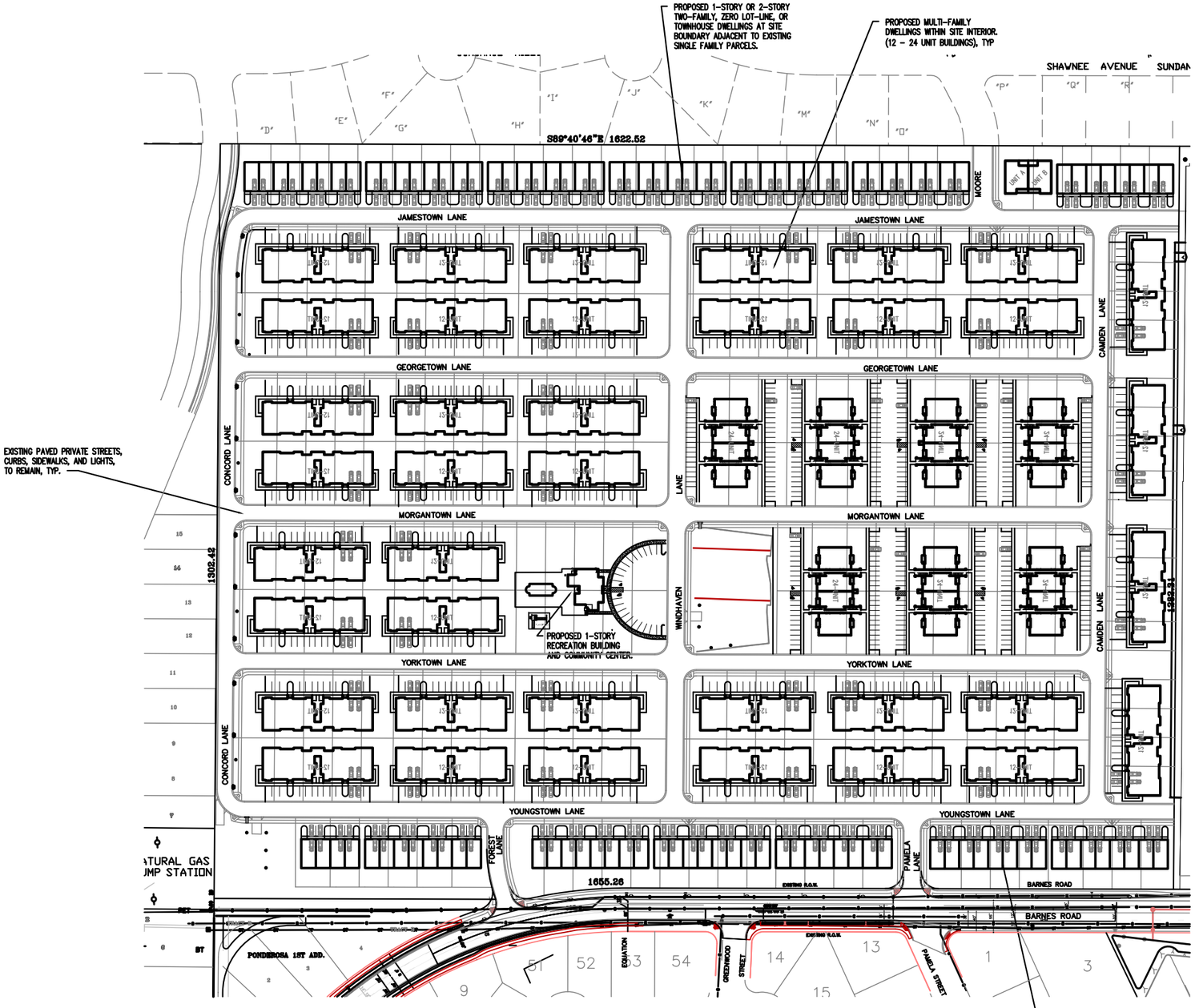
P.O.BOX 641
COLBERT,WA 99005
509/467-0148

SCALE:1"=100'

100' 60' 0' 100' 200'
GRAPHIC SCALE

Sheet 2/6

APPENDIX - F
WINDHAVEN FIRST ADDITION, P.U.D. FINAL PLAT



CONCEPTUAL SITE PLAN

SCALE: 1" = 100'

UNDERGROUND SERVICE ALERT
ONE-CALL NUMBER
811
CALL TWO BUSINESS DAYS BEFORE YOU DIG

APPENDIX - G
CONCEPTUAL SITE PLAN

ISSUED 5/3/16

NOTE:
THE INFORMATION PRESENTED ON THIS DRAWING IS FOR INFORMATIONAL PURPOSES ONLY AND MAY BE SUBJECT TO CHANGE. FINAL RESIDENTIAL DENSITY, SITE LAYOUT AND BUILDING CONFIGURATIONS HAVE NOT BEEN DETERMINED.

REV.	DATE	BY	DESCRIPTION

J.R. BONNETT ENGINEERING
CIVIL AND STRUCTURAL CONSULTING AND DESIGN
803 E. 3RD AVENUE
SPOKANE, WASHINGTON 99202
(509) 534-3929 / FAX (509) 534-4014

JOB TITLE: WINDHAVEN FIRST ADD. COMP. PLAN AMENDMENT — BARNES ROAD — SPOKANE, WA

SHEET TITLE: CONCEPTUAL SITE PLAN

5/3/16

DATE: MAR, 2016
DRAWN BY: JRB
DESIGN BY: JRB
JOB NO.: 13-071.10
SHEET NO.: EX1.2

Contents

Layers	Legend

Property

Parcel

Planning

Landuse Plan

- Conservation Open Space
- Potential Open Space
- Open Space
- Agriculture
- Residential 4-10
- Residential 10-20
- Residential 15-30
- Residential 15+
- Office
- CC Core
- CC Transition
- Neighborhood Retail
- Mini Center
- General Commercial
- Downtown
- Light Industrial
- Heavy Industrial
- Institutional
- Mining

Updated 7/21/16

SUBJECT PROPERTY

PROPERTY 1
R15-30 (FULLY DEVELOPED)
AREA = 10 ACRES
ALLOWED NO. OF UNITS = 300
EXISTING NO. OF UNITS = 212
ADDITIONAL ALLOWED = 88

PROPERTY 2
R15-30 (FULLY DEVELOPED)
AREA = 6.78 ACRES
ALLOWED NO. OF UNITS = 203
EXISTING NO. OF UNITS = 96
ADDITIONAL ALLOWED = 107

PROPERTY 8
0-35 (FULLY DEVELOPED)
AREA = 4.45 ACRES
ALLOWED NO. OF UNITS = NA
EXISTING NO. OF UNITS = 96

PROPERTY 7
R10-20 (FULLY DEVELOPED)
AREA = 1.9 ACRES
ALLOWED NO. OF UNITS = 38
EXISTING NO. OF UNITS = 10
ADDITIONAL ALLOWED = 28

PROPERTY 3A - CENTER CORE
R15-32 (DEVELOPED-COMMERCIAL)
AREA = 21.74 ACRES
ALLOWED NO. OF UNITS = 696
EXISTING NO. OF UNITS = 0
ADDITIONAL ALLOWED = 696

PROPERTY 6
R10-20 (FULLY DEVELOPED)
AREA = 5.26 ACRES
ALLOWED NO. OF UNITS = 106
EXISTING NO. OF UNITS = 27
ADDITIONAL ALLOWED = 79

PROPERTY 3B - CENTER CORE
R15-32 (UNDEVELOPED)
AREA = 11.64 ACRES
ALLOWED NO. OF UNITS = 372
EXISTING NO. OF UNITS = 0
ADDITIONAL ALLOWED = 372

PROPERTY 5
R15-30 (PARTIALLY DEVELOPED)
AREA = 9.93 ACRES
ALLOWED NO. OF UNITS = 298
EXISTING NO. OF UNITS = 34
ADDITIONAL ALLOWED = 264

PROPERTY 9A
R10-20 (FULLY DEVELOPED)
AREA = 1.9 ACRES
ALLOWED NO. OF UNITS = 38
EXISTING NO. OF UNITS = 6
ADDITIONAL ALLOWED = 32

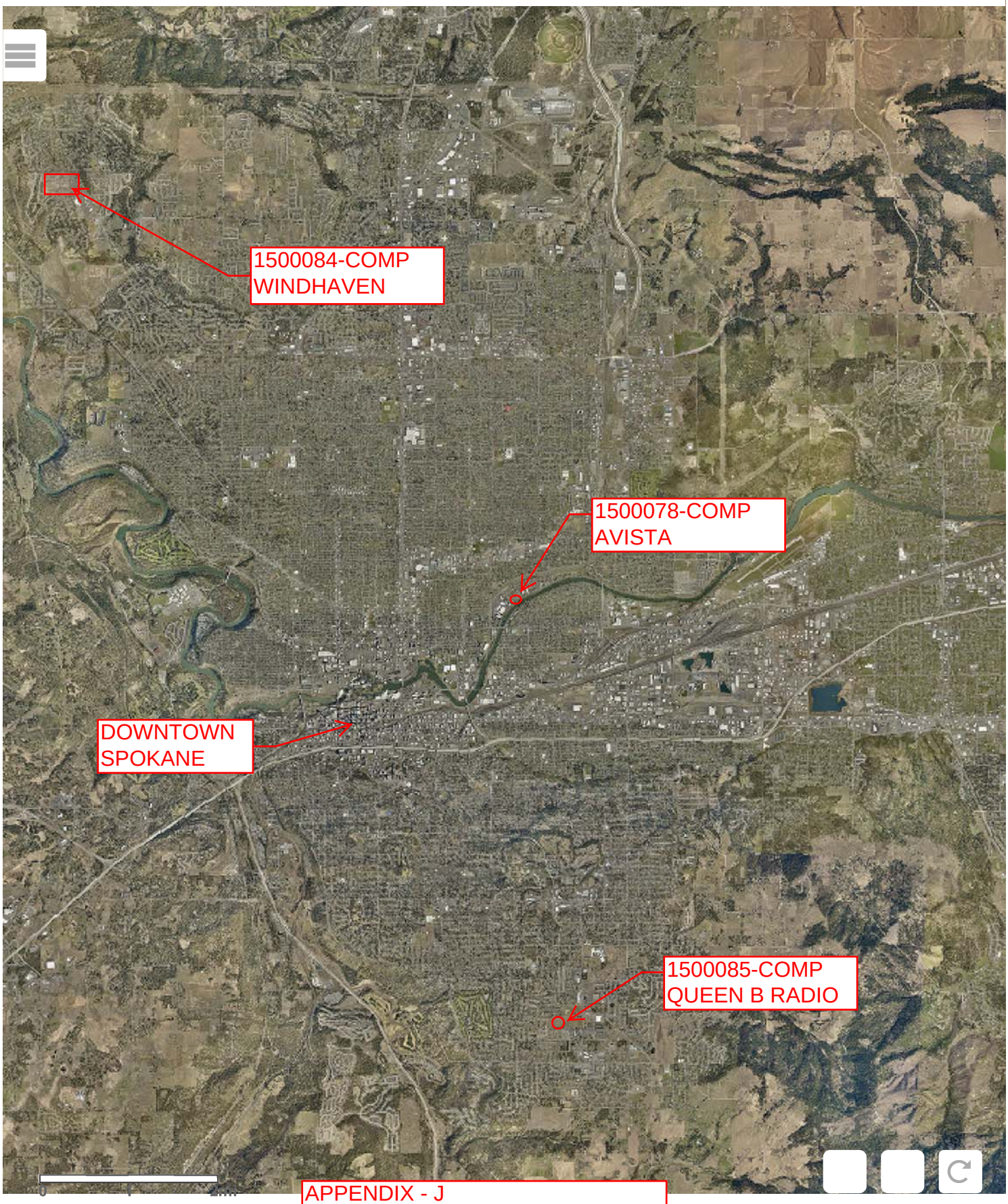
PROPERTY 4
R15-30 (DEVELOPED-COMMERCIAL)
AREA = 6.76 ACRES
ALLOWED NO. OF UNITS = 203
EXISTING NO. OF UNITS = 0
ADDITIONAL ALLOWED = 203

PROPERTY 9B
R10-20 (UNDEVELOPED)
AREA = 8.4 ACRES
ALLOWED NO. OF UNITS = 168
ADDITIONAL ALLOWED = 168

MULI-FAMILY LAND USE UTILIZATION SUMMARY
TOTAL DEVELOPED AREA = 67.72 ACRES
TOTAL ALLOWED UNITS = 2,050
TOTAL EXISTING UNITS = 481
TOTAL ADDITIONAL ALLOWED UNITS = 1,569
EXISTING MULTI-FAMILY DENSITY = 7.1 UNITS/ACRE

APPENDIX - H
EXISTING MULTI-FAMILY LAND USE UTILIZATION @ NEIGHBORHOOD CENTER

TABLE LU 2 DESCRIPTION OF LAND USE DESIGNATIONS			
Land Use Designations	**Typical Land Use**	**Minimum Density (units per acre)**	**Maximum Density (units per acre)**
Heavy Industrial	Heavier Industrial uses. No residential uses		
Light Industrial	Light industrial uses, limited commercial and residential uses.		
General Commercial	Commercial and residential uses, warehouses.		
Regional Center (Downtown)	Variety of goods, services, cultural, governmental, hospitality, and residential uses. Downtown plan provides detail of planning for this area.		
Neighborhood Retail	Neighborhood-Serving Business and residential use. Maximum containment area of two acres.		30
Neighborhood Mini-Center	Same uses as Neighborhood Retail.		30
Office	Offices and residential use.		
Institutional	Includes uses such as middle and high schools, colleges, universities, and large governmental facilities.	Same standards as designation in which institution is located or as allowed by discretionary permit approval.	
Residential 15+	Higher density residences. No medical office or other office use allowed.	15	
Residential 15-30	Higher density residences.	15	30
Residential 10-20	Attached or detached single-family and two-family residences.	10	20
Residential 4-10	Attached or detached single-family residences.	4	10
Agriculture	Agricultural lands of local importance.		
Conservation Open Space	Areas that are publicly owned, not developed and designated to remain in a natural state.		
Potential Open Space	Areas that are not currently publicly owned, not developed and expected to remain in a natural state.		
Open Space	Major publicly or privately owned open space areas such as golf courses, major parks and open space areas, and cemeteries.		
Neighborhood Center	Neighborhood-oriented commercial uses, offices, mixed-type housing, parks, civic uses in a master-planned, mixed-use setting.	15	32 in the core, 22 at the perimeter
District Center	Community-oriented commercial uses, offices, mixed-type housing, parks, civic uses in a master-planned, mixed-use setting.	15	44 in the core, 22 at the perimeter
Corridor	Community-oriented commercial uses, mixed-type housing in a master-planned, mixed-use setting.	15	44 in the core, 22 at the perimeter
Employment Center	Major employment uses, community-oriented commercial uses, mixed-type housing in a master-planned, mixed-use setting.	15	44 in the core, 22 at the perimeter
Center & Corridor Core	Commercial, office and residential uses consistent with type of designated Center and Corridor. [per Ord. #C-33240, effective 7-18-03]		
Center & Corridor Transition	Office, small retail, and multi-family residential uses. Office and retail uses are required to have residential uses on the same site. [per Ord. #C-33240, effective 7-18-03]		



APPENDIX - J
COMP. PLAN AMENDMENTS
RELATIVE LOCATIONS

Map Use Disclaimer

Waste not!

Put underappreciated radish greens to use

FOOD, C1

THE SPOKESMAN-REVIEW

WEDNESDAY, JULY 6, 2016 | PASSING SHOWER ▲74 ▼54 | WWW.SPOKESMAN.COM

Election 2016: Public lands leadership up for grabs NORTHWEST, A5

Spokane renters face competitive market

Single-family apartments, homes shrink in availability, grow in price

By Rachel Alexander
rachela@spokesman.com, (509) 459-5406

After a month of searching for a new apartment, Cory Rinderneck was still coming up blank.

Rinderneck, 25, and a friend began searching for a two-bedroom apartment in May after their third roommate moved out.

They were looking for a place under $800 a month and willing to live in nearly any part of Spokane or Spokane Valley. But they quickly found few apartments were open, and the ones that were rented nearly instantly.

Also today

» **On the rise:** Map shows changes in Spokane single-family rentals./A8

"Two hours after the posting went up we'd be third in line," Rinderneck said.

Spokane's apartment vacancy rate is at a near historic low of 1.3 percent, according to the Washington Center for Real Estate Research's report released this spring. A 5 percent vacancy rate is typical for a robust, healthy rental market, but Spokane's rate was last above 5 percent in March 2012, past

See RENTERS, A8

FIREWORKS SET OFF FEARS

PHOTOS BY DAN PELLE danp@spokesman.com

SCRAPS Animal Protection Officer Jennifer Merrell coaxes a stray shepherd-husky mix from the backyard of a home near 18th Avenue and Hatch Street on Tuesday. Brian Hantz found the dog roaming loose and contained it until Merrell arrived late in the morning.

Owners search for runaway pets

Number of impounded animals spikes in early July, SCRAPS says

By Chad Sokol
chadso@spokesman.com, (509) 459-5047

and couldn't find her."

Perkins is one of dozens of pet owners who arrived at the Spokane County Regional Ani-

Associated Press

Hillary Clinton speaks at a campaign rally in Charlotte, N.C., on Tuesday with President Barack Obama.

FBI ADVISES NO CHARGES AGAINST CLINTON

Director: Email setup 'extremely careless'

By Eric Tucker and Ken Thomas
Associated Press

WASHINGTON – The FBI lifted a major legal threat to Hillary Clinton's presidential campaign Tuesday, recommending no criminal charges for her handling of highly classified material in a private email account. But Director James Comey's scathing criticism of her "extremely careless" behavior revitalized Republican attacks and guaranteed the issue will continue to dog her.

Comey's announcement effectively removed any possibility of criminal prosecution arising from Clinton's email practices as President Barack Obama's secretary of state. Attorney General Loretta Lynch said last week that she intended to accept the recommendations of the FBI and of career prosecutors.

But the FBI director's blistering televised statement excori-

See FBI, A4

Authorities arrest felon in overdose death case

Suspect allegedly forced meth on victim

By Scott Maben
scottm@spokesman.com,
(208) 758-0260

The grandson of a former West Palm mayor died last August after investigators say he was forced at gunpoint to eat a

FROM THE FRONT PAGE

RENTERS

Continued from A1

reports show.

That rate is based on a survey of apartments, not other rental properties like houses. But property managers say little to no vacancy has been the norm across rental properties for about a year.

Brian and Sandra Jones began renting houses in West Central almost by accident, after their daughter had trouble finding an affordable place to live. They began buying dilapidated homes in 2014 and fixing them up to flip or rent out.

"I said, I can handle 750 middle school kids by myself. How hard can this be?" said Brian Jones, who's a retired middle school principal.

The couple currently manages two duplexes, both of which they bought in December 2014. Jones said they've been able to fill vacancies "immediately."

Eric Bessett, president and owner of Madison Real Estate, estimated the company's 880 properties had a vacancy rate lower than 2 percent. Most of those properties are single-family rentals.

"We get holding fees and new applications on a lot of them before the old tenants have even moved out," Bessett said.

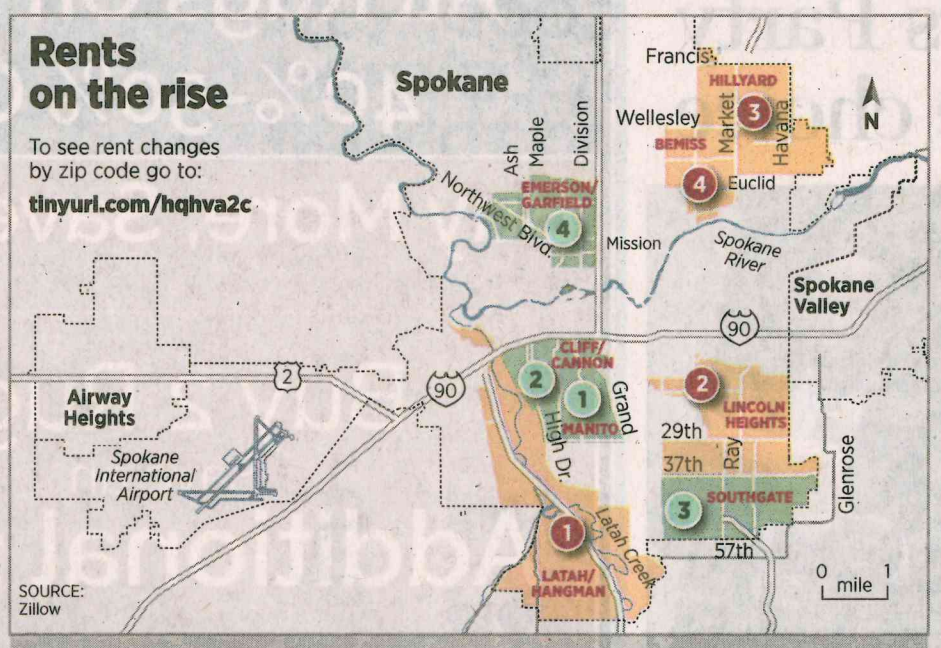
Landlords say they're receiving dozens of responses within hours of posting ads for available rentals, and many prospective tenants end up disappointed.

"A lot of them are like an hour too late. They'll respond to an ad or respond to a sign and someone has rented the place before they got there," said Maria Trunkenbolz, the president of M-T Management, which manages about 400 rental properties in the Spokane area.

Rinderneck's roommate ended up moving back in with his parents since the pair couldn't find an apartment together.

"There's no other options right now," Rinderneck said.

"I've been doing this for 35 years. I've never seen it like this," Trunkenbolz said.



Percentage change in median rent for homes, June 2015 to May 2016

(Monthly rent for May 2016)

	LARGEST CHANGE		SMALLEST CHANGE	
1	Manito/Cannon $1,462 per month	12.38%	Latah/Hangman $1,549 per month	-4.26%
2	Cliff/Cannon $1,290 per month	7.77%	Lincoln Heights $1,156 per month	.61%
3	Southgate $1,452 per month	7.64%	Hillyard $888 per month	2.19%
4	Emerson/Garfield $916 per month	6.39%	Bemiss $878 per month	3.29%

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JESSE TINSLEY jesset@spokesman.com

Brian and Sandra Jones stand in the vestibule of an older West Central home that's been divided into a duplex, which they have refurbished and rented out. The couple have invested in a handful of rental properties and have no trouble filling them with tenants because of the tight rental market in the Spokane area.

Tight market has its roots in recession

The roots of Spokane's rental shortage lie in the Great Recession, as well as demographic shifts that have increased the number of people looking for rentals.

When the housing market collapsed in 2007 and 2008, new construction halted and many homes lost as much as one-third of their value.

After the market settled down, many people had lost their homes to foreclosure. Others were wary of becoming homeowners after witnessing the chaos of the recession. Some saw their credit ratings fall and were no longer eligible for mortgages.

"Since then, there's been a preponderance of people that are renting as opposed to purchasing," said Rawley Harrison, the owner of Watson Management.

Slow construction in understanding among younger workers that they need to be labor mobile, and it's hard to be labor mobile if you're having to constantly buy and sell a house every time you move for a new job," said Grant Forsyth, chief economist for Avista.

Lee Arnold, the founder of Secure Investments, a real estate lending firm, said some people are being forced into renting because there aren't enough houses to buy.

"There's such a shortage of inventory right now that the people who want to buy a house can't find one," he said.

Migration into Spokane is compounding the issue. Economists say Spokane's labor market is picking up, driving more people to move here for jobs in growing sectors like health care. Many of them can't find homes to buy right away or want to get the feel of a neighborhood before committing to a home long-term.

Rents climb, but not as fast as Seattle's

In spite of the low vacancy, rents in Spokane haven't climbed anywhere near as quickly as in Seattle, where the median price to rent a square foot

His tenants had been living there for a year and agreed to the raise.

Other landlords are still reluctant to charge more. Aaron Villemure rents a duplex in the Finch Arboretum area and charges $550 for each side of the house. He said that's unlikely to change even if the vacancy rates stay low because he doesn't want to push out good tenants.

"I can't justify really in my mind raising it more than it is," he said. "If you find a good tenant, you want to keep them for as long as they want to stay."

But rents are going up, especially in more popular neighborhoods. Zillow's data shows Manito and Cliff-Cannon have had the largest increases in median rent for single-family homes over the last year at 12.4 percent and 7.8 percent, respectively. Meanwhile, rents on single-family homes have climbed just 2.2 percent in Hillyard and 0.6 percent in Lincoln Heights, while falling 4.3 percent in the Latah Valley.

Zillow does not have neighborhood-level data on apartments in Spokane, but many brokers and managers say rents are rising across the board. Harrison said apartment rents have been rising about 2 to 3 percent per year for the past few years, but may climb as much as 5 percent this year. He agrees popular neighborhoods like the lower South Hill are seeing faster increases, but the upward trend is citywide, he said.

"There's really no segment of the rental marketplace that's not impacted," Harrison said.

Rent increases have low-income housing advocates worried. Because landlords have their pick of tenants, they're more likely to turn away people who have less-than-perfect rental histories or who have low-income housing vouchers.

"People that have very little choices because the vacancy rate's low, they're not finding places," Anderson said. "I don't know what's happening to that population. I think we have a lot of doubling up, a lot of couch-surfing."

Washington also allows landlords to give tenants 20 days notice to vacate without any reason. Some cities, including Seattle, have passed more restrictive laws requiring just cause for these notices; Spokane has not. In a tight rental market, Anderson said that leaves tenants less likely to complain about poor housing conditions or ask for repairs for fear of being asked to move out.

"That's a real concern, particularly with the low vacancy rates. They could actually become homeless and have never missed a day of rent," she said.

Prospective renters have to worry about more than finding a place to rent. Some have also been targeted by scammers.

Arnold said that's common to see in hot rental markets, where people are desperate to find a place to live. He lived in Salt Lake City around the 2002 Olympics and said he remembered a case where a landlord went to jail after advertising a home for rent and accepting $75 application fees from prospective renters with no intention of actually renting the home.

Selah Stapp, 23, has been looking for a one- or two-bedroom apartment in the Perry District for a month and a half with no luck. She's now expanded her search, but has found many ads for rentals are misleading.

"We've been interested in like six different places and three of them were scammers," Stapp said. One woman took a $50 fee to run a credit check but took weeks to return the money after she decided to rent the unit to someone else, Stapp said. Two other ads listed properties that Stapp discovered were not owned by the person who placed the ad and were not actually for rent.

"We're striking out left and right. It's horrible," Stapp said.

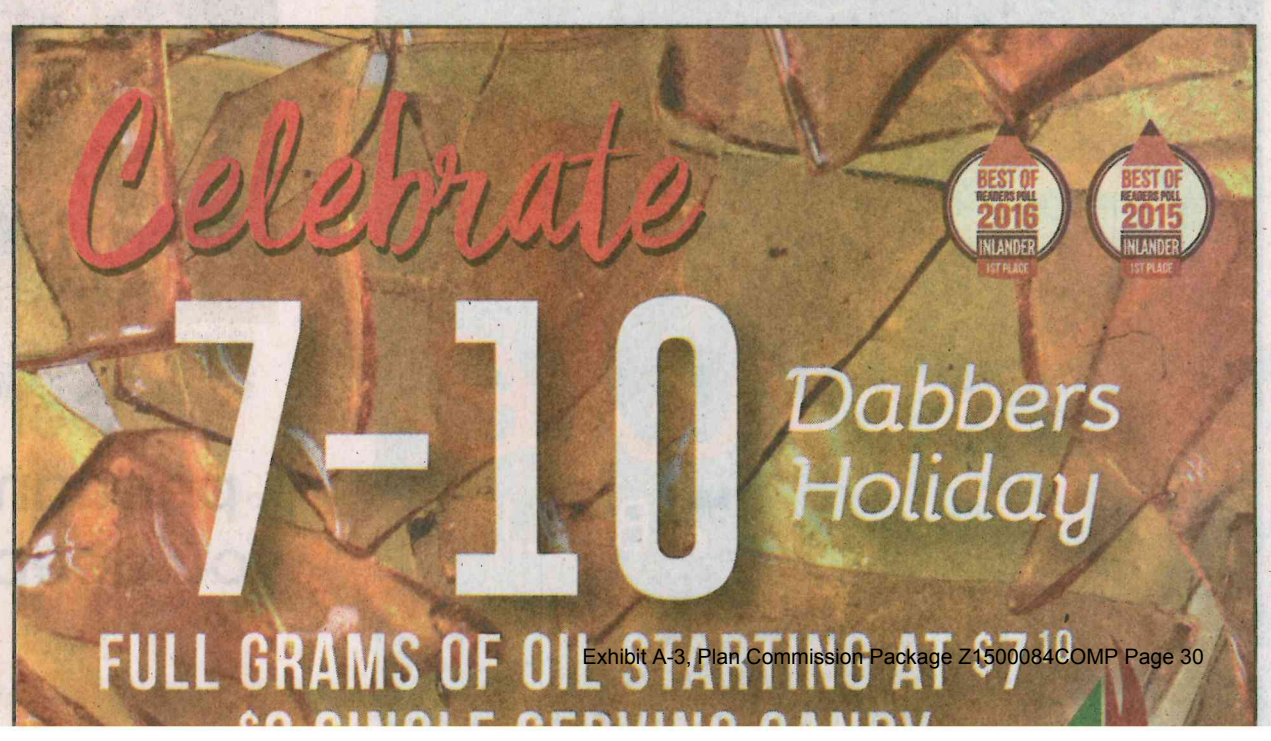
Apartments that fill quickly are good news for landlords, but it's not all bad news for renters. Vacancy rates are similarly low across the state, the Washington Center for Real Estate Research report says, but Spokane County has the lowest average apartment rent of 19 Washington counties surveyed by the center, at $660.

Single-family home rentals remain more affordable in Spokane County than in much of the state. In May 2016, the median rent for a single-family home ranged from a low of $876 per month in the 99207 ZIP code, which includes parts of Hillyard and Bemiss, to $1,634 in the 99019 ZIP code, south of the city of Liberty Lake.

Rising rents in Spokane are more likely to be a trend for a few years than a way of life, experts say. Cities like San Francisco and Seattle that have become synonymous with skyrocketing rents are geographically bounded by water and other features that make growth difficult. Spokane, in contrast, has room to develop.

Spokane developer Jim Frank, president of Greenstone Corp., said the market is likely to stabilize over the next few years as developers build more apartment units to meet demand from millennials.

"When a shift like that occurs, it takes a lot of time to fill the demand," he said.



both of which they bought in December 2014. Jones said they've been able to fill vacancies "immediately."

Eric Bessett, president and owner of Madison Real Estate, estimated the company's 880 properties had a vacancy rate lower than 2 percent. Most of those properties are single-family rentals.

"We get holding fees and new applications on a lot of them before the old tenants have even moved out," Bessett said.

Landlords say they're receiving dozens of responses within hours of posting ads for available rentals, and many prospective tenants end up disappointed.

"A lot of them are like an hour too late. They'll respond to an ad or respond to a sign and someone has rented the place before they got there," said Maria Trunkenbolz, the president of M-T Management, which manages about 400 rental properties in the Spokane area.

Rinderneck's roommate ended up moving back in with his parents since the pair couldn't find an apartment together.

"There's no other options right now," Rinderneck said.

"I've been doing this for 35 years. I've never seen it like this," Trunkenbolz said.

2	Cliff/Cannon $1,290 per month	7.77%	2	Lincoln Heights $1,156 per month	.61%
3	Southgate $1,452 per month	7.64%	3	Hillyard $888 per month	2.19%
4	Emerson/Garfield $916 per month	6.39%	4	Bemiss $878 per month	3.29%

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"Since then, there's been a preponderance of people that are renting as opposed to purchasing," said Rawley Harrison, the owner of Watson Management.

Slow construction in the years following the recession has meant a shortage of available housing, both for prospective renters and buyers. Some homeowners who couldn't sell their houses in the years following recession became "accidental landlords," Trunkenbolz said. Now that the housing market has picked up, they're starting to sell, making the rental shortage worse.

Younger people are waiting to get married and have children and tend to prefer apartments to owning a home.

"There's a growing understanding among younger workers that they need to be labor mobile, and it's hard to be labor mobile if you're having to constantly buy and sell a house every time you move for a new job," said Grant Forsyth, chief economist for Avista.

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Rents climb, but not as fast as Seattle's

In spite of the low vacancy, rents in Spokane haven't climbed anywhere near as quickly as in Seattle, where the median price to rent a square foot spiked 24 percent from 2014 to 2015, according to the Seattle Times. Some say that's because wages in Spokane remain relatively low, so landlords aren't able to charge more for units.

"The only reason our rents aren't raising is because our income isn't getting any higher," said Terri Anderson, an organizer with the Tenants Union of Washington State.

Brian Jones recently raised the rent for a three-bedroom unit in one of his West Central homes to pay for repairs and other improvements he'd made. His tenants had been living there for a year and agreed to the raise.

Other landlords are still reluctant to charge more. Aaron Villemure rents a duplex in the Finch Arboretum area and charges $550 for each side of the house. He said that's unlikely to change even if the vacancy rates stay low because he doesn't want to push out good tenants.

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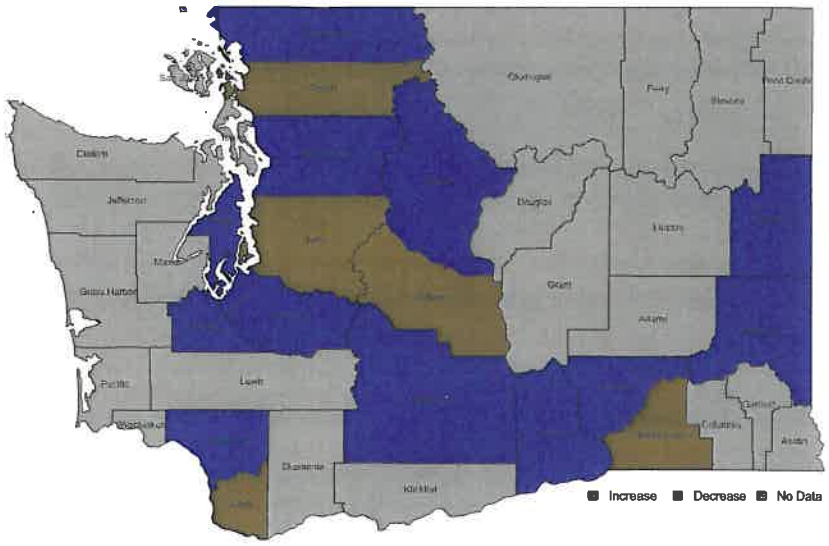
Spokane developer Jim Frank, president of Greenstone Corp., said the market is likely to stabilize over the next few years as developers build more apartment units to meet demand from millennials.

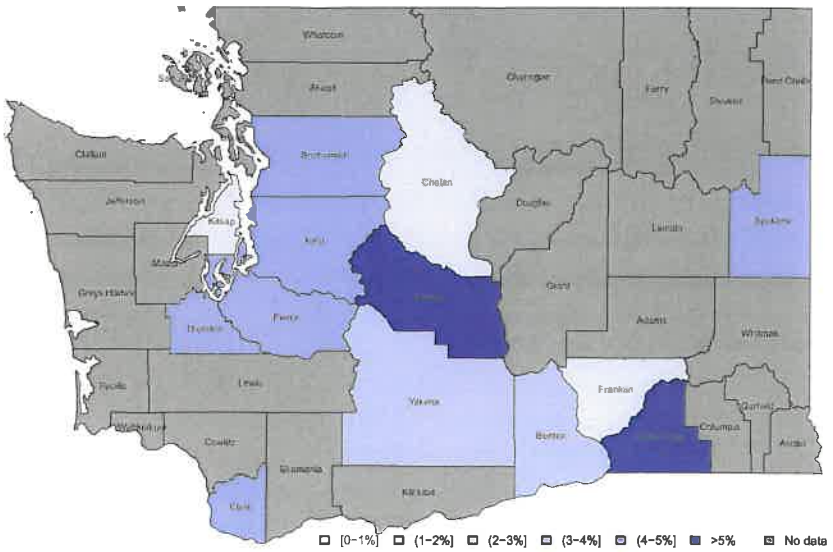
"When a shift like that occurs, it takes a lot of time to fill the demand," he said.

APPENDIX - K
SPOKESMAN REVIEW ARTICLE - 7/6/16

Washington Apartment Market — Spring 2016

Washington State's apartment vacancy rate decreased slightly to 3.0% following a new low set in Spring 2015. While there is variability among the individual county rates, all counties included in the survey had vacancy rates below 4%, including Kittitas county. The Kittias county data is often skewed because of the difficulty in gauging occupancy of a handful of buildings that typically house students at Central Washington University. Of the rest, sixteen counties have rates below three percent indicating a shortage of rental units. Seven of the eighteen counties included in the survey had decreasing vacancy rates compared to the same time period one year ago.





APPENDIX - K-1
WASHINGTON APARTMENT MARKET
SURVEY - SPRING 2016

Since 1996 the Washington Center for Real Estate Research (WCRER) has collected, analyzed, and published apartment market statistics for each of the 39-counties within the state of Washington. Produced semi-annually by the Runstad Center for Real Estate Studies at the University of Washington, the results provide an estimate of the overall apartment vacancy rate for each county in the state. In addition, an average unit size and corresponding rental rate is calculated, with a particular emphasis on one and two-bedroom apartment units. Data specific to the 5-county's that constitute the Seattle Metropolitan Area is provided with permission from Dupre + Scott (D+S), a prominent real estate research firm whose market attention and analysis is focused exclusively on the Puget Sound region. It is in combination with Dupre + Scott that the WCRER is able to provide the most comprehensive resource of apartment market data on a statewide basis.

Market Coverage / Response Rates

The current size of the overall Washington State apartment market is established by the total number of rental apartments quantified by the 2010 American Community Survey (ACS). As the base-line statistic, this number is adjusted by the total number of building permits authorized, which is published annually by the U.S. Bureau of the Census. Further, this information is disaggregated down to the county level, which serves as the unit of measurement in this report. The exception occurs within several counties where the level of market activity is relatively small by comparison. In these situations, particularly where the counties are contiguous, they are combined to form a single "market" area.

To generate a response rate for each individual market, the total number of apartment units identified by the completed and returned WCRER survey is compared to the total estimated number of rental apartments in each individual market. Once achieved, response rates from the D+S market research and the research conducted by the WCRER are combined to generate an overall statewide response. The resulting statistic for the combined surveys was nearly 59 percent, slightly higher than the previous survey.

While an overall response rate of 59 percent may sound low, the result is due to several contributing factors. First, there is a wide range of variability in the response rate among many of the more local markets with lower levels of inventory. Second, there are a significant number of apartment managers who do not respond to the survey due to the limited numbers of units within their respective projects. (D+S surveys are limited to projects with at least 20 units) Further, there is reluctance among some apartment manager's to share what they believe to be private information for the survey.

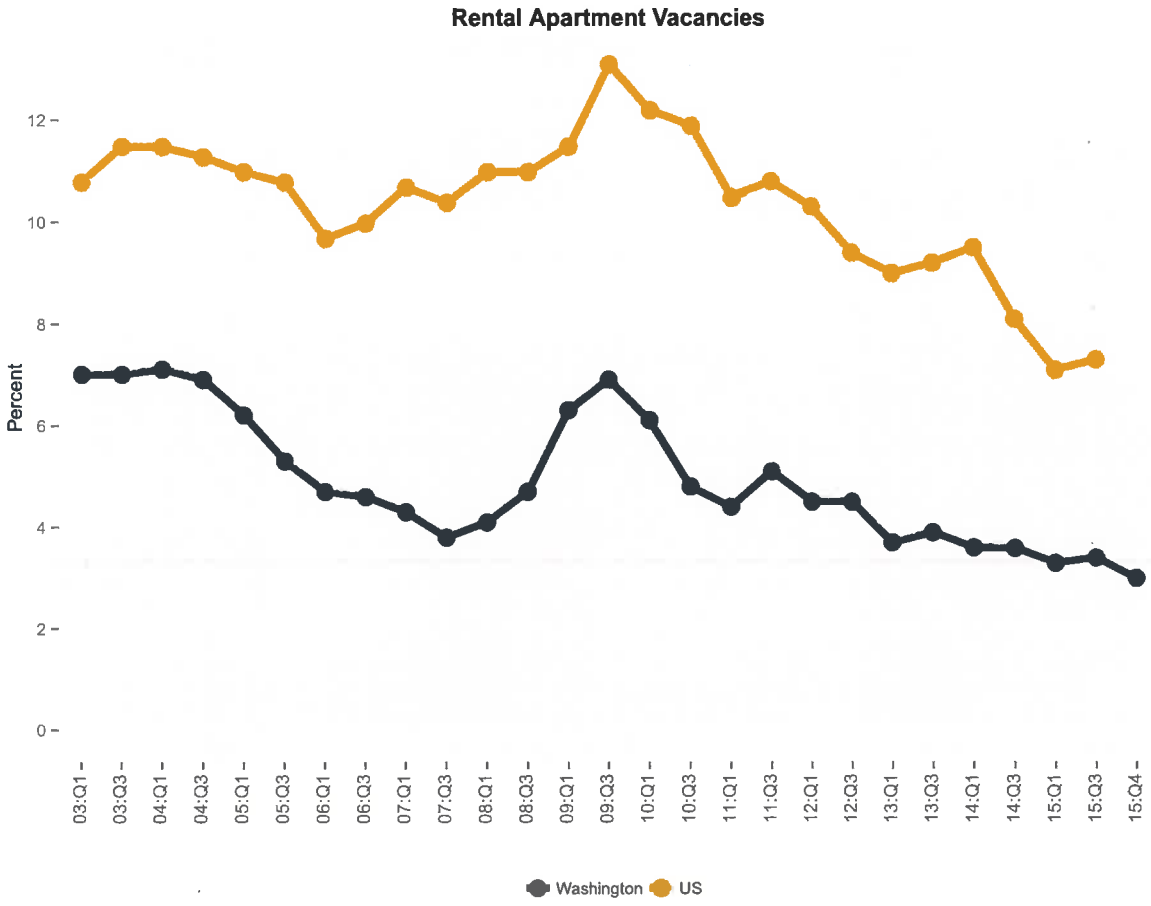
While neither the D+S survey nor the WCRER survey includes government-assisted housing, the total universe of rental units within the state includes both subsidized and market rate properties. This is a significant exception, particularly within the smaller communities where a greater proportion of the multifamily market is dependent on some form of Federal, state or local funding. In combination with all of the above factors, it is often difficult for local response rates to exceed half of the total numbers of rental units. In addition, response rates to surveys generally are declining, regardless of the business value of the aggregated data.

WCRER and Dupre + Scott Apartment Market Surveys
Market Coverage

County	2014 Rental Apartments	March 2016 Survey	Response Rate (%)
Benton/Franklin (Tri-Cities)	13,987	6,100	43.6
Chelan/Douglas (Wenatchee)	3,986	929	23.3
Clark (Vancouver)	24,570	15,089	61.4
Cowlitz (Longview/Kelso)	5,166	819	15.9
King (Seattle/Bellevue)	240,182	153,575	63.9
Kitsap (Bremerton)	13,229	6,786	51.3
Kittitas (Ellensburg)	3,030	1,790	59.1
Pierce (Tacoma)	52,801	39,508	74.8
Skagit (Mt. Vernon/Anacortes)	5,028	496	9.6
Snohomish (Everett)	47,369	32,378	68.4
Spokane	35,922	11,397	31.7
Thurston (Olympia)	15,770	9,411	59.7
Walla Walla		605	
Whatcom (Bellingham)	16,375	1,315	8.0
Whitman (Pullman)	5,890	4,788	81.3
Yakima	7,946	1,175	14.8
STATEWIDE	491,252	289,365	58.9

Market Summary

Historically, apartment markets nationwide registered record vacancies in the second quarter of 2004. For the next two years national apartment rental markets improved consistently before once again rising slightly due to an increase in multifamily construction. Today, particularly in the nation's major metropolitan areas, the apartment rental market has seen rental vacancies decline to their lowest level in over a decade. As of the first quarter of 2016, the statewide vacancy rate fell to a new low of 3.0 percent. Much of the decrease in vacancies can be attributed to an increase in household formations, coupled with a surge in relocation to Washington State as a result of robust job growth.



Over the past year Yakima County has recorded the greatest decrease in vacancy rate with a considerable drop of 5.8 percent (from 7.8% to 1.7%). Meanwhile, 10 counties have seen an increase in vacancy, led by an increase in Douglas County area. All of the counties included in the survey had vacancy rates below five percent. The lowest vacancy was in the Skagit county market, with a vacancy rate of only 0.2%, and the highest was in Snohomish County market recorded the highest vacancy, with 3.7 percent of units unrented.

Average rents ranged from a low of $660 in Spokane County to a high of $1,493 in King County. Since the largest share of apartments are located in the more expensive urban communities (more than 50% are in King County alone), it comes as no surprise that the statewide average rent of $1,261 is closer to the prevailing level in greater Seattle. The statewide average rent increased by 6.3 percent in the last year, reflecting the improving market conditions (from the perspective of landlords).

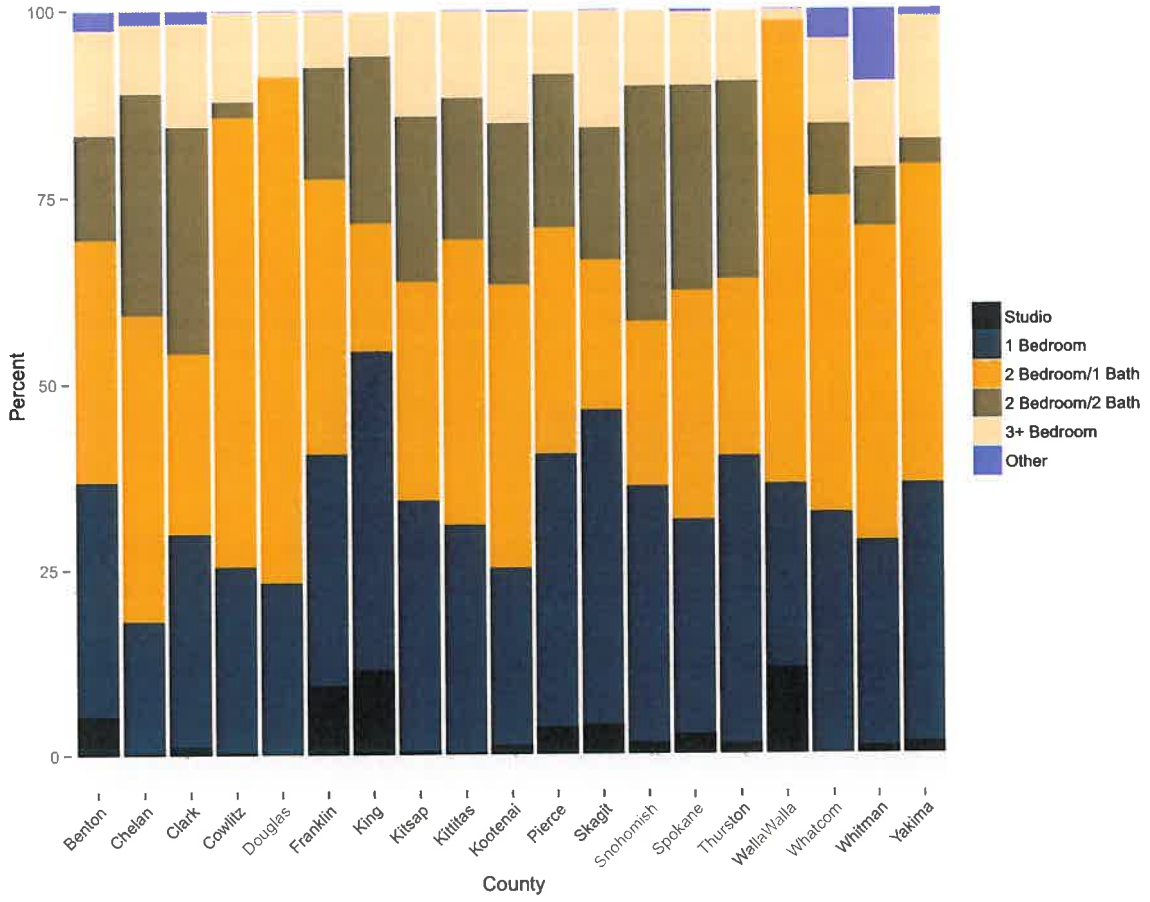
Appartment Summary Statistics: All Units

County	Avg. Size(sqft)	Avg. Rent($)	Units Surveyed	Units Vacant	Pct. Vacant
Benton	819	775	5,259	109	2.1
Chelan	790	1,078	860	17	2.0
Clark	903	1,048	15,089	266	1.8
Cowlitz	811	758	819	7	0.9
Douglas	798	818	69	1	1.4
Franklin	853	744	841	7	0.8
King	807	1,493	153,575	5,222	3.4
Kitsap	872	1,038	6,786	190	2.8
Kittitas	772	861	1,790	13	0.7
Kootenai	904	800	3,195	5	0.2
Pierce	846	990	39,508	1,106	2.8
Skagit	736	921	496	1	0.2
Snohomish	889	1,236	32,378	1,198	3.7
Spokane	849	660	11,397	143	1.3
Thurston	855	958	9,411	245	2.6
WallaWalla	688	783	605	21	3.5
Whatcom	736	859	1,315	11	0.8
Whitman	799	816	4,788	81	1.7
Yakima	766	682	1,175	23	2.0
STATEWIDE	831	1,261	289,356	8,666	3.0

The WCRER survey includes the average size of units within each apartment complex. The smallest apartment units are found in Walla Walla County where the average size is 688 square feet. The largest average apartment size is significantly larger in Kootenain at 904 square feet. While these aggregate statistics are interesting, it is important to compare similar types of properties across markets.

The following graphic clearly illustrates the differences in the composition of the apartment market from community to community. Studio apartments are more prevalent in Walla Walla, King andFrankin counties, while 2-bedroom/1-bath units are most frequently encountered in Clark, Cowlitz and Walla Walla counties. One-bedroom units are especially dominant in King, Skagit and Thurston counties. Since 1-bedroom or 2-bedroom units with one bath are most prevalent in virtually all communities, those unit types will be the basis of subsequent comparisons.

Composition of Apartment Market
Selected Washington Communities, March 2016



1-Bedroom Apartments

One-bedroom apartments are the most popular type of apartment unit in the state, accounting for about 38 percent of all the units in the combined WCRER and D+S surveys. The statewide vacancy rate for 1-bedroom units has steadily decreased from its peak of 6.5% in third quarter 2009 to a 6-year low of 3.0 percent in the spring 2016. Vacancy rates varied from county to county throughout the state, with 15 of the 18 counties included in the survey reporting fewer than 3.0 percent of one-bedroom apartments vacant. The highest vacancy rate for these small units was 3.8 percent in Snohomish County.

The average rent for one-bedroom units has increased by about $89 (8.2%) from last March to $1,179. Average rent also ranged widely from a low of $590 in Whitman County to a high in King County of $1,388. The average size for a one-bedroom unit was 675 square feet. The largest 1-bedroom apartments were found in Franklin County where the average size of surveyed units was 766 square feet, while in Kittitas County the average 1-bedroom unit was only 548 square feet.

Appartment Summary Statistics: 1 Bedroom Units

County	Avg. Size(sqft)	Avg. Rent($)	Units Surveyed	Units Vacant	Pct. Vacant
Benton	651	658	1,659	31	1.9
Chelan	619	1,155	153	5	3.3
Clark	698	982	4,314	62	1.4
Cowlitz	633	639	205	2	1.0
Douglas	674	695	16	0	0.0
Franklin	766	694	262	1	0.4
King	677	1,388	64,893	2,206	3.4
Kitsap	676	886	2,252	65	2.9
Kittitas	548	639	549	5	0.9
Kootenai	757	693	763	2	0.3
Pierce	660	845	14,398	360	2.5
Skagit	632	808	210	0	0.0
Snohomish	692	1,086	11,152	424	3.8
Spokane	699	622	3,293	59	1.8
Thurston	669	836	3,608	83	2.3
WallaWalla	558	618	150	0	0.0
Whatcom	601	724	428	2	0.5
Whitman	582	590	1,321	17	1.3
Yakima	636	626	409	4	1.0
STATEWIDE	675	1,179	110,035	3,328	3.0

2-Bedroom/1-Bath Apartments

The second most prevalent unit type in the state was the 2-bedroom/1-bath apartment, which accounted for about 22% of all the units responding to the survey. Average rent for a 2-bedroom/1-bath unit was $1,117, a $43 (4.0%) increase from the Spring 2016 survey. Average rents for 2-bedroom/1-bath units ranged from $545 in Spokane County to $1,417 in King County. The vacancy rate for 2-bedroom/1-bath units throughout the state fell half a percentage point since last March to 2.8 percent. Vacancy rates ranged from a high of 3.5 percent in Snohomish County to a low of 0 percent in Skagit County. Overall, sixteen counties had a shortage of 2-bedroom/1-bath units with vacancy rates less than three percent. In terms of unit size, Franklin County had the largest average size in the state (902 sq. ft.). The smallest 2-bedroom/1-bath apartments, on average, were in Skagit County (741 sq. ft.)

Appartment Summary Statistics: 2 Bedroom/1 Bath Units

County	Avg. Size(sqft)	Avg. Rent($)	Units Surveyed	Units Vacant	Pct. Vacant
Benton	855	765	1,716	52	3.0
Chelan	838	1,031	355	6	1.7
Clark	882	1,000	3,674	75	2.0
Cowlitz	821	773	495	5	1.0
Douglas	840	846	47	1	2.1
Franklin	902	699	311	4	1.3
King	864	1,417	26,056	886	3.4
Kitsap	868	972	1,967	47	2.4
Kittitas	771	787	687	6	0.9
Kootenai	843	779	1,219	2	0.2
Pierce	872	942	11,935	310	2.6
Skagit	741	844	100	0	0.0
Snohomish	887	1,153	7,154	250	3.5
Spokane	794	545	3,505	40	1.1
Thurston	851	911	2,213	58	2.6
WallaWalla	810	723	376	4	1.1
Whatcom	795	884	558	8	1.4
Whitman	778	754	2,020	34	1.7
Yakima	837	706	502	5	1.0
STATEWIDE	859	1,117	64,890	1,793	2.8

Time Trends

Consistency is the key to a more complete understanding of the time trends associated with different apartment markets. For example, seasonal patterns vary from community to community (e.g. academic year in Whitman and Kittitas counties; agricultural cycle in Yakima and Chelan/Douglas counties). Both WCRER and D+S conduct surveys in March and September—months that are less subject to seasonal variation. Results from the March 2015 and March 2016 surveys are shown in the following table. The statewide vacancy rate over the last year has slightly decreased to 3.0 percent, a decrease of 0.3 percentage points during the year. Since this rate is significantly below the 5 percent vacancy considered to represent "market equilibrium," where supply and demand are in balance, rent increases and continued apartment construction should be anticipated in the months ahead. It is notable that all markets included in the survey are below five percent vacancy, and thirteen of the markets are below three percent, indicating a shortage of rental units.

Given this decline in vacancy rates, average rents across markets increased $75 (6.3%) in the last year. However, nine counties have seen an increase in their overall vacancy rates, led by a 1.1 percent vacancy rate in Clark County. Meanwhile, there have been decreases in the vacancy rates in other communities, with Yakima County shedding 5.8 percentage points off its total vacancies. In terms of rent increases, the Wenatchee area (Chelan & Douglas) has seen the greatest rise in rental rates since March 2015 with an increase of $357 (50%).

Vacancy Rate and Average Rent Comparisons – Previous Year

County	Avg. Rent (Prior)	Pct. Vacant (Prior)	Avg. Rent	Pct. Vacant
Benton/Franklin (Tri-Cities)	786	1.7	771	1.9
Chelan/Douglas (Wenatchee)	701	1.3	1,058	1.9
Clark (Vancouver)	1,123	0.7	1,048	1.8
Cowlitz (Longview/Kelso)	675	1.0	758	0.9
King (Seattle/Bellevue)	1,371	3.3	1,493	3.4
Kitsap (Bremerton)	947	2.4	1,038	2.8
Kittitas (Ellensburg)	619	0.1	861	0.7
Pierce (Tacoma)	924	3.7	990	2.8
Skagit (Mt. Vernon/Anacortes)	883	0.0	921	0.2
Snohomish (Everett)	1,123	4.3	1,236	3.7
Spokane	748	1.8	660	1.3
Thurston (Olympia)	910	3.3	958	2.6
WallaWalla	886	2.7	783	3.5
Whatcom (Bellingham)	900	0.6	859	0.8
Whitman (Pullman)	695	1.7	816	1.7
Yakima	576	7.8	682	2.0
STATEWIDE	1,186	3.3	1,261	3.0

Runstad Center for Real Estate Studies / University of Washington

< 1986

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	0.0	591	1.21	129	6
1 Bedroom	1.5	663	1.04	1,113	28
2 Bedroom/1 Bath	1.6	742	0.88	1,269	30
2 Bedroom/2 Bath	0.9	735	0.73	328	9
3 Bedroom/1 Bath	5.9	918	0.97	119	3
3 Bedroom/2 Bath	0.8	833	0.77	252	14
Other	NA	NA	NA	NA	1
All	1.5	722	0.92	3,220	37

1986–1999

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	NA	NA	NA	NA	1
1 Bedroom	2.9	722	1.13	240	4
2 Bedroom/1 Bath	10.6	804	0.90	273	4
2 Bedroom/2 Bath	NA	NA	NA	NA	1
3 Bedroom/2 Bath	1.8	992	0.76	226	3
All	4.4	807	0.94	919	4

> 1999

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	NA	NA	NA	NA	1
1 Bedroom	2.5	580	0.80	282	5
2 Bedroom/1 Bath	2.2	898	0.99	134	3
2 Bedroom/2 Bath	1.2	1,078	1.03	329	5
3 Bedroom/2 Bath	3.1	1,158	1.01	130	4
Other	1.2	1,081	NA	85	2
All	2.0	913	0.99	1,008	5

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	0.4	617	1.22	277	8
1 Bedroom	1.9	658	1.01	1,659	37
2 Bedroom/1 Bath	3.0	765	0.90	1,716	38
2 Bedroom/2 Bath	0.9	902	0.87	737	15
3 Bedroom/1 Bath	5.3	909	0.96	131	4
3 Bedroom/2 Bath	1.6	962	0.84	608	21
Other	0.8	999	NA	131	3
All	2.1	775	0.95	5,259	47

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	2.1	775	0.947	5,259	47
September 2015	2.6	824	0.969	5,206	51
March 2015	1.8	785	0.942	5,569	51
September 2014	2.8	761	0.897	5,134	41
March 2014	3.9	784	0.897	4,198	42
September 2013	4.6	771	0.913	5,136	43

Kennewick

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	0.0	564	1.12	197	4
1 Bedroom	1.8	670	1.08	1,011	24
2 Bedroom/1 Bath	3.3	756	0.90	1,316	27
2 Bedroom/2 Bath	0.6	783	0.77	341	7
3 Bedroom/1 Bath	2.3	913	1.01	87	3
3 Bedroom/2 Bath	1.5	930	0.83	408	13
Other	NA	NA	NA	NA	1
All	2.1	747	0.93	3,370	32

Prosser

Unit Type	Pct. Vacant	Avg. Rent	Rent/SqFt($)	Units Surveyed	Complexes
NA	NA	NA	NA	NA	NA

Richland

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	1.2	747	1.47	80	4
1 Bedroom	2.1	636	0.92	624	13
2 Bedroom/1 Bath	2.4	798	0.89	372	11
2 Bedroom/2 Bath	1.3	1,005	0.95	396	8
3 Bedroom/1 Bath	NA	NA	NA	NA	1
3 Bedroom/2 Bath	2.0	1,027	0.85	200	8
Other	1.2	1,081	NA	85	2
All	2.1	826	0.98	1,801	15

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	0.4	617	1.22	277	8
1 Bedroom	1.9	658	1.01	1,659	37
2 Bedroom/1 Bath	3.0	765	0.90	1,716	38
2 Bedroom/2 Bath	0.9	902	0.87	737	15
3 Bedroom/1 Bath	5.3	909	0.96	131	4
3 Bedroom/2 Bath	1.6	962	0.84	608	21
Other	0.8	999	NA	131	3
All	2.1	775	0.95	5,259	47

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	2.1	775	0.947	5,259	47
September 2015	2.6	824	0.969	5,206	51
March 2015	1.8	785	0.942	5,569	51
September 2014	2.8	761	0.897	5,134	41
March 2014	3.9	784	0.897	4,198	42
September 2013	4.6	771	0.913	5,136	43

< 1986

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	NA	NA	NA	NA	1
1 Bedroom	3.5	1,194	1.93	144	7
2 Bedroom/1 Bath	3.0	1,141	1.48	200	5
2 Bedroom/2 Bath	4.1	1,457	1.64	122	5
3 Bedroom/1 Bath	0.0	910	1.01	43	3
Other	NA	NA	NA	NA	1
All	3.1	1,209	1.60	512	8

1986–1999

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
2 Bedroom/1 Bath	0.0	914	0.96	132	2
2 Bedroom/2 Bath	0.0	877	1.17	134	3
3 Bedroom/2 Bath	0.0	975	1.15	12	2
All	0.0	899	1.02	278	4

> 1999

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
2 Bedroom/1 Bath	NA	NA	NA	NA	1
3 Bedroom/1 Bath	NA	NA	NA	NA	1
Other	NA	NA	NA	NA	1
All	NA	NA	NA	NA	1

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	NA	NA	NA	NA	1
1 Bedroom	3.3	1,155	1.87	153	8
2 Bedroom/1 Bath	1.7	1,031	1.23	355	9
2 Bedroom/2 Bath	2.0	1,154	1.39	256	8
3 Bedroom/1 Bath	0.0	895	0.99	67	5
3 Bedroom/2 Bath	0.0	975	1.15	12	2
Other	6.7	898	NA	15	3
All	2.0	1,078	1.36	860	14

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	2.0	1,078	1.364	860	14
September 2015	1.4	798	1.029	910	15
March 2015	1.4	701	0.949	276	5
September 2014	1.7	764	1.020	782	11
March 2014	1.7	769	0.941	644	7
September 2013	0.6	758	0.902	834	12

Wenatchee

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	NA	NA	NA	NA	1
1 Bedroom	3.3	1,155	1.87	153	8
2 Bedroom/1 Bath	1.7	1,031	1.23	355	9
2 Bedroom/2 Bath	2.0	1,154	1.39	256	8
3 Bedroom/1 Bath	0.0	895	0.99	67	5
3 Bedroom/2 Bath	0.0	975	1.15	12	2
Other	6.7	898	NA	15	3
All	2.0	1,078	1.36	860	14

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	NA	NA	NA	NA	1
1 Bedroom	3.3	1,155	1.87	153	8
2 Bedroom/1 Bath	1.7	1,031	1.23	355	9
2 Bedroom/2 Bath	2.0	1,154	1.39	256	8
3 Bedroom/1 Bath	0.0	895	0.99	67	5
3 Bedroom/2 Bath	0.0	975	1.15	12	2
Other	6.7	898	NA	15	3
All	2.0	1,078	1.36	860	14

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	2.0	1,078	1.364	860	14
September 2015	1.4	798	1.029	910	15
March 2015	1.4	701	0.949	276	5
September 2014	1.7	764	1.020	782	11
March 2014	1.7	769	0.941	644	7
September 2013	0.6	758	0.902	834	12

< 1986

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	0.0	704	1.62	64	2
1 Bedroom	1.3	763	1.21	1,159	23
2 Bedroom/1 Bath	0.6	890	1.00	858	24
2 Bedroom/2 Bath	2.7	1,048	1.07	519	8
3 Bedroom/1 Bath	0.0	967	1.02	56	5
3 Bedroom/2 Bath	0.0	1,031	0.88	67	4
All	1.2	866	1.10	2,723	29

1986–1999

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	1.7	578	1.16	119	4
1 Bedroom	1.5	1,063	1.46	3,114	40
2 Bedroom/1 Bath	2.5	1,034	1.18	2,739	26
2 Bedroom/2 Bath	2.1	1,023	1.00	3,978	34
3 Bedroom/1 Bath	0.0	862	NA	55	2
3 Bedroom/2 Bath	1.4	1,402	1.22	1,829	26
Other	2.1	1,283	1.00	242	9
All	1.9	1,093	1.17	12,076	47

> 1999

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	NA	NA	NA	NA	1
2 Bedroom/1 Bath	2.4	1,065	1.06	42	2
2 Bedroom/2 Bath	0.0	780	0.84	96	3
3 Bedroom/2 Bath	1.3	720	NA	76	2
All	0.8	830	0.89	238	3

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	1.1	622	1.32	183	6
1 Bedroom	1.4	982	1.41	4,314	65
2 Bedroom/1 Bath	2.0	1,000	1.13	3,674	53
2 Bedroom/2 Bath	2.1	1,021	1.00	4,593	45
3 Bedroom/1 Bath	0.0	915	0.97	111	7
3 Bedroom/2 Bath	1.3	1,364	1.18	1,972	32
Other	2.1	1,283	1.00	242	9
All	1.8	1,048	1.16	15,089	80

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	1.8	1,048	1.161	15,089	80
September 2015	3.5	1,026	1.133	10,311	78
March 2015	0.7	1,123	1.227	5,484	23
September 2014	2.2	918	1.024	9,813	67
March 2014	3.3	916	0.987	8,284	63
September 2013	2.3	864	0.939	14,052	91

Battle Ground

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	NA	NA	NA	NA	1
2 Bedroom/1 Bath	NA	NA	NA	NA	1
All	NA	NA	NA	NA	1

Camas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	0.0	1,350	1.72	103	2
2 Bedroom/1 Bath	NA	NA	NA	NA	1
2 Bedroom/2 Bath	NA	NA	NA	NA	1
3 Bedroom/2 Bath	NA	NA	NA	NA	1
All	0.3	1,145	1.11	310	2

Vancouver

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	1.1	622	1.32	183	6
1 Bedroom	1.5	973	1.40	4,194	62
2 Bedroom/1 Bath	2.0	1,003	1.14	3,580	50
2 Bedroom/2 Bath	2.1	1,027	1.01	4,422	43
3 Bedroom/1 Bath	0.0	915	0.97	111	7
3 Bedroom/2 Bath	1.3	1,354	1.18	1,933	31
Other	2.1	1,283	1.00	242	9
All	1.8	1,047	1.16	14,665	76

Washougal

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
2 Bedroom/1 Bath	NA	NA	NA	NA	1
2 Bedroom/2 Bath	NA	NA	NA	NA	1
All	NA	NA	NA	NA	1

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	1.1	622	1.32	183	6
1 Bedroom	1.4	982	1.41	4,314	65
2 Bedroom/1 Bath	2.0	1,000	1.13	3,674	53
2 Bedroom/2 Bath	2.1	1,021	1.00	4,593	45
3 Bedroom/1 Bath	0.0	915	0.97	111	7
3 Bedroom/2 Bath	1.3	1,364	1.18	1,972	32
Other	2.1	1,283	1.00	242	9
All	1.8	1,048	1.16	15,089	80

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	1.8	1,048	1.161	15,089	80
September 2015	3.5	1,026	1.133	10,311	78
March 2015	0.7	1,123	1.227	5,484	23
September 2014	2.2	918	1.024	9,813	67
March 2014	3.3	916	0.987	8,284	63
September 2013	2.3	864	0.939	14,052	91

< 1986

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	0.0	455	NA	2	2
1 Bedroom	1.4	597	1.13	140	5
2 Bedroom/1 Bath	1.1	706	0.95	279	7
3 Bedroom/1 Bath	0.0	843	0.79	53	3
3 Bedroom/2 Bath	NA	NA	NA	NA	1
All	1.0	691	0.98	480	8

1986–1999

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	0.0	808	1.06	41	3
2 Bedroom/1 Bath	0.7	913	1.03	136	3
2 Bedroom/2 Bath	NA	NA	NA	NA	1
3 Bedroom/2 Bath	0.0	1,044	0.95	22	2
All	0.5	911	1.02	214	3

> 1999

Unit Type	Pct. Vacant	Avg. Rent	Rent/SqFt($)	Units Surveyed	Complexes
NA	NA	NA	NA	NA	NA

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	0.0	435	NA	3	2
1 Bedroom	1.0	639	1.01	205	9
2 Bedroom/1 Bath	1.0	773	0.94	495	11
2 Bedroom/2 Bath	NA	NA	NA	NA	1
3 Bedroom/1 Bath	0.0	838	0.79	55	3
3 Bedroom/2 Bath	0.0	989	0.88	44	4
All	0.9	758	0.94	819	12

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	0.9	758	0.935	819	12
September 2015	0.7	610	0.835	1,672	15
March 2015	1.0	675	0.869	1,223	21
September 2014	3.6	661	0.756	332	6
March 2014	2.5	701	0.889	935	12
September 2013	5.3	652	0.827	986	16

Longview

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	0.0	455	NA	2	2
1 Bedroom	0.7	608	1.12	147	6
2 Bedroom/1 Bath	1.0	759	0.90	416	7
3 Bedroom/1 Bath	0.0	850	NA	50	2
3 Bedroom/2 Bath	0.0	958	0.89	32	3
All	0.8	742	0.93	647	8

Woodland

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	NA	NA	NA	NA	1
2 Bedroom/1 Bath	0.0	905	1.29	53	2
3 Bedroom/1 Bath	NA	NA	NA	NA	1
All	0.0	896	1.20	73	2

Kelso

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	3.4	691	0.96	29	2
2 Bedroom/1 Bath	7.1	850	0.88	14	2
2 Bedroom/2 Bath	NA	NA	NA	NA	1
3 Bedroom/2 Bath	NA	NA	NA	NA	1
All	2.9	848	0.88	70	2

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	0.0	435	NA	3	2
1 Bedroom	1.0	639	1.01	205	9
2 Bedroom/1 Bath	1.0	773	0.94	495	11
2 Bedroom/2 Bath	NA	NA	NA	NA	1
3 Bedroom/1 Bath	0.0	838	0.79	55	3
3 Bedroom/2 Bath	0.0	989	0.88	44	4
All	0.9	758	0.94	819	12

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	0.9	758	0.935	819	12
September 2015	0.7	610	0.835	1,672	15
March 2015	1.0	675	0.869	1,223	21
September 2014	3.6	661	0.756	332	6
March 2014	2.5	701	0.889	935	12
September 2013	5.3	652	0.827	986	16

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	0.0	695	1.03	16	2
2 Bedroom/1 Bath	2.1	846	1.01	47	2
3 Bedroom/1 Bath	0.0	922	NA	6	2
All	1.4	818	1.02	69	2

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	1.4	818	1.025	69	2
September 2015	1.7	819	0.904	118	3
March 2015	0.0	NA	NA	40	1
September 2014	NA	NA	NA	NA	1
March 2014	NA	NA	NA	NA	0
September 2013	3.8	693	0.865	104	3

East Wenatchee

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	0.0	695	1.03	16	2
2 Bedroom/1 Bath	2.1	846	1.01	47	2
3 Bedroom/1 Bath	0.0	922	NA	6	2
All	1.4	818	1.02	69	2

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	0.0	695	1.03	16	2
2 Bedroom/1 Bath	2.1	846	1.01	47	2
3 Bedroom/1 Bath	0.0	922	NA	6	2
All	1.4	818	1.02	69	2

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	1.4	818	1.025	69	2
September 2015	1.7	819	0.904	118	3
March 2015	0.0	NA	NA	40	1
September 2014	NA	NA	NA	NA	1
March 2014	NA	NA	NA	NA	0
September 2013	3.8	693	0.865	104	3

< 1986

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	0.0	525	1.15	79	3
1 Bedroom	0.0	608	0.91	154	5
2 Bedroom/1 Bath	1.3	699	0.78	311	7
3 Bedroom/1 Bath	NA	NA	NA	NA	1
3 Bedroom/2 Bath	0.0	829	0.69	39	3
All	0.7	662	0.83	589	7

1986–1999

Unit Type	Pct. Vacant	Avg. Rent	Rent/SqFt($)	Units Surveyed	Complexes
NA	NA	NA	NA	NA	NA

> 1999

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	NA	NA	NA	NA	1
2 Bedroom/2 Bath	NA	NA	NA	NA	1
3 Bedroom/2 Bath	NA	NA	NA	NA	1
All	NA	NA	NA	NA	1

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	0.0	525	1.15	79	3
1 Bedroom	0.4	694	0.91	262	6
2 Bedroom/1 Bath	1.3	699	0.78	311	7
2 Bedroom/2 Bath	NA	NA	NA	NA	1
3 Bedroom/1 Bath	NA	NA	NA	NA	1
3 Bedroom/2 Bath	0.0	946	0.76	57	4
All	0.8	744	0.87	841	8

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	0.8	744	0.872	841	8
September 2015	1.9	680	0.750	872	9
March 2015	0.8	800	0.970	612	5
September 2014	2.7	571	0.775	639	8
March 2014	6.4	710	0.811	484	4
September 2013	5.5	736	0.855	380	2

Pasco

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	0.0	525	1.15	79	3
1 Bedroom	0.4	694	0.91	262	6
2 Bedroom/1 Bath	1.3	699	0.78	311	7
2 Bedroom/2 Bath	NA	NA	NA	NA	1
3 Bedroom/1 Bath	NA	NA	NA	NA	1
3 Bedroom/2 Bath	0.0	946	0.76	57	4
All	0.8	744	0.87	841	8

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	0.0	525	1.15	79	3
1 Bedroom	0.4	694	0.91	262	6
2 Bedroom/1 Bath	1.3	699	0.78	311	7
2 Bedroom/2 Bath	NA	NA	NA	NA	1
3 Bedroom/1 Bath	NA	NA	NA	NA	1
3 Bedroom/2 Bath	0.0	946	0.76	57	4
All	0.8	744	0.87	841	8

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	0.8	744	0.872	841	8
September 2015	1.9	680	0.750	872	9
March 2015	0.8	800	0.970	612	5
September 2014	2.7	571	0.775	639	8
March 2014	6.4	710	0.811	484	4
September 2013	5.5	736	0.855	380	2

< 1986

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	0.0	445	0.99	4	2
1 Bedroom	3.3	545	0.64	30	2
2 Bedroom/1 Bath	NA	NA	NA	NA	1
2 Bedroom/2 Bath	NA	NA	NA	NA	1
3 Bedroom/1 Bath	NA	NA	NA	NA	1
3 Bedroom/2 Bath	NA	NA	NA	NA	1
Other	NA	NA	NA	NA	1
All	2.9	533	0.66	34	2

1986–1999

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	NA	NA	NA	NA	1
1 Bedroom	0.3	631	1.44	319	2
2 Bedroom/1 Bath	0.7	834	1.08	610	9
2 Bedroom/2 Bath	0.0	999	1.09	215	2
All	0.4	808	1.14	1,145	11

> 1999

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	NA	NA	NA	NA	1
2 Bedroom/1 Bath	NA	NA	NA	NA	1
2 Bedroom/2 Bath	NA	NA	NA	NA	1
3 Bedroom/2 Bath	1.0	1,444	1.21	209	2
All	1.0	1,198	1.22	382	2

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	0.0	464	1.03	5	3
1 Bedroom	0.9	639	1.17	549	6
2 Bedroom/1 Bath	0.9	787	1.02	687	12
2 Bedroom/2 Bath	0.0	1,014	1.18	340	4
3 Bedroom/1 Bath	NA	NA	NA	NA	1
3 Bedroom/2 Bath	1.0	1,444	1.21	209	3
Other	NA	NA	NA	NA	1
All	0.7	861	1.11	1,790	17

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	0.7	861	1.115	1,790	17
September 2015	23.4	808	1.224	931	14
March 2015	0.1	619	0.703	1,625	3
September 2014	0.8	725	1.028	2,110	12
March 2014	7.0	788	1.157	772	11
September 2013	3.4	1,033	1.189	2,085	17

Ellensburg

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	0.0	464	1.03	5	3
1 Bedroom	0.9	639	1.17	549	6
2 Bedroom/1 Bath	0.9	787	1.02	687	12
2 Bedroom/2 Bath	0.0	1,014	1.18	340	4
3 Bedroom/1 Bath	NA	NA	NA	NA	1
3 Bedroom/2 Bath	1.0	1,444	1.21	209	3
Other	NA	NA	NA	NA	1
All	0.7	861	1.11	1,790	17

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	0.0	464	1.03	5	3
1 Bedroom	0.9	639	1.17	549	6
2 Bedroom/1 Bath	0.9	787	1.02	687	12
2 Bedroom/2 Bath	0.0	1,014	1.18	340	4
3 Bedroom/1 Bath	NA	NA	NA	NA	1
3 Bedroom/2 Bath	1.0	1,444	1.21	209	3
Other	NA	NA	NA	NA	1
All	0.7	861	1.11	1,790	17

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	0.7	861	1.115	1,790	17
September 2015	23.4	808	1.224	931	14
March 2015	0.1	619	0.703	1,625	3
September 2014	0.8	725	1.028	2,110	12
March 2014	7.0	788	1.157	772	11
September 2013	3.4	1,033	1.189	2,085	17

< 1986

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	NA	NA	NA	NA	1
1 Bedroom	0.0	591	0.88	129	3
2 Bedroom/1 Bath	0.0	661	0.77	99	2
2 Bedroom/2 Bath	0.0	746	0.67	127	3
Other	NA	NA	NA	NA	1
All	0.0	662	0.78	401	3

1986–1999

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	0.9	688	0.96	228	6
2 Bedroom/1 Bath	0.6	596	0.68	308	7
2 Bedroom/2 Bath	0.6	629	0.62	158	5
3 Bedroom/2 Bath	0.0	628	0.56	70	3
All	0.7	633	0.72	764	7

> 1999

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	NA	NA	NA	NA	1
2 Bedroom/1 Bath	NA	NA	NA	NA	1
2 Bedroom/2 Bath	NA	NA	NA	NA	1
3 Bedroom/2 Bath	NA	NA	NA	NA	1
All	NA	NA	NA	NA	1

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	NA	NA	NA	NA	1
1 Bedroom	0.3	693	0.92	763	10
2 Bedroom/1 Bath	0.2	779	0.92	1,219	10
2 Bedroom/2 Bath	0.1	836	0.82	691	9
3 Bedroom/2 Bath	0.0	989	0.85	476	4
Other	NA	NA	NA	NA	1
All	0.2	800	0.88	3,195	11

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	0.2	800	0.885	3,195	11
September 2015	0.7	696	0.793	1,382	14
March 2015	0.5	686	0.809	969	8
December 2014	1.0	696	0.834	1,753	18
September 2014	1.8	660	0.841	1,021	11
June 2014	1.8	700	0.810	1,260	10

Coeur d'Alene

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	NA	NA	NA	NA	1
1 Bedroom	0.3	700	0.92	708	7
2 Bedroom/1 Bath	0.1	786	0.94	1,128	6
2 Bedroom/2 Bath	0.0	900	0.88	595	6
3 Bedroom/2 Bath	0.0	1,003	0.86	446	3
Other	NA	NA	NA	NA	1
All	0.1	819	0.90	2,923	7

Post

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	0.0	595	0.83	55	3
2 Bedroom/1 Bath	1.1	685	0.78	91	4
2 Bedroom/2 Bath	1.0	435	0.46	96	3
3 Bedroom/2 Bath	NA	NA	NA	NA	1
All	0.7	588	0.66	272	4

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	NA	NA	NA	NA	1
1 Bedroom	0.3	693	0.92	763	10
2 Bedroom/1 Bath	0.2	779	0.92	1,219	10
2 Bedroom/2 Bath	0.1	836	0.82	691	9
3 Bedroom/2 Bath	0.0	989	0.85	476	4
Other	NA	NA	NA	NA	1
All	0.2	800	0.88	3,195	11

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	0.2	800	0.885	3,195	11
September 2015	0.7	696	0.793	1,382	14
March 2015	0.5	686	0.809	969	8
December 2014	1.0	696	0.834	1,753	18
September 2014	1.8	660	0.841	1,021	11
June 2014	1.8	700	0.810	1,260	10

< 1986

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	NA	NA	NA	0	2
1 Bedroom	0.0	696	1.33	94	3
2 Bedroom/1 Bath	0.0	875	1.16	48	3
2 Bedroom/2 Bath	0.0	925	0.84	30	3
3 Bedroom/1 Bath	0.0	995	NA	24	3
3 Bedroom/2 Bath	0.0	1,225	0.76	2	3
Other	NA	NA	NA	0	2
All	0.0	816	1.17	198	3

1986–1999

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	NA	NA	NA	NA	1
1 Bedroom	0.0	677	0.85	60	2
2 Bedroom/1 Bath	NA	NA	NA	NA	1
2 Bedroom/2 Bath	NA	NA	NA	NA	1
3 Bedroom/1 Bath	NA	NA	NA	NA	1
3 Bedroom/2 Bath	NA	NA	NA	NA	1
All	0.7	923	1.19	152	3

> 1999

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	NA	NA	NA	NA	1
2 Bedroom/1 Bath	NA	NA	NA	NA	1
2 Bedroom/2 Bath	NA	NA	NA	NA	1
3 Bedroom/2 Bath	NA	NA	NA	NA	1
All	NA	NA	NA	NA	1

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	0.0	NA	NA	20	3
1 Bedroom	0.0	808	1.28	210	7
2 Bedroom/1 Bath	0.0	844	1.14	100	6
2 Bedroom/2 Bath	1.1	1,106	1.07	88	5
3 Bedroom/1 Bath	0.0	970	1.11	32	4
3 Bedroom/2 Bath	0.0	1,089	0.96	46	6
Other	NA	NA	NA	0	2
All	0.2	921	1.25	496	8

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	0.2	921	1.251	496	8
September 2015	0.6	818	1.000	1,045	9
March 2015	0.0	883	1.059	327	4
September 2014	0.3	776	1.059	676	8
March 2014	3.3	810	1.000	1,059	15
September 2013	2.8	793	0.930	1,358	16

Mount Vernon

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	0.0	NA	NA	20	3
1 Bedroom	0.0	696	1.10	146	4
2 Bedroom/1 Bath	0.0	875	1.16	48	3
2 Bedroom/2 Bath	2.0	955	0.93	50	4
3 Bedroom/1 Bath	0.0	995	NA	24	3
3 Bedroom/2 Bath	0.0	1,111	0.98	22	4
Other	NA	NA	NA	0	2
All	0.3	855	1.16	310	5

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	0.0	NA	NA	20	3
1 Bedroom	0.0	808	1.28	210	7
2 Bedroom/1 Bath	0.0	844	1.14	100	6
2 Bedroom/2 Bath	1.1	1,106	1.07	88	5
3 Bedroom/1 Bath	0.0	970	1.11	32	4
3 Bedroom/2 Bath	0.0	1,089	0.96	46	6
Other	NA	NA	NA	0	2
All	0.2	921	1.25	496	8

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	0.2	921	1.251	496	8
September 2015	0.6	818	1.000	1,045	9
March 2015	0.0	883	1.059	327	4
September 2014	0.3	776	1.059	676	8
March 2014	3.3	810	1.000	1,059	15
September 2013	2.8	793	0.930	1,358	16

< 1986

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	4.1	439	0.83	245	7
1 Bedroom	1.6	547	0.87	1,611	24
2 Bedroom/1 Bath	1.4	400	0.54	2,267	22
2 Bedroom/2 Bath	0.2	690	0.82	952	7
3 Bedroom/1 Bath	5.0	786	0.89	20	2
3 Bedroom/2 Bath	2.8	892	0.66	36	4
Other	0.0	2,750	NA	16	2
All	1.4	509	0.69	5,147	28

1986–1999

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	1.9	467	0.68	312	8
2 Bedroom/1 Bath	0.0	536	0.65	246	6
2 Bedroom/2 Bath	0.8	573	0.58	649	8
3 Bedroom/2 Bath	NA	NA	NA	NA	1
Other	NA	NA	NA	NA	1
All	0.9	539	0.61	1,265	11

> 1999

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	2.1	496	1.00	47	2
1 Bedroom	1.1	784	1.02	1,111	8
2 Bedroom/1 Bath	0.8	897	0.96	896	7
2 Bedroom/2 Bath	1.1	733	0.68	1,327	9
3 Bedroom/1 Bath	NA	NA	NA	NA	1
3 Bedroom/2 Bath	0.6	1,106	0.93	932	8
All	0.9	859	0.87	4,361	11

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	3.6	435	0.83	307	9
1 Bedroom	1.8	622	0.89	3,293	40
2 Bedroom/1 Bath	1.1	545	0.69	3,505	35
2 Bedroom/2 Bath	0.7	701	0.73	3,137	24
3 Bedroom/1 Bath	2.6	902	1.02	77	3
3 Bedroom/2 Bath	0.8	1,071	0.90	1,045	13
Other	0.0	1,010	NA	33	3
All	1.3	660	0.78	11,397	50

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	1.3	660	0.778	11,397	50
September 2015	3.3	751	0.869	8,876	83
March 2015	1.8	748	0.894	6,719	76
December 2014	2.7	744	0.913	12,580	141
September 2014	3.5	710	0.857	9,230	113
June 2014	2.9	826	0.930	2,281	12

North Spokane

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	1.5	548	0.80	271	9
2 Bedroom/1 Bath	3.0	618	0.82	197	7
2 Bedroom/2 Bath	2.1	693	0.64	242	5
3 Bedroom/2 Bath	1.9	741	0.60	52	3
Other	0.0	601	NA	29	2
All	2.0	627	0.71	791	11

Central Spokane

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	4.7	422	0.77	171	3
1 Bedroom	5.3	464	0.74	303	8
2 Bedroom/1 Bath	7.0	621	0.78	258	6
2 Bedroom/2 Bath	3.3	872	0.67	60	2
3 Bedroom/1 Bath	NA	NA	NA	NA	1
Other	NA	NA	NA	NA	1
All	5.6	554	0.79	802	8

Spokane Valley

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	NA	NA	NA	NA	1
1 Bedroom	1.5	812	1.07	718	8
2 Bedroom/1 Bath	0.5	859	0.94	762	9
2 Bedroom/2 Bath	0.6	532	0.52	622	5
3 Bedroom/2 Bath	0.5	1,155	0.98	549	2
All	0.8	827	0.87	2,682	11

South Spokane

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	3.0	430	0.86	67	4
1 Bedroom	0.5	603	0.85	1,218	9
2 Bedroom/1 Bath	0.4	388	0.52	1,854	8
2 Bedroom/2 Bath	0.7	699	0.81	1,278	8
3 Bedroom/1 Bath	NA	NA	NA	NA	1
3 Bedroom/2 Bath	0.0	691	NA	66	4
All	0.6	546	0.70	4,531	13

West Spokane

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	NA	NA	NA	NA	1
1 Bedroom	1.4	534	0.88	209	6
2 Bedroom/1 Bath	0.7	689	0.80	147	5
2 Bedroom/2 Bath	1.0	863	0.80	195	4
3 Bedroom/1 Bath	NA	NA	NA	NA	1
3 Bedroom/2 Bath	1.7	1,227	1.03	177	4
All	1.2	819	0.90	747	7

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	3.6	435	0.83	307	9
1 Bedroom	1.8	622	0.89	3,293	40
2 Bedroom/1 Bath	1.1	545	0.69	3,505	35
2 Bedroom/2 Bath	0.7	701	0.73	3,137	24
3 Bedroom/1 Bath	2.6	902	1.02	77	3
3 Bedroom/2 Bath	0.8	1,071	0.90	1,045	13
Other	0.0	1,010	NA	33	3
All	1.3	660	0.78	11,397	50

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	1.3	660	0.778	11,397	50
September 2015	3.3	751	0.869	8,876	83
March 2015	1.8	748	0.894	6,719	76
December 2014	2.7	744	0.913	12,580	141
September 2014	3.5	710	0.857	9,230	113
June 2014	2.9	826	0.930	2,281	12

< 1986

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	4.9	486	0.77	41	4
1 Bedroom	0.0	468	0.82	137	6
2 Bedroom/1 Bath	0.5	658	0.82	182	5
3 Bedroom/1 Bath	NA	NA	NA	NA	1
All	0.8	569	0.80	369	6

1986–1999

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	NA	NA	NA	NA	1
1 Bedroom	0.0	2,208	4.91	13	2
2 Bedroom/1 Bath	1.5	784	0.95	194	2
All	7.6	1,118	1.74	236	3

> 1999

Unit Type	Pct. Vacant	Avg. Rent	Rent/SqFt($)	Units Surveyed	Complexes
NA	NA	NA	NA	NA	NA

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	24.3	1,469	4.22	70	5
1 Bedroom	0.0	618	1.11	150	8
2 Bedroom/1 Bath	1.1	723	0.89	376	7
3 Bedroom/1 Bath	NA	NA	NA	NA	1
All	3.5	783	1.14	605	9

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	3.5	783	1.139	605	9

Walla City

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	24.3	1,469	4.22	70	5
1 Bedroom	0.0	625	1.16	126	7
2 Bedroom/1 Bath	1.1	730	0.89	356	6
3 Bedroom/1 Bath	NA	NA	NA	NA	1
All	3.7	798	1.16	561	8

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	24.3	1,469	4.22	70	5
1 Bedroom	0.0	618	1.11	150	8
2 Bedroom/1 Bath	1.1	723	0.89	376	7
3 Bedroom/1 Bath	NA	NA	NA	NA	1
All	3.5	783	1.14	605	9

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	3.5	783	1.139	605	9

< 1986

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	0.5	671	1.17	205	5
2 Bedroom/1 Bath	1.3	760	0.95	159	5
2 Bedroom/2 Bath	NA	NA	NA	NA	1
3 Bedroom/1 Bath	0.0	1,023	NA	15	2
All	0.8	730	1.06	397	5

1986–1999

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	0.6	782	1.19	171	4
2 Bedroom/1 Bath	2.2	871	1.10	277	7
2 Bedroom/2 Bath	0.0	977	1.12	109	3
3 Bedroom/2 Bath	0.7	1,007	0.97	135	6
Other	0.0	1,020	NA	52	2
All	1.1	901	1.13	744	8

> 1999

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	0.0	745	1.26	52	2
2 Bedroom/1 Bath	NA	NA	NA	NA	1
All	0.0	976	1.66	174	2

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	0.5	724	1.20	428	11
2 Bedroom/1 Bath	1.4	884	1.11	558	13
2 Bedroom/2 Bath	0.0	965	1.06	127	4
3 Bedroom/1 Bath	0.0	1,023	NA	15	2
3 Bedroom/2 Bath	0.7	1,007	0.97	135	6
Other	0.0	1,020	NA	52	2
All	0.8	859	1.17	1,315	15

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	0.8	859	1.168	1,315	15
September 2015	0.2	824	1.094	1,499	16
March 2015	0.6	900	1.120	2,069	23
September 2014	1.3	846	1.056	2,116	20
March 2014	2.0	815	1.010	3,170	27
September 2013	1.2	822	1.020	3,491	30

Bellingham

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	0.5	724	1.20	428	11
2 Bedroom/1 Bath	1.2	895	1.12	499	11
2 Bedroom/2 Bath	0.0	965	1.06	127	4
3 Bedroom/1 Bath	0.0	1,023	NA	15	2
3 Bedroom/2 Bath	0.0	1,010	0.96	126	5
Other	NA	NA	NA	NA	1
All	0.6	862	1.18	1,246	13

Ferndale

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
2 Bedroom/1 Bath	3.4	792	1.01	59	2
3 Bedroom/2 Bath	NA	NA	NA	NA	1
Other	NA	NA	NA	NA	1
All	4.3	816	1.00	69	2

Lynden

Unit Type	Pct. Vacant	Avg. Rent	Rent/SqFt($)	Units Surveyed	Complexes
NA	NA	NA	NA	NA	NA

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	0.5	724	1.20	428	11
2 Bedroom/1 Bath	1.4	884	1.11	558	13
2 Bedroom/2 Bath	0.0	965	1.06	127	4
3 Bedroom/1 Bath	0.0	1,023	NA	15	2
3 Bedroom/2 Bath	0.7	1,007	0.97	135	6
Other	0.0	1,020	NA	52	2
All	0.8	859	1.17	1,315	15

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	0.8	859	1.168	1,315	15
September 2015	0.2	824	1.094	1,499	16
March 2015	0.6	900	1.120	2,069	23
September 2014	1.3	846	1.056	2,116	20
March 2014	2.0	815	1.010	3,170	27
September 2013	1.2	822	1.020	3,491	30

< 1986

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	6.7	486	1.44	30	3
1 Bedroom	1.5	559	0.95	733	20
2 Bedroom/1 Bath	2.6	713	0.92	887	23
2 Bedroom/2 Bath	0.0	592	0.56	122	2
3 Bedroom/1 Bath	4.1	1,133	1.20	123	5
3 Bedroom/2 Bath	NA	NA	NA	NA	1
Other	1.7	1,524	1.49	178	2
All	2.3	743	0.93	2,135	31

1986–1999

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	NA	NA	NA	NA	1
1 Bedroom	0.0	646	1.08	90	4
2 Bedroom/1 Bath	1.5	688	0.86	340	6
2 Bedroom/2 Bath	NA	NA	NA	NA	1
3 Bedroom/1 Bath	0.0	899	0.85	14	2
3 Bedroom/2 Bath	3.0	1,233	1.21	67	2
Other	7.3	1,420	1.13	55	2
All	1.9	815	0.97	644	7

> 1999

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	1.2	625	1.10	494	10
2 Bedroom/1 Bath	0.8	827	1.08	791	10
2 Bedroom/2 Bath	0.0	926	0.96	190	4
3 Bedroom/1 Bath	0.0	1,395	NA	35	5
3 Bedroom/2 Bath	1.6	1,235	1.25	250	7
Other	1.4	1,450	1.13	217	7
All	1.0	895	1.15	1,977	16

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	5.6	521	1.42	54	4
1 Bedroom	1.3	590	1.01	1,321	36
2 Bedroom/1 Bath	1.7	754	0.97	2,020	40
2 Bedroom/2 Bath	0.0	810	0.77	377	8
3 Bedroom/1 Bath	2.9	1,129	1.18	174	13
3 Bedroom/2 Bath	3.2	1,155	0.98	379	10
Other	2.2	1,489	1.29	463	14
All	1.7	816	1.02	4,788	58

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	1.7	816	1.022	4,788	58
September 2015	0.8	1,093	1.350	4,322	75
March 2015	1.7	695	0.896	2,769	50
September 2014	2.0	747	1.006	3,510	39
March 2014	5.2	763	0.987	4,061	42
September 2013	2.4	771	0.993	4,381	49

Pullman

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	5.6	521	1.42	54	4
1 Bedroom	1.3	590	1.01	1,321	36
2 Bedroom/1 Bath	1.7	754	0.97	2,020	40
2 Bedroom/2 Bath	0.0	810	0.77	377	8
3 Bedroom/1 Bath	2.9	1,129	1.18	174	13
3 Bedroom/2 Bath	3.2	1,155	0.98	379	10
Other	2.2	1,489	1.29	463	14
All	1.7	816	1.02	4,788	58

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	5.6	521	1.42	54	4
1 Bedroom	1.3	590	1.01	1,321	36
2 Bedroom/1 Bath	1.7	754	0.97	2,020	40
2 Bedroom/2 Bath	0.0	810	0.77	377	8
3 Bedroom/1 Bath	2.9	1,129	1.18	174	13
3 Bedroom/2 Bath	3.2	1,155	0.98	379	10
Other	2.2	1,489	1.29	463	14
All	1.7	816	1.02	4,788	58

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	1.7	816	1.022	4,788	58
September 2015	0.8	1,093	1.350	4,322	75
March 2015	1.7	695	0.896	2,769	50
September 2014	2.0	747	1.006	3,510	39
March 2014	5.2	763	0.987	4,061	42
September 2013	2.4	771	0.993	4,381	49

< 1986

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	10.5	525	NA	19	2
1 Bedroom	1.0	626	0.98	409	12
2 Bedroom/1 Bath	1.0	706	0.84	502	14
2 Bedroom/2 Bath	NA	NA	NA	NA	1
3 Bedroom/1 Bath	5.2	713	0.77	134	4
3 Bedroom/2 Bath	8.2	873	NA	61	3
Other	NA	NA	NA	NA	1
All	2.0	682	0.89	1,175	20

1986–1999

Unit Type	Pct. Vacant	Avg. Rent	Rent/SqFt($)	Units Surveyed	Complexes
NA	NA	NA	NA	NA	NA

> 1999

Unit Type	Pct. Vacant	Avg. Rent	Rent/SqFt($)	Units Surveyed	Complexes
NA	NA	NA	NA	NA	NA

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	10.5	525	NA	19	2
1 Bedroom	1.0	626	0.98	409	12
2 Bedroom/1 Bath	1.0	706	0.84	502	14
2 Bedroom/2 Bath	NA	NA	NA	NA	1
3 Bedroom/1 Bath	5.2	713	0.77	134	4
3 Bedroom/2 Bath	8.2	873	NA	61	3
Other	NA	NA	NA	NA	1
All	2.0	682	0.89	1,175	20

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	2.0	682	0.890	1,175	20
September 2015	2.2	627	0.890	2,156	30
March 2015	7.8	576	0.806	460	11
September 2014	2.6	624	0.924	2,039	42
March 2014	2.7	678	0.910	1,421	12
September 2013	2.7	604	0.790	2,124	25

Grandview

Unit Type	Pct. Vacant	Avg. Rent	Rent/SqFt($)	Units Surveyed	Complexes
NA	NA	NA	NA	NA	NA

Granger

Unit Type	Pct. Vacant	Avg. Rent	Rent/SqFt($)	Units Surveyed	Complexes
NA	NA	NA	NA	NA	NA

Selah

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	NA	NA	NA	NA	1
2 Bedroom/1 Bath	0.0	578	0.96	16	2
All	4.2	568	0.95	24	2

Sunnyside

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
1 Bedroom	0.0	649	1.00	34	2
2 Bedroom/1 Bath	0.0	742	0.66	12	2
All	0.0	673	0.87	46	2

Topenish

Unit Type	Pct. Vacant	Avg. Rent	Rent/SqFt($)	Units Surveyed	Complexes
NA	NA	NA	NA	NA	NA

Union

Unit Type	Pct. Vacant	Avg. Rent	Rent/SqFt($)	Units Surveyed	Complexes
NA	NA	NA	NA	NA	NA

Wapato

Unit Type	Pct. Vacant	Avg. Rent	Rent/SqFt($)	Units Surveyed	Complexes
NA	NA	NA	NA	NA	NA

Yakima

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	10.5	525	NA	19	2
1 Bedroom	0.8	625	0.98	367	9
2 Bedroom/1 Bath	1.1	710	0.85	474	10
2 Bedroom/2 Bath	NA	NA	NA	NA	1
3 Bedroom/1 Bath	5.2	713	0.77	134	4
3 Bedroom/2 Bath	8.2	873	NA	61	3
Other	NA	NA	NA	NA	1
All	2.0	685	0.89	1,105	16

Zillah

Unit Type	Pct. Vacant	Avg. Rent	Rent/SqFt($)	Units Surveyed	Complexes
NA	NA	NA	NA	NA	NA

All Years / All Areas

Unit Type	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
Studio	10.5	525	NA	19	2
1 Bedroom	1.0	626	0.98	409	12
2 Bedroom/1 Bath	1.0	706	0.84	502	14
2 Bedroom/2 Bath	NA	NA	NA	NA	1
3 Bedroom/1 Bath	5.2	713	0.77	134	4
3 Bedroom/2 Bath	8.2	873	NA	61	3
Other	NA	NA	NA	NA	1
All	2.0	682	0.89	1,175	20

History

Survey	Pct. Vacant	Avg. Rent($)	Rent/SqFt($)	Units Surveyed	Complexes
March 2016	2.0	682	0.890	1,175	20
September 2015	2.2	627	0.890	2,156	30
March 2015	7.8	576	0.806	460	11
September 2014	2.6	624	0.924	2,039	42
March 2014	2.7	678	0.910	1,421	12
September 2013	2.7	604	0.790	2,124	25

Windhaven Apartments
Traffic Impact Analysis

MORRISON MAIERLE, INC.

WINDHAVEN APARTMENTS
TRAFFIC IMPACT ANALYSIS

SUBMITTED TO:

CITY OF SPOKANE

July 2016

PREPARED BY:

William (Bill) White

PROJECT ENGINEER:

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MMI PROJECT #: 5594.002

EXECUTIVE SUMMARY

Windhaven First Addition is an approved City residential development that occupies 49.48 acres aligned north of Barnes Road and west of Indian Trail Road within the Indian Trail neighborhood of Spokane. The project was initially approved in year 2006 for the construction of 286 single family homes. No homes have been constructed yet; although the street infrastructure for the development is complete. This includes primary vehicle access to Barnes Road via Forest Lane and Pamela Lane, with secondary access provided to the adjacent apartment development (to the east) via Jamestown Lane. The project is within an RSF zone of the City with a site Comprehensive Plan designation of Residential 4-10.

Due to evolving market conditions, the project proponent has recently proposed to develop up to 750 apartment units on the site as opposed to single family homes. The proposal results in a density of 15.2 homes per acres, which exceeds the approved residential density. Thus, a Comprehensive Plan amendment and zone change would be needed to accommodate the proposal; specifically to a RMF zone and Comprehensive Plan designation of Residential 15-30.

Note the proposed apartment density marginally exceeds minimum zoning and Comprehensive Plan allowances, and is just under half of maximum allowable densities (of up to 30 apartments per acre). The reduced density was accommodated to minimize the traffic impacts of the proposed development on the Indian Trail neighborhood; as this was expressed as a concern of citizens living within the area. The developers have reduced site densities considerably from initial development proposals.

Site access is promoted as described previously, with primary access provided via Forest Lane and Pamela Street and secondary access via Jamestown Lane. Currently, pedestrian access only is proposed via Moore Street intersecting with Shawnee Avenue to the north, as this is a pedestrian/school route. However, this can be revisited during the design process if City officials determine vehicle access would benefit the neighborhood in the future.

Per City concurrency evaluations, Windhaven First Addition with 286 homes is vested to generate 210 trips during the AM peak hour and 271 trips during the PM peak hour. This would represent the trip generation equivalent of 460 apartment units. This distinction is important because it demonstrates that 46 percent of the current apartment proposal could be developed before surpassing vested/programmed traffic generation levels. A comparison of trip generation equivalencies is provided below.

Vested Residential Land Use & Trip Comparisons

Residential Land Use	Dwelling Units	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Single Family Homes (ITE Code 210)	286	65	145	210	179	92	271
General Apartment Units (ITE Code 220)	460	46	183	229	176	95	271

As shown on the next page, the 750 unit apartment proposal represents a net gain of 161 trips during the AM peak hour and 159 trips during the PM peak hour over those vested/associated with single family home development. This TIA is being required by the City to support the Comprehensive Plan amendment and zone change processes because the current land use proposal (of apartments) presents a net gain in trip generation over those vested/identified above for the site (as single family homes).

Project Trip Generation Gains – Proposed Apartments Vrs. Vested Single Family

Land Use	Dwelling Units	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Apartments - ITE Code 220	750	74	297	371	280	150	430
Single Family Homes - ITE Code 210	286	65	145	210	179	92	271
Net Gain Site Trips	--	9	152	161	101	58	159

TRAFFIC FORECASTS AND CAPACITY

City officials require this study address traffic operations principally for site access intersections and seven off-site intersections most impacted by development within the Indian Trail neighborhood. The analysis was required for the AM and PM peak hours of the typical weekday, as based on the forecast year 2021 completion year of the project. A summary of study intersections include:

- Shawnee Avenue/Indian Trail Road
- Barnes Road/Indian Trail Road
- Strong Road/Indian Trail Road
- Indian Trail Road/Francis Avenue
- Alberta Street/Francis Avenue
- Ash Street/Francis Avenue
- Maple Street/Francis Avenue
- Barnes Road/Forest Lane (Project Access)
- Barnes Road/Pamela Lane (Project Access)

Existing Conditions. Traffic counts were performed during typical weekdays in March, with a follow-up count in April (for Shawnee Road/Indian Trail Road intersection) to capture the peak demands of the morning and afternoon commutes. These counts were performed specifically while local schools were in session, as to capture the travel demands of these special traffic generators.

City of *Spokane Administrative Policy and Procedure for Transportation Concurrency Level of Service Standards* defines a LOS E standard for signalized and unsignalized intersections aligned along a principal arterial. An analysis of existing traffic operations indicates there were no levels-of-service (LOS) issues identified within the field, as all intersections were shown to function at LOS E or better between the AM and PM peak hours. Existing intersection LOS conclusions are shown on the next page.

Existing LOS and Delay - AM and PM Peak Hours				
	AM Peak		PM Peak	
Signalized Intersections	LOS[1]	Delay[2]	LOS[1]	Delay[2]
Shawnee Ave/Indian Trail Rd	B	17.3	A	7.7
Barnes Rd/Indian Trail Rd	B	18.1	B	14.4
Strong Rd/Indian Trail Rd	A	9.7	B	18.9
Indian Trail Rd/Francis Ave	B	12.3	A	7.9
Alberta St/Francis Ave	D	36.4	C	32.2
Ash St/Francis Ave	C	22.3	C	20.4
Maple St/Francis Ave	B	17.7	D	41.9

1. LOS = Levels-of-Service
2. Del = Delay in seconds

Secondary lane capacity analyses and speed counts were performed discretionarily to support conclusions for Indian Trail Road. The lane analysis was used to help identify whether adequate capacity exists for through traffic (northbound and southbound movements) outside of study intersections along Indian Trail Road. Lane capacities were reviewed for three count locations within the vicinity of the "bottleneck" on Indian Trail Road: 1) north of Weile Avenue (south of bottleneck); 2) north of Kathleen Avenue (within bottleneck); and 3) north of Lowell Avenue (north of Bottleneck). A summary of the lane capacity analysis is shown below.

Existing Indian Trail Lane Capacity - AM and PM Peak Hours									
	Capacity			AM Peak Hour			PM Peak Hour		
Indian Trail Road	NB	SB	Tot	NB	SB	Tot	NB	SB	Tot
N/of Weile Ave	1,800	1,800	3,600	287	1,114	1,401	1,099	450	1,549
N/of Kathleen Ave	900	900	1,800	283	1,151	1,434	1,085	449	1,534
N/of Lowell Ave	900	900	1,800	246	954	1,200	807	384	1,191

As shown, lane capacity is sufficient within the four lane section of Indian Trail north Road north of Weile Avenue. However, existing counts are shown to exceed directional lane capacities within specifically within the bottleneck area north of Kathleen Avenue. There is minor lane capacity exceptions noted north of Lowell Avenue, but overall capacity appears to be sufficient north of the bottleneck. A comparison/review of this data does suggest need for lane widening as based on existing count data.

Despite the lane capacity results above, travel speeds within the corridor do not seem to be overly compromised. Speed counts were performed at the locations identified/reviewed above, south of, within, and north of the bottleneck area along Indian Trail Road. Average travel speeds were found to be 3 to 6 mph above the posted 30 mph speed limit along the roadway during AM and PM peak hours in both travel directions. The conclusion from this is that, while

additional capacity is needed, the travel time of typical commuters is not yet impacted. A summary of speed data is shown on the next page.

Indian Trail ADT and Speed Counts - AM and PM Peak Hours					
Indian Trail Road	ADT	Average Speed - Northbound		Average Speed - Southbound	
		AM Peak	PM Peak	AM Peak	PM Peak
N/of Weile Ave	17,299	36.5	36.8	36.0	35.7
N/of Kathleen Ave	16,821	37.9	36.8	34.8	37.9
N/of Lowell Ave	13,555	34.3	31.9	33.4	33.2

Future Conditions. Future 2021 traffic volumes were developed for operational analyses assuming: 1) baseline (non-development associated) traffic growth, 2) the development of eleven study area pipeline projects (including vested Windhaven First Addition), and 3) the assignment of project trips. A 0.5 percent annual growth rate was applied to counts to reflect baseline (non-development) traffic growth. This growth was combined with the trips generated by pipeline projects to generate future without project traffic forecasts. The trip generation of these developments is shown below.

Vested Residential Land Use & Trip Comparisons by TAZ								
TAZ and Development	Dwelling Units/Homes		AM Peak Hour			PM Peak Hour		
	Single	Multi	In	Out	Total	In	Out	Total
TAZ 29								
- Hunts Point	183	48	48	119	167	142	72	214
- Windhaven First	286	0	65	145	210	179	92	271
- Ponderosa Ridge 3rd	12	0	6	13	19	10	5	15
- Ponderosa Ridge 4th	25	0	8	19	27	20	10	30
Subtotal TAZ 29	*506*	*48*	*127*	*296*	*423*	*351*	*179*	*530*
TAZ 30								
- Diamond Rock	0	96	10	41	51	46	25	71
- Replat McCarroll	13	0	6	13	19	11	6	17
- McCaroll's 3rd	10	0	5	12	17	9	5	14
- McCaroll's 4th	15	0	6	14	20	13	7	20
- McCarroll's East	7	28	8	26	34	21	10	31
- Woodridge View	7	0	5	10	15	6	3	9
Subtotal TAZ 30	*52*	*124*	*40*	*116*	*156*	*106*	*56*	*162*
TAZ 31								
- Estates at Rocky	15	0	6	14	20	13	7	20
- Westwinds PUD	19	0	7	16	23	16	8	24
Subtotal TAZ 31	*34*	*0*	*13*	*30*	*43*	*29*	*15*	*44*
Total Pipeline Trips	592	172	180	442	622	486	250	736

Note from the previous table that trip generation for the existing, approved development is reflected via the row "Windhaven First" located in TAZ 29; indicating trip generation of 210 AM peak hour and 271 PM peak hour trips. These trips are highlighted because they are already vested by the City for the Windhaven site and have entitlement to roadway capacity. They are therefore reflected in the future without project condition presented by this TIA.

As highlighted previously, the current land use proposal represents a net gain of 161 trips during the AM peak hour and 159 trips during the PM peak hour over those vested/associated with single family home development (described preceding paragraph). Future with project traffic forecasts reflects this gain in trips, over future without project traffic (including pipeline), as it represents a change in forecast travel demands (as currently anticipated by City officials). Thus, to be clear, this TIA addresses the full traffic impacts associated with the construction of a 750 unit apartment complex upon City roadways. The impacts were essentially reviewed/defined in stages given the approved status of a single family development versus that of a proposed apartment community.

The resulting traffic forecasts result in growth rates of between 6 and 7 percent annually on Indian Trail Road, which far exceeds historical growth rates ranging between 1 and 1.5 percent annually. Thus, traffic forecasts are very conservative for year 2021 and may be more representative of long term traffic growth (beyond year 2021).

Note that about 19 percent of project trips are anticipated to/from the east on Barnes Road (via the new extension and connection to Strong Road). About 2 percent are anticipated from adjacent businesses, services, and retail. About 9 percent of project trips are anticipated to/from the north and 70 percent to/from the south on Indian Trail Road. The majority of project trips along Indian Trail Road south will travel to/from the east on Francis Avenue; distributing throughout a study area that addresses the Alberta Street and Maple/Ash Couplet intersections with Francis Avenue.

Future intersection analyses indicated that no overall LOS issues were noted based upon a review of future year 2021 traffic forecasts. This determination is made because no study intersection is forecast to function below LOS E on the principal arterials of Indian Trail Road or Francis Avenue during the peak hours. LOS at site access intersections are also shown to operate acceptably at LOS C or better during the peak hours. The resulting, forecast LOS, both without and with project development, are shown on the following Table.

Forecast Year 2021 LOS and Delay - AM and PM Peak Hours								
Year 2021 Condition	Future Without Project Traffic				Future With Project Traffic			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
Signalized Intersections	LOS[1]	Delay[2]	LOS[1]	Delay[2]	LOS[1]	Delay[2]	LOS[1]	Delay[2]
Shawnee Ave/Indian Trail Rd	B	17.9	A	8.2	B	17.9	A	8.3
Barnes Rd/Indian Trail Rd	C	26.9	B	19.9	D	43.7	C	22.9
Strong Rd/Indian Trail Rd	C	20.2	D	52.4	D	37.3	E	68.8
Indian Trail Rd/Francis Ave	C	20.3	B	10.1	C	29.6	B	10.7
Alberta St/Francis Ave	E	65.6	D	53.7	E	78.3	E	59.4
Ash St/Francis Ave	C	26.1	C	21.3	C	28.9	C	21.5
Maple St/Francis Ave	B	17.8	D	55.9	B	17.1	E	58.7
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
Unsignalized Intersections	LOS[1]	Delay	LOS[1]	Delay	LOS[1]	Delay	LOS[1]	Delay
Forest Ln/Barnes Rd	B	10.6	B	10.2	B	11.4	B	10.6
Pamela Ln/Barnes Rd	B	31.1	B	12.0	C	19.0	C	14.0

1. LOS = Levels-of-Service
2. Del = Delay in seconds

Note although overall intersection LOS were forecast to be acceptable during the peak hours, meeting City concurrency requirements, the westbound approach to Maple Street/Francis Avenue intersection is forecast to have 89 seconds of average control delay during the PM peak hour; representing a LOS F condition. The maximum phase split for the approach is currently 43 seconds (the available green time during one signal cycle). A comparison of control delay with this phase split confirms individual vehicles would wait about three full signal cycles before clearing the intersection. Queue conditions are forecast to be extensive within this approach.

Forecast lane capacity was still shown to be sufficient within the four lane section of Indian Trail north Road north of Weile Avenue. Forecast traffic volumes further demonstrate the need for lane widening north of Kathleen Avenue (within bottleneck) and north of Lowell Avenue (north of Bottleneck). This determination is confirmed because forecast traffic volumes well exceed single lane capacity in the southbound direction during the AM peak hour and the northbound direction during the PM peak hour. Forecast lane volume comparisons are shown below.

Future With-Project Indian Trail Lane Capacity - AM and PM Peak Hours									
	Capacity			AM Peak Hour			PM Peak Hour		
Indian Trail Road	NB	SB	Tot	NB	SB	Tot	NB	SB	Tot
N/of Weile Ave	1,800	1,800	3,600	376	1,396	1,772	1,351	732	2,083
N/of Kathleen Ave	900	900	1,800	385	1,483	1,868	1,410	781	2,191
N/of Lowell Ave	900	900	1,800	371	1,360	1,731	1,211	790	2,001

Pedestrian, Bike, and Transit. Pedestrian, bicycle, and transit access conditions are favorable within the project vicinity. Sidewalk is contiguous between the developments and nearby transit stops, shopping centers, and public facilities (a library and a park). There are commute bicycle routes on Indian Trail Road and Barnes Road; although some form of designated bike lanes for recreational facilities would be ideal in the future (such remediation is beyond the scope of development projects). Finally STA transit access to Indian Trail Road is sufficient on weekdays, with transit stops located within walking distance about ¼- mile east of Windhaven.

Supplemental Studies. Two supplemental studies were performed to support this TIA: 1) a Microsimulation analysis submitted to the City on 5/24/16 (provided in Technical Appendix E) and 2) an analysis of collision data submitted to the City on 6/8/16 (provided in Technical Appendix F).

The microsimulation analysis was performed to review the cumulative impact of traffic within the context of closely spaced intersections such as those aligned along Francis Avenue. The analysis addresses conditions such as spillback between intersections, spillback beyond turning bays, forced lane changes, and unbalanced lane use for downstream turns.

The intersections of Francis Avenue with Indian Trail Road, Alberta Street, Ash Street, and Maple Street were reviewed with this supplemental study, as based on existing counts, future without, and future with-project traffic forecasts during the PM peak hour. The analysis generally concludes the cumulative impact of traffic congestion between the Francis Avenue intersections with Ash Street and Maple Street may cause average delays and queues that moderately surpass those stated by this TIA. Thus, the microsimulation analysis indicates the westbound approach issues specified for the Maple Street/Francis Avenue may be greater than identified based on traditional LOS and delay analyses.

The collision analysis was performed for Indian Trail Road and indicates 52 recorded collisions occurred along the roadway between January 1, 2013 and May 31, 2016. Overall, 42 percent of collisions involved vehicle property damage only with 58 percent involving injuries. There were no fatalities within the study timeframe.

An average of 15.2 collisions occur the study arterial segment each year that, when compared with an average of 15,892 ADT, results in rate of 0.98 collisions per million miles of vehicle travel. Comparatively, the Washington State Department of Transportation 2014 Annual Collision Summary Report indicates Spokane County experiences a system/network-wide rate of 168.7 collisions per 100 million miles of travel, or 1.687 collisions per million miles of travel. Thus, by comparison, the calculated corridor rate is well below the average for Spokane County suggesting no unusual collision issue exists along Indian Trail Road. This conclusion was confirmed based on a review of intersections and driveways on an individual basis.

IMPROVEMENT RECOMMENDATION AND MITIGATION

The project is responsible for mitigating traffic impacts via transportation impact fee (TIF) contribution. The fee scheduled for the Northwest Service Area, within which the project is located, is $483.49 per until for two-story apartments and $296.33 for three-story apartments. Thus, the Windhaven development would be conditioned with up to **$362,620** of traffic impact fees ($483.49 * 750 two-story apartments), as collected prior to the issuance of any building permit on a per-unit/home or development phase basis.

The study concludes that adequate overall LOS is maintained at study intersections in accordance with City of Spokane Standards. However, secondary and supplemental analyses identify transportation improvements or demand strategies are needed to help improve traffic mobility for two study area locations, as based on a review of forecast traffic conditions.

1. **Improvement – Indian Trail Road.** The lane capacity analysis indicates additional through lanes are needed in the northbound and southbound travel directions of Indian Trail Road, respectively. Upon coordination with City officials, it has been determined that the arterial can be restriped with some widening in locations to provide a minimum four-lane cross section throughout the current "bottleneck" extending between Kathleen Avenue and Lowell Avenue. This would provide needed lane capacity and address one of the top neighborhood concerns expressed via comment letters and emails, and also via the 5/25/15 public meeting.

   Mitigation. The project proponent has offered to front the costs of improving Indian Trail Road, to be constructed with a City pavement rehabilitation project scheduled summer of year 2018. The City pavement rehabilitation project is funded. The Windhaven TIF of $362,620 would be dedicated specifically to Indian Trail improvements as SEPA (and future concurrency) mitigation. Additional costs not be covered by the City would be fronted by the Windhaven developer and would be reimbursed either by TIF credits (for future developments within the Northwest Service Area) or via latecomers reimbursement provided via other Indian Trail Neighborhood developments. City officials indicate they will provide design services. The specifics of mitigation will be coordinated with City officials and enforced via developer agreements.

2. **Improvement – Maple Street/Francis Avenue Congestion.** Traditional analyses indicate the westbound approach to the intersection will experience less tolerable LOS, delays, and vehicle queues. This was confirmed with microsimulation analysis. Two alternatives are being considered for managing/minimizing project impacts on Francis Avenue: 1) Adaptive signal controls retrofitted to the Francis Avenue intersections with Ash Street and Maple Street or 2) development travel demand management strategies. Adaptive signal controls would increase the operational efficiency of study intersections. Travel demand strategy would reduce development travel demands on Francis Avenue.

   Mitigation. Adaptive signal control would be a direct mitigation of development; with design and installation coordinated with City and WSDOT officials. The prevailing travel demand strategy is to offer STA bus passes to residence of Windhaven. The Spokane Regional Commute Trip Reduction Plan has a 10 percent travel reduction goal. Thus, a minimum of 80 monthly bus passes would be offered to residences of Windhaven, as provided on a first-come basis. This would affect a 10 percent decrease in project trip generation meeting regional CTR goals. The preferred alternative would be advanced in coordination with City officials, as enforced with a developer agreement.

PUBLIC PARTICIPATION

Primary questions/points from the public involvement process performed to support this project are addressed as follows:

- The scope for this study was set in coordination with officials from the City of Spokane and WSDOT. Any locations/areas not included (in this study) were likely because project impacts were anticipated to be minimal outside of the specified and highlighted study area (reviewed by this TIA).

- The study did not review impacts to Woodside Avenue because trips from Windhaven are not likely to turn to/from this unsignalized intersection; especially because traffic circles programmed along Woodside Avenue should deter the occurrence of neighborhood cut through traffic. Note it is understood overall that turning traffic at this intersection is a public concern, but the collision rate determined for this intersection currently does not denote the potential for a high accident location.
- A collision analysis was performed in response to neighborhood concerns. The analysis does not highlight a high accident location (HAL) along Indian Trail Road, nor does it conclude that Indian Trail Road is a high accident corridor (HAC).
- The Barnes Road, Phoebe to Strong "Safety" project programmed for construction in year 2017 will provide a paved, secondary route of travel in the event some emergency forced the closure of Indian Trail Road.
- The project reviews a number of concurrent development projects (i.e. pipeline projects), specifically in the development of traffic forecasts. Any subsequent developments must review Windhaven and these pipeline projects in order to assure cumulative traffic growth and capacity commitments are considered as the region continues to mature.
- City officials identified the pipeline projects to be included with this development.
- The TIA addresses the full traffic impacts associated with trip generation for 750 apartment units. The TIA phases the analysis into future without and then future with project conditions because a number of trips are already vested for the site and are treated as a pipeline project. But trip gains/increases are then combined to reflect total-apartment build trip totals.
- Conservative traffic forecasts were developed for the Barnes Road connection to Strong Road; reflecting specified and non-specified development/pipeline project traffic. The traffic forecasts presented in the TIA are more conservative (higher) than traffic studies generated by the City Street Department for the roadway.
- The City has directed that the final TIA moderately the Barnes Road assignments from 21% to 19% with the remaining trips directed to other destinations along Indian Trail Road (such as the shopping center).
- This TIA reflects a resultant 6 to 7 percent annual growth by year 2021 which can be extrapolated to a 1.4 percent annual growth rate through year 2040. By comparison, the Indian Trail Widening Roadway Capacity Justification Report provided by City Engineers predicts 1.3 percent annual growth on Indian Trail Road by year 2040. Thus, the TIA uses conservative traffic forecasts that exceeds the projections of even City officials.
- LOS were demonstrated to be adequate along Indian Trail Road with this TIA, as defined by City LOS Standards. As such, any recommendations of this report do not have to be programmed within the City 6-Transporation Improvement Program/Plan. With that said, this Final TIA does recommend a minimum four lane roadway with two northbound and two southbound lanes will be constructed along Indian Trail Road, within the Kathleen Avenue and Lowell Avenue "bottleneck" area, as a condition of development. The improvement would be developed with the City roadway rehabilitation project programmed for Indian Trail Road in year 2018.
- A summary field study was performed for the Lusitano Apartment complex located adjacent to the proposed Windhaven development along Barnes Road. The field study indicates the resultant trip generation rates used in the TIA are nearly 60 percent higher

in the AM and over 45 percent higher in the PM versus rates established on local field counts. This means this TIA well overestimates traffic versus what is likely to occur in the future with Windhaven development.

SUMMARY

The improvements and mitigation described will address project-related deficiencies noted throughout the TIA (specifically for Indian Trail Road). The project will contribute $362,620 towards mitigation of area deficiencies, via the TIF; specifically working to Indian Trail Road improvements. The project will also either provide adaptive traffic controls for the Maple Street/Francis Avenue intersection or promote travel demand management strategies to minimize project impacts to Francis Avenue. Thus, this TIA should successfully support the zone change and comprehensive plan modifications being sought with the 750 unit apartment project proposal being sought for Windhaven, as project impacts will be addressed.

No further recommendations are provided by this TIA.
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TABLES AND FIGURES

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FIGURES

1 INTRODUCTION

Windhaven First Addition is an approved residential planned unit development (PUD) located within the Indian Trail neighborhood of Spokane, Washington. The project is located within a Residential Single Family (RSF) zone of the City with a Comprehensive Plan designation of Residential 4-10. Approved by City officials in the year 2006, the roadway infrastructure for the development has been constructed but no homes have been built.

As a result of evolving market conditions, the project proponent would like to develop apartment units on the site in-lieu of single family homes. A Comprehensive Plan amendment and zone change would be needed to accommodate this development modification. Specifically, Residential Multifamily (RMF) zone and Residential 15-30 Comprehensive Plan designations would be needed (and are being sought) to allow for apartment development.

Through the growth management act (GMA), City officials have planned for and certified transportation concurrency for roads within the Indian Trail neighborhood, as based on historical land use development proposals (Windhaven and other development projects). Zone and Comprehensive Plan changes could impact concurrency determinations. As such, City officials have requested due-diligence, in terms of a development traffic study, to assess the impact of a revised development proposal.

This report summarizes the Traffic Impact Analysis (TIA) performed for the Windhaven Apartments development proposed in the City of Spokane, Washington. The analysis identifies the transportation impacts of the current development proposal on primary arterials and roadways located within and providing access to the Indian Trail neighborhood. The scope and work program for this study was developed in coordination with technical staff from City of Spokane, and was performed in accordance with City of Spokane Road TIA Guidelines.

The City of Spokane is lead agency for this project and will provide principal TIA review. Any additional agencies would provide secondary review per the request of City officials.

1.1 PROJECT DESCRIPTION

Approved Project. The Windhaven First Addition project site occupies 49.48 acres aligned north of Barnes Road just under 1,000 feet west of Indian Trail Road within the Indian Trail neighborhood of Spokane. The approved project includes the construction of up to 286 single family homes programmed for construction over approximately five years. The project was historically approved for development by City officials in year 2006 within an RSF zone of the City and with a site Comprehensive Plan designation of Residential 4-10. The approved proposal represents a density of 5.8 single family homes per acre.

According to Spokane Municipal Code, the Residential Single-Family zone "*is a low density single-family residential zone. It allows a minimum of four and a maximum of ten dwelling units per acre. One- and two-story builds characterize the allowed housing. The major type of new development will be attached and detached single-family residences.*"

According to the City Comprehensive Plan, the Residential 4-10 "*designation allows single-family residences, and attached (zero-lot line) single-family residences. The allowed density is*

a minimum of four units and a maximum of ten units per acre. Allowed structure types are single-family residences, attached (zero-lot line) single family residences, or two-family residences in appropriate areas."

Primary access to the project has already been constructed via Forest Lane and Pamela Lane; two local streets extending into the development from Barnes Road (along southern boundary of site). Secondary access would be promoted through an extension of Jamestown Lane into the adjacent apartment development east of Windhaven. A final access was historically developed for vehicle traffic via an extension of Moore Street to Shawnee Avenue (along northern boundary of site). However, this approach would be used only for pedestrian access in the future.

As shown (right), Windhaven has already been developed with a network of local streets. North-south circulation streets include Concord Lane, Windhaven Lane, and Camden Lane. East-west circulation includes Jamestown Lane, Georgetown Lane, Morgantown Lane, Yorktown Lane, and Youngstown Lane.

Aerial: Existing Windhaven Site (Source: Google Maps)

Project Proposal. The project proponent has recently proposed to develop up to 750 apartment units on the 49.48 acre site, as a result of changing market demands. The proposal results in a density of 15.2 homes per acre, which exceeds the approved residential density. Thus, this proposal dictates that a Comprehensive Plan amendment and zone change would be needed to accommodate the apartment proposal; specifically to a RMF zone and Comprehensive Plan designation of Residential 15-30. The current apartment proposal results in a density that just marginally exceeds minimum zoning and Comprehensive Plan allowances, and just under half of maximum allowable density (nearly 1,500 apartments could be developed under these City designations). The reduced apartment densities

According to Spokane Municipal Code, the Residential Multifamily (RMF) zone "*is a medium-density residential zone. Allowed housing is characterized by one to four story structures and a higher percentage of building coverage than in the RTF zone. The major types of development will include attached and detached single-family residential, condominiums, apartments, duplexes, townhouses and row houses. The minimum and maximum densities are fifteen and thirty units per acre.*"

The Residential 15-30 land use is simply described within the City Comprehensive Plan as a "*designation that allows higher density residential use at a density of 15 to 30 units per acre.*"

Site access and internal circulation would be promoted as described previously. Primary access would be provided via the Barnes Road intersections with Forest Lane and Pamela Street. Secondary access would be provided by an extension of Jamestown Lane into the adjacent apartment complex. Pedestrian access only would be provided via Moose Street. Internal circulation would be promoted by three north-south and five east-west local streets.

Figure 1 provides a vicinity map locating Windhaven. Figure 2 provides the current site plan for the proposed apartment development. Note this plan will evolve with time. As such, this study was intentionally developed to review a high unit count for the site in order to present a worse-case analysis of project transportation impacts.

1.1.1 Project Scope

City transportation engineering staff has reviewed capacity conditions for primary roadways aligned within the Indian Trail neighborhood. To be clear, there are long term improvement needs confirmed within the area; in particular, the widening of Indian Trail Road to a four lane section between Lowell Avenue and Excell Avenue. However, city staff has been able to confirm transportation concurrency for Indian Trail roadways within the immediate future. This means they have been able to demonstrate that adequate capacity would generally be available to accommodate some traffic growth. Currently there are 12 development projects vested and approved via the Comprehensive Plan process.

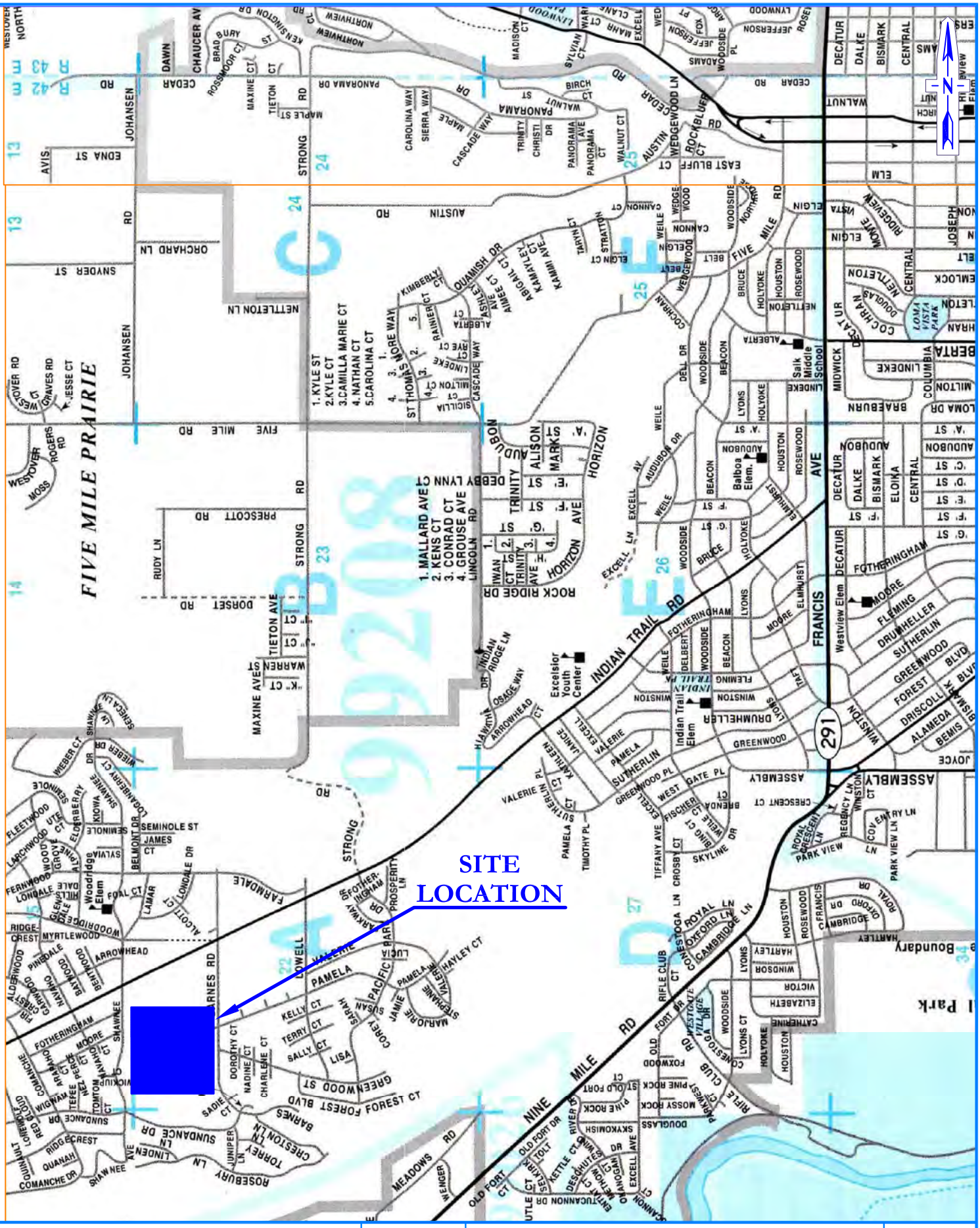
Windhaven First Addition is one of the development projects vested and addressed within the current Comprehensive Plan. As indicated, 286 single family homes were approved historically and, according to City resources, this development would be allowed to generate 210 trips during the AM peak hour and 271 during the PM peak hour of the work commute under the previous Comprehensive Plan and zoning approval.

According to comparisons developed using the *Trip Generation Manual* (ITE 9th Edition, 2012), the trips generated by 286 homes is equivalent to the trips generated by 460 apartment units. Thus, from a transportation perspective, 286 single family homes and 460 apartments are generally equivalent. A summary of this comparison is provided in Table 1.

Table 1. Vested Residential Land Use & Trip Comparisons

Residential Land Use	Dwelling Units	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Single Family Homes (ITE Code 210)	286	65	145	210	179	92	271
General Apartment Units (ITE Code 220)	460	46	183	229	176	95	271

Transportation concurrency is reviewed within the City of Spokane based upon PM peak hour traffic conditions. As shown above, the trips generated by 286 homes and 460 apartments are equal during the PM peak hour. There is a minor differential during the AM peak hour. Trip generation was based upon equations that relate trips to dwelling units for single and multi-family homes. Further discussion on trip generation is provided within Section 3.2.



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DATE: 05-2016

WINDHAVEN APARTMENTS
TRAFFIC IMPACT ANALYSIS
SPOKANE WA

PROJECT NO. 5594.002

FIGURE NUMBER 1

SITE LOCATION

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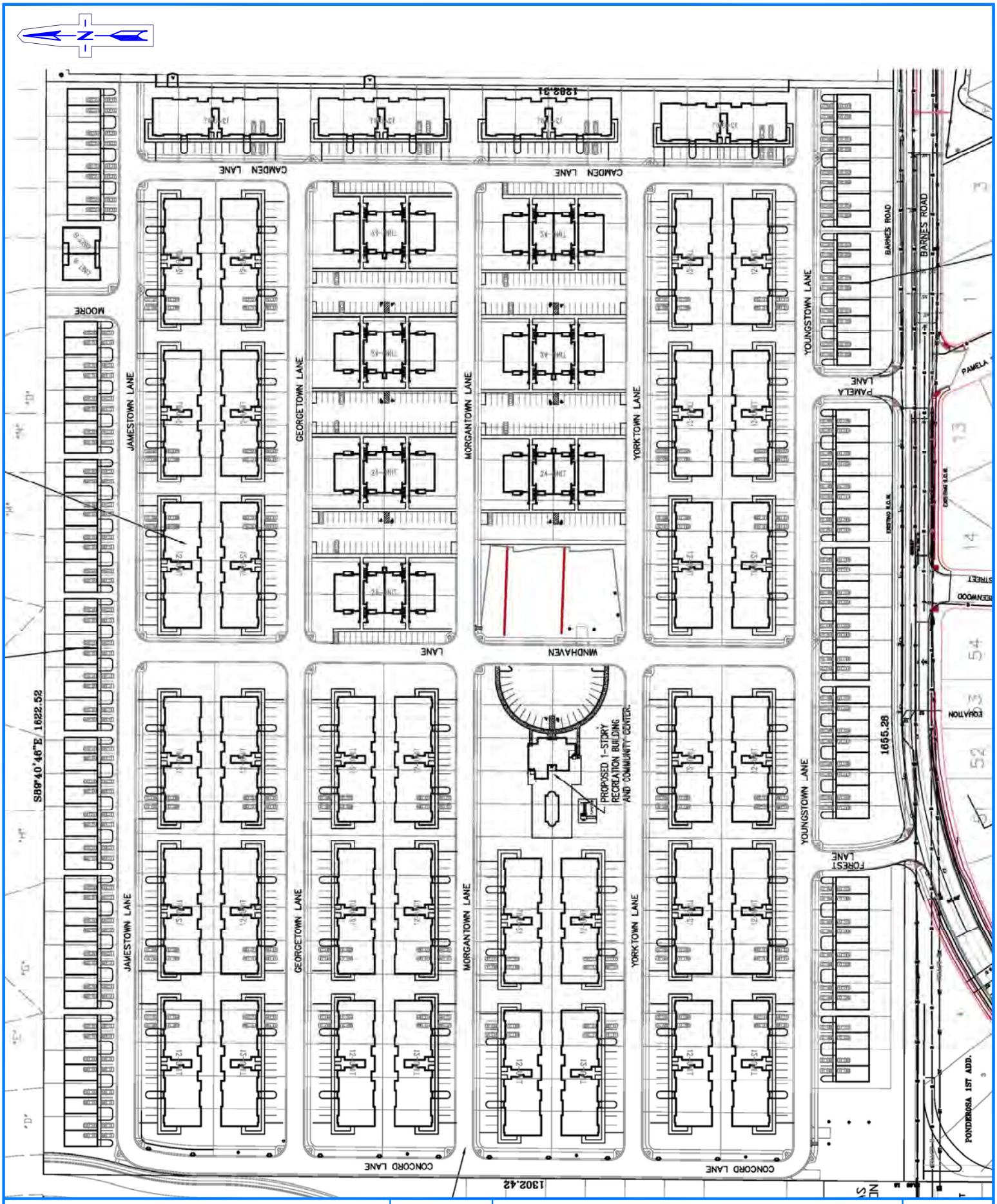

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WINDHAVEN APARTMENTS
TRAFFIC IMPACT ANALYSIS
SPOKANE WA

PROJECT NO. 5594.002

PRELIMINARY SITE PLAN
(Source: BK Bonner Engineering)

FIGURE NUMBER 2

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1.2 ANALYSIS SCOPE AND METHODOLOGY

The purpose of this TIA is to review the traffic and transportation impacts of the proposed development on vicinity arterials and recommend improvements and strategies, as needed, to mitigate impacts in order to assure adequate transportation capacities. This section describes the primary scope and methods used to evaluate traffic conditions and determine potential improvements for the project study area.

1.2.1 Project Scope

A TIA evaluates roadway capacity primarily through an examination of intersection operations. Congestion and increased vehicle delays are experienced more rapidly at intersections versus road segments (between intersections) due to the number and frequency of conflicts (i.e. turning vehicles and stopping or slowing movements).

The scope for this study was established in coordination with City of Spokane and Washington State Department of Transportation (WSDOT) engineering officials. Per direction, this study quantifies traffic operations and capacity based principally on intersection level-of-service (LOS), as performed by direction for the intersections of:

- Shawnee Avenue/Indian Trail Road
- Barnes Road/Indian Trail Road
- Strong Road/Indian Trail Road
- Indian Trail Road/Francis Avenue
- Alberta Street/Francis Avenue
- Ash Street/Francis Avenue
- Maple Street/Francis Avenue
- Barnes Road/Forest Lane (Project Access)
- Barnes Road/Pamela Lane (Project Access)

Per the direction of local agency staff, the analysis was performed for the AM and PM peak/commute hours of the weekday, which are the highest hours of capacity demand within this area of Spokane. The forecast analysis horizon year for this study is 2021, which is the completion and final occupancy year of the proposed development.

1.2.1 Methodology - Intersection Operations

Intersection capacity was evaluated using the level-of-service (LOS) methodologies of the *Highway Capacity Manual* (TRB, 2010). The *Highway Capacity Manual* (HCM) is a nationally recognized and locally accepted method of measuring traffic flow and congestion for intersections. Criteria range from LOS A, indicating free-flow conditions with minimal vehicle delays, to LOS F, indicating congestion with significant vehicle delays (and operational failures).

LOS for a signalized intersection is defined in terms of the average control delay experienced by all vehicles at the intersection, as measured over a specific time period such as a peak hour. LOS for a one or two-way stop controlled intersection or driveway is the function of average control delays experienced by vehicles in a particular approach or approach movement over a timeframe such as a peak hour. Typically, the stopped approach or movement experiencing the worst LOS is reported. Finally, LOS at an all-way stop-controlled intersection is defined by the average control delays experienced by all vehicles at the intersection, as with signals, but the LOS thresholds are associated with delays for unsignalized intersections.

Table 2 outlines the LOS criteria for signalized and unsignalized intersections from the *Highway Capacity Manual*. As shown, LOS thresholds, as a function of delay, vary between signalized

and unsignalized intersections. This is because driver tolerances for delay have been documented to be much higher at signalized versus unsignalized intersections.

Table 2. Intersection Level of Service Criteria

Level of Service	Signalized: Control Delay (sec/veh)	Unsignalized: Control Delay (sec/veh)
A	≤10	≤10
B	>10 – 20	>10 - 15
C	>20 – 35	>15 - 25
D	>35 – 55	>25 - 35
E	>55 – 80	>35 - 50
F	> 80	>50

Source: *Highway Capacity Manual* (TRB, 2010)

LOS was determined for this study using Synchro Version 9.1, (Trafficware, 2015). This software tool can apply the analysis methodologies of HCM 2010 and is a standard industry software application.

LOS thresholds for the City of Spokane are highlighted by "Transportation Concurrency Level of Service Standards", which is an administrative policy and procedure document available from the City clerk's office. Section 5.2.1.3 indicates LOS E is the threshold for "signalized arterial intersections along Principal or Minor arterials identified on Comprehensive Plan Map TR3." This standard applies to all signalized study intersections, as they are located along the principal arterials of Francis Avenue and Indian Trail Road. Section 5.2.2 indicates LOS E is the operational threshold for movements at unsignlaized intersections. Road improvements and/or transportation demand strategies may be required to help mitigate capacity issues, as determined via results that fall below City LOS thresholds.

1.2.2 Methodology – Vehicle Queues

Average and 95th percentile queue analyses were performed to provide guidance regarding turn pocket impacts for signalized intersections. Average queues are those most typically predicted to occur at an intersection with some frequency. 95th percentile queues represent near-maximum queue conditions predicted to occur only a few times during the peak hour. While it is not ideal to have 95th percentile queue potentials exceed turn lane/pocket storage length, it is acceptable so long as average queues can be accommodated. A turn lane/pocket issue is prevalent when average queues exceed storage length. Thus some form of improvement may need to be considered; typically in the form of signal phase adjustment, turn lane/pocket adjustment, and sometimes even the provision of a second turn lane.

Queues are presented in terms of total "stacking" vehicles with the equivalent queue length provided in feet. For this study, an average length of 25-feet was used per vehicle, as recommended by the HCM, and via standard industry practices. This space includes the length of the vehicle plus spacing between vehicles. Queue determinations were provided using Synchro, which also bases evaluations on HCM methodologies.

1.2.3 Methodology – Lane Capacity

A lane capacity analysis was developed as a secondary measure and method for evaluating traffic conditions specifically for Indian Trail Road. This analysis was performed due to the "bottleneck" that exists along the roadway; caused by a narrowing of the arterial from four lanes south of Excell Avenue to three lanes north.

Table 2.2 SRTC Regional Demand Model Street Typology

Street Type	Type Number	Capacity (vphpl)	Operating Speed
Rural Freeway	1	2000	70
Rural Local Street	9	500	25
I-90, SR 195 to Freya-NSC	10	1800	60
Urban Interstate	11	2000	60
Urban Expressway	12	2000	60
Urban Arterial	14	1100	40
Urban Arterial – CBD	15	900	30
Collector Arterial	17	900	35
Urban Arterial-CBD–One-way	18	800	30
Local Street	23	500	25
Neighborhood Collector	20	600	30
Ramps	50	1600	40
Rural Highways	52	1800	60
Urban Arterial Ramp	53	1000	50
I-90 Viaduct Ramp, SR 195-Freya	54	1200	40
Local Road	60	1000	25
Exclusive Light-rail Transit Link	66	1000	35
Fairchild AFB	99	500	25

Hourly Lane Capacity Thresholds (Source: SRTC)

The lane capacity analysis was performed based upon peak hourly volume data provided by the Year 2011-2035 Spokane Metropolitan Transportation Plan (SRTC, 2011). Generally, the Plan provides vehicle per hour per lane (vphpl) capacity thresholds distinguished by functional classification and operating speed. According to this table, the best approximation of Indian Trail Road is that of a 30 mph urban arterial collector arterial; both with a practical capacity of 900 vphpl. Therefore, this was used as the basis for reviewing lane capacities for the roadway.

Note these are capacity thresholds typically associated and used with the development of a forecast travel demand model and are not typically used as a primary means for evaluating capacities on city roadways. However, this secondary means was sought specifically as a method for reviewing "through" traffic capacity on Indian Trail Road, as primary analysis measures focus on intersection operations.

Thus, the conclusions of this TIA were primarily derived from intersection analyses and the methodologies of the HCM. Secondary conclusions were derived from lane capacity analyses, and other considerations such as travel speed and queuing.

2 EXISTING CONDITIONS

This section describes existing traffic conditions within the project study area. Described are study roadways, current traffic volumes, and existing operations and capacity conditions.

2.1 ROADWAY NETWORK

The study focuses on traffic operations for a number of intersections located along the roadways of Indian Trail Road, Barnes Road, Strong Road, Francis Avenue, Alberta Street, Ash Street, and Maple Street. A description of study roadways is provided as follows, in order of descending functional classification:

- **Francis Avenue.** Also designated State Route 291, Francis Avenue is an u*rban principal arterial*. The roadway has a five lane cross section, which includes a two-way left-turn lane (TWLTL), with contiguous sidewalk, curb, and gutter along both sides of the roadway. The posted speed limit is 35 mph within the study area. The current City traffic flow map indicates the arterial supports between 26,000 and 29,000 average daily traffic (ADT) within the study area east of Indian Trail Road, dropping to 11,900 ADT west.
- **Indian Trail Road.** This *urban principal arterial* has a speed limit of 35 mph within the City of Spokane. City traffic flow map indicates the roadway supports about 17,100 ADT north of Francis Avenue, dropping to 11,000 ADT north of Strong Road. Curb, sidewalk, and gutter are contiguous on both sides of the roadway throughout the project study area. Precluding intersection configurations, general lane geometrics are as follows:
  - Four travel lanes immediately north of Francis Avenue to about Elmhurst Avenue (approximate 500 foot section).
  - Five lanes (including a TWLTL) adjacent to Indian Trail Center between Elmhurst Avenue and Holyoke Avenue (nearly a 900 foot section).
  - Four lanes from Holyoke Avenue north to about Excell Avenue (about a 3,600 foot section).
  - Three lanes (including a TWLTL) north of Excell Avenue to Lowell Avenue (about a 5,100 foot section). A traffic "bottleneck" has been noted to occur in the four to three lane transition area within the vicinity of Excell Avenue.
  - Four lanes with two southbound, one northbound, and one TWLTL between Lowell Avenue and Barnes Road (nearly a 1,500 foot section) adjacent to Sundance Plaza.
  - Three lanes (including a TWLTL) north of Excell Avenue to nearly City limits (section length is greater than a mile).
- **Maple Street & Ash Street Couplet.** These are urban principal arterials throughout the majority of the City. Maple Street is a two-lane northbound arterial and Ash Street a two lane southbound arterial; both with posted speeds of 30 mph within the vicinity of Francis Avenue. Sidewalk, curb, and gutter are contiguous along both sides of both roadways within the project study area. City traffic flow maps indicate about 25,000 ADT south and nearly 28,000 ADT north of Francis Avenue on the couplet.
- **Alberta Street.** This is an *urban minor arterial* with a three-lane cross-section, including a TWLTL, and a posted speed limit of 30 mph south of Francis Avenue. North of Francis Avenue, this *local street* with a two-lane cross-section and posted speed limit of 25 mph. Curb, gutter, and sidewalk are contiguous along the arterial. Traffic flow maps indicate the roadway supports 10,600 ADT south of Francis Avenue with no counts to the north.

- **Barnes Road.** This is an *urban major collector* for approximately ½ mile on either side of Indian Trail Road. The collector primarily has a two-lane cross-section east of Indian Trail Road. The roadway has a five-lane cross section for about 1,300 feet west of Francis Avenue, adjacent to Sundance Plaza; continuing an approximate 2,000 additional feet as a three lane roadway (including a TWLTL). The speed limit is 25 mph within the study area. Curb, gutter, and sidewalk are contiguous along the majority of the roadway. City traffic flow maps indicate the roadway supports about 2,000 ADT on either side of Indian Tail Road.
- **Shawnee Avenue.** This is currently classified as an *urban major collector* within the City. The roadway has a two-lane cross section, improved with sidewalks, curb, and gutter. The posted speed limit is 25 mph with a 20 mph school zone west of Indian Trail Road. The roadway supports about 2,300 ADT.
- **Strong Road.** This is currently classified as an *urban major collector* within the City. The roadway has a two-lane cross section, improved with sidewalks, curb, and gutter west of Indian Trail Road. A 40-foot wide, unimproved section (a gravel roadway) is aligned east of Indian Trail Road. The posted speed limit is 25 mph. The roadway is estimated to support less than 2,000 vehicles per day within the study area.

A summary of existing intersection turn lane locations and traffic control conditions (signal, one-way, two-way, or all way stops) is provided in Table 3. Shown are different traffic movements at intersections and whether a turn-lane is provided. If no specific lane is shown, then turns are performed from adjacent, shared through-lane. Also indicated are traffic control conditions for the intersection. Controls and lanes are denoted with an "X". Turn lanes are denoted with a "1" for a single-lane, "2" for a double-lane, etc.

Table 3. Existing Intersection Geometrics and Traffic Controls

Intersection	Traffic Control				Intersection Geometrics							
	Traffic Signal	One-Way Stop	Two-Way Stop	All-Way Stop	NB Left Turn Lane	NB Right Turn Lane	SB Left Turn Lane	SB Right Turn Lane	WB Left Turn Lane	WB Right Turn Lane	EB Left Turn Lane	EB Right Turn Lane
Shawnee Ave/Indian Trail Rd	X	-	-	-	1	1	1	1	1	-	1	-
Barnes Rd/Indian Trail Rd	X	-	-	-	1	1	1	1[3]	1	-	1	-
Strong Rd/Indian Trail Rd	X	-	-	-	1	1	1	1	-	-	1	-
Indian Trail Rd/Francis Ave	X	-	-	-	-	-	2[1]	-	-	1	1	-
Alberta St/Francis Ave	X	-	-	-	-2[1]	-	1	-	1	-	1	-
Ash St/Francis Ave	X	-	-	-	-	-	1	1	1	-	-	-
Maple St/Francis Ave	X	-	-	-	2[2]	-	-	-	-	-	1	-
Barnes Rd/Forest Ln	-	X	-	-	-	-	-	-	-	-	1	-
Barnes Rd/Pamela Ln	-	-	X	-	-	-	-	-	1	-	1	-

1. Double left-turn lane with right-turns shared from outer left-turn lane.
2. Double left-turn lane with through movements shared from inner left-turn lane.
3. Widened pocket that continues as a through lane south of intersection.

2.2 TRAFFIC COUNTS

Traffic counts were collected specifically for this study on typical weekdays in March and April of 2016 (Tuesday through Thursday). Traffic counts were performed in the morning between 7:00 and 9:00 AM and in the afternoon/evening between 4:00 PM to 6:00 PM in order to identify the AM and PM peak hours of commute traffic activity for each intersection.

The peak volume for each intersection was used in traffic analyses, respectively, in order to assure a worst-case review of capacity demands. As such, the peak hour did vary between intersections during the morning and afternoon timeframes. With that said, a prevalent 7:00 to 8:00 AM peak hour was noted on Indian Trail Road in the morning. A 5:00 to 6:00 PM peak was noted at nearly all study intersections during the evening. Original count worksheets are provided in Section B of the technical Appendix.

Typically, raw counts are used directly in LOS analysis. However, in some situations, a reconciliation of arrival versus departure volumes must be performed to fully consider travel demands at intersection. A departure volume is noted as vehicle traffic crosses the stop-bar and enters an intersection; typically recorded and used in analyses as specific through and turn movements are identified. However, in some instances arrival volumes must also be recorded as vehicle traffic does not always make it through the stop-bar during a typical signal cycle. Residual traffic must therefore wait in queues until the next green phase (or more) allows them to clear the intersection. The difference in arrival less departure traffic represents additional travel demands upon through and turning movements at an intersection. Thus, this differential is recorded and then combined with base/raw traffic counts in order to fully review travel demands upon an intersection.

Upon scope coordination with City and State agencies, it was determined there were particular approaches of concern where vehicle traffic did not clear the stop-bar and had to wait through an additional signal cycle on Francis Avenue and Indian Trail Road. The movements and timeframes of concern are as follows:

- Eastbound Alberta Street/Francis Avenue - AM Peak Hour
- Eastbound Ash Street/Francis Avenue - AM Peak Hour
- Southbound Indian Trail Road/Francis Avenue - AM Peak Hour
- Northbound Maple Street/Francis Avenue - PM Peak Hour
- Westbound Maple Street/Francis Avenue - PM Peak Hour
- Westbound Indian Trail Road/Francis Avenue - PM Peak Hour

Follow-up counts were performed in March 2016 for the traffic movements specified, for the respective AM and PM peak hours noted through weekday counts. Data collected included arrival volumes, departing traffic (crossing the stop-line), and then the remaining vehicles that queue following the end of the green signal phase. Counts were performed for every signal cycle, with residential queues/vehicle identified following many signal cycles. These residual vehicles were summarized for each approach noted above and combined, as needed, with raw counts to assure maximum travel demands would be assessed with this TIA.

A summary of this comparison is provided in Table 4 for the AM and PM peak hours. The original count worksheets are provided in Technical Appendix B. The original count worksheets show arrival, departure, and queue volumes on a per cycle basis.

Table 4. Arrival, Departure, and Queue Volume Comparisons					
Location & Approach	Timeframe	Original Count	Additional Arrival Count	Additional Departure Count	Queue Volume
Eastbound Alberta St/Francis Ave	AM Peak	1,175	1,228	193	1,413 √
Eastbound Ash St/Francis Ave[1]	AM Peak	1,053	1,029	61	1,090 √
Southbound Indian Trail Rd/Francis Ave	AM Peak	1,113	1,129	20	1,149 √
Northbound Maple St/Francis Ave	PM Peak	1,374	1,406	31	1,437 √
Westbound Maple St/Francis Ave	PM Peak	1,362	1,362	28	1,390 √
Westbound Indian Trail Rd/Francis Ave	PM Peak	1,636 √	997	7	1,004
1. Through volume only impacted.					

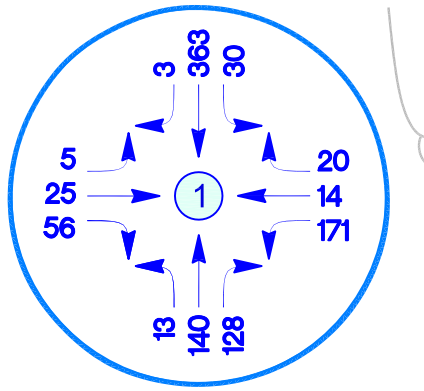
As shown, the majority of follow up counts exceed original counts when factoring in the residential queues (i.e. the balance remaining between arrival and departure counts). The only exception occurs within the westbound approach to the Indian Trail Road/Francis Avenue intersections. As such, the higher of count volumes were used in the analysis, as denoted with a check (√). The resulting traffic gains for these approaches were proportioned to each movement based on turning volume count data. Figure 3 and Figure 4 provide a summary of the resulting AM and PM peak hour counts for study intersections.

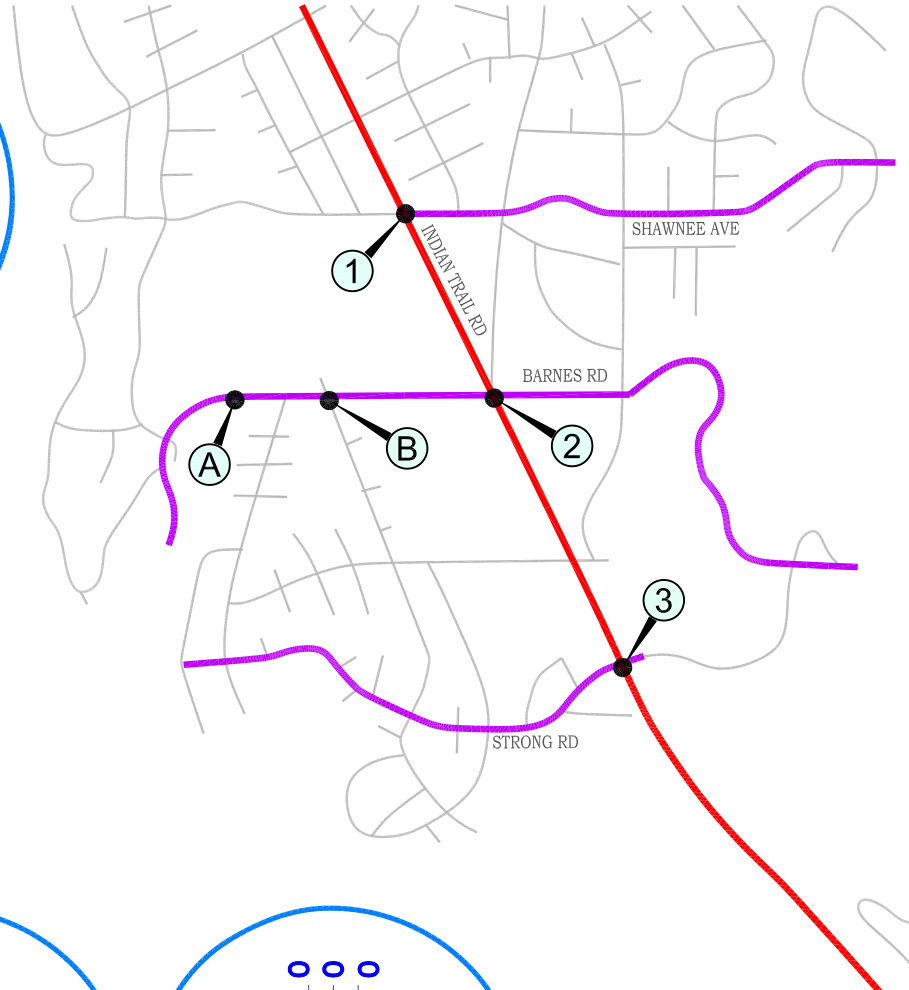
Speed Counts. Speed counts were performed at three locations to further review the impact of the "bottleneck". Counters were placed on Indian Trail Road: 1) north of Weile Avenue (south of bottleneck); 2) north of Kathleen Avenue (within bottleneck); and 3) north of Lowell Avenue (north of Bottleneck). Average speeds and corresponding ADT are summarized in Table 5.

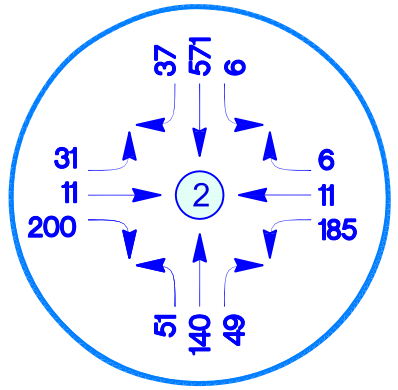
Table 5. Indian Trail ADT and Speed Counts - AM and PM Peak Hours					
Indian Trail Road	ADT	Average Speed - Northbound		Average Speed - Southbound	
		AM Peak	PM Peak	AM Peak	PM Peak
N/of Weile Ave	17,299	36.5	36.8	36.0	35.7
N/of Kathleen Ave	16,821	37.9	36.8	34.8	37.9
N/of Lowell Ave	13,555	34.3	31.9	33.4	33.2

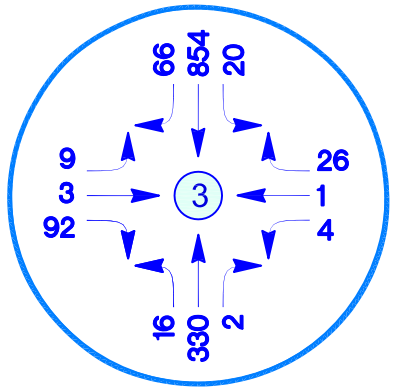
As shown, ADT counts range between 17,300 ADT south to 13,555 north of the bottleneck. The posted speed limit is 30 mph. Counts indicate average speeds exceed the posted limit by 3 to nearly 8 mph throughout analysis limits in both directions. There is a minimal difference in average speeds between the four lane section south of the bottleneck and the three lane section within the bottleneck.

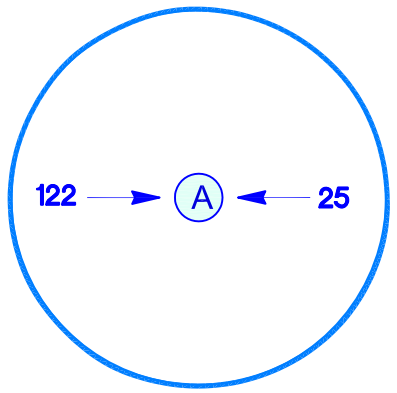
School Traffic. This statement has been provided to simply acknowledge that all traffic counts were performed while local schools were in operation within the study area. Area schools can generate traffic that results in higher demand on City roadways. Thus, counts were performed to assure the activities of schools such as Indian Trail Elementary, Woodridge Elementary, Westview Elementary, Balboa Elementary, and Salk Middle School are addressed.

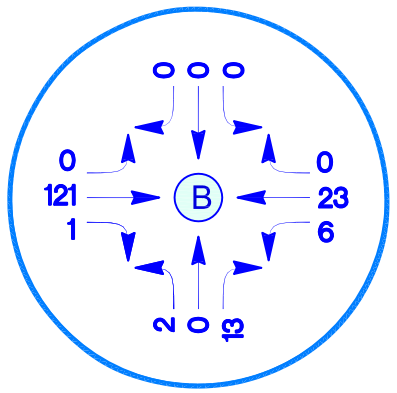


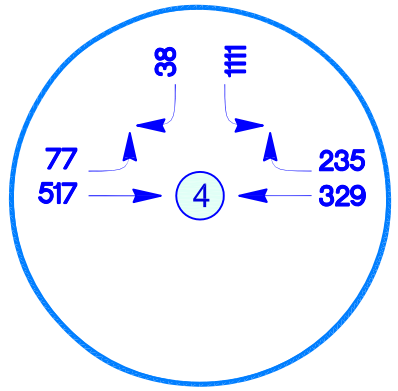


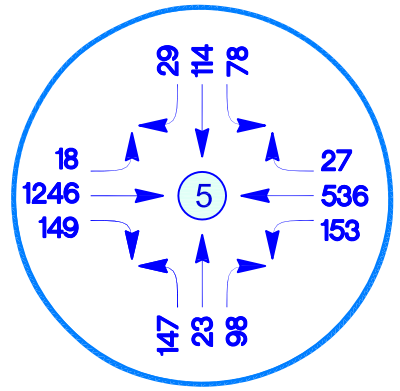












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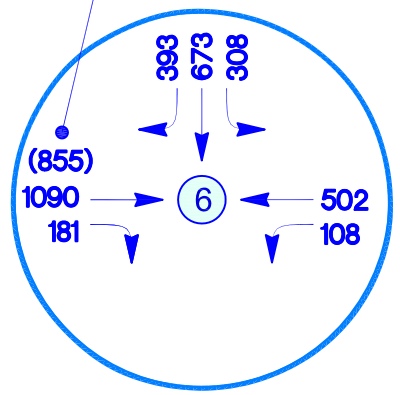

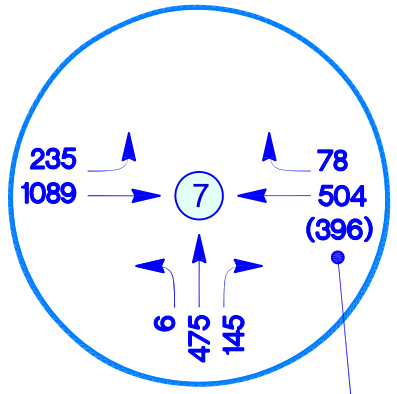

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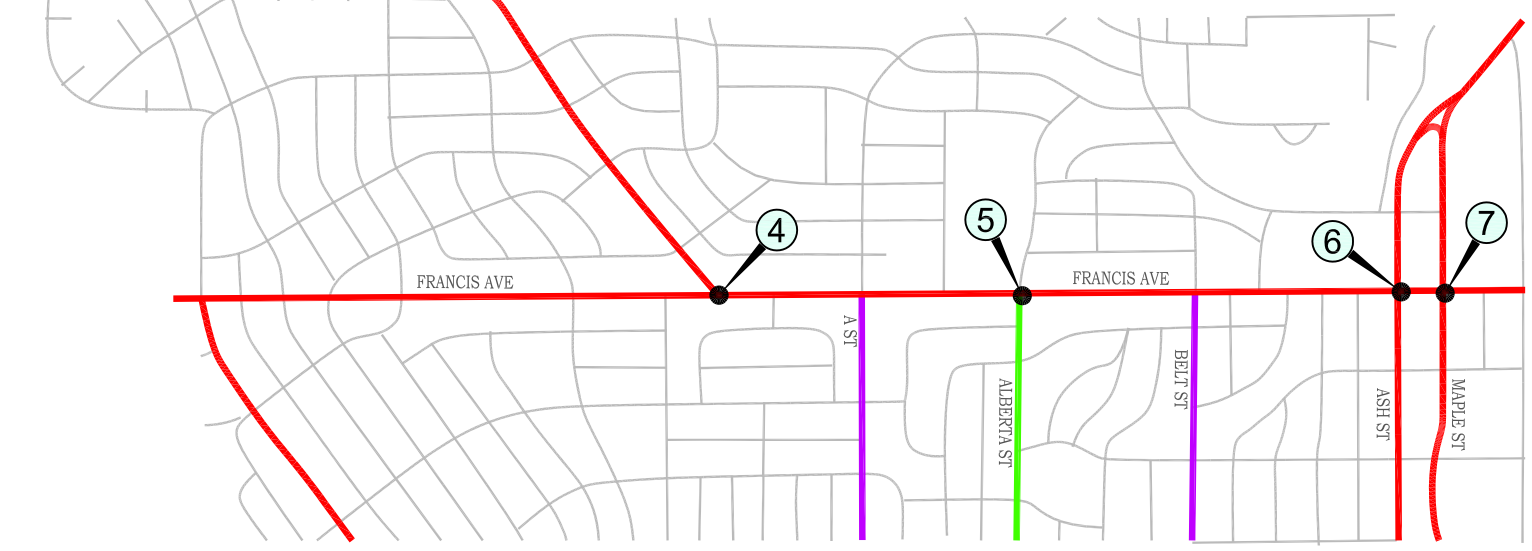

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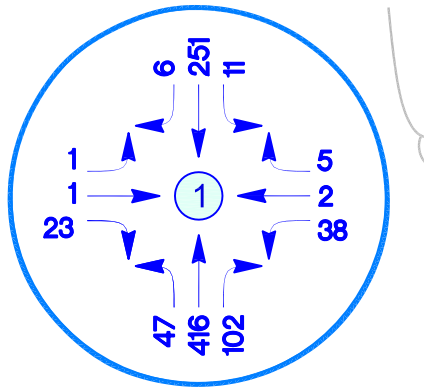
APPR. BY: KB
DATE: 05/2016

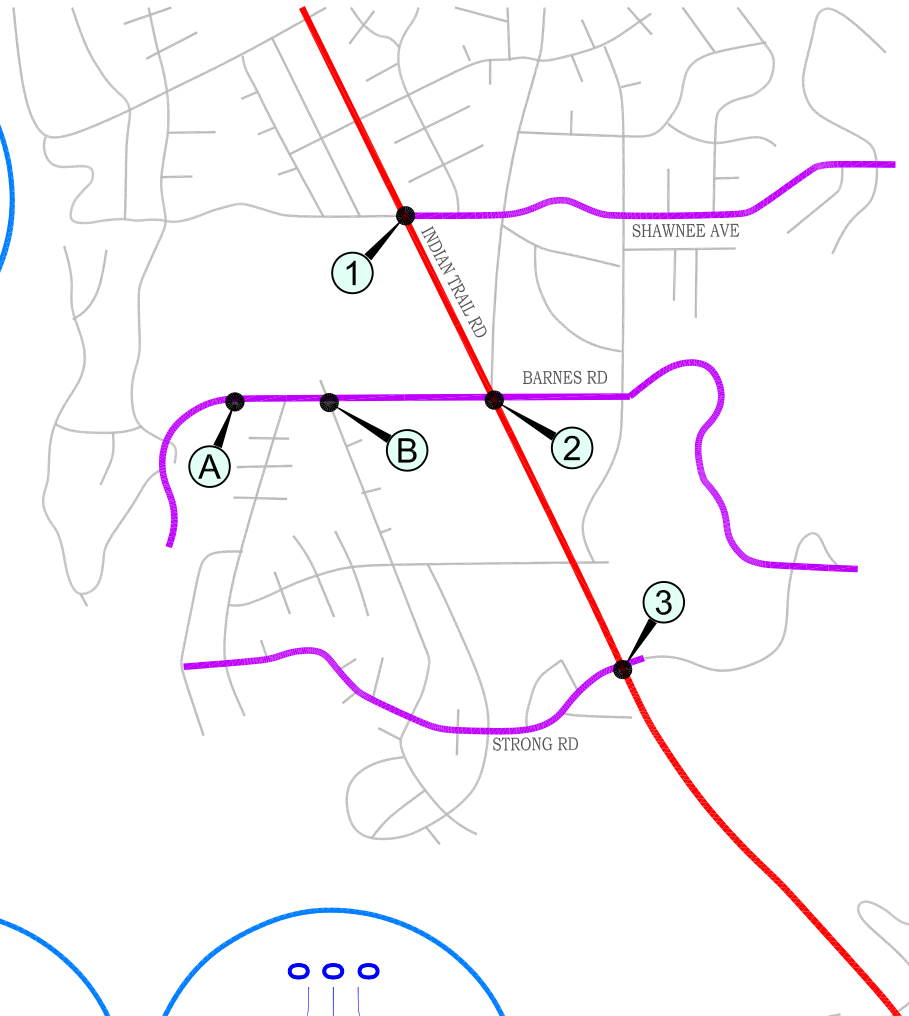
WINDHAVEN APARTMENTS
TRAFFIC IMPACT ANALYSIS
SPOKANE WA

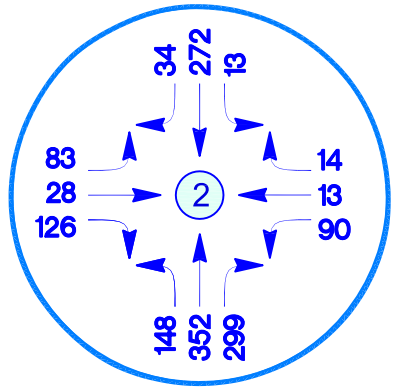
EXISTING TRAFFIC VOLUMES - AM PEAK HOUR

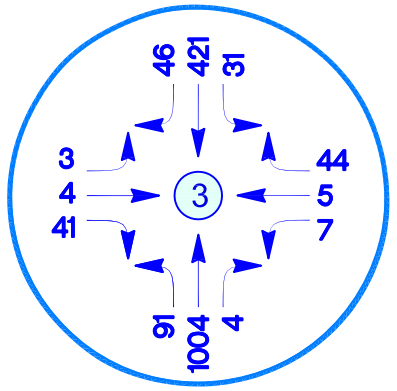
PROJECT NO.
5447.001

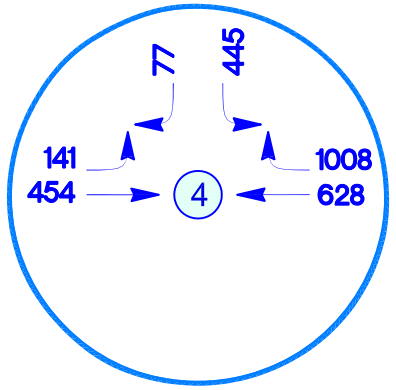
FIGURE NUMBER
FIG. 3

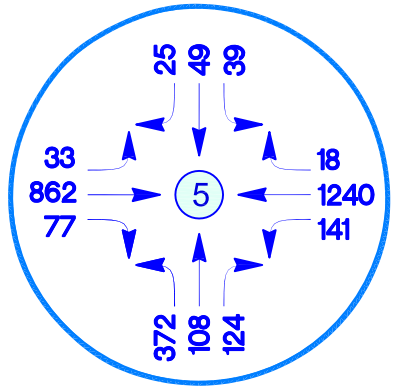


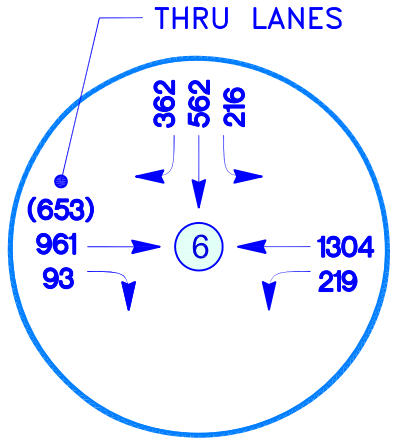


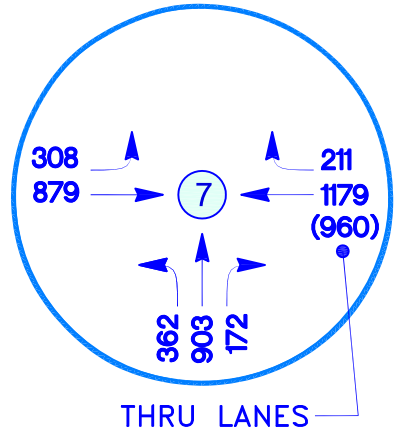


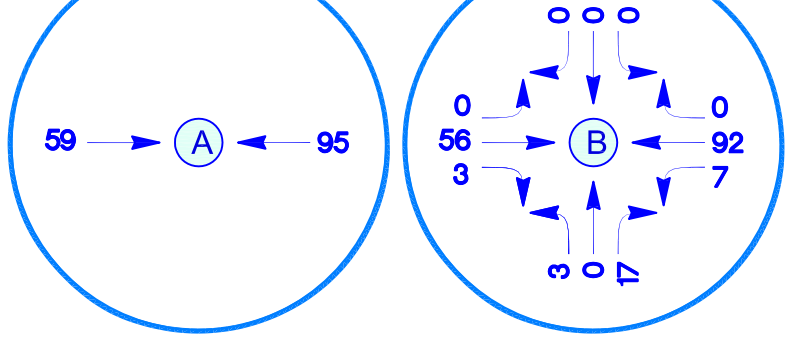


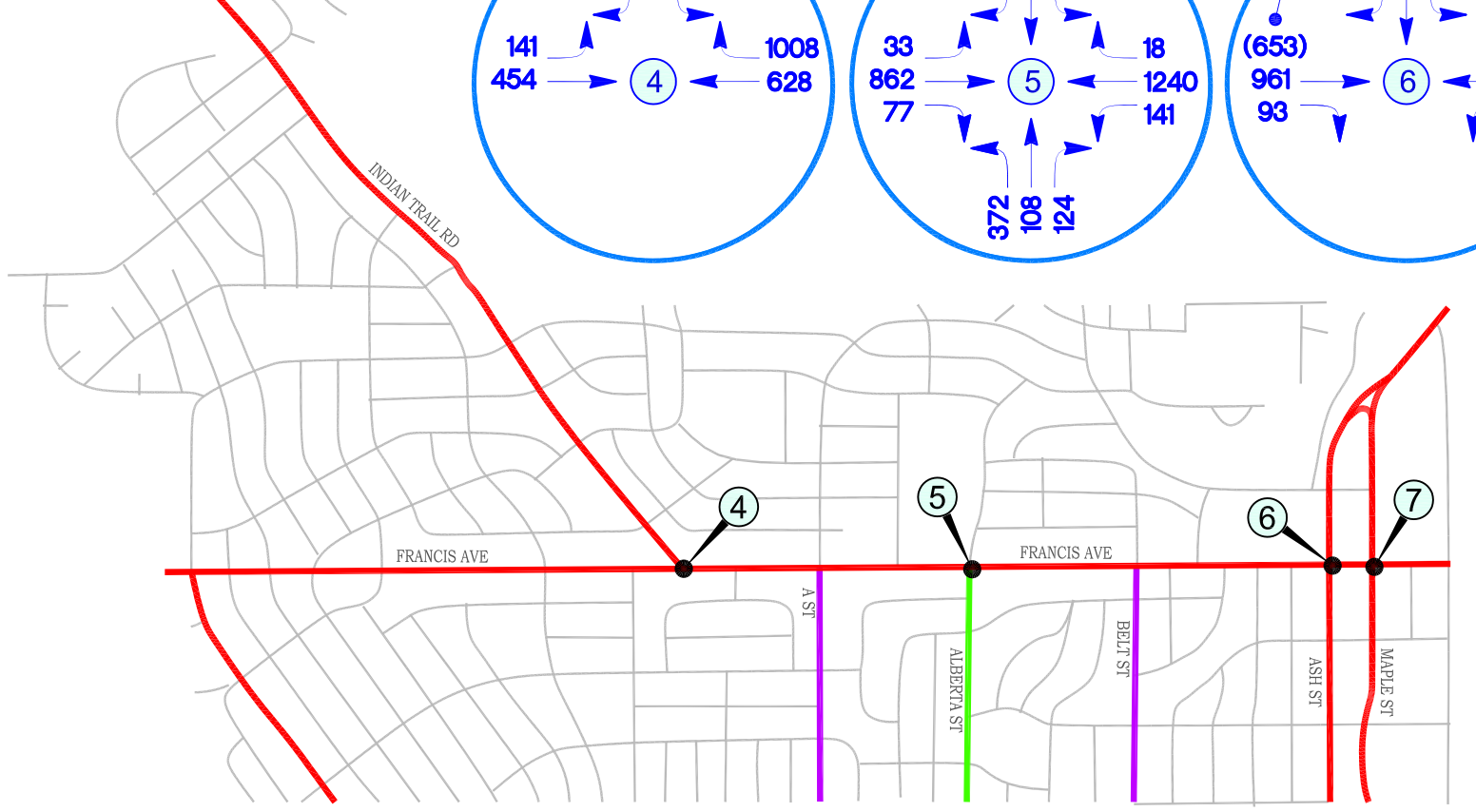












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WINDHAVEN APARTMENTS
TRAFFIC IMPACT ANALYSIS
SPOKANE WA

EXISTING TRAFFIC VOLUMES - PM PEAK HOUR

PROJECT NO. 5447.001

FIGURE NUMBER FIG. 4

2.3 TRAFFIC OPERATIONS & CAPACITY

The LOS and capacity analyses were performed based on a review of the adjusted traffic volumes summarized in Section 2.2 and the geometric conditions described in Section 2.1. Signal timing data was provided by City of Spokane staff via Synchro files and timing cards.

This data includes information such as phase minimum and maximum splits, all-red and yellow times, pedestrian timing data, additional vehicle passage and gaps, etc.; generally the working parameters of an actuated traffic signal. No optimization or adjustment was made to these files as to maintain precise City timings noted in the field, including coordination details for the Ash and Maple Street intersections with Francis Avenue. Note that northbound lane utilizations for the Maple Street/Francis Avenue intersection were adjusted per field observations performed in July 2016, per the direction of City officials. These utilizations were used in forecast analyses as well.

Table 6 provides a summary of LOS for the AM and PM peak hours. Also shown are average control vehicle delays for each intersection. Note there are no project turning movements that currently occur at the Forest Lane and Pamela Lane intersections with Barnes Road. As such, these intersections were not included in the analysis.

Table 6. Existing LOS and Delay - AM and PM Peak Hours

Signalized Intersections	AM Peak		PM Peak	
	LOS[1]	Delay[2]	LOS[1]	Delay[2]
Shawnee Ave/Indian Trail Rd	B	17.3	A	7.7
Barnes Rd/Indian Trail Rd	B	18.1	B	14.4
Strong Rd/Indian Trail Rd	A	9.7	B	18.9
Indian Trail Rd/Francis Ave	B	12.3	A	7.9
Alberta St/Francis Ave	D	36.4	C	32.2
Ash St/Francis Ave	C	22.3	C	20.4
Maple St/Francis Ave	B	17.7	D	41.9

1. LOS = Levels-of-Service
2. Del = Delay in seconds

As shown, all study intersections currently function within acceptable LOS ranges, as no signalized intersection functions below LOS E. This indicates that no capacity improvements would be warranted on the basis of existing traffic operations, as there is sufficient roadway capacity. LOS summary worksheets are provided in Section C of the Technical Appendix.

Queue Potentials. Existing queue potentials were reviewed for study intersections. As indicated, both average and 95th percentile queues are considered. Most acceptable conditions are those where average and 95th percentile queues do not exceed lane/pocket storage. Tolerable conditions are those where average queues do not exceed lane storage/pocket length, even when 95th percentile queues do exceed storage. Unacceptable conditions are noted where both average and 95th percentile queues exceed available lane/pocket storage.

Summary queue conditions are provided in Table 7 for the AM and PM peak hours. Again, queues are represented in terms of vehicle demands versus vehicle storage. A sense of length impacts is determined roughly by multiplying vehicles times a transportation industry spacing standard of 25 feet.

Table 7. Existing Queue Potentials - AM and PM Peak Hours

Signalized Intersections	Lane Capacity	AM Peak		PM Peak	
		Avg.	95%	Avg.	95%
Shawnee Ave/Indian Trail Rd					
- Northbound Left-Turn Lane	7 vehicles[1]	1 vehicle	1 vehicles	1 vehicle	1 vehicle
- Northbound Right-Turn Lane	3 vehicles	0 vehicle	1 vehicle	1 vehicle	1 vehicle
- Southbound Left-Turn Lane	3 vehicles[1]	1 vehicle	1 vehicle	1 vehicle	1 vehicle
- Southbound Right-Turn Lane	3 vehicles	0 vehicle	0 vehicle	1 vehicle	1 vehicle
- Westbound Left-Turn Lane	3 vehicles	5 vehicle	6 vehicles	1 vehicle	2 vehicles
- Eastbound Left-Turn Lane	3 vehicles	1 vehicle	1 vehicles	0 vehicle	1 vehicles
Barnes Rd/Indian Trail Rd					
- Northbound Left-Turn Lane	8 vehicles[1]	1 vehicle	2 vehicles	2 vehicles	5 vehicles
- Northbound Right-Turn Lane	5 vehicles	0 vehicle	1 vehicle	1 vehicle	5 vehicles
- Southbound Left-Turn Lane	7 vehicles[1]	1 vehicle	1 vehicle	1 vehicle	1 vehicle
- Westbound Left-Turn Lane	6 vehicles	3 vehicles	6 vehicles	1 vehicle	3 vehicles
- Eastbound Left-Turn Lane	4 vehicles	1 vehicle	2 vehicles	1 vehicle	3 vehicles
Strong Rd/Indian Trail Rd					
- Northbound Left-Turn Lane	7 vehicles[1]	1 vehicle	1 vehicle	1 vehicle	2 vehicles
- Northbound Right-Turn Lane	4 vehicles	0 vehicle	0 vehicle	0 vehicle	0 vehicle
- Southbound Left-Turn Lane	7 vehicles[1]	1 vehicle	1 vehicle	1 vehicle	1 vehicle
- Southbound Right-Turn Lane	4 vehicles	1 vehicle	1 vehicle	0 vehicle	1 vehicle
- Eastbound Right-Turn Lane	8 vehicles	1 vehicle	2 vehicles	0 vehicle	1 vehicle
Indian Trail Rd/Francis Ave					
- Westbound Right-Turn Lane	16 vehicles[2]	0 vehicle	2 vehicles	1 vehicle	7 vehicles
- Eastbound Left-Turn Lane	2 vehicles	1 vehicle	2 vehicles	1 vehicle	3 vehicles
Alberta St/Francis Ave					
- Northbound Left-Turn Lane	9 vehicles[1]	4 vehicles	7 vehicles	8 vehicles	17 vehicles
- Southbound Left-Turn Lane	4 vehicles	2 vehicles	4 vehicles	1 vehicle	3 vehicles
- Westbound Left-Turn Lane	8 vehicles[1]	3 vehicles	8 vehicles	2 vehicles	5 vehicles
- Eastbound Left-Turn Lane	8 vehicles[1]	1 vehicle	1 vehicle	1 vehicle	2 vehicles
Ash St/Francis Ave					
- Southbound Left-Turn Lane	21 vehicles	6 vehicles	9 vehicles	5 vehicles	8 vehicles
- Southbound Right-Turn Lane	21 vehicles	4 vehicle	7 vehicles	7 vehicles	12 vehicles
- Westbound Left-Turn Lane	20 vehicles[1,3]	2 vehicles	6 vehicles	6 vehicles	7 vehicles
Maple St/Francis Ave					
- Northbound Left-Turn Lane	13 vehicles	1 vehicle	1 vehicle	9 vehicle	16 vehicle
- Eastbound Left-Turn Lane	20 vehilces[1,3]	6 vehicles	8 vehicles	9 vehicles	16 vehicles

1. Transitions into a TWLTL, so additional storage can be available.
2. Free movement which turns into a designated receiving lane, so queues not as critical.
3. The designated left-turn lane is broken by an intersection so queue pocket is a two-length measurement.

As shown, the majority of average queues are accommodated within available turn lane/pocket lengths, which represent acceptable or tolerable conditions. The only exception occurs within the westbound left-turn lane for the Shawnee Road/Indian Trail intersection. Both analytically

and through visual inspection in the field, queues extend beyond the available turn pocket for about 10 to 15 minutes of the peak hour(s) as a result of activities associated with Woodridge Elementary school. Outside these short timeframes, queue activity is minimal; thus, there would be minimal cost-benefit to extending the lane for a 20 to 30 minute queue impact per day.

95th percentile exceptions are noted at the following locations:

- Shawnee Avenue/Indian Trail Road – Westbound left turn 95th percentile queues exceed storage by 3 vehicles during the AM peak hour.
- Indian Trail Road/Francis Avenue – Eastbound left-turn 95th percentile demands exceed storage by one vehicle during the PM peak hour.
- Alberta Street/Francis Avenue – Northbound left-turn 95th percentile queues exceed storage by 8 vehicles; although there is a shared left-turn lane at this intersection also. As such, this impact may be somewhat overstated during the PM peak hour.

Indian Trail Lane Capacity. Lane capacities were reviewed for three count locations on Indian Trail Road: 1) north of Weile Avenue (south of bottleneck); 2) north of Kathleen Avenue (within bottleneck); and 3) north of Lowell Avenue (north of Bottleneck). As indicated, a practical lane capacity is 900 vphpl as based on information provided by the SRTC. A summary of existing approach counts versus capacity is provided in Table 8 for the AM and PM peak hours.

Note the lane capacity analysis is based on a review of through-lane capacity only (northbound and southbound travel lanes). A TWLTL helps traffic operationally as it accommodates neighborhood turning traffic, but it has minimal influence on the movement of through traffic.

Table 8. Existing Indian Trail Lane Capacity - AM and PM Peak Hours

Indian Trail Road	Capacity			AM Peak Hour			PM Peak Hour		
	NB	SB	Tot	NB	SB	Tot	NB	SB	Tot
N/of Weile Ave	1,800	1,800	3,600	287	1,114	1,401	1,099	450	1,549
N/of Kathleen Ave	900	900	1,800	283	1,151	1,434	1,085	449	1,534
N/of Lowell Ave	900	900	1,800	246	954	1,200	807	384	1,191

As shown, lane capacity is sufficient within the four lane section of Indian Trail north Road north of Weile Avenue. However, existing counts are shown to exceed directional lane capacities within the bottleneck area north of Kathleen Avenue. Specifically, counts exceed southbound lane capacities during the AM peak hour and northbound capacities during the PM peak hour, by approximately 200 to 250 vehicles. There is minor lane capacity exceptions noted north of Lowell Avenue, but overall capacity appears to be sufficient north of the bottleneck.

This review was based on data collected from machine counters. There is some difference between approach volumes from these counts versus turn movement counts because: 1) machine and tube counts were performed on different days and 2) differences in count location.

2.4 TRANSIT

Spokane Transit Authority (STA) operates one accessible route within reasonable vicinity of Windhaven. STA Route 23 "Maple/Ash" accesses the Indian Trail neighborhood on weekdays only, with no service provided on weekends. The weekday route operates on a 30 minute rotation, operating along Indian Trail Road between 7:00 AM and 6:30 PM. The route circulates between the downtown Plaza and Meadow Park Glen (a bus turnaround north of Blackfoot Avenue) principally via Monroe Street, Broadway Avenue, the Maple/Ash Couplet, Rowan Street, Alberta Street, Francis Avenue, and Indian Trail Road.

The nearest transit stops to Windhaven are located at the Barnes Road/Indian Trail Road intersection. Located approximately ¼ mile to the east, these stops are within reasonable walking distance for typical transit users.

2.5 PEDESTRIAN AND BICYCLE FACILITIES

Pedestrian access/mobility and circulation is generally well-served within the project study area. This supposition is based on the consideration of sidewalk being available on most arterial roadways leading to/from the development. Specifically, sidewalk is available between the development and destinations such as STA transit access, the nearby Sundance Plaza shopping center (Albertsons, Rite Aid, Starbucks, Subway, and other shops and restaurants), Pacific Park (on Lowell Avenue), and the Indian Trail Spokane public library.

According to the Spokane Regional Transportation Council website, Indian Trail Road and Barnes Road are two designated bike routes within the project vicinity. Both roadways are designated as "Shared Roadway" routes, defined as a select roadway allowing both vehicular traffic and bicycle traffic to share the street. There is no signage, striping, or designated bike lanes along these types of bicycle routes.

2.6 COLLISION HISTORIES

Per public comment and the subsequent direction of City officials, an analysis of collision histories was performed to support this TIA. The analysis was summarized as submitted to the City on June 8, 2016 as a supplemental analysis called "Windhaven Apartments, Indian Trail Safety/Collision Analysis". This technical memorandum is summarized in Section F of the Technical Appendix. A summary of the analysis is provided in this section.

Collision histories were reviewed for 2.67 miles of Indian Trail Road between Navaho Avenue and Francis Avenue, as directed by City officials. Intersections, driveways, and mid-block locations were considered, as well as for the corridor section overall. Histories were reviewed for nearly a three and a half-year period extending between January 1, 2013 and May 31, 2016, the most current three-plus year timeframe available. Collision data was provided by City of Spokane officials. The histories/data reviewed reflects recorded collisions, as identified through evidentiary reports provided by City of Spokane, Spokane County, and/or State law enforcement officials. Unreported collisions do occur on roadways such as Indian Trail Road. However, Safety studies can be performed only based on recorded data. Most typically, unreported collisions would involve minor property damage only (typically non-injury).

The purposes of collision analyses is to determine whether safety issues occur as a result of operational or design issues, such as signal phase issues, sight distance limitations,

channelization alignment issues, etc. A location where numerous incidents occur could indicate a high accident location (HAL). A high number of collisions occurring along a street or street section may indicate a high accident corridor (HAC).

Any collision is important to consider and is relevant in safety analyses. However, collisions are reviewed on the basis of severity rates to help determine whether some form of remediation may be needed to address persistent, reoccurring collision issues within the context of traffic densities. An intersection or corridor section may have a high number of collisions/incidents, but this is not as statistically significant if the high traffic volumes are also experienced. Collision rates are calculated to provide a statistical means for quantifying collision density.

Typically jurisdictions such as Spokane have no set thresholds for identifying an HAL or HAC. However, a typical industry recommendation is that further evaluation/analysis should be considered if accident rates exceed 1.0 collisions per million entering vehicles for an intersection or driveway.

The Washington State Department of Transportation provides collision statistics within annual summary reports. The "2014 Annual Collision Summary", the most current report available, indicates Spokane County experiences a system/network-wide rate of 168.7 collisions per 100 million miles of travel, or 1.687 collisions per million miles of travel.

Data and Results. 52 recorded collisions were recorded to occur along Indian Trail Road during the three year and five month study period. Overall, 42 percent of collisions involved vehicle property damage only with 58 percent involving injuries. There were no fatalities within the study timeframe. An average of 15.2 collisions occurs along Indian Trail Road each year that, when compared with an average of 15,892 ADT, results in a CCR of 0.98 collisions per million miles of vehicle travel. Three prevailing collision types along the corridor include:

1. **35% Rear-End Collisions** - A following vehicle collides with a preceding stopped or slowing vehicle);
2. **25% Left Angle** - A left turn "tee" collisions where a permissive left-turning vehicle crosses in front of a through vehicle at an intersection or driveway.
3. **19% Right Angle** - A right-turning vehicle at an intersection or driveway enters the roadway in front of a through vehicle.

The remaining 21 percent of collision types varied between same direction side-swipe, opposite direction side-swipe, opposite direction head-on, a collision with a fixed object (tree, pole, sign, or parked car), and a collision with a pedestrian or bicyclist.

A summary of intersection collision data for the highest three intersection locations, as determined on the basis of ICR comparisons, is summarized as follow:

1. **Francis Avenue/Indian Trail Road.** Sixteen collisions occurred over three years and five months with an average of 4.7 collisions occurring per year; calculating to an ICR of 0.74 collisions per million entering vehicles. Severities were equal between injury and property damage only collisions. The prevailing intersection types include left-angle (56-percent) and rear end (31 percent).
2. **Navaho Avenue/Indian Trail Road.** Three collisions occurred over three years and five months with an average of 0.9 collisions occurring per year; calculating to an ICR of 0.59

collisions per million entering vehicles. Two collisions involved property damage only with one injury accident. All collisions were right angle.

3. **Barnes Road/Indian Trail Road.** Eight collisions occurred over three years and five months with an average of 2.3 collisions occurring per year; calculating to an ICR of 0.47 collisions per million entering vehicles. 75 percent of collisions involved injuries with 25 percent property damage only. The prevailing intersection types include left and right-angle collisions (63 percent). A pedestrian was hit crossing at the intersection.

The supplemental report indicates intersection and driveway ICR do not exceed 1.0 collisions per million entering vehicles. Thus, it does not appear an HAL is prevalent on the basis of collision densities. Similarly, the CCR is just below 1.0 collisions per million entering vehicles, suggesting a HAC does not exist along Indian Trail Road as the rate is well below the average for roadways throughout Spokane County.

Other highlights and pertinent information from the safety analysis includes:

- No fatalities were noted within the three year and five month study timeframe.
- A pedestrian incident was noted at the Barnes Road intersections.
- A pedestrian incident was noted mid-block between Shawnee Avenue and Barnes Road.
- Nine collisions were attributed to “wet” roadway conditions, with four during rain, outside of snow/ice.
- Two additional collisions were attributed to snow/ice.
- Twelve collisions occurred at night (dark)

3 FUTURE 2021 TRAFFIC CONDITIONS

This section summarizes year 2021 future traffic conditions. Described are future roadway network changes, future traffic volumes, and forecast traffic operations and capacity.

3.1 ROADWAY NETWORK

Project One. An improvement project is programmed and fully funded for the study area. *The City of Spokane Six Year Capital Improvement Program* (City of Spokane, 2016) highlights the Barnes Road, Phoebe to Strong "Safety" project programmed for construction in year 2017. The project includes the construction of a two lane roadway with offset sidewalks constructed about 2,200 feet between Phoebe Drive (west) and Strong Road (east).

Barnes Rd Improvement Alignment (Source: City)

The project will improve access to the Five Mile neighborhood (east of the Indian Trail neighborhood) and north of Spokane, as opposed to continued and lengthier travel via Francis Avenue, the Maple/Ash couplet, and/or other arterials. The project is anticipated to divert 80 percent of existing traffic turning to/from the east at the Strong Road/Indian Trail Intersection to the new connection via Barnes Road. In addition, future development trips are anticipated to use the new roadway, as described in the next section.

Given this is programmed and fully funded prior to the year 2021 analysis/horizon year of this study, the capacity benefit from this improvement project was included in forecast analyses.

Project Two. The North Indian Trail Road Widening project has been incorporated into the City of Spokane Transportation Impact Fee program. The project includes the widening of Indian Trail Road with two through lanes constructed between Barnes Road (north) and Excell Avenue (south), maintaining the TWLTL; including any signal upgrades.

The timeline for this project cannot yet be determined. City officials are aware of the need and citizens of the Indian Trail neighborhood support the project. However, the City currently lacks the funding needed to construct this $3,000,000 project. As such, this project is not yet programmed in the *Six Year Capital Improvement Program.* Given these conditions, the improvement was NOT reflected in future year 2021 analyses.

Project Three. There are a number of pavement preservation projects programmed by the City throughout the Indian Trail neighborhood. These will improve street conditions but do not impact circulation or capacity. Specifically a pavement rehabilitation project is programed for

Indian Trail Road in year 2018. While this is not relevant to capacity on the onset, it is highlighted because of mitigation discussions provided later within this document for the arterial.

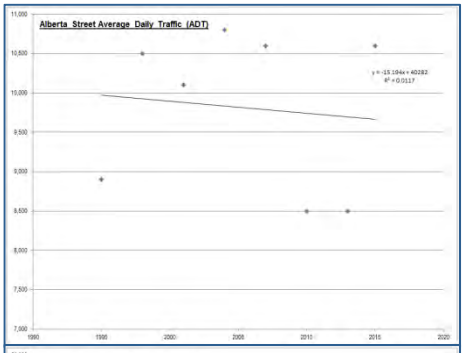
There are no other agency or development improvements planned or programmed within the five-year analysis timeframe of this project. Other than the trips diverted as a result of the Barnes Road extension, no other improvements or changes to forecast conditions were considered.

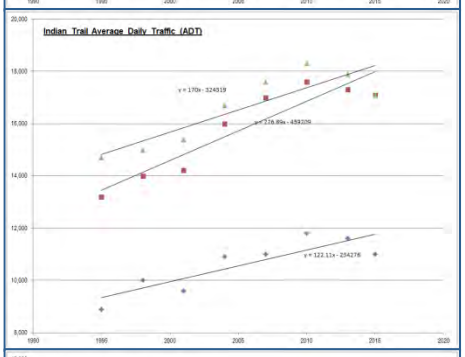
3.2 TRAFFIC FORECASTS

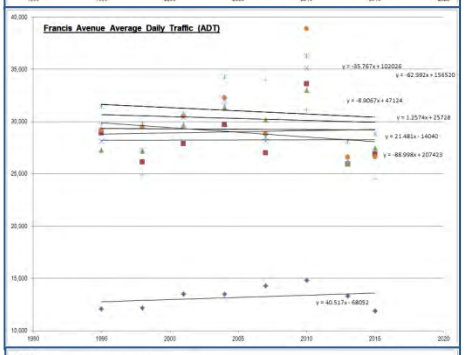
Year 2021 traffic forecasts were comprised of baseline growth, the trips generated by other vested, but yet to be constructed developments projects, and the trips generated by the proposed development. Baseline traffic growth refers to the increase of through traffic not typically associated with development of projects within the project study area. Baseline growth is projected with the use of traffic growth rates. To establish the growth rate for this study, historical traffic counts were reviewed for study arterials.

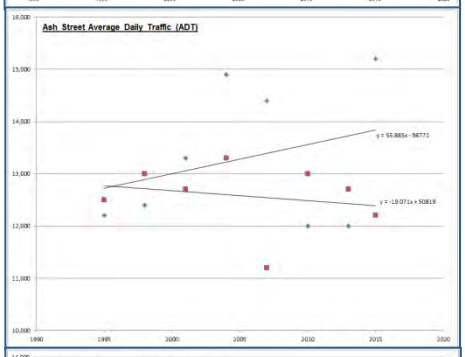
Traffic growth was compared based on historical year 1995 to 2015 ADT counts, as available for Indian Trail Road, Francis Avenue, Alberta Street, Ash Street, and Maple Street (multiple locations). Counts indicate minimal and even negative growth on the majority of City roadways; however, positive growth was noted specifically for Indian Trail Road, ranging between 1.0 and 1.5 percent annually. The statistical average growth rate of all count points reviewed was 0.3 percent annually.

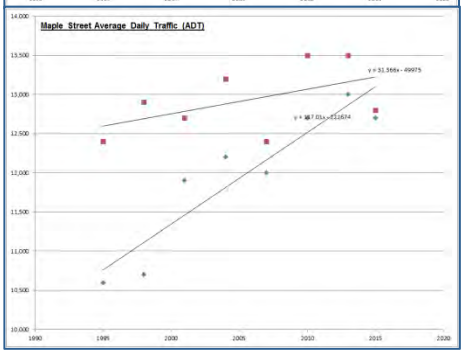
Based on this analysis, a 0.5% annual growth rate was applied to counts to forecast baseline 2021 traffic forecasts. This rate is conservative (high) for the majority of the study area. The baseline growth rate was seemingly moderate for Indian Trail Road. However, it must be understood the 1.0 to 1.5 percent annual growth rate almost directly reflects development growth within the Indian Trail neighborhood throughout the last 20 years. The impact of development growth is discussed in the following sections. Once the trips generated by these developments and Windhaven are reflected in forecasts, the annual growth rate for the roadway well exceeds historical growth for Indian Trail Road. Thus, all traffic forecasts are ultimately conservative (high-end) for this TIA.











3.2.1 Pipeline Projects

Per coordination with agencies, the trips generated by eleven vested land use projects, known as pipeline projects, were addressed within this study. These projects have been approved by the City of Spokane, but are in the process of

being developed. As such, the trips generated by these projects are not yet recorded in counts and need to be addressed in forecasts as they have rights to future capacity. A summary of pipeline projects are as follows:

1. **Hunts Point.** 183 single family and 48 multifamily homes aligned on 52.56 acres south of Pacific Park Drive and west of Indian Trail Road. No homes have been developed (as of yet) on the site.
2. **Windhaven First Addition.** 289 single family homes aligned on 49.48 acres north of Barnes Road and west of Indian Trail Road. No homes have been developed (as of yet) on the site.
3. **Ponderosa Ridge 3rd Addition.** 12 single family homes yet to be developed out of 43 approved on 9.94 acres aligned north of Barnes Road and west of Sundance Drive.
4. **Ponderosa Ridge 4th Addition.** 25 single family homes aligned on 18.95 acres west and east of Rosebury Lane. No homes have been developed (as of yet) on the site.
5. **Diamond Rock.** 96 apartment units developed on 4.32 acres aligned within the southeast quadrant of the Barnes Road/Indian Trail Road intersection.
6. **Replat McCarroll's Addition Phase 2.** 13 single family homes aligned on 2.69 acres north of Barnes Road and east of Woodridge Drive. No homes have been developed.
7. **McCarroll's East 3rd Addition.** 10 single family homes yet to be developed out of 44 approved on 19.18 acres aligned north of Barnes Road and east of Seminole Street.
8. **McCarroll's East 4th Addition.** 15 single family homes aligned on 8.85 acres south of Barnes Road and east of James Street. No homes have been developed (as of yet).
9. **McCarroll's East.** 133 single family and 28 multifamily homes aligned on 118.2 acres south of Barnes Road.
10. **Woodridge View 1st Addition.** 7 single family homes yet to be developed out of 40 approved on 24.72 acres aligned north of Seminole Drive and east of Fleetwood Court.
11. **Estates at Rocky Ridge.** 15 single family homes yet to be developed out of 42 approved on 13.17 acres aligned south of Lincoln Road and east of Hiawatha Drive.
12. **Westwinds PUD.** 19 single family homes yet to be developed out of 36 approved on 19.96 acres aligned south of Strong Road and west of Upper Mayes Lane.

The assignment of pipeline project trips was developed based upon trip generation and trip distribution information provided by City traffic engineers. In summary, City staff performed trip generation calculations based upon information provided within the ITE *Trip Generation Manual*, as based upon a comparison of rate and equation data that correlate site trips to dwelling units for single and multi-family land uses. And then, using the regional travel demand model, the City identified the likely distribution patterns of trips throughout the project study area.

The City congregated trip generation and distribution information into three transportation analysis zones (TAZ's). A TAZ a transportation analysis and modeling term which refers to a geographical area that experiences similarities in travel characteristics (i.e. approaching and departing access/traffic trends); as bordered by arterials, agency limits, or topographical features (cliffs, rivers/streams, etc.). They simply allow for the organization of transportation data, both for analytical reasons and for the presentation of information. With this understanding, a summary of trip generation for TAZ 29, 30, and 31 are shown in Table 9 for the AM and PM peak hours. Trip generation is shown per development within each TAZ.

Table 9. Vested Residential Land Use & Trip Comparisons by TAZ

TAZ and Development	Dwelling Units/Homes		AM Peak Hour			PM Peak Hour		
	Single	Multi	In	Out	Total	In	Out	Total
TAZ 29								
- Hunts Point	183	48	48	119	167	142	72	214
- Windhaven First	286	0	65	145	210	179	92	271
- Ponderosa Ridge 3rd	12	0	6	13	19	10	5	15
- Ponderosa Ridge 4th	25	0	8	19	27	20	10	30
Subtotal TAZ 29	*506*	*48*	*127*	*296*	*423*	*351*	*179*	*530*
TAZ 30								
- Diamond Rock	0	96	10	41	51	46	25	71
- Replat McCarroll	13	0	6	13	19	11	6	17
- McCaroll's 3rd	10	0	5	12	17	9	5	14
- McCaroll's 4th	15	0	6	14	20	13	7	20
- McCarroll's East	7	28	8	26	34	21	10	31
- Woodridge View	7	0	5	10	15	6	3	9
Subtotal TAZ 30	*52*	*124*	*40*	*116*	*156*	*106*	*56*	*162*
TAZ 31								
- Estates at Rocky	15	0	6	14	20	13	7	20
- Westwinds PUD	19	0	7	16	23	16	8	24
Subtotal TAZ 31	*34*	*0*	*13*	*30*	*43*	*29*	*15*	*44*
Total Pipeline Trips	592	172	180	442	622	486	250	736

As shown, the 592 single family and 172 multi-family homes approved within the Indian Trail neighborhood generate 622 trips during the AM peak hour and 736 trips during the PM peak hour. Overall, about 71 percent of these trips are generated by TAZ 29, 23 percent by TAZ 30, and 6 percent by TAZ 31, as averaged between the AM and PM peak hours.

As indicated, City staff also provided TAZ distribution information as based upon information gained from the regional travel demand model. Project trips were assigned to the study area based upon these distributions. Trip distributions for each TAZ are summarized below.

TAZ 29 - Located west of Indian Trail Road, all trips from this TAZ are anticipated to access or travel through Indian Trail Road. Overall 4 percent of trips from TAZ 29 are anticipated to access Indian Trail Road via Shawnee Avenue, 49 percent via Barnes Avenue, 25 percent via Strong Road, and 22 percent via Pacific Park Drive. The distribution of trips outside of the study area is as follows (100 percent distributions to/from):

- **Barnes Road.** 19 percent of trips are anticipated to/from the east of Indian Trail Road; via the new connection with Strong Road.
- **Indian Trail Road.** 9 percent of project trips are anticipated to/from the north of Barnes Road.
- **Francis Avenue.** 6 percent of project trips are anticipated to/from the west of Indian Trail Road and 25 percent to/from the east of the Maple/Ash Couplet.
- **A Street.** 8 percent of project trips are anticipated to/from the south of Francis Avenue.
- **Alberta Street.** 12 percent of project trips are anticipated to/from the south and 3 percent to/from the north of Francis Avenue.

- **Belt Street.** 1 percent of project trips are anticipated to/from the south of Francis Avenue.
- **Maple/Ash Couplet.** 9 percent of project trips are anticipated to/from the south and 6 percent to/from the north of Francis Avenue.
- **Local Generators.** 2 percent of project trips are anticipated via local trip generators such as the Sundance Plaza shopping center.

TAZ 30 - Located east of Indian Trail Road, the majority of trips from this TAZ will access or cross Indian Trail Road. Overall 57 percent of trips from TAZ 30 are anticipated to access Indian Trail Road via Barnes Avenue, 1 percent via Lowell Avenue, and 10 percent via Strong Road. Of these trips, the distribution outside of the study area is as follows (68 percent distributions to/from):

- **Barnes Road.** 6 percent of trips are anticipated to/from the west of Indian Trail Road.
- **Strong Road.** 2 percent of trips are anticipated to/from the west of Indian Trail Road.
- **Indian Trail Road.** 7 percent of project trips are anticipated to/from the north of Barnes Road.
- **Francis Avenue.** 5 percent of project trips are anticipated to/from the west of Indian Trail Road and 13 percent to/from the east of the Maple/Ash Couplet.
- **A Street.** 4 percent of project trips are anticipated to/from the south of Francis Avenue.
- **Alberta Street.** 6 percent of project trips are anticipated to/from the south of Francis Avenue.
- **Maple/Ash Couplet.** 7 percent of project trips are anticipated to/from the south and 18 percent to/from the north of Francis Avenue.

TAZ 31 - Located on the western edge of the Indian Trail neighborhood, a minority of these trips from this TAZ will access or cross Indian Trail Road. Overall 14 percent of trips from TAZ 31 are anticipated to access Indian Trail Road via Barnes Avenue, 2 percent via Lowell Avenue, and 2 percent via Strong Road. Of these trips, the distribution outside of the study area is as follows (18 percent distributions to/from):

- **Barnes Road.** 2 percent of trips are anticipated to/from the west of Indian Trail Road.
- **Strong Road.** 2 percent of trips are anticipated to/from the west of Indian Trail Road.
- **Indian Trail Road.** 4 percent of project trips are anticipated to/from the north of Barnes Road.
- **Francis Avenue.** 5 percent of project trips are anticipated to/from the west of Indian Trail Road and 1 percent to/from the east of the Maple/Ash Couplet.
- **A Street.** 1 percent of project trips are anticipated to/from the south of Francis Avenue.
- **Alberta Street.** 1 percent of project trips are anticipated to/from the south of Francis Avenue.
- **Maple/Ash Couplet.** 1 percent of project trips are anticipated to/from the south and 1 percent to/from the north of Francis Avenue.

Note that a number of trips will travel through the study area as a result of travel via the Five Mile Road and Cedar Road intersections with the Maple/Ash Couplet (or Country Homes Boulevard). About 47 percent of TAZ 31 trips will impact the study area, via Maple/Ash north. Of these trips, about 20 percent anticipated to/from the east and 2 percent to/from the west (of Maple/Ash) on Francis Avenue, and 25 percent are anticipated to/from the south (of Francis Avenue) via the Maple/Ash Couplet.

Figure 5 and Figure 6 provide a summary of pipeline project trip assignments for the AM and PM peak hours at study intersections. Also highlighted are pipeline project locations and rough TAZ boundaries. Pipeline trips were combined with baseline forecasts to develop the future without project traffic volumes, as shown on Figure 7 and Figure 8 for the peak hours. TAZ trips assignments are provided in Section D of the Technical Appendices.

Windhaven First Addition. The trips generated by Windhaven Fist Addition were purposefully included in future without-project traffic forecasts. This is because the trips associated with these 286 homes are already programmed/approved for the Indian Trail neighborhood. Thus, these would be considered pipeline project trips, just like any other approved, but yet to be constructed, development project. Proposed development trips are combined with vested trips to reflect site traffic for the 750 unit apartment complex, as described in the following sections.

3.2.2 Trip Generation

Trip generation was predicted using the methods outlined in the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (9th Edition, 2012). The Trip Generation Manual is a nationally recognized and locally accepted method for forecasting trip generation for a range of commercial, retail, and residential land uses. The forecasting methods were developed based on the survey of other existing land use developments located throughout the United States.

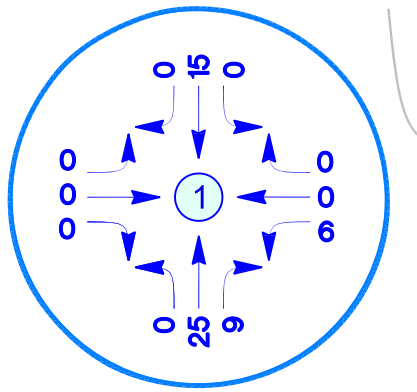
Trip generation was determined using ITE Code 220 for Apartment land uses. The ITE describes this land use as "rental dwelling units located within the same building with at least three other dwelling units." Trip generation was determined based on equations that estimate trips according to the number of dwelling units. Equations were used over rates because more than 10 surveys/studies were used to develop ITE equations with a resulting data regression fit of near or in excess of 0.75.

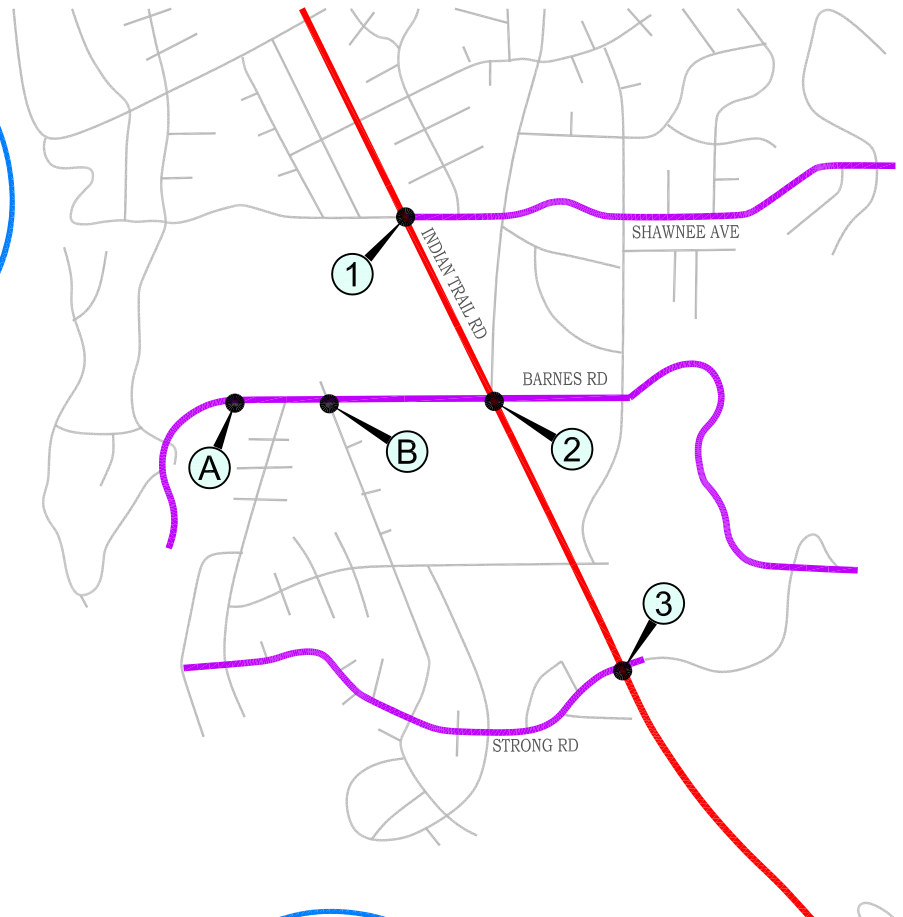
As indicated, the site has already been approved for development of 286 single family homes. According to Table 1, this represents the trips of approximately 460 apartment units. However, because trip generation is based upon linear regression equations, trip generation projections were developed for 750 apartment units. The trip generation associated with Windhaven First addition and 286 homes, as specified by City data, was then subtracted from these totals to determine the net gain in site-generated trips. A summary of trip forecasts are shown in Table 10 for the AM and PM peak hours.

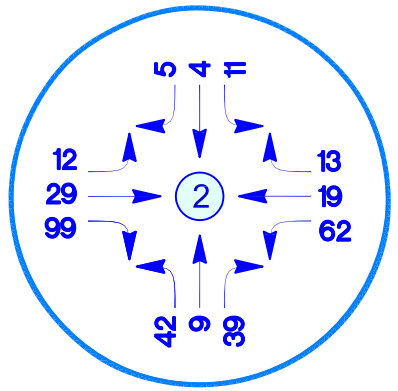
Table 10. Project Trip Generation Gains

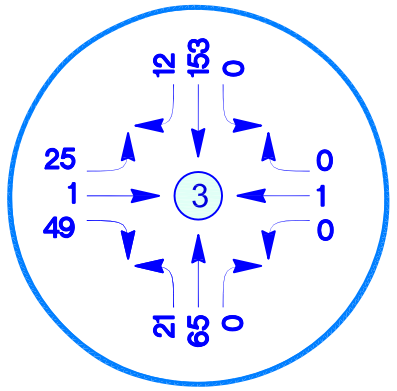
Land Use	Dwelling Units	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Apartments - ITE Code 220	750	74	297	371	280	150	430
Single Family Homes - ITE Code 210	286	65	145	210	179	92	271
Net Gain Site Trips	--	9	152	161	101	58	159

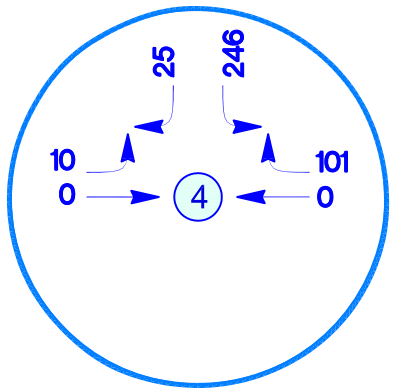
As the project proposal results in a net gain in trip generation of 161 trips during the AM peak hour and 159 trips during the PM peak hour. These trips represent the net gain in traffic over those vested and approved by the City of Spokane.

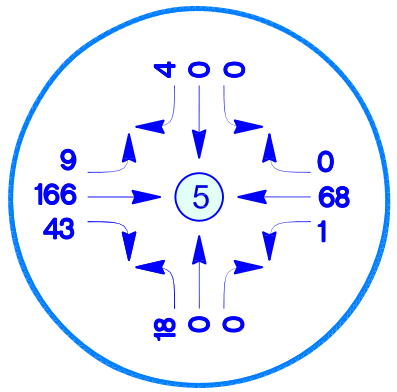


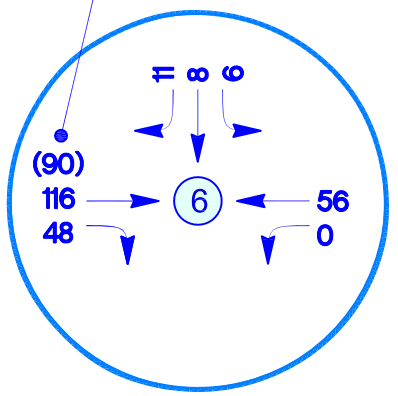


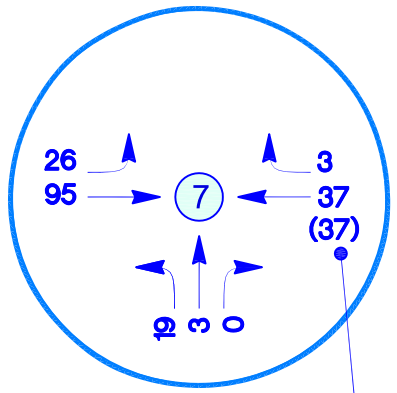


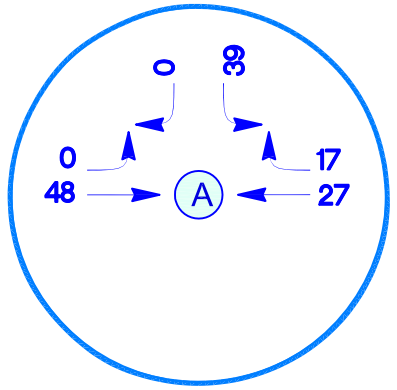


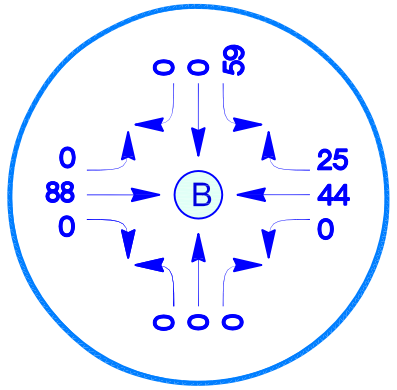


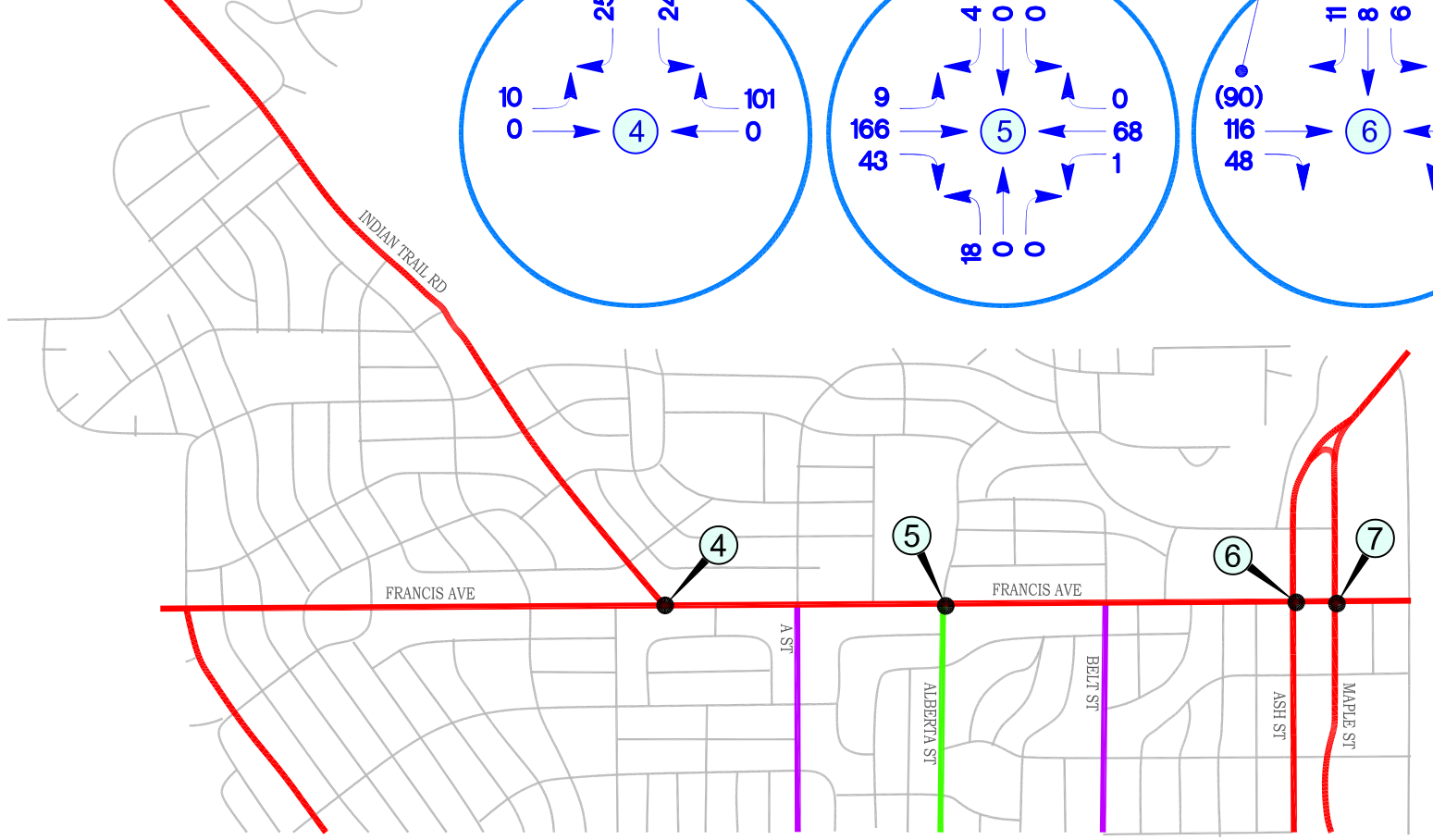












PRINCIPAL ARTERIAL –

MINOR ARTERIAL –

COLLECTOR STREET –

LOCAL STREET –

INTERSECTION TURNING MOVEMENTS –

MORRISON MAIERLE, INC.
An Employee-Owned Company
Engineers
Surveyors
Scientists
Planners
1 Engineering Place
Helena MT 59602
Phone: (406) 442-3050
Fax: (406) 442-7862

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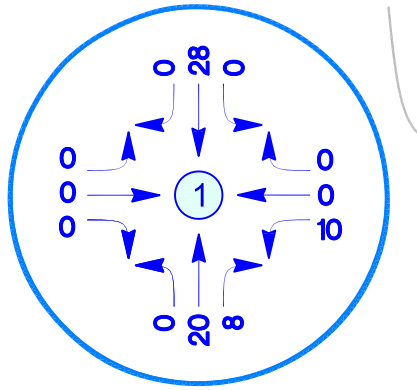
DRAWN BY: KB
CHK'D. BY: KB
APPR. BY: KB
DATE: 05/2016

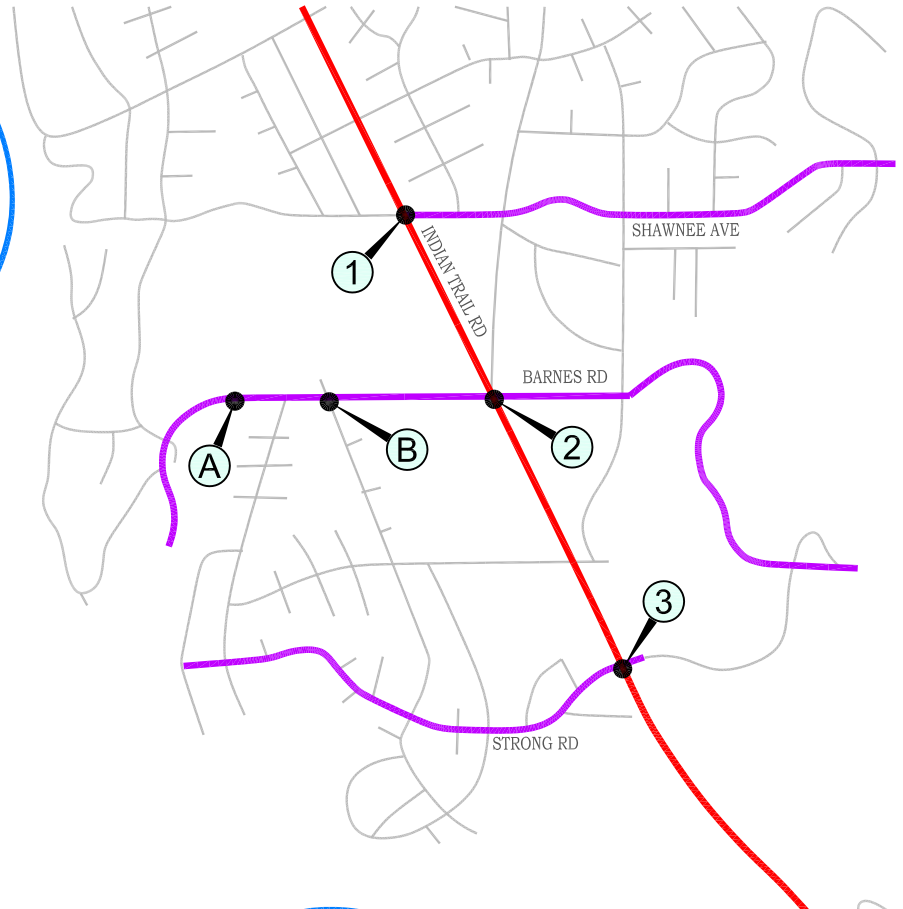
WINDHAVEN APARTMENTS
TRAFFIC IMPACT ANALYSIS
SPOKANE WA

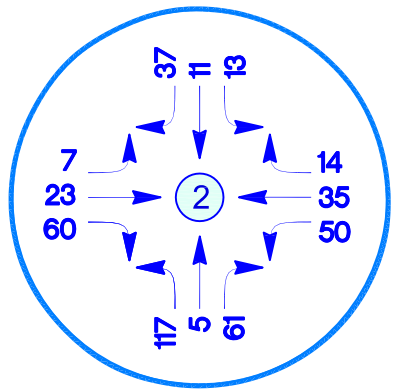
PROJECT NO. 5447.001

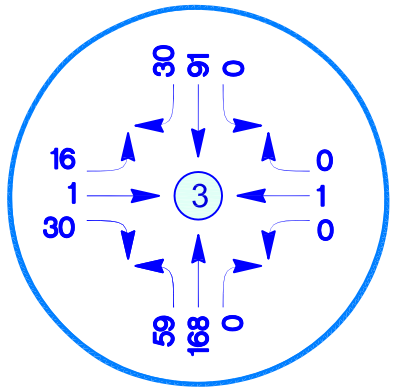
PIPELINE PROJECT TRIP ASSIGNMENTS - AM PEAK HOUR

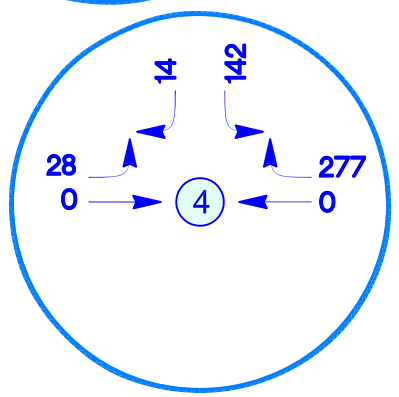
FIGURE NUMBER FIG. 5

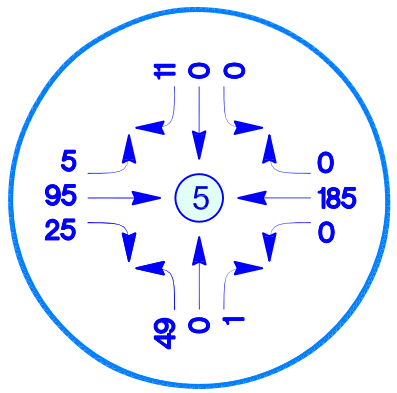


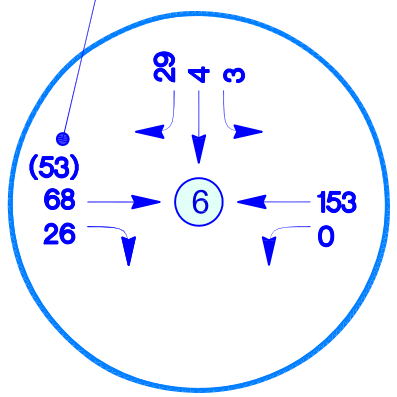


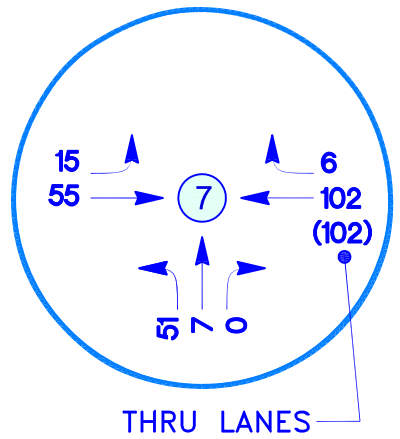


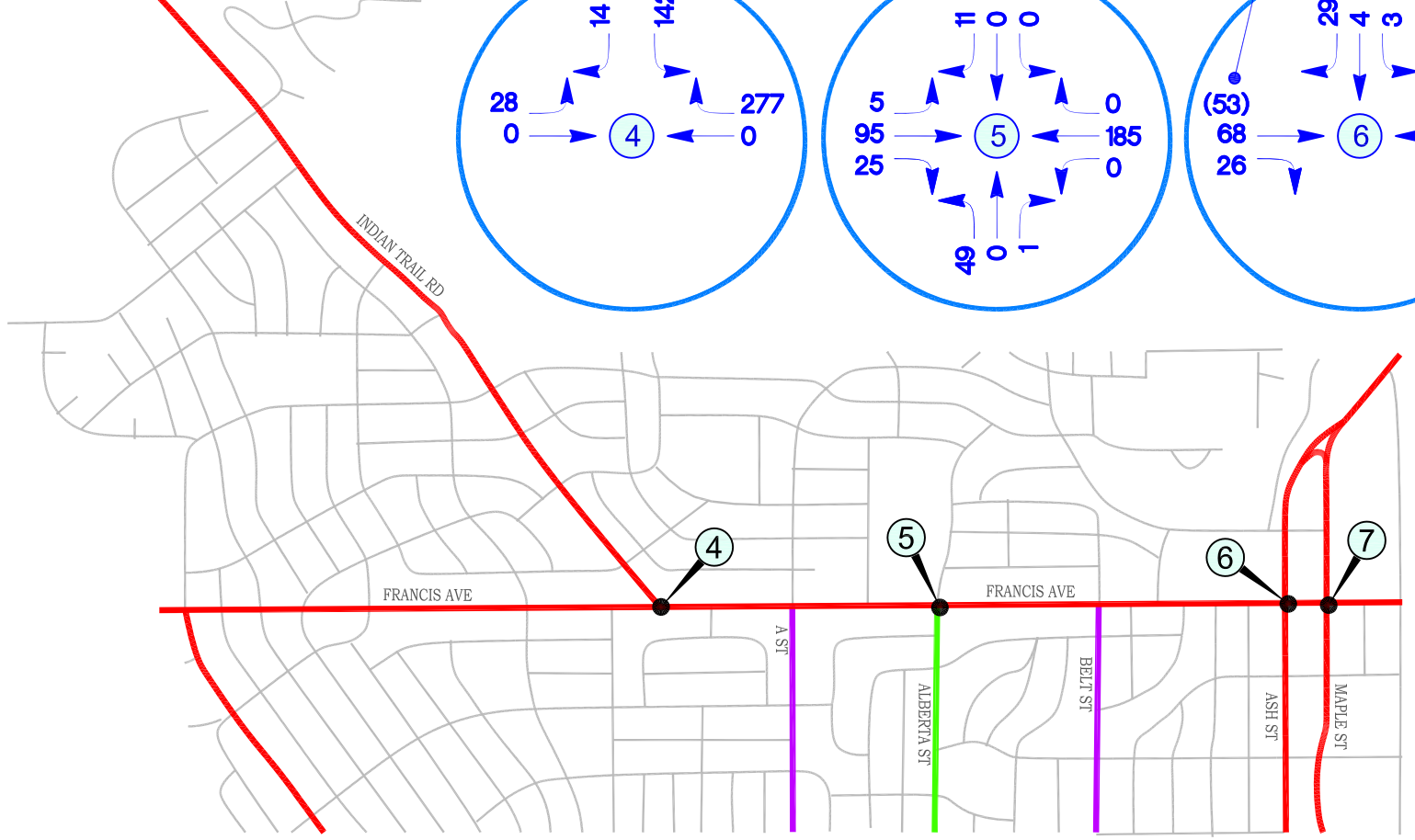












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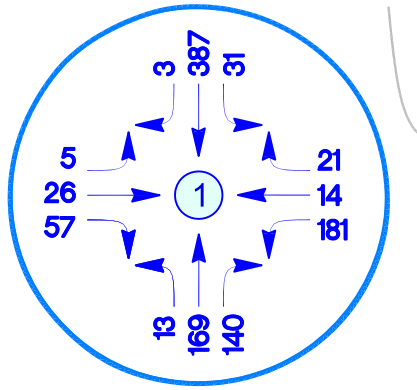
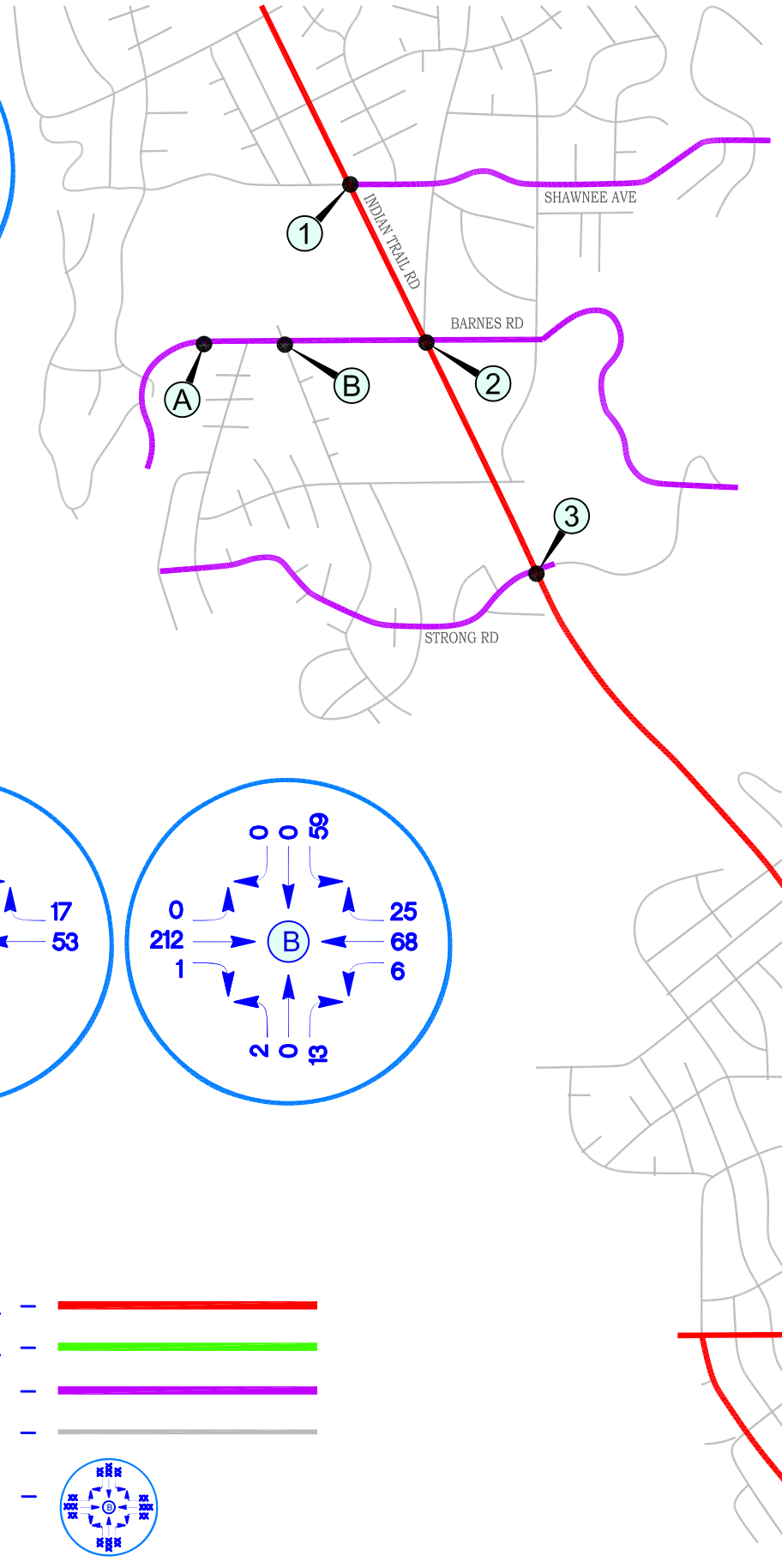
WINDHAVEN APARTMENTS
TRAFFIC IMPACT ANALYSIS
SPOKANE WA

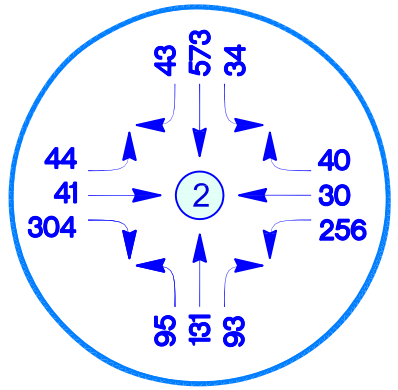
PIPELINE PROJECT TRIP ASSIGNMENTS - PM PEAK HOUR

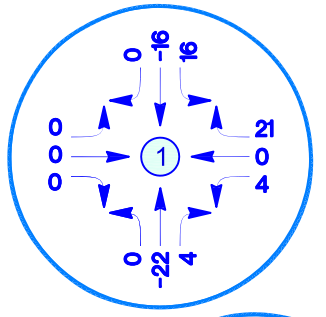
PROJECT NO. 5447.001

FIGURE NUMBER FIG. 6

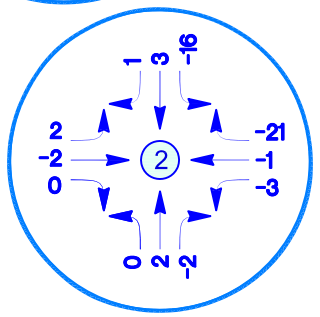








BARNES ROAD EXTENTION PROJECT
– BARNES RD/INDIAN TRAIL RD
INTERSECTION VOLUME ADJUSTMENTS



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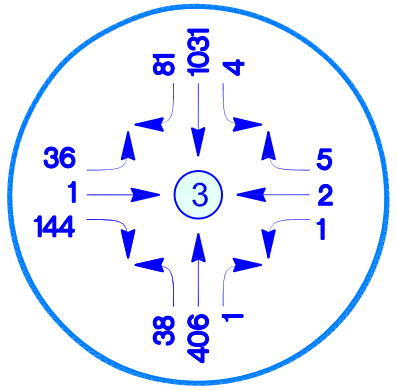
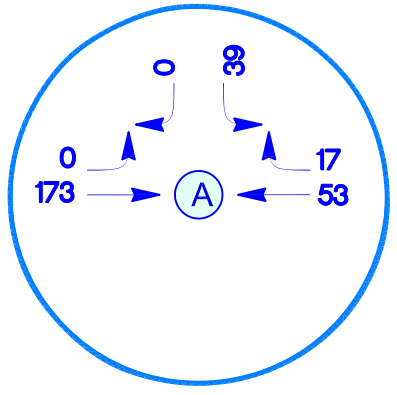
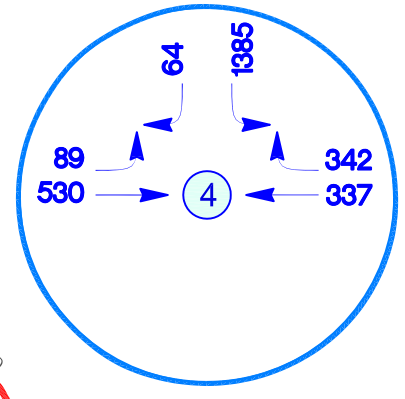
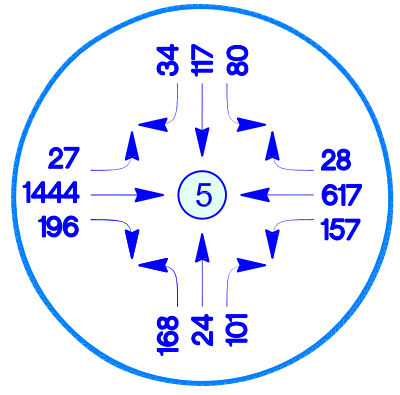
– STRONG RD/INDIAN TRAIL RD
INTERSECTION VOLUME ADJUSTMENTS









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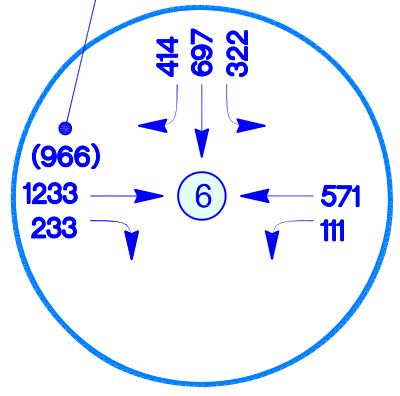

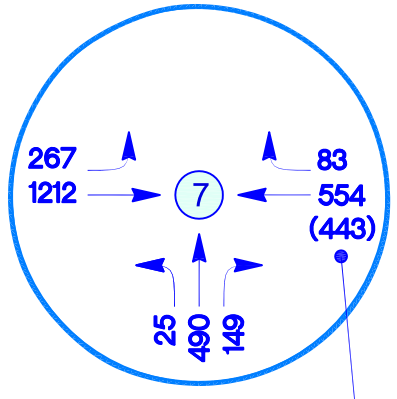

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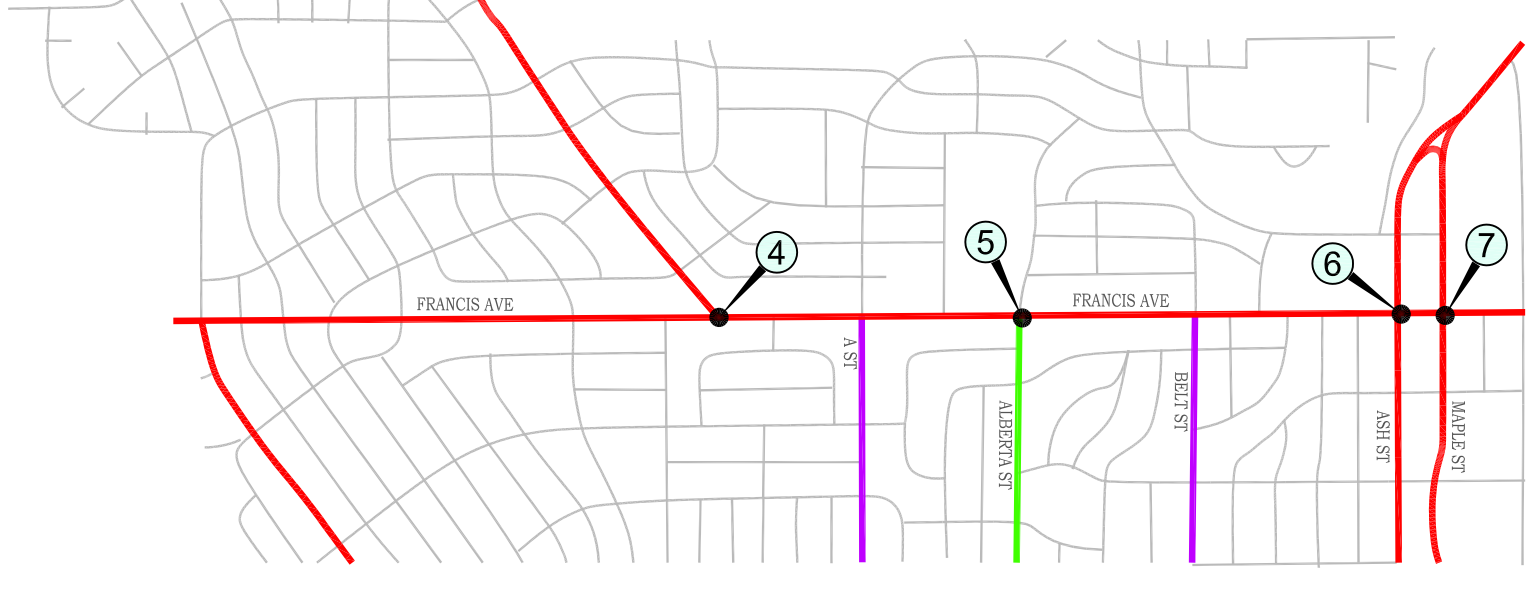

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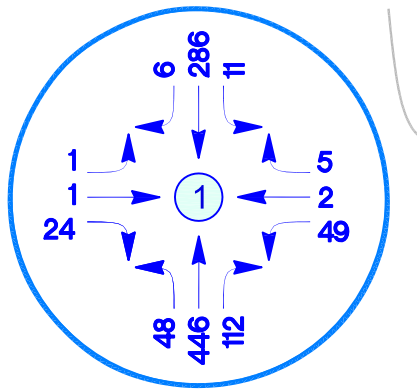
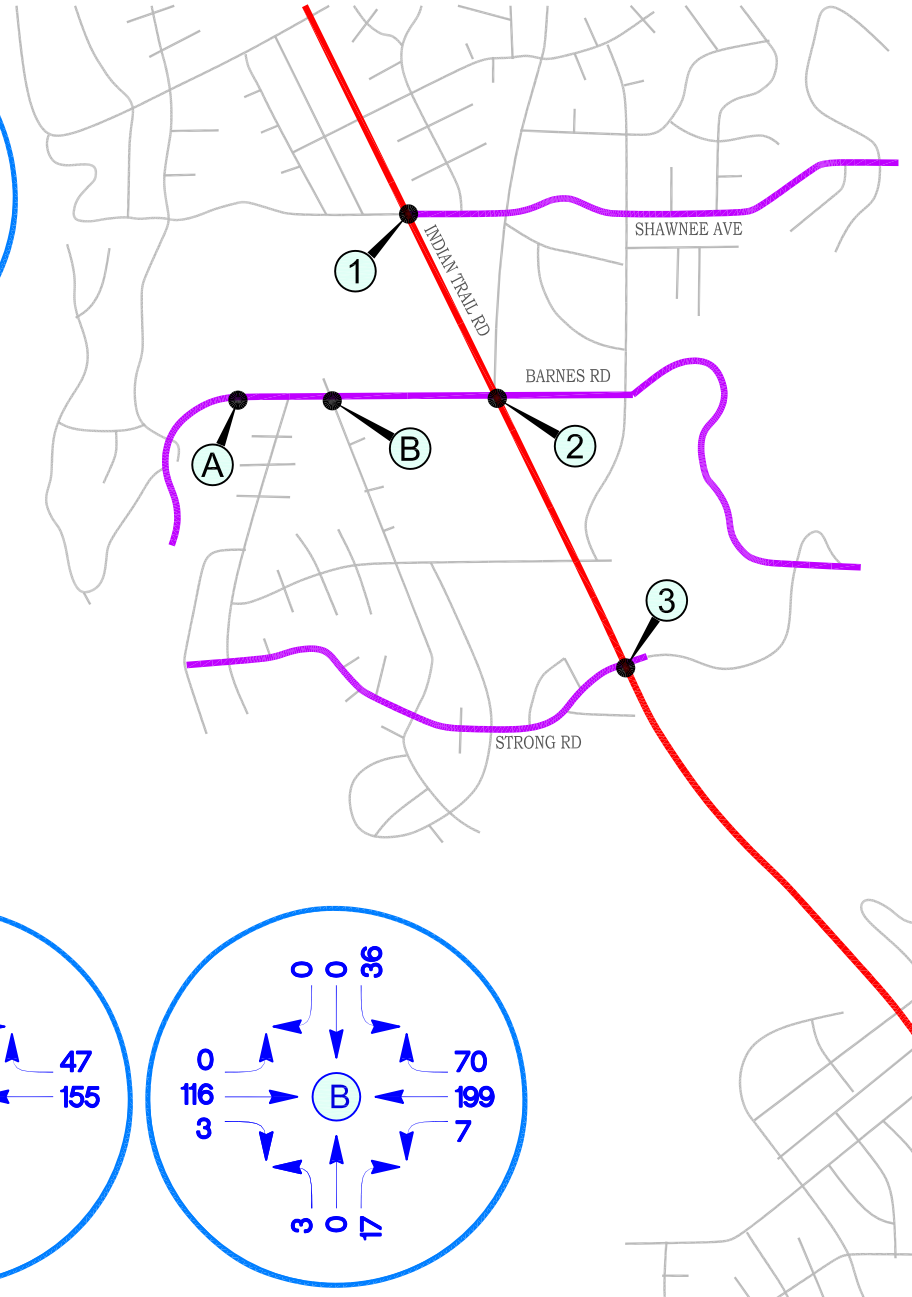
WINDHAVEN APARTMENTS
TRAFFIC IMPACT ANALYSIS
SPOKANE WA

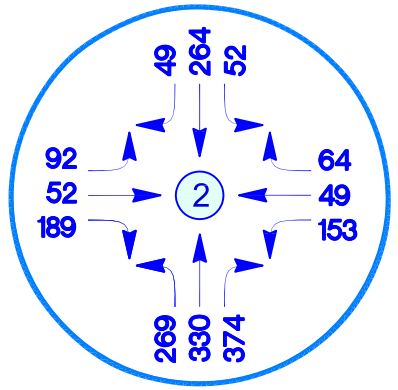
FUTURE WITHOUT-PROJECT TRAFFIC VOLUMES - AM PEAK HOUR

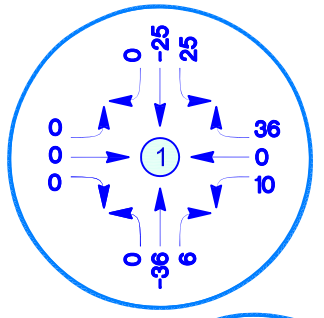
PROJECT NO. 5447.001

FIGURE NUMBER FIG. 7

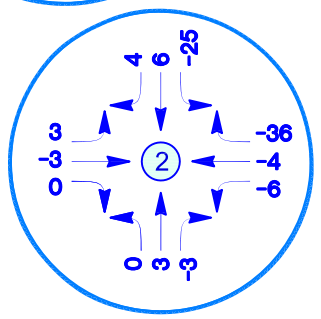








BARNES ROAD EXTENTION PROJECT
– BARNES RD/INDIAN TRAIL RD
INTERSECTION VOLUME ADJUSTMENTS



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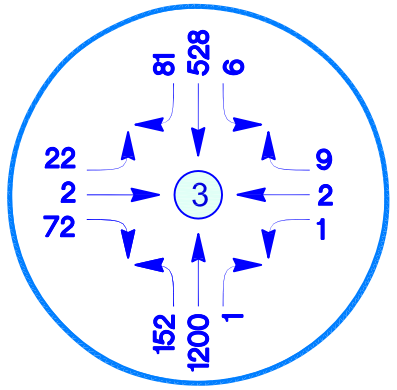
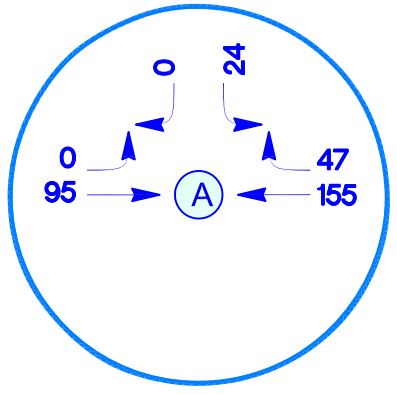
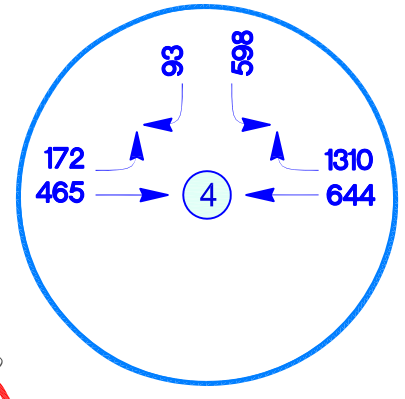
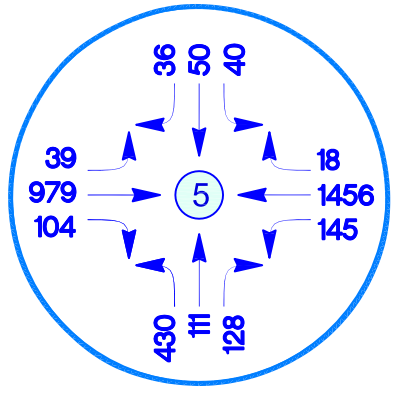
– STRONG RD/INDIAN TRAIL RD
INTERSECTION VOLUME ADJUSTMENTS









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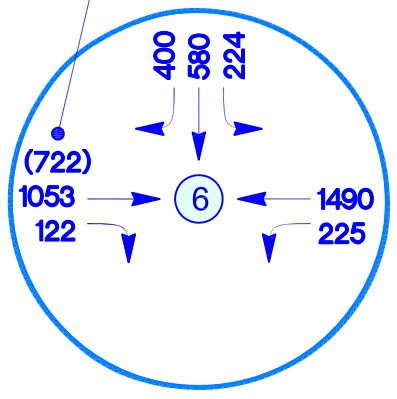

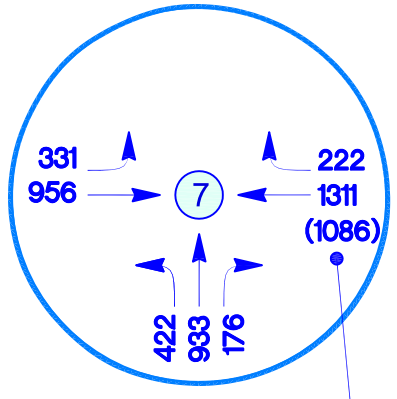

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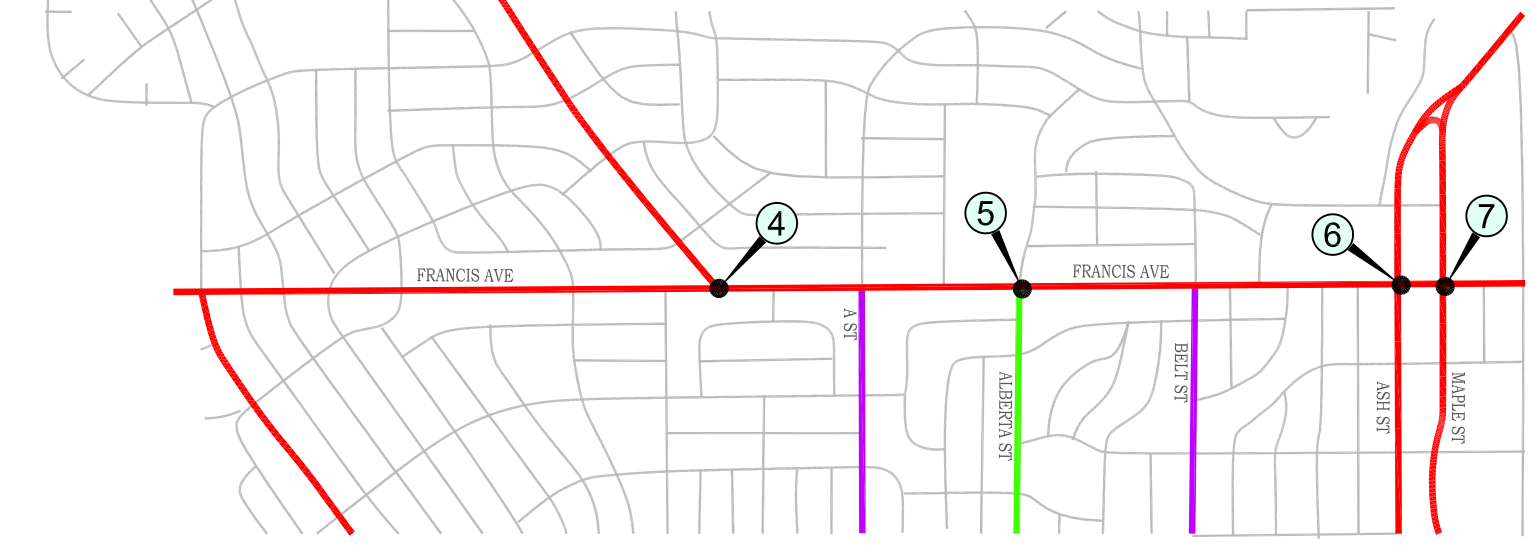

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WINDHAVEN APARTMENTS
TRAFFIC IMPACT ANALYSIS
SPOKANE WA

FUTURE WITHOUT-PROJECT TRAFFIC VOLUMES - PM PEAK HOUR

PROJECT NO. 5447.001

FIGURE NUMBER FIG. 8

3.2.3 Trip Distribution

As Windhaven is located with City TAZ 29, the assignment of site trip gains was based on the distribution patterns established for this zone. The only difference is all project trips would use the Barnes Road intersection to access Indian Trail Road. Approximately 40 percent of project trips would access Windhaven via Barnes Road and 60 percent via Pamela Lane. A summary of overall site distributions is again as follows:

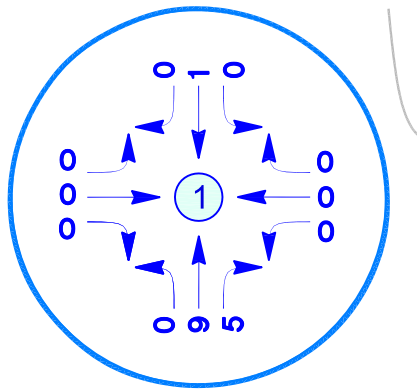
- **Barnes Road.** 19 percent of trips are anticipated to/from the east of Indian Trail Road, via the new connection with Strong Road.
- **Indian Trail Road.** 9 percent of trips are anticipated to/from the north of Barnes Road.
- **Francis Avenue.** 6 percent of project trips are anticipated to/from the west of Indian Trail Road and 25 percent to/from the east of the Maple/Ash Couplet.
- **A Street.** 8 percent of project trips are anticipated to/from the south of Francis Avenue.
- **Alberta Street.** 12 percent of project trips are anticipated to/from the south and 3 percent to/from the north of Francis Avenue.
- **Belt Street.** 1 percent of project trips are anticipated to/from the south of Francis Avenue.
- **Maple/Ash Couplet.** 9 percent of project trips are anticipated to/from the south and 6 percent to/from the north of Francis Avenue.
- **Local Generators.** 2 percent of project trips are anticipated via local trip generators such as the Sundance Plaza shopping center.

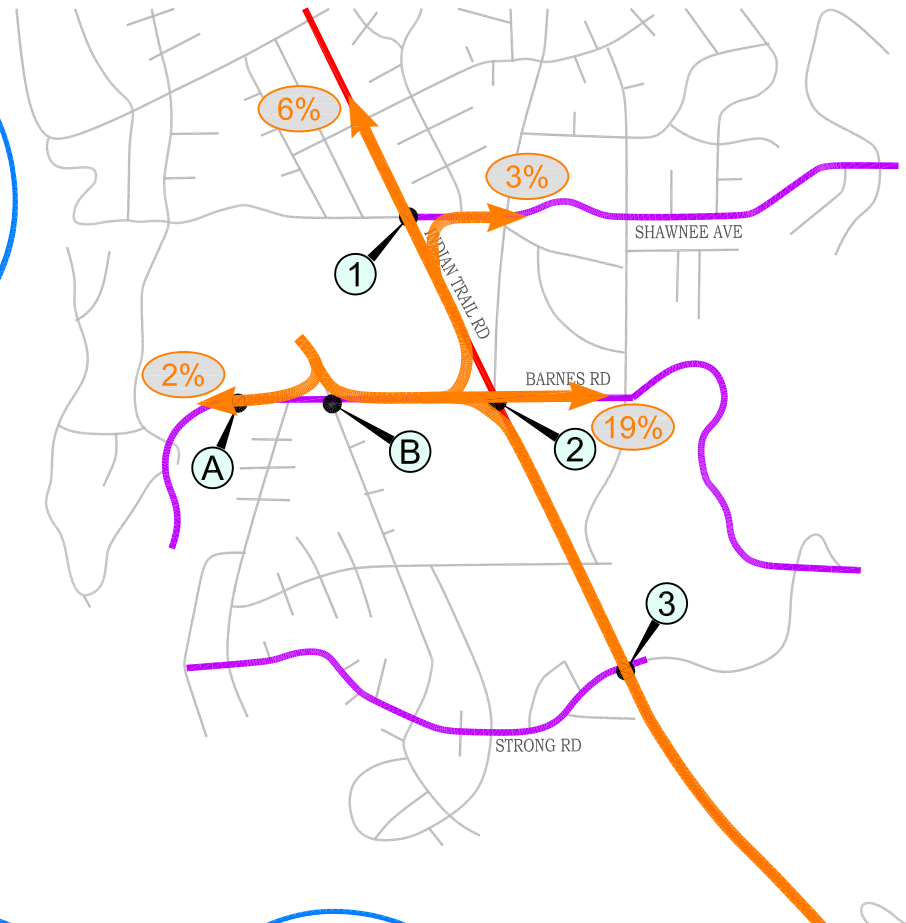
The resulting trip gain assignments are shown on Figure 9 for the AM peak hour and Figure 10 for the PM peak hour. Future with project traffic volumes and project trip assignments were then combined to generate the future year 2021 with project traffic forecasts, as shown on Figure 11 for the AM peak hour and Figure 12 for the PM peak hour.

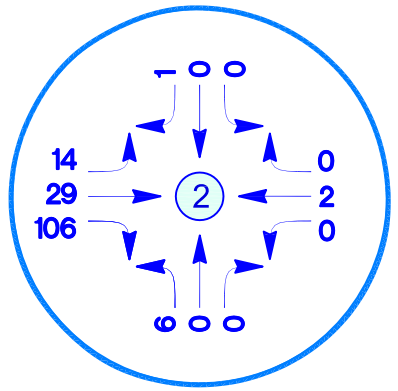
Indian Trail Traffic Gains. As indicated, traffic has historically increased on Indian Trail Road at a rate of 1.0 to 1.5 percent annually. The resulting future with project traffic volumes result in growth rates that range between 6 and 7 percent annually during the AM and PM peak hours (ranging between 30 and 40 percent overall). Thus, traffic forecasts are very conservative for year 2021; more likely reflecting traffic forecasts several years beyond this horizon as pipeline projects will require more than five years to be fully developed and occupied.

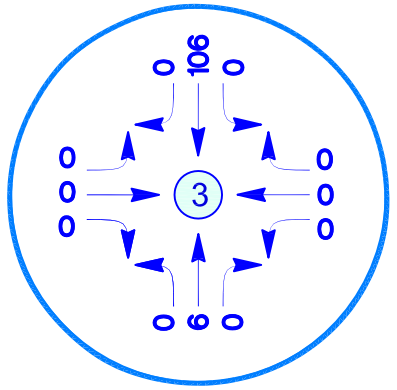
Barnes Road Extension. As indicated, the City has programmed the Barnes Road, Phoebe to Strong "Safety" project for construction in year 2017. The traffic diverted/forecast by this TIA as a result of this improvement for Barnes Road east of Indian Trail Road includes: the assignment of pipeline project trips, the assignment of Windhaven project trips, and some background traffic growth. The results are traffic projections that are 75 percent to 100 percent higher than counts during the PM and AM peak hours, respectively.

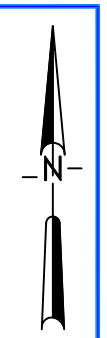
City officials reviewed the potential traffic gains associated with this project as a factor studied with a February 2015 Street Department Technical Memorandum prepared for the Five Mile and Strong Road intersection. Generally, the analysis concludes that a 5.5 percent annual traffic increase can be expected by year 2040 as a result of the Barnes Road extension project; which reflect the diversion of traffic to the new route plus the increase of traffic as a result of development growth. This growth was established based upon information City officials

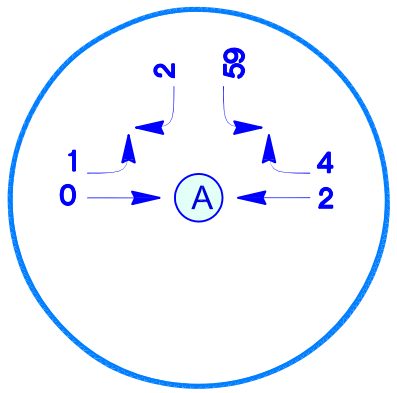


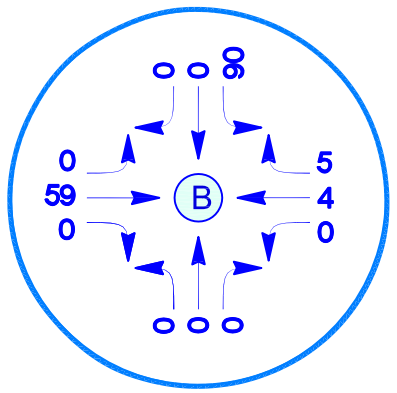


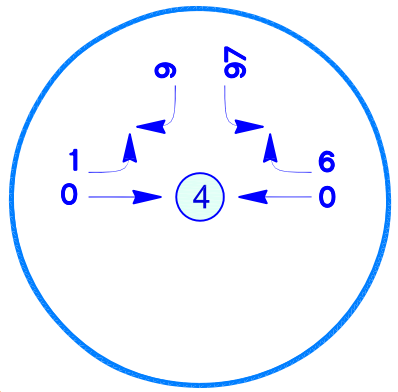


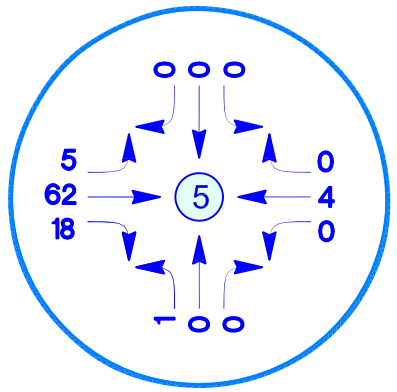


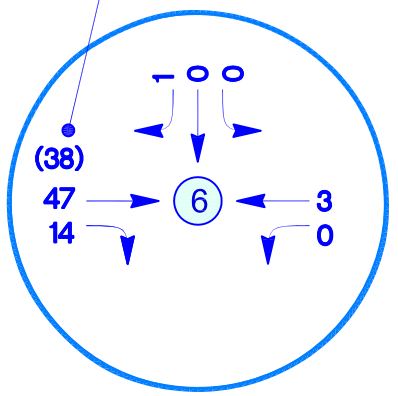


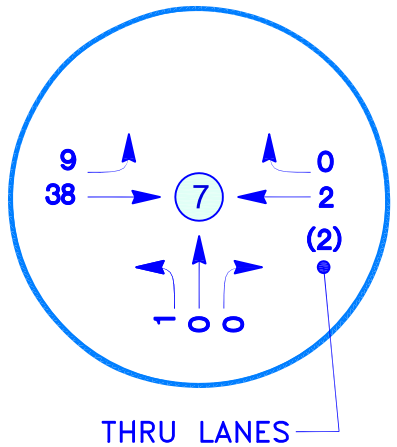


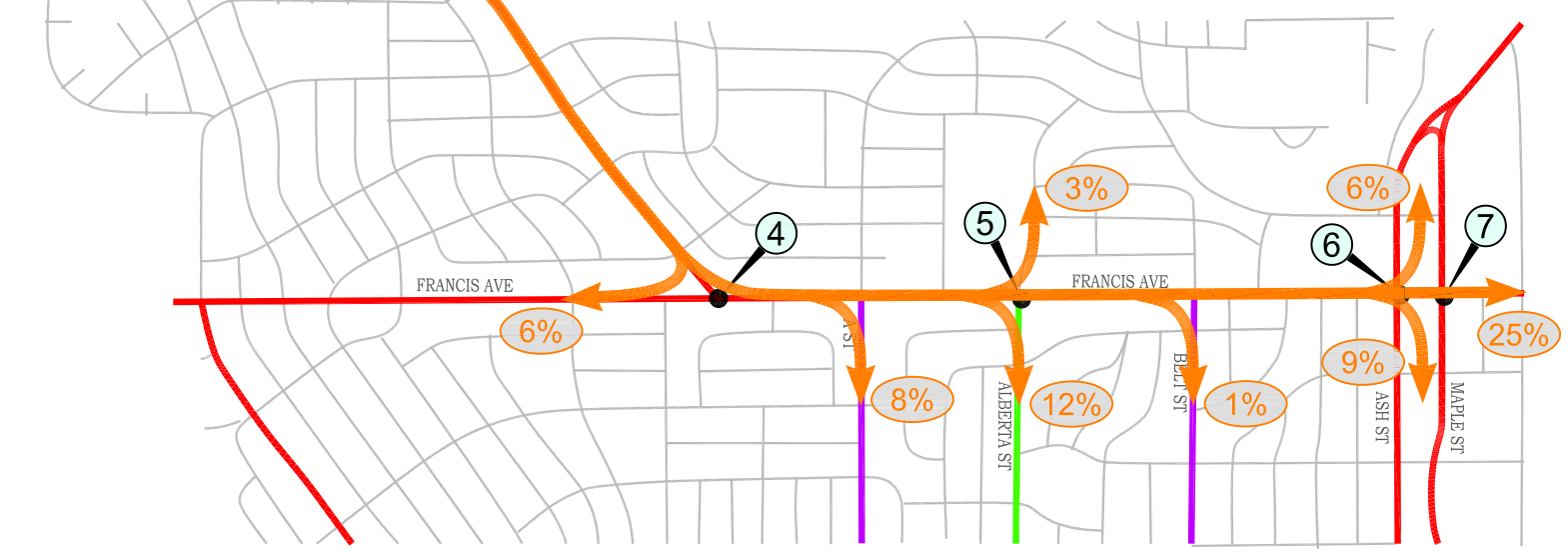












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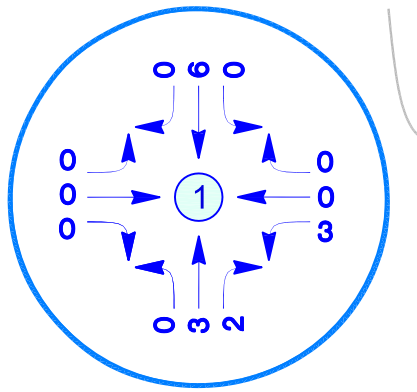
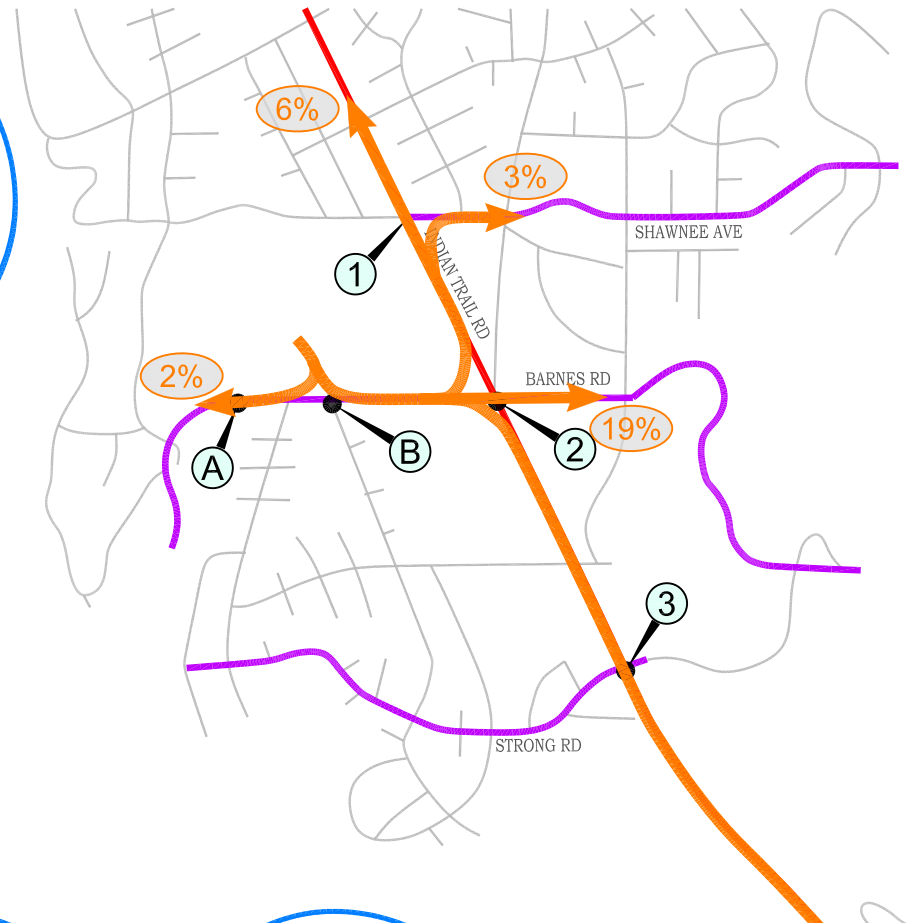
WINDHAVEN APARTMENTS
TRAFFIC IMPACT ANALYSIS
SPOKANE WA

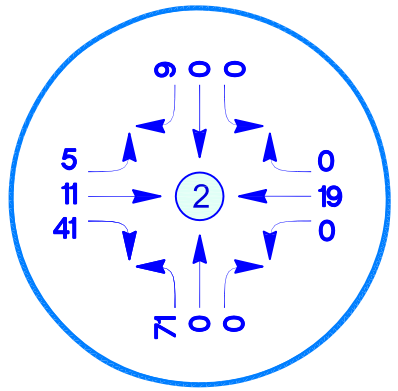
PROJECT TRIP ASSIGNMENTS - AM PEAK HOUR

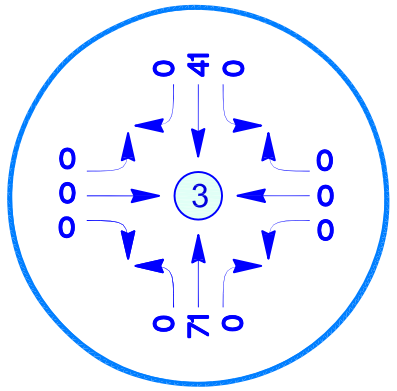
PROJECT NO. 5447.001

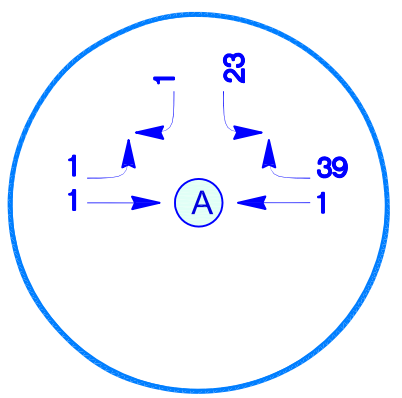
FIGURE NUMBER FIG. 9

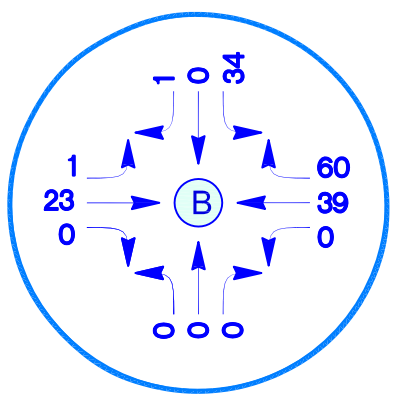


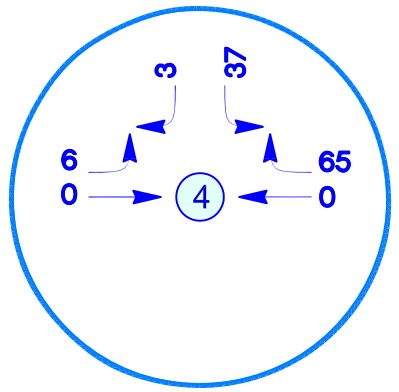


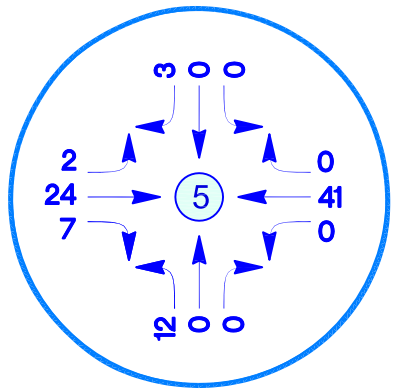


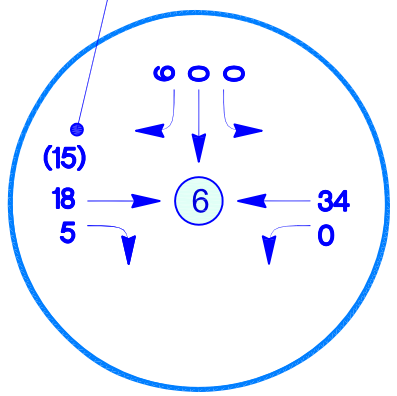


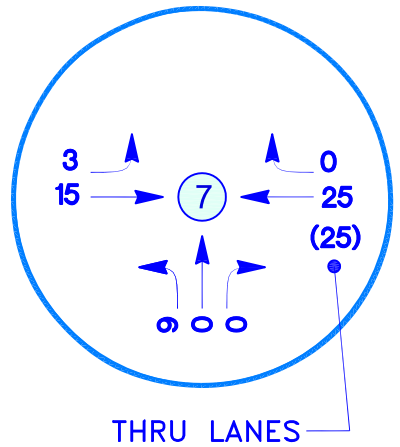












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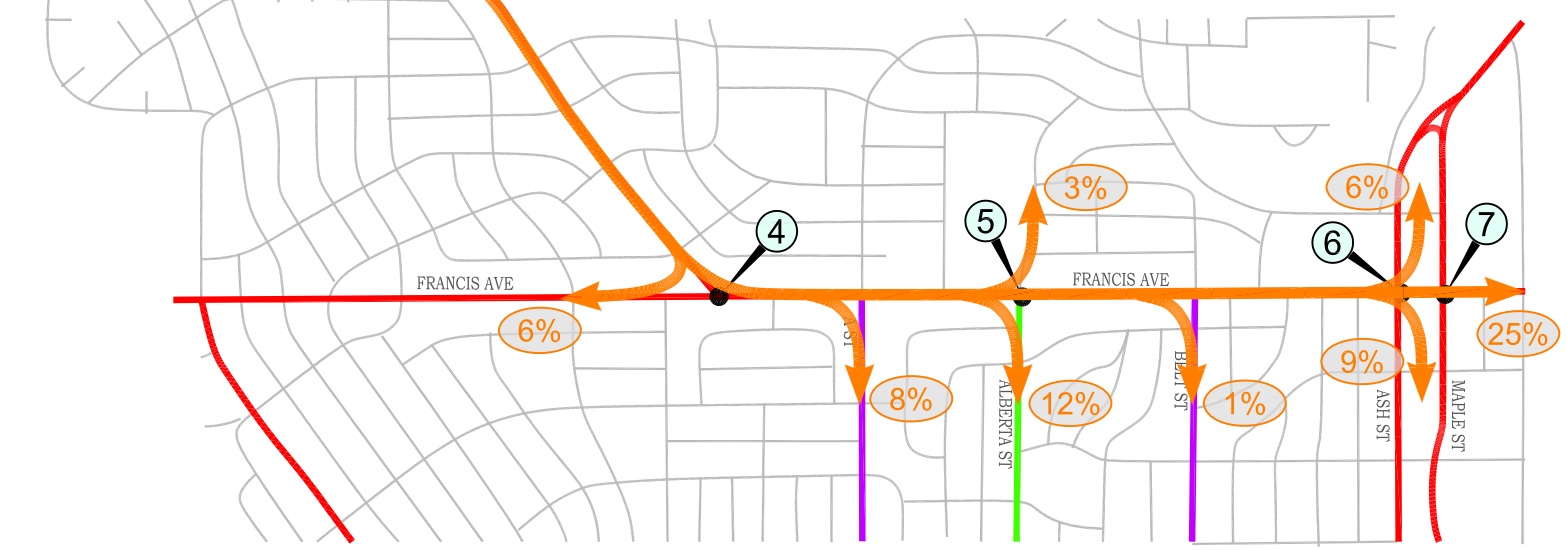

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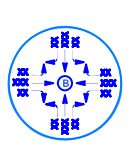

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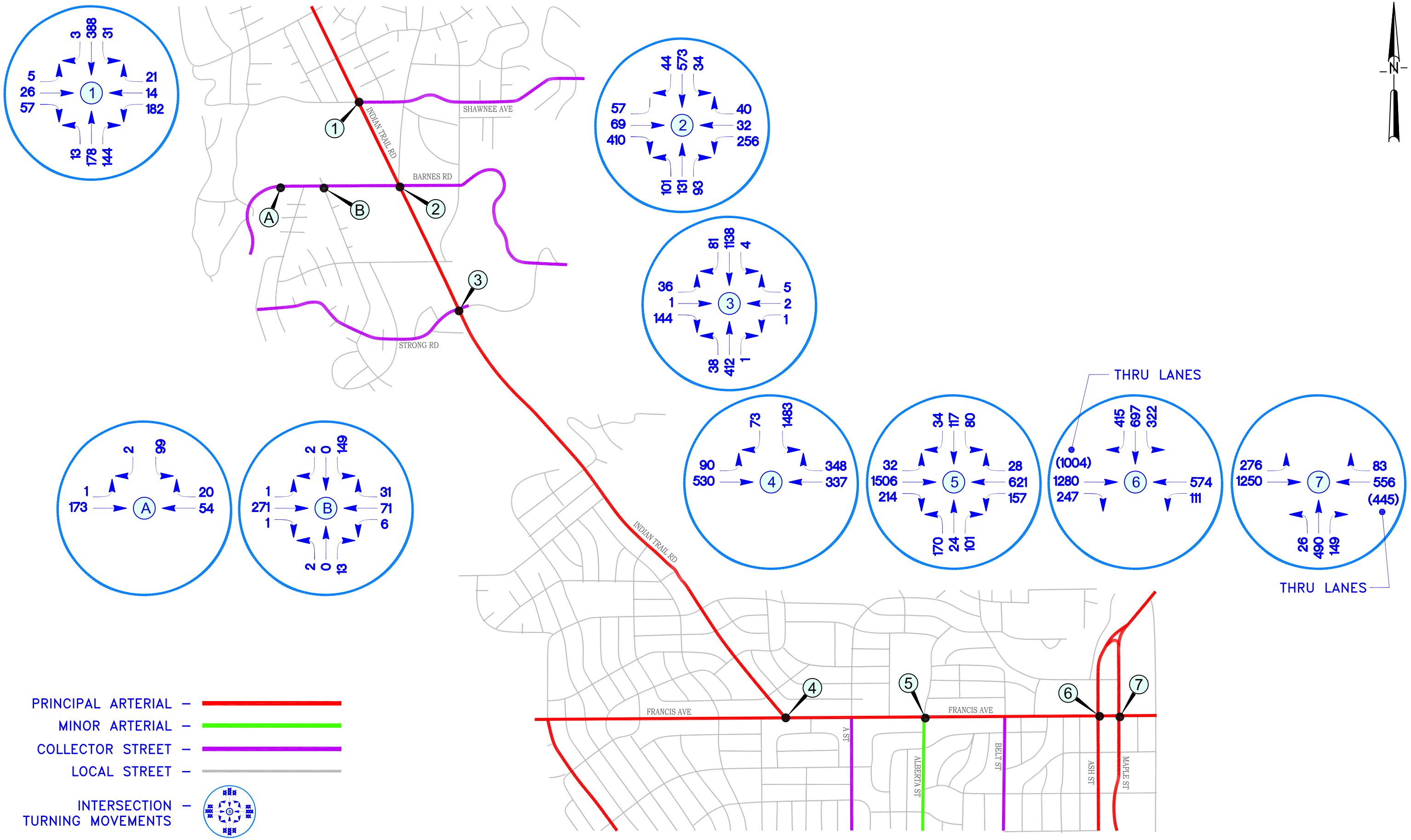
WINDHAVEN APARTMENTS
TRAFFIC IMPACT ANALYSIS
SPOKANE WA

PROJECT TRIP ASSIGNMENTS - PM PEAK HOUR

PROJECT NO. 5447.001

FIGURE NUMBER FIG. 10



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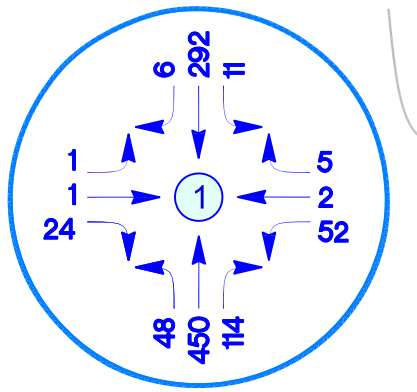
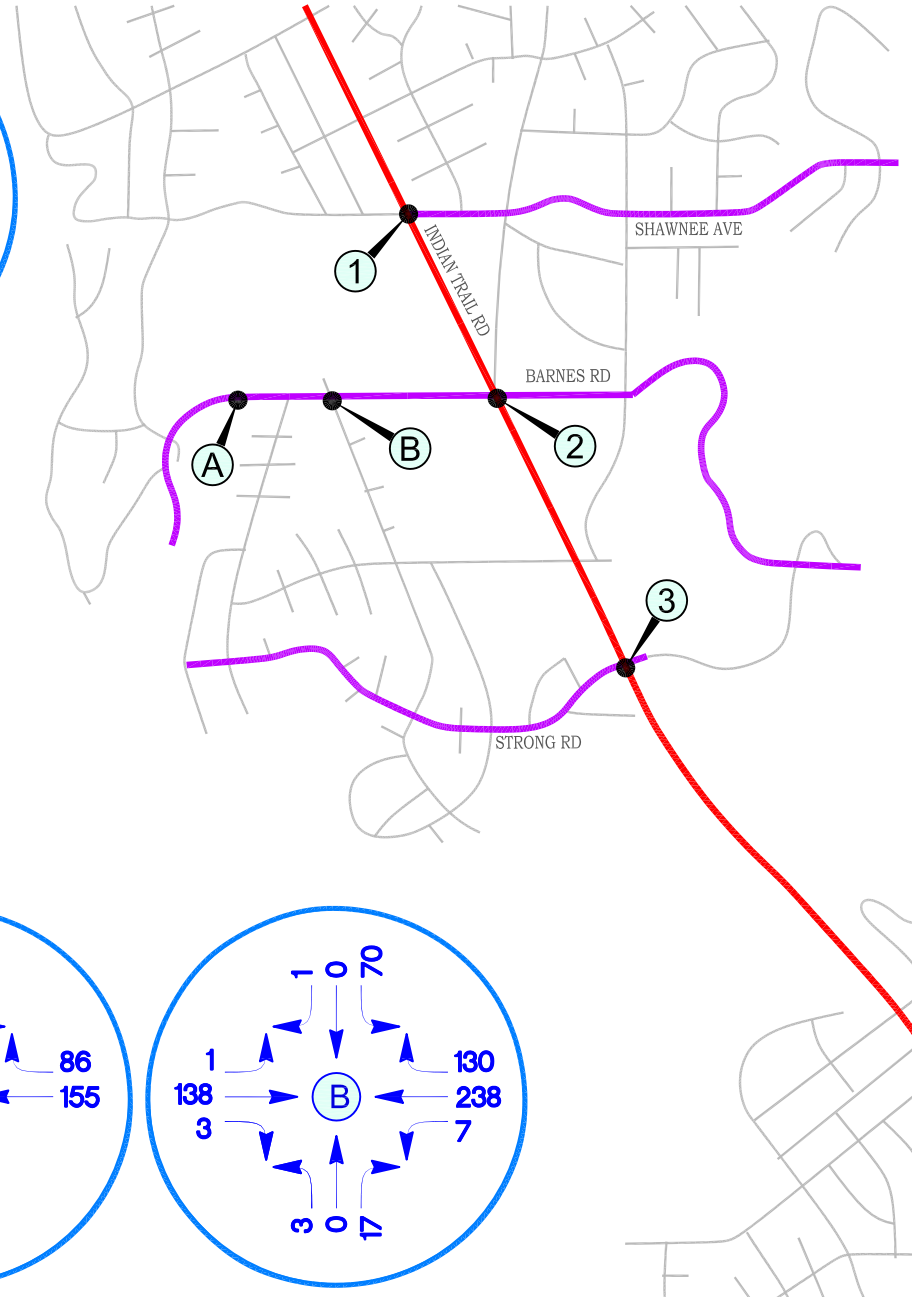
WINDHAVEN APARTMENTS
TRAFFIC IMPACT ANALYSIS
SPOKANE WA

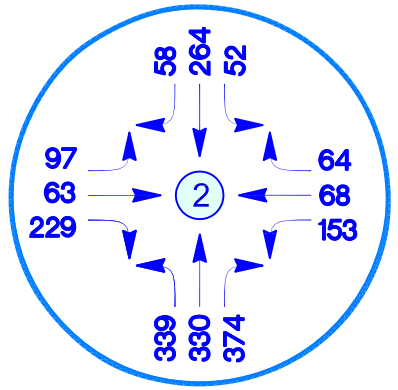
FUTURE WITH-PROJECT TRAFFIC VOLUMES - AM PEAK HOUR

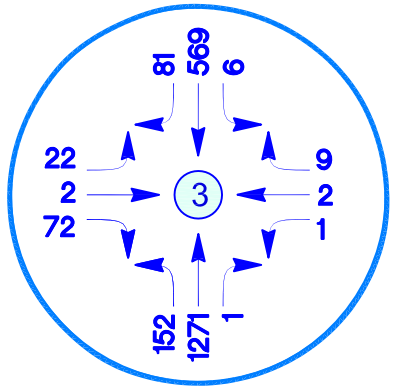
PROJECT NO. 5447.001

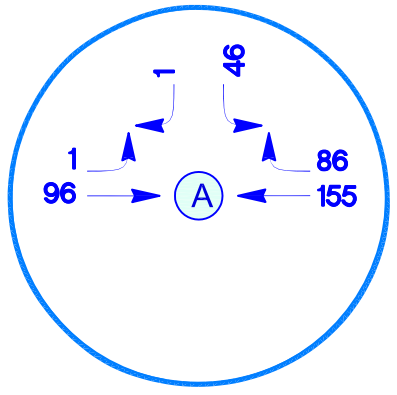
FIGURE NUMBER FIG. 11

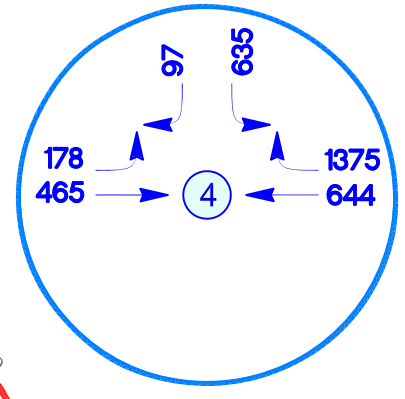


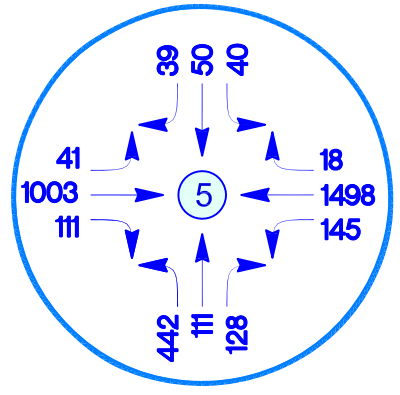


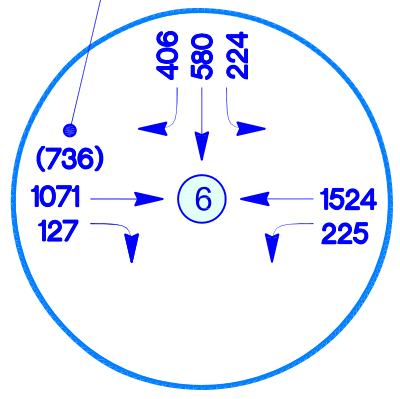


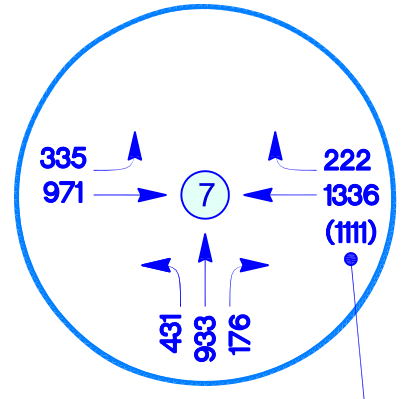












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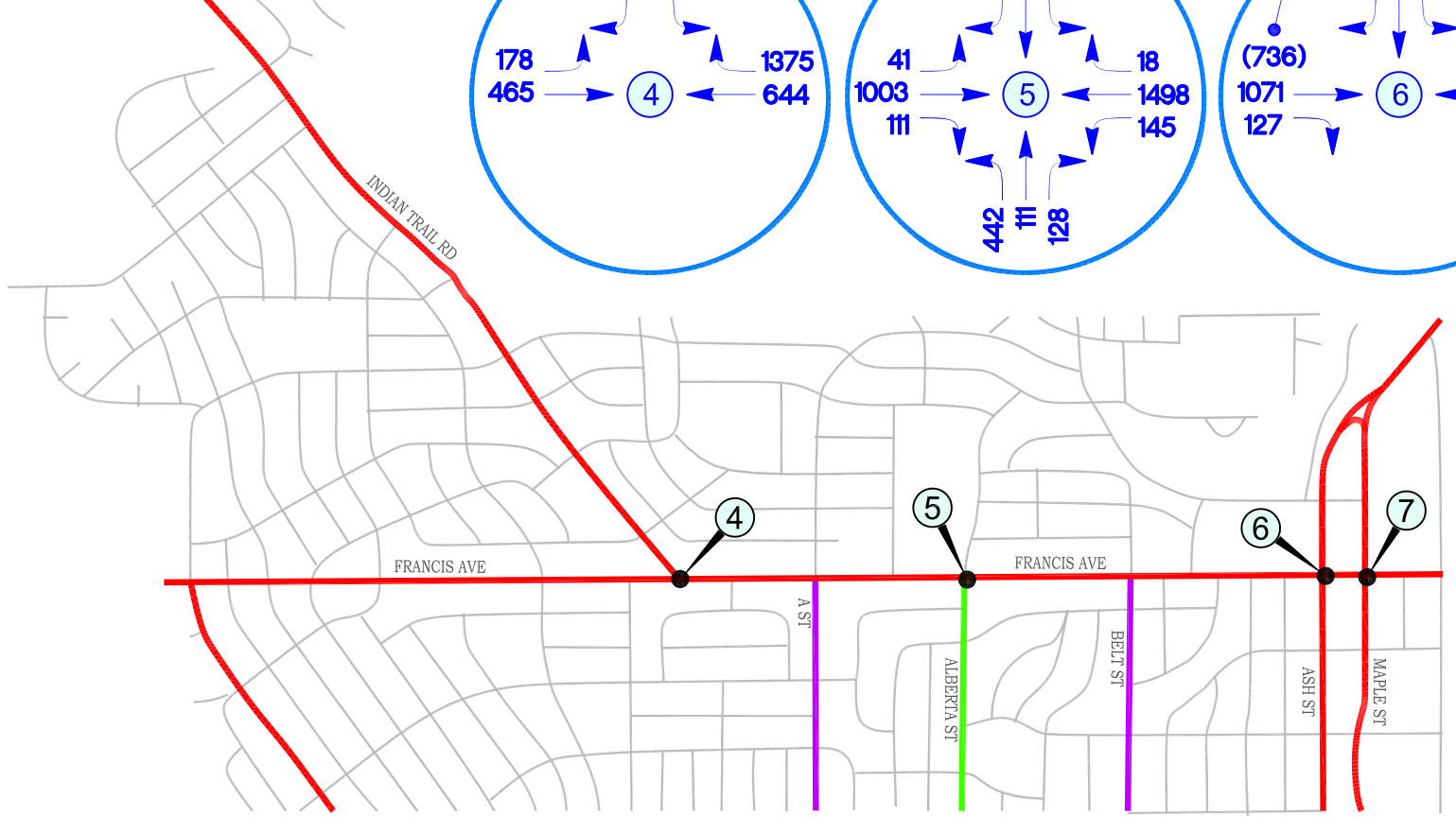

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WINDHAVEN APARTMENTS
TRAFFIC IMPACT ANALYSIS
SPOKANE WA

FUTURE WITH-PROJECT TRAFFIC VOLUMES - PM PEAK HOUR

PROJECT NO. 5447.001

FIGURE NUMBER FIG. 12

secured from the Spokane regional travel demand model. Thus, the hand forecasting methodologies used in this study result in a 10 to 15 percent annual increase on the roadway connection during peak hours, which well exceeds City projections.

These paragraphs have been added to this section to confirm that, while traffic increases on Barnes Road and Strong Road may occur (as a result of the extension) for numerous reasons (i.e. access to the Sundance Plaza Shopping Center, schools, alternative emergency routes, weather conditions, etc.), the overall forecasts are conservative when compared with the results of the City Memorandum and, by extension, the results generated by the regional travel demand model. Thus, no additional traffic diversions of forecasts were addressed, as the resulting traffic forecasts would likely be unrealistic for the year 2021 analysis horizon of this study.

3.3 TRAFFIC OPERATIONS

LOS and capacity analyses were performed based on traffic forecasts, as summarized in Section 3.2, versus the road geometrics and traffic control conditions described in Section 3.1. This analysis was performed initially based on the current geometric conditions, as the Barnes Road extension only causes traffic to divert and does not impact capacity. Indian Trail Road widening was not included as the project is not fully funded. Table 11 provides a summary of resulting future without and with project LOS and control delays for the AM and PM peak hours.

Table 11. Forecast Year 2021 LOS and Delay - AM and PM Peak Hours

Year 2021 Condition	Future Without Project Traffic				Future With Project Traffic			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
Signalized Intersections	LOS[1]	Delay[2]	LOS[1]	Delay[2]	LOS[1]	Delay[2]	LOS[1]	Delay[2]
Shawnee Ave/Indian Trail Rd	B	17.9	A	8.2	B	17.9	A	8.3
Barnes Rd/Indian Trail Rd	C	26.8	B	20.0	D	43.6	C	23.0
Strong Rd/Indian Trail Rd	C	20.2	D	52.4	D	37.3	E	68.8
Indian Trail Rd/Francis Ave	C	20.3	B	10.1	C	29.6	B	10.7
Alberta St/Francis Ave	E	65.6	D	53.7	E	78.3	E	59.4
Ash St/Francis Ave	C	26.1	C	21.3	C	28.9	C	21.5
Maple St/Francis Ave	B	17.6	D	51.4	B	17.6	D	54.0
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
Unsignalized Intersections	LOS[1]	Delay	LOS[1]	Delay	LOS[1]	Delay	LOS[1]	Delay
Forest Ln/Barnes Rd	B	10.6	B	10.2	B	11.4	B	10.6
Pamela Ln/Barnes Rd	B	31.1	B	12.0	C	19.0	C	14.0

1. LOS = Levels-of-Service
2. Del = Delay in seconds

As indicated, LOS E is the threshold for signalized and unsignalized intersections along principal arterials within the City of Spokane. As shown, there are no intersection forecast to function below minimum thresholds during the forecast AM and PM peak hours. To be clear, this does not say the typical driver may not experience some frustration as the result of longer wait times at intersections during peak hours, as compared with other timeframes of the typical

weekday. However, principal arterials are intended to move high traffic volumes within the City and this LOS standard reflects this condition. Thus, citizens within the City have come to expect expect delays and higher traffic volumes along principal arterials; especially as the regional continues to growth. A summary of conditions for each intersection is as follows:

- **Shawnee Avenue/Indian Trail Road.** This intersection operates within the LOS A/B range during peak hours, which is well above minimum thresholds. The highest traffic impacts at this intersection occur during the AM peak hour when the work commute and school traffic activities overlap.
- **Barnes Road/Indian Trail Road.** This signalized intersection will operate at acceptable LOS during the AM and PM peak hours, both without and with project development in year 2021. The work commute and shopping activities have the highest impacts upon this intersection during the AM peak hour.
- **Strong Road/Indian Trail Road.** This signalized intersection will operate at acceptable LOS during both peak hours. The work commute has the highest impact upon this intersection during the PM peak hour.
- **Barnes Road/Indian Trail Road.** This signalized intersection will operate at acceptable LOS during the AM and PM peak hours, both without and with project development in year 2021. The morning work commute will have the highest impact upon the intersection, as Indian Trail Road drivers wait to turn onto Francis Avenue.
- **Alberta Street/Francis Avenue.** This signalized intersection will function primarily within the LOS E range during the AM and PM peak hours. The works commutes, and to a lesser extent Salk Middle school travel demands, have high impacts at this intersection. Although operating within LOS tolerances, this intersection was identified to have the worse congestion analytically and through field observations and was the least improved by signal optimization evaluation (see below).
- **Ash Street/Francis Avenue.** This signalized intersection will operate at acceptable LOS C during the AM and PM peak hours, both without and with project development in year 2021. Impacts principally occur as a result of the work commute.
- **Maple Street/Francis Avenue.** This signalized intersection will operate at acceptable LOS during the AM and PM peak hours, both without and with project development in year 2021. The highest impacts occur during the evening/homebound work commute.

  Note although overall intersection LOS were forecast to be acceptable during the peak hours, meeting City concurrency requirements, the westbound approach to Maple Street/Francis Avenue intersection is forecast to have 89 seconds of average control delay during the PM peak hour; representing a LOS F condition. The maximum phase split for the approach is currently 43 seconds (the available green time during one signal cycle). A comparison of control delay with this phase split confirms individual vehicles would wait about three full signal cycles before clearing the intersection.

It should be noted City of Spokane traffic engineering staff routinely works to "optimize" traffic signal performance in order to improve intersection and corridor mobility; especially along principal arterials such as Francis Avenue and Indian Trail. Although this study demonstrates no overall LOS issues at study intersections, as compared with code, it should be noted that enhanced performances (via improved LOS and/or reduced average vehicle delay) were identified analytically by modifying signal cycle lengths or phase splits in response to the higher travel demands identified with forecast traffic volumes. City staff should have the ability to maintain current traffic operations for some time as the area continues to grow in the future.

Queue Potentials. Future with-project queue potentials were reviewed for signalized study intersections. Future without-project queuing was not shown as there was no difference in queue results. Again, most acceptable conditions are those where average and 95th percentile queues do not exceed lane/pocket storage. Tolerable conditions are those where average queues do not exceed lane storage/pocket length, even when 95th percentile queues do exceed storage. Unacceptable conditions are noted where both average and 95th percentile queues exceed available lane/pocket storage. A summary of queue conditions is shown by Table 12 for the AM and PM peak hours.

Table 12. Future With-Project Queue Potentials - AM and PM Peak Hours

Signalized Intersections	Lane Capacity	AM Peak		PM Peak	
		Avg.	95%	Avg.	95%
Shawnee Ave/Indian Trail Rd					
- Northbound Left-Turn Lane	7 vehicles[1]	1 vehicle	1 vehicles	1 vehicle	1 vehicle
- Northbound Right-Turn Lane	3 vehicles	1 vehicle	1 vehicle	1 vehicle	1 vehicle
- Southbound Left-Turn Lane	3 vehicles[1]	1 vehicle	1 vehicle	1 vehicle	1 vehicle
- Southbound Right-Turn Lane	3 vehicles	0 vehicle	0 vehicle	1 vehicle	1 vehicle
- Westbound Left-Turn Lane	3 vehicles	5 vehicle	7 vehicles	1 vehicle	2 vehicles
- Eastbound Left-Turn Lane	3 vehicles	1 vehicle	1 vehicles	0 vehicle	1 vehicles
Barnes Rd/Indian Trail Rd					
- Northbound Left-Turn Lane	8 vehicles[1]	1 vehicle	3 vehicles	4 vehicles	14 vehicles
- Northbound Right-Turn Lane	5 vehicles	0 vehicle	2 vehicle	1 vehicle	6 vehicles
- Southbound Left-Turn Lane	7 vehicles[1]	1 vehicle	2 vehicles	1 vehicle	2 vehicles
- Westbound Left-Turn Lane	6 vehicles	4 vehicles	9 vehicles	2 vehicles	5 vehicles
- Eastbound Left-Turn Lane	4 vehicles	1 vehicle	3 vehicles	2 vehicles	4 vehicles
Strong Rd/Indian Trail Rd					
- Northbound Left-Turn Lane	7 vehicles[1]	1 vehicle	2 vehicles	1 vehicle	3 vehicles
- Northbound Right-Turn Lane	4 vehicles	0 vehicle	0 vehicle	0 vehicle	0 vehicle
- Southbound Left-Turn Lane	7 vehicles[1]	1 vehicle	1 vehicle	1 vehicle	1 vehicle
- Southbound Right-Turn Lane	4 vehicles	1 vehicle	1 vehicle	1 vehicle	1 vehicle
- Eastbound Right-Turn Lane	8 vehicles	2 vehicles	3 vehicles	1 vehicle	1 vehicle
Indian Trail Rd/Francis Ave					
- Westbound Right-Turn Lane	16 vehicles[2]	0 vehicle	2 vehicles	22 vehicles	33 vehicles
- Eastbound Left-Turn Lane	2 vehicles	1 vehicle	2 vehicles	2 vehicle	7 vehicles
Alberta St/Francis Ave					
- Northbound Left-Turn Lane	9 vehicles[1]	5 vehicles	8 vehicles	11 vehicles	21 vehicles
- Southbound Left-Turn Lane	4 vehicles	2 vehicles	4 vehicles	2 vehicle	3 vehicles
- Westbound Left-Turn Lane	8 vehicles[1]	3 vehicles	9 vehicles	5 vehicles	10 vehicles
- Eastbound Left-Turn Lane	8 vehicles[1]	1 vehicle	2 vehicles	1 vehicle	3 vehicles
Ash St/Francis Ave					
- Southbound Left-Turn Lane	21 vehicles	6 vehicles	10 vehicles	5 vehicles	8 vehicles
- Southbound Right-Turn Lane	21 vehicles	5 vehicles	9 vehicles	9 vehicles	18 vehicles
- Westbound Left-Turn Lane	20 vehicles[1,3]	3 vehicles	6 vehicles	6 vehicles	7 vehicles
Maple St/Francis Ave					
- Northbound Left-Turn Lane	13 vehicles	1 vehicle	2 vehicle	8 vehicles	20 vehicle
- Eastbound Left-Turn Lane	20 vehilces[1,3]	7 vehicles	9 vehicles	6 vehicles	17 vehicles

1. Transitions into a TWLTL, so additional storage can be available.
2. Free movement which turns into a designated receiving lane, so queues not as critical.
3. The designated left-turn lane is broken by an intersection so queue pocket is a two-length measurement.

As shown, all average queues are accommodated within available turn lane/pocket lengths, again with the exception of the westbound left-turns at Shawnee Avenue/Indian Trail Road during the short duration of school traffic. 95th percentile exceptions are noted as follows:

- Shawnee Avenue/Indian Trail Road – The 95th percentile queue exceeds the turn pocket by 4 vehicles during the AM peak hour.
- Barnes Road/Indian Trail Road – 95th percentile queues will exceed storage within the northbound left-turn lane, northbound right turn lane, and westbound left-turn lane between the peak hours. There are no average queue exceptions within the northbound right-turn or westbound left-turn lanes. There were queue issues noted in the northbound left-turn lane turning the PM peak hour.
- Indian Trail Road/Francis Avenue – Eastbound left-turn 95th percentile demands exceed storage by 5 vehicles during the PM peak hour; although average queues are within lane storage. Average and 95th percentile queues exceed storage "on paper" within the westbound right-turn lane. This issue may be overstated though, as in the field this designated right turn has free movement that transitions directly into a northbound lane with no immediate conflict.
- Alberta Street/Francis Avenue – Average and 95th percentile queues exceed storage within the northbound left-turn lane during both peak hours; although again there is a shared left-turn lane at this intersection. Thus, this issue may be moderately overstated (although drivers do indicate long wait times at the intersection). 95th percentile queues exceed storage within the westbound left-turn lane during both peak hours; although there are no average queue issues. This lane does transition into a TWLTL, so additional storage is available outside of through lanes.
- Maple Street/Francis Avenue – 95th percentile queues exceed available storage within the northbound left-turn lane at the intersection during the PM peak hour. Average queues are accommodated with the lane.

It should be noted that westbound queues were noted in the field to exceed beyond Cedar Road, aligned east of Maple Street. This current condition will likely be worsened with traffic growth. This analysis predicts queues in the approach would increase by nearly 25 percent, as measured during the PM peak hour between the existing and future with-project conditions.

Indian Trail Lane Capacity. Forecast lane capacities were reviewed for the three count locations identified previously along on Indian Trail Road. Capacities were reviewed for the future with-project condition, as there was minimal difference between without and with project forecasts. A summary of the forecast lane capacity analysis is shown in Table 13.

Table 13. Future With-Project Indian Trail Lane Capacity - AM and PM Peak Hours

	Capacity			AM Peak Hour			PM Peak Hour		
Indian Trail Road	NB	SB	Tot	NB	SB	Tot	NB	SB	Tot
N/of Weile Ave	1,800	1,800	3,600	376	1,396	1,772	1,351	732	2,083
N/of Kathleen Ave	900	900	1,800	385	1,483	1,868	1,410	781	2,191
N/of Lowell Ave	900	900	1,800	371	1,360	1,731	1,211	790	2,001

As shown, lane capacity is still sufficient within the four lane section of Indian Trail Road north of Weile Avenue. Forecast traffic volumes further demonstrate the need for lane widening along Indian Trail Road, as volumes well exceed single lane capacity in the southbound direction during the AM peak hour and the northbound direction during the PM peak hour.

3.4 TRANSIT

STA is responsible for adjusting transit service throughout the City. Routes can be changed, alternated, diverted, or increased upon petition; however, there needs to be a very compelling reason to make a change. The completion of Windhaven alone would not provide the platform for any change. And given there is adequate weekday service, this TIA does not find any reason to do so regardless. In addition, the close proximity of transit access, within ¼ mile to the east, does not dictate the need for service to be diverted nearer to the Windhaven site.

3.5 PEDESTRIAN AND BICYCLE FACILITIES

As indicated, pedestrian access/mobility and circulation is generally well-served within the project study area; with adequate sidewalk access provided between Windhaven and nearby public facilities, transit, and shopping centers. No improvements seem to be necessary in relation to project development.

Designated commuter bike routes are available within the study area on Indian Trail Road and Barnes Road. Again, these are facilities where vehicle and bike activity share common right-of-way along both streets. Ideally, a recreational bike route would be of benefit to the Indian Trail neighborhood, as delineated via designated bike lanes and/or off-street roadways or pathways. However, while identified via this study as a need for the area, this is a non-project related issue.

3.6 MICROSIMULATION

A Microsimulation analysis was submitted to the City on 5/24/16. The microsimulation analysis was performed to review the cumulative impact of traffic within the context of closely spaced intersections such as those aligned along Francis Avenue. This is somewhat different than the "spot" analyses provided through Highway Capacity Manual (HCM) methodologies and the software that generates HCM results (such as Synchro used with the Windhaven TIA). Cumulative results can be different with micro-simulation because the effect of the traffic influences from upstream and downstream intersections are addressed, whereas spot analysis focuses on traffic conditions predominantly at an intersection only. Spillback between intersections, spillback beyond turning bays, forced lane changes, unbalanced lane use for downstream turns, and other traffic flow interactions are examples of traffic conditions that can have a cumulative impact upon the operation of a single intersection.

The intersections of Francis Avenue with Indian Trail Road, Alberta Street, Ash Street, and Maple Street were reviewed with this supplemental study, as based on existing counts, future without, and future with-project traffic forecasts during the PM peak hour. The analyses confirms traffic growth will increase cumulative impacts upon study intersections located along Francis Avenue, as measured by gains in intersection delay, block time, and queue penalty. The typical driver will experience an average delay of between 12 and 30 additional seconds per intersection by year 2021, assuming development of all projected specified within the TIA. On average, blockage time is anticipated to increase between the peak hours by: up to 7

percent at the Indian Trail Road/Francis Avenue intersection, up to 3 percent at the Alberta Street/Francis Avenue intersection, up to 2 percent at the Ash Street/Francis Avenue intersection, and up to 19 percent at the Maple Street/Francis Avenue intersection, assuming; assuming development of all projected specified within the TIA. Finally, the number of vehicles impacted by queues between peak hours will elevate by up to: 61 for the Indian Trail Road/Francis Avenue intersection, 62 for the Alberta Street/Francis Avenue intersection, 8 for the Ash Street/Francis Avenue intersection, and 155 for the Maple Street/Francis Avenue intersection, assuming development of all projected specified within the TIA.

However, the analysis confirms marginal changes between the future without and with project conditions. Drivers are forecast to potentially experience an average delay increase of between 2 and 5 additional seconds per intersection by year 2021, along Francis Avenue, which is a moderate change. The analysis also confirms the project proposal will have a minimal impact upon cumulative traffic operations for intersections located along Francis Avenue.

It should be noted Microsimulation analyses highlights average vehicle delays and queue potentials that moderately exceed those highlighted on Table 11 and 12, because of the cumulative impact of traffic congestion between closely spaced intersections. This is relevant because it highlights the congestion issues noted for the westbound approach to the Maple Street/Francis Avenue intersection may be worse than what is stated in Section 3.3.

The microsimulation analysis was entitled “Windhaven Apartments, Summary Micro-simulation/SimTraffic Analysis” is provided in Section E of the Technical Appendix.

4 IMPROVEMENT RECOMMENDATION & MITIGATION

There were no overall operational deficiencies (LOS issues) for study intersections. Some 95th percentile queue issues were noted with this analyses; however, it is not typical nor recommended by this study to recommend maximum queues as these are conditions that only occur a few times each peak hour (minimal cost-to-benefit). The study generally concludes LOS and queue results are in compliance with thresholds identified per City standard for study intersections.

With that said, existing and forecast traffic volumes were noted to exceed lane capacities within and north of the traffic bottleneck area of Indian Trail Road (north of Kathleen Avenue). In addition, additional congestion (vehicle delay and queue increases) are forecast within the westbound approach to the Maple Street/Francis Avenue intersection, as per standard analyses and microsimulation results.

As such, this section recommends improvements and/or transportation demand management strategies to minimize the impact of the proposed development along Indian Trail Road and at the Maple Street/Francis Avenue intersection. Also discussed are the development mitigation fee potential and a recommended use of development funds.

4.1 INDIAN TRAIL ROAD RESTRIPING AND WIDENING

Currently, Indian Trail Road is comprised of a three-lane cross section north of Kathleen Avenue to Lowell Avenue, a distance of about 4,600 feet. This includes one northbound, one southbound, and one center two-way left-turn lane (TWLTL). The width of the roadway ranges from 43 and 44 feet between Kathleen Avenue and Lowell Avenue. The northbound and southbound lanes have a width of about 15 feet, respectively, and the TWLTL about 13 feet.

A single vehicle through lane capacity along Indian Trail Road is 900 vehicles per hour. Through lane capacity is limited to 1,800 vehicles per hour between Kathleen Avenue and Lowell Avenue due to the provision of only one northbound and one southbound travel lane in the “bottleneck” area. Existing and forecast travel demands would exceed single lane capacity in the southbound direction during the AM peak hour and in the northbound direction during the PM peak hour. As such, this study recommends the restriping with some widening of Indian Trail Road between Kathleen Avenue and Lowell Avenue to include two northbound and two southbound travel lanes. This would increase through capacity to 3,600 vehicles per hour; sufficient to accommodate forecast traffic volumes.

The project proposal has been coordinated with City officials. The plan would include the widening of Indian Trail Road to accommodate four lanes with an additional two-way left-turn lane (TWLTL) north from Janice Avenue for approximately 650 feet. The TWLTL would be dropped at this point and two northbound and two southbound travel lanes would be maintained through Lowell Avenue. In addition to the widening area, some curb relocations would be required at the intersections of Pacific Park Drive and Lowell Avenue to accommodate through lanes and the relocation of right turn lanes.

The cross section would include 11.5 foot curb lanes and 10.5 foot inner lanes throughout the project improvement area. The width of the TWLTL would be 11 feet. Note these widths are

moderately narrower than what currently exists. Narrower streets have the advantages of slowing travel speeds which would help improve roadway safety, given high existing travel speeds were noted for the arterial.

Note this improvement recommendation does not reflect the City's ultimate plans to widening Indian Trail Road to five lanes with bike lanes in the future, as discussed in Section 3.1. Rather, this would be an interim measure to assure an acceptable level of mobility until long term widening plans can be accomplished.

4.2 MAPLE STREET/FRANCIS AVENUE CONGESTION RELIEF

Traditional analyses indicate the westbound approach to the intersection will experience less tolerable LOS, delays, and vehicle queues. This was confirmed with microsimulation analysis. Two options are being considered for managing/minimizing project impacts on Francis Avenue: 1) Adaptive signal controls retrofitted to the Francis Avenue intersections with Ash Street and Maple Street or 2) development travel demand management (TDM) strategies.

Adaptive Signal Control. According to the U.S. DOT website, adaptive signal control technology adjusts the timing of red, yellow and green lights to accommodate changing traffic patterns and ease traffic congestion. The main benefits of adaptive signal control technology over conventional signal systems are that it can:

- Continuously distribute green light time equitably for all traffic movements.
- Improve travel time reliability by progressively moving vehicles through green lights.
- Reduce congestion by creating smoother flow.
- Prolong the effectiveness of traffic signal timing

Adaptive signal controls would increase the operational efficiency of study intersections. Traffic sensors collect data; traffic data is evaluated and signal timing improvements are developed; and finally signal timing updates are implemented. The process is repeated every few minutes to keep traffic flowing smoothly. On average these improvements improve travel time by more than 10 percent due to faster response conditions.

Travel Demand Management. Page 18 Bullet C of the Spokane Regional Commute Trip Reduction Plan (STRC, 2008) indicates a goal of the regional commute trip reduction (CTR) program is to "reduce drive alone trips by 10 percent". Therefore, the second option for reducing travel demands is a 10 percent reduction of Windhaven development travel demands.

The most feasible and quantifiable TDM option is for management to offer transit passes from Spokane Transit Authority to residence of Windhaven. The minimum use of 80 monthly bus passes would affect a 10 percent decrease in project trip generation (as reviewed on the basis of equations), meeting regional CTR goals.

4.3 PROJECT MITIGATION

TIF's and Indian Trail Road. The project is responsible for mitigating traffic impacts via transportation impact fee (TIF) contribution, as defined in Spokane Municipal Code Chapter 17D.075. The fee scheduled for the Northwest Service Area, within which the project is located, is $483.49 per until for two-story apartments and $296.33 for three-story apartments. Thus, the

Windhaven development would be conditioned with up to **$362,620** of traffic impact fees ($483.49 * 750 two-story apartments).

Normally, a development TIF contribution is placed into an account dedicated towards improvements located within a specific service area: in this instance, the Northwest Service Area. However, upon coordination with City officials, it was determined the restriping and widening of Indian Trail Road must be a priority. Therefore, the $362,620 owed/conditioned for the project as a TIF would be utilized directly for the Indian Trail Road project.

City officials have confirmed that even with this direct TIF allocation, funding would still be approximately 40 percent short of the construction costs needed to timely implement the project described in Section 4.1. This funding shortfall does include use additional funds available within the City Northwest Service area TIF account. As such, the project proponent for Windhaven has offered to front the capital funds not covered by the City to assure the completion of this improvement proposal, to help assure operations and capacity for the arterial. Reimbursement for this additional expenditure would be assured by the City through future latecomer's contribution (financial reimbursement provided by other development projects) and/or through TIF credits provided on future development proposals located within the City Northwest Service area.

As mentioned in Section 3.1, the City has a pavement rehabilitation project programed for Indian Trail Road. The project is scheduled for construction in the summer of 2018. It is anticipated the roadway restriping and widening project can be designed and constructed concurrently with this rehabilitation project (by year 2018). City officials have agreed to design the project. The aforementioned mitigation proposal would be identified as SEPA mitigation and enforced via a development agreement between the City and project proponent.

Maple Street/Francis Avenue Congestion Relief. Two alternatives were offered to help reduce project impacts upon the Maple Street/Francis Avenue intersection: adaptive signal control or development transit passes to affect a 10 percent reduction in trip generation (a TDM practice). The project proponent will coordinate with City and WSDOT officials to determine what improvement option is fair/proportionate and ultimately best benefits to this intersection. The project proponent would then provide adaptive control or implement a transit pass policy for Windhaven to mitigate impacts upon Maple Street/Francis Avenue. The mitigation proposal would be identified as SEPA mitigation and enforced via a development agreement between the City and project proponent.

5 PUBLIC INVOLEMENT

A traffic information meeting was performed on May 25, 2016 to present details of the draft TIA and to answer questions. The meeting was conducted a special session/meeting of the North Indian Trail Neighborhood Council (NITNC). The lingering questions of the NITNC were presented to the City via a June 2 comment letter and a follow up letter provided by their consultant on June 20. The bulk of public commentary falls in line with these comments; thus, these questions are reviewed/addressed in this section of the TIA. The question is highlighted in bold lettering with the response provided thereafter.

The TIA being limited to signalized intersections, ignores the already congested and dangerous intersection of IT and Woodside. The proposed development would increase congestion and danger.

The TIA did not study Woodside, which already has some 4,000 trips per day, and would likely see more from further development in the NIT Neighborhood. The traffic calming Traffic Circles to be built, (June 2016) may or may not reduce trips on Woodside. Any reduction would increase traffic on Francis.

The scope for the study was developed in coordination with technical staff from the City of Spokane and WSDOT. Indian Trail Road/Woodside Avenue was not requested as a study intersection by technical officials; likely because the impacts of the development on Indian Trail are more quantifiable at signalized versus unsignalized intersections in this situation and because project impacts will be minimal at this intersection.

The impact of the Windhaven development should primarily be limited to north-south through movements on Indian Trail Road at this intersection. Woodside Avenue does not offer travel time savings which would cause development traffic to divert from Indian Trail Road in order to access commute arterials such as Francis Avenue. Traffic calming improvements (traffic circles) programmed by the City along Woodside Avenue at F Street, A Street, and Alberta Street would further minimize the advent of development "cut-through" traffic on this route (Windhaven and other projects), as travel times would be further diminished. Thus, the impact of any turning traffic at this intersection, causing potential slow-downs on Indian Trail Road, is not anticipated to be the result of the Windhaven development.

Note a supplemental Indian Trail Safety/Collision analysis was submitted to the City on 6/8/10. Table 1 of this study indicates about 1.8 collisions are occurring per year at the Woodside Avenue/Indian Trail Road intersection. This total is somewhat high when compared with other unsignalized intersections located along the corridor. However, statistically speaking, the intersection wouldn't be flagged as a high accident location (HAL) because collisions versus traffic volume densities are below industry thresholds for the identification of such locations. This is not meant to infer that every collision isn't important; only that the thresholds for identifying an HAL are not apparently met. The *Indian Trail Safety/Collision Analysis* is provided in Technical Appendix F.

The minimal impact of turning traffic on this unsignalized intersection, the likely reduction in turning traffic as the result of Woodside Avenue traffic circles, and the reduced collision rate are all likely reasons City officials did not request analysis of Indian Trail Road/Woodside Avenue.

No "Collision Analysis" was done with this Traffic Study. The 2012 Traffic Study conducted by the City concluded that IT is a dangerous street if a major emergency or crash occurred due to the bottleneck at Kathleen and IT. The 2 fires that we had are perfect examples of the in-grass and e-gress safety issues on IT.

The *Windhaven Apartments, Indian Trail Safety/Collision Analysis* was submitted to the City on June 8, 2016 in response to comments of the NITNC. This is provided in Technical Appendix F of this report. The analysis does not highlight a high accident location (HAL) along Indian Trail Road, nor does it conclude that Indian Trail Road is a high accident corridor (HAC). All collisions are important. However collision-to-volume densities were not sufficient to alert City officials to the potential for HAL's along Indian Trail, nor does data support a HAC, which is why the memorandum makes this conclusion.

In regards to the second point, t*he City of Spokane Six Year Capital Improvement Program* (City of Spokane, 2016) highlights the Barnes Road, Phoebe to Strong "Safety" project programmed for construction in year 2017. The project includes the construction of a two lane paved roadway with offset sidewalks constructed about 2,200 feet between Phoebe Drive (west) and Strong Road (east) in order to provide a secondary outlet to the Indian Trail neighborhood. Admittedly, the route would be somewhat circuitous and would require travel via Five Mile Road, another busy City street. But the neighborhood and emergency service would have a paved secondary route of travel in the event some emergency forced the closure of Indian Trail Road through the highlighted bottleneck area.

The Indian Trail and Five Mile Neighborhoods are housing growth neighborhoods and there was inadequate consideration of future development. Vacant land which will eventually be developed, but is not currently platted, is not considered in the TIA for future impacts. One example being the land on the East side of IT and Strong Rd that is owned by Douglass that is zoned for multi-family apartments. As Mr. Douglass stated at our Board meeting, "When we get done with Morningside we would be heading South."

The City requires that each successive traffic impact analysis review the impacts of previously approved, but yet to be developed, land use projects. Known as "pipeline" projects, these developments have been granted rights to future roadway capacity but have yet to generate traffic which would be reflected in traffic counts. In this way, the cumulative impacts of development are addressed.

Forecasts from the Windhaven TIA reflects the trips generated by 11 vested pipeline projects and recommends mitigations to help minimize traffic from all forecast traffic growth. Any subsequent developments will have to consider these projects in addition to Windhaven, recommending new or revised roadway infrastructure strategy, as a function of Concurrency and SEPA policy. This includes any land use action that Douglass Properties may have for other properties located along Indian Trail Road. Section 3.2.1 of this report provides further discussion on pipeline projects reviewe4d with the TIA.

The currently vested trips for the 286 units do not actually exist, but they are credited against the trips to be generated by the proposed development. (Am 65 in 145 out, PM 179 in 92 out). If the amendment is approved, those trips will become "real" and will add to the traffic impact forecast by the TIA.

The trips generated by the currently approved 286 homes on the Windhaven site were treated as a pipeline project, as they are already approved/vested by City officials. This means these trips are addressed in in the TIA via future without-project traffic forecasts. The additional trips generated with the current land use proposal, increasing density to 750 apartment units, were then added to these forecasts to generate total future with-project traffic forecasts. Thus, the TIA appropriate trip generation (traffic forecasts) assuming the development of 750 apartment units (in-lieu of 286 single family homes).

The possibility of residential units being built within the Sundance Center in lieu of businesses is not addressed. The 96 unit Apartments being constructed in an 0-35 zone is an example of what could be done in the Sundance Center.

As described previously, any sizeable development/land use action would be precipitate the need for a traffic study under various City process (SEPA, Comp. Plan Amendment, etc.). The study would consider the impact of vested "pipeline" projects; thus, addressing the cumulative impact of traffic growth upon Indian Trail Road.

The City identified the pipeline projects to be included in the study, as these are approved and vested developments. No other projects (such as the one described via the comment) were identified because, we assume, there are no development/land use proposals on file at the City for these properties. Or they submitted application after the process was initiated for Windhaven. Thus and again, and subsequent development will have to address pipeline projects, including Windhaven, to assure cumulative consideration of future development traffic.

Future development on Five Mile Prairie, in both the City and the County will add traffic to that already existing, but is not included in the TIA projections. With Barnes Rd connecting to IT traffic would probably increase.

Conservative traffic forecasts were developed for the Barnes Road connection to Strong Road; reflecting specified and non-specified development/pipeline project traffic. The traffic forecasts presented in the TIA are more conservative (higher) than traffic studies generated by the City Street Department for the roadway. Thus, the TIA sufficiently addresses the impact of this improved arterial connection upon Indian Trail Road. Section 3.2 of the TIA describes traffic forecasts.

The Traffic Study states that 21% of project traffic will use Barnes Rd, based on traffic modeling software, which likely doesn't take topography or weather into consideration. Completing Barnes RD will not significantly reduce peak hour traffic on IT or Francis-as acknowledged by Mr. White due to limited roads off Five Mile, (3 single lanes roads), and because only people working in the far North side are likely to use it.

The City has directed that the final TIA reduce the assumption to 19% assignment and reassign the remaining trips to other destinations along Indian Trail Road (such as the shopping center). However, note this will only be a moderate adjustment. Trip distribution and assignment for this project were established based on direction from the regional travel demand model. This data was provided by the City and they have confirmed that they trust the results and assumption.

Future development to the North, (9 mile and Suncrest, for example), will add traffic to Francis and likely IT, but is not considered in the TIA.

Please refer to previous discussions regarding pipeline projects and the City requirements of future traffic studies. However, to provide context, traffic has increased historically by a 1 to 1.5 percent annual growth rate on Indian Trail Road throughout the last 20 years; reflecting development growth within the area. The City forecasts a resulting 1.3 percent annual growth rate by year 2040 via the *Indian Trail Widening Roadway Capacity Justification Report* (City of Spokane, 2015). The year 2021 traffic forecasts of the TIA reflect 6 to 7 percent annual growth rates; well exceeding historical trends and outpacing City projections. Thus, the TIA establishes conservative traffic forecasts upon which system recommendations were based.

If IT is eventually widened to a full 4 lanes and center turn lane, and the signal timing "tweeks" are done and a turn lane constructed at Alberta, all possible capacity improvements will be done. Any future increases in traffic will not be remediable. There is not possible route parallel to IT, no feasible even if possible, route to the West, such as extending Barnes Rd; and no possible additional lanes or road to/from 5 mile Prairie.

The comment is noted. The City will have to determine at that time if further development is feasible within the region without further roadway connections.

Britton Enterprises is a consultant hired by NITNC and provided additional questions/comments, with traffic-related comments addressed via the following bullets.

- The first primary comment of the letter generally indicates the development can be accepted/approved only if funding is in place for roadway improvement proposals, as specified via the City 6-Year Street Program. The comment continues to describe Indian Trail Road widening project, as referred to in the TIA, is programmed only in the Transportation Impact Fee project list and not the 6-Year Plan. The inference is the project should not be approved, or at least scaled back, until a fully funded widening project can be programed in the 6-Year Plan.

  The premise presented by Britton Enterprises is partially correct. A development can be approved if a programed and funded roadway improvement is scheduled in the 6-Year Plan, but this is applicable only when concurrency (i.e. acceptable LOS) cannot be demonstrated. In this case, LOS were demonstrated to be adequate along Indian Trail Road and therefore concurrency is met for the corridor, as prescribed by City LOS standards and definitions. Only a secondary analysis provided the bases for recommendation, outside of City requirement/definition. Thus, there is no requirement roadway widening be programmed in the 6-Year Plan at this time.

  With that said, this Final TIA does recommend an alternate improvement strategy, to be coordinated with City officials. In coordination with City engineers, a minimum four lane roadway with two northbound and two southbound lanes will be constructed along Indian Trail Road, within the Kathleen Avenue and Lowell Avenue "bottleneck" area, as a condition of development. The Windhaven project proponent will dedicate TIF's to the improvement and front whatever construction costs cannot be covered by the City (with any pay-back arrangement to be coordinated with City officials). The City has a roadway rehabilitation project programmed for Indian Trail Road in year 2018. The roadway restriping and partial widening project would be coupled with rehabilitation; thus, Indian Trail Road four-lane would be available by the end of year 2018. This mitigates the issues highlighted by the secondary capacity analyses of the TIA and, because a project is programmed within 6-Years, addresses the first concern of Britton Enterprises.

- The letter seems to infer that a 0.5 percent annual traffic growth rate was used in forecast analyses. To the contrary, a resultant 6 to 7 percent annual growth rate was forecast when accounting for baseline growth, pipeline projects, and Windhaven development. The 0.5 percent mentioned in this TIA is a background growth rate, used to account for any unspecified development or pipeline projects that may have been neglected outside of the immediate project study area. In other words, the baseline growth rate is used to help assure conservative traffic forecasts.

  As indicated on the prior page, the *Indian Trail Widening Roadway Capacity Justification Report* provided by City Engineers predicts 1.3 percent annual growth on Indian Trail Road by year 2040. This TIA reflects 6 to 7 percent annual growth by year 2021 which can be extrapolated to a 1.4 percent annual growth rate if extrapolated to year 2040. Thus, the TIA uses conservative traffic forecasts that exceeds the projections of even City Engineers.

- The letter questions the use of the ITE, suggesting actual trip generation may be higher than predicted using this nationally and locally accepted resource. This was also a concern of citizens of the May 25 community meeting.

  To help address this concern, a summary field study was performed for the Lusitano Apartment complex, which is located adjacent to the proposed Windhaven development along Barnes Road. Counts were performed on the weekdays of June 8 and June 13, 2016 for timeframes extending between 7 and 9 AM and 4 and 6 PM in order to identify the peak hours of commute traffic. The highest hourly count in the morning occurred between 7:30 and 8:30 AM with 65 vehicles on June 8 and highest afternoon/evening count occurred between 4:45 and 5:45 PM with 75 vehicles on June 13. This apartment complex has 212 units similar to that proposed with Windhaven, with peak resulting trip generation rates of 0.31 trips per unit during the AM peak hour and 0.39 trips per unit during the PM peak hour.

  By comparison, a rate resultant rate of 0.49 trips per unit during the AM peak hour and 0.57 trips per unit during the PM peak hour was used to forecast Windhaven trips, as based on the ITE. Therefore, the rates used in this study are nearly 60 percent higher in the AM and over 45 percent higher in the PM versus rates established on local field counts. This means this TIA well overestimates traffic versus what is likely to occur in the future with Windhaven development.

The remaining comments of the Britton Enterprises letter regards non-traffic issues, have been addressed by previous points (within this Section), refer to editorial issues, or highlight minor disagreement with TIA assumptions; none of which have been identified by City Engineers for being addressed with the final TIA. Thus, no further comments from this letter were highlighted.

The comments highlighted above address majority comments highlighted by citizens within the North Indian Trail neighborhood. There were numerous other comments that didn't involve traffic or would be overwhelming to address with this Final TIA on a case-by-case basis; sufficed all comments were thoughtful and helpful to the development of this TIA. The level of involvement from this community is not common and their diligence has made this study more comprehensive and thorough. Thus, the comments and questions have been appreciated throughout the project process.

6 SUMMARY AND CONCLUSIONS

Windhaven First Addition is an approved City residential development that occupies 49.48 acres aligned north of Barnes Road and west of Indian Trail Road within the Indian Trail neighborhood of Spokane. The project was initially approved in year 2006 for the construction of 286 single family homes. No homes have been constructed yet; although the street infrastructure for the development is complete. This includes primary vehicle access to Barnes Road via Forest Lane and Pamela Lane, with secondary access provided to the adjacent apartment development (to the east) via Jamestown Lane. The project is within an RSF zone of the City with a site Comprehensive Plan designation of Residential 4-10.

Due to evolving market conditions, the project proponent has recently proposed to develop up to 750 apartment units on the site as opposed to single family homes. The proposal results in a density of 15.2 homes per acres, which exceeds the approved residential density. Thus, a Comprehensive Plan amendment and zone change would be needed to accommodate the proposal; specifically to a RMF zone and Comprehensive Plan designation of Residential 15-30.

Note the proposed apartment density marginally exceeds minimum zoning and Comprehensive Plan allowances, and is just under half of maximum allowable densities (of up to 30 apartments per acre). The reduced density was accommodated to minimize the traffic impacts of the proposed development on the Indian Trail neighborhood; as this was expressed as a concern of citizens living within the area. The developers have reduced site densities considerable from initial development proposals.

Site access is promoted as described previously, with primary access provided via Forest Lane and Pamela Street and secondary access via Jamestown Lane. Currently, pedestrian access only is proposed via Moore Street intersecting with Shawnee Avenue to the north, as this is a pedestrian/school route. However, this can be revisited during the design process if City officials determine vehicle access would benefit the neighborhood in the future.

Per City concurrency evaluations, Windhaven First Addition with 286 homes is vested to generate 210 trips during the AM peak hour and 271 trips during the PM peak hour. This would represent the trip generation equivalent of 460 apartment units. This distinction is important because it demonstrates that 46 percent of the current apartment proposal could be developed before surpassing vested/programmed traffic generation levels.

This TIA is responsible for addressing the net gain in trips over those vested/identified above. The current 750 unit apartment proposal represents a net gain in trip generation of 161 trips during the AM peak hour and 159 trips during the PM peak hour over those vested/associated with single family home development. About 19 percent of project trips are anticipated to/from the east on Barnes Road (via the new extension and connection to Strong Road). About 9 percent of project trips are anticipated to/from the north and 70 percent to/from the south on Indian Trail Road. About 2 percent are anticipated from adjacent businesses, services, and retail. The majority of project trips along Indian Trail Road south will travel to/from the east on Francis Avenue; distributing throughout a study area that addresses the Alberta Street and Maple/Ash Couplet intersections with Francis Avenue. Note forecast traffic volumes doe address trip generation for a 750 unit apartment complex. The analysis was performed in future without and with-project stages/conditions due trips that are currently vested for the site.

6.1 TRAFFIC FORECASTS AND CAPACITY

City officials require this study address traffic operations principally for site access intersections and seven off-site intersections most impacted by development within the Indian Trail neighborhood. The analysis was required for the AM and PM peak hours of the typical weekday, as based on the forecast year 2021 completion year of the project.

Existing Conditions. Traffic counts were performed during typical weekdays in March and April to capture the peak demands of the morning and afternoon commutes. These counts were performed specifically while local schools were in session, as to capture the travel demands of these special traffic generators.

City of *Spokane Administrative Policy and Procedure for Transportation Concurrency Level of Service Standards* defines a LOS E standard for signalized and unsignalized intersections aligned along a principal arterial. An analysis of existing traffic operations indicates there were no levels-of-service (LOS) issues identified within the field, as all intersections were shown to function at LOS E or better between the AM and PM peak hours.

Secondary lane capacity analyses and speed counts were performed discretionarily to support conclusions for Indian Trail Road. The lane analysis was used to help identify whether adequate capacity exists for through traffic (northbound and southbound movements) outside of study intersections along Indian Trail Road. Lane capacities were reviewed for three count locations within the vicinity of the "bottleneck" on Indian Trail Road: 1) north of Weile Avenue (south of bottleneck); 2) north of Kathleen Avenue (within bottleneck); and 3) north of Lowell Avenue (north of Bottleneck).

The analysis indicates lane capacity is sufficient within the four lane section of Indian Trail north Road north of Weile Avenue. However, existing counts are shown to exceed directional lane capacities within specifically within the bottleneck area north of Kathleen Avenue. There is minor lane capacity exceptions noted north of Lowell Avenue, but overall capacity appears to be sufficient north of the bottleneck. A comparison/review of this data does suggest need for lane widening as based on existing count data.

Despite lane capacity results, travel speeds within the corridor do not seem to be overly compromised. Speed counts were performed at the locations identified/reviewed above, south of, within, and north of the bottleneck area along Indian Trail Road. Average travel speeds were found to be 3 to 6 mph above the posted 30 mph speed limit along the roadway during AM and PM peak hours in both travel directions. The conclusion from this is that, while additional capacity is needed, the travel time of typical commuters is not yet impacted.

Future Conditions. Future 2021 traffic volumes were developed for operational analyses assuming: 1) baseline (non-development associated) traffic growth, 2) the development of eleven study area pipeline projects (including vested Windhaven First Addition), and 3) the assignment of project trips. A 0.5 percent annual growth rate was applied to counts to reflect baseline (non-development) traffic growth. This growth was combined with the trips generated by pipeline projects to generate future without project traffic forecasts.

Finally, project trip assignments and future without project traffic volumes were combined to generate future with-project traffic forecasts. The resulting traffic forecasts result in growth rates

of between 6 and 7 percent annually on Indian Trail Road, which far exceeds historical growth rates ranging between 1 and 1.5 percent annually. Thus, traffic forecasts are very conservative for year 2021 and may be more representative of long term traffic growth (beyond year 2021).

Future intersection analyses indicated that no LOS issues were noted based upon a review of future year 2021 traffic forecasts. This determination is made because no study intersection is forecast to function below LOS E on the principal arterials of Indian Trail Road or Francis Avenue during the peak hours. LOS at site access intersections are also shown to operate acceptably at LOS C or better during the peak hours.

Note although overall intersection LOS were forecast to be acceptable during the peak hours, meeting City concurrency requirements, the westbound approach to Maple Street/Francis Avenue intersection is forecast to have 89 seconds of average control delay during the PM peak hour; representing a LOS F condition. The maximum phase split for the approach is currently 43 seconds (the available green time during one signal cycle). A comparison of control delay with this phase split confirms individual vehicles would wait about three full signal cycles before clearing the intersection. Queue conditions are forecast to be extensive within this approach.

City of Spokane traffic engineering staff routinely works to "optimize" traffic signal performance in order to improve intersection and corridor mobility; especially along arterials such as Francis Avenue and Indian Trail. Although this study demonstrates no LOS issues at study intersections, compared with code, it should be noted that enhanced performances (via improved LOS and/or reduced average vehicle delay) were identified analytically by modifying signal cycle lengths or phase splits in response to the higher travel demands identified with forecast traffic volumes. This confirms City staff should have the ability to maintain traffic operations beyond levels stated in the report as the area continues to grow in the future.

Forecast lane capacity was still shown to be sufficient within the four lane section of Indian Trail north Road north of Weile Avenue. Forecast traffic volumes further demonstrate the need for lane widening along Indian Trail Road north of Kathleen Avenue (within bottleneck) and north of Lowell Avenue (north of Bottleneck). This determination is confirmed because forecast traffic volumes well exceed single lane capacity in the southbound direction during the AM peak hour and the northbound direction during the PM peak hour.

Pedestrian, Bike, and Transit. Pedestrian, bicycle, and transit access conditions are favorable within the project vicinity. Sidewalk is contiguous between the developments and nearby transit stops, shopping centers, and public facilities (a library and a park). There are commute bicycle routes on Indian Trail Road and Barnes Road; although some form of designated bike lanes for recreational facilities would be ideal in the future (such remediation is beyond the scope of development projects). Finally STA transit access to Indian Trail Road is sufficient on weekdays, with transit stops located within walking distance about ¼- mile east of Windhaven.

Supplemental Studies. Two supplemental studies were performed to support this TIA: 1) a Microsimulation analysis submitted to the City on 5/24/16 (provided in Technical Appendix E) and 2) an analysis of collision data submitted to the City on 6/8/16 (provided in Technical Appendix F).

The microsimulation analysis was performed to review the cumulative impact of traffic within the context of closely spaced intersections such as those aligned along Francis Avenue. The analysis addresses conditions such as spillback between intersections,

spillback beyond turning bays, forced lane changes, and unbalanced lane use for downstream turns.

The intersections of Francis Avenue with Indian Trail Road, Alberta Street, Ash Street, and Maple Street were reviewed with this supplemental study, as based on existing counts, future without, and future with-project traffic forecasts during the PM peak hour. The analysis generally concludes the cumulative impact of traffic congestion between the Francis Avenue intersections with Ash Street and Maple Street may cause average delays and queues that moderately surpass those stated by this TIA. Thus, the microsimulation analysis indicates the westbound approach issues specified for the Maple Street/Francis Avenue may be greater than identified based on traditional LOS and delay analyses.

The collision analysis was performed for Indian Trail Road and indicates 52 recorded collisions occurred along the roadway between January 1, 2013 and May 31, 2016. Overall, 42 percent of collisions involved vehicle property damage only with 58 percent involving injuries. There were no fatalities within the study timeframe.

An average of 15.2 collisions occur the study arterial segment each year that, when compared with an average of 15,892 ADT, results in rate of 0.98 collisions per million miles of vehicle travel. Comparatively, the Washington State Department of Transportation 2014 Annual Collision Summary Report indicates Spokane County experiences a system/network-wide rate of 168.7 collisions per 100 million miles of travel, or 1.687 collisions per million miles of travel. Thus, by comparison, the calculated corridor rate is well below the average for Spokane County suggesting no unusual collision issue exists along Indian Trail Road. This conclusion was confirmed based on a review of intersections and driveways on an individual basis.

6.2 IMPROVEMENT RECOMMENDATIONS AND MITIGATION

The project is responsible for mitigating traffic impacts via transportation impact fee (TIF) contribution. The fee scheduled for the Northwest Service Area, within which the project is located, is $483.49 per until for two-story apartments and $296.33 for three-story apartments. Thus, the Windhaven development would be conditioned with up to **$362,620** of traffic impact fees ($483.49 * 750 two-story apartments), as collected prior to the issuance of any building permit on a per-unit/home or development phase basis.

The study concludes that adequate overall LOS is maintained at study intersections in accordance with City of Spokane Standards. However, secondary and supplemental analyses identify transportation improvements or demand strategies are needed to help improve traffic mobility for two study area locations, as based on a review of forecast traffic conditions.

3. **Improvement – Indian Trail Road.** The lane capacity analysis indicates additional through lanes are needed in the northbound and southbound travel directions of Indian Trail Road, respectively. Upon coordination with City officials, it has been determined that the arterial can be restriped with some widening in locations to provide a minimum four-lane cross section throughout the current "bottleneck" extending between Kathleen Avenue and Lowell Avenue. This would provide needed lane capacity and address one of the top neighborhood concerns expressed via comment letters and emails, and also via the 5/25/15 public meeting.

   Mitigation. The project proponent has offered to front the costs of improving Indian Trail Road, to be constructed with a City pavement rehabilitation project scheduled summer of

year 2018. The City pavement rehabilitation project is funded. The Windhaven TIF of $362,620 would be dedicated specifically to Indian Trail improvements as SEPA (and future concurrency) mitigation. Additional costs not be covered by the City would be fronted by the Windhaven developer and would be reimbursed either by TIF credits (for future developments within the Northwest Service Area) or via latecomers reimbursement provided via other Indian Trail Neighborhood developments. City officials indicate they will provide design services. The specifics of mitigation will be coordinated with City officials and enforced via developer agreements.

4. **Improvement – Maple Street/Francis Avenue Congestion.** Traditional analyses indicate the westbound approach to the intersection will experience less tolerable LOS, delays, and vehicle queues. This was confirmed with microsimulation analysis. Two alternatives are being considered for managing/minimizing project impacts on Francis Avenue: 1) Adaptive signal controls retrofitted to the Francis Avenue intersections with Ash Street and Maple Street or 2) development travel demand management strategies. Adaptive signal controls would increase the operational efficiency of study intersections. Travel demand strategy would reduce development travel demands on Francis Avenue.

   Mitigation. Adaptive signal control would be a direct mitigation of development; with design and installation coordinated with City and WSDOT officials. The prevailing travel demand strategy is to offer STA bus passes to residence of Windhaven. The Spokane Regional Commute Trip Reduction Plan has a 10 percent travel reduction goal. Thus, a minimum of 80 monthly bus passes would be offered to residences of Windhaven, as provided on a first-come basis. This would affect a 10 percent decrease in project trip generation meeting regional CTR goals. The preferred alternative would be advanced in coordination with City officials, as enforced with a developer agreement.

6.3 PUBLIC PARTICIPATION

Primary questions/points from the public involvement process performed to support this project are addressed as follows:

- The scope for this study was set in coordination with officials from the City of Spokane and WSDOT. Any locations/areas not included (in this study) were likely because project impacts were anticipated to be minimal outside of the specified and highlighted study area (reviewed by this TIA).
- The study did not review impacts to Woodside Avenue because trips from Windhaven are not likely to turn to/from this unsignalized intersection; especially because traffic circles programmed along Woodside Avenue should deter the occurrence of neighborhood cut through traffic. Note it is understood overall that turning traffic at this intersection is a public concern, but the collision rate determined for this intersection currently does not denote the potential for a high accident location.
- A collision analysis was performed in response to neighborhood concerns. The analysis does not highlight a high accident location (HAL) along Indian Trail Road, nor does it conclude that Indian Trail Road is a high accident corridor (HAC).
- The Barnes Road, Phoebe to Strong “Safety” project programmed for construction in year 2017 will provide a paved, secondary route of travel in the event some emergency forced the closure of Indian Trail Road.
- The project reviews a number of concurrent development projects (i.e. pipeline projects), specifically in the development of traffic forecasts. Any subsequent developments must

review Windhaven and these pipeline projects in order to assure cumulative traffic growth and capacity commitments are considered as the region continues to mature.

- City officials identified the pipeline projects to be included with this development.
- The TIA addresses the full traffic impacts associated with trip generation for 750 apartment units. The TIA phases the analysis into future without and then future with project conditions because a number of trips are already vested for the site and are treated as a pipeline project. But trip gains/increases are then combined to reflect total-apartment build trip totals.
- Conservative traffic forecasts were developed for the Barnes Road connection to Strong Road; reflecting specified and non-specified development/pipeline project traffic. The traffic forecasts presented in the TIA are more conservative (higher) than traffic studies generated by the City Street Department for the roadway.
- The City has directed that the final TIA moderately the Barnes Road assignments from 21% to 19% with the remaining trips directed to other destinations along Indian Trail Road (such as the shopping center).
- This TIA reflects a resultant 6 to 7 percent annual growth by year 2021 which can be extrapolated to a 1.4 percent annual growth rate through year 2040. By comparison, the Indian Trail Widening Roadway Capacity Justification Report provided by City Engineers predicts 1.3 percent annual growth on Indian Trail Road by year 2040. Thus, the TIA uses conservative traffic forecasts that exceeds the projections of even City officials.
- LOS were demonstrated to be adequate along Indian Trail Road with this TIA, as defined by City LOS Standards. As such, any recommendations of this report do not have to be programmed within the City 6-Transporation Improvement Program/Plan. With that said, this Final TIA does recommend a minimum four lane roadway with two northbound and two southbound lanes will be constructed along Indian Trail Road, within the Kathleen Avenue and Lowell Avenue "bottleneck" area, as a condition of development. The improvement would be developed with the City roadway rehabilitation project programmed for Indian Trail Road in year 2018.
- A summary field study was performed for the Lusitano Apartment complex located adjacent to the proposed Windhaven development along Barnes Road. The field study indicates the resultant trip generation rates used in the TIA are nearly 60 percent higher in the AM and over 45 percent higher in the PM versus rates established on local field counts. This means this TIA well overestimates traffic versus what is likely to occur in the future with Windhaven development.

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6.4 SUMMARY

The improvements and mitigation described will address project-related deficiencies noted throughout the TIA (specifically for Indian Trail Road). The project will contribute $362,620 towards mitigation of area deficiencies, via the TIF; specifically working to Indian Trail Road

improvements. The project will also either provide adaptive traffic controls for the Maple Street/Francis Avenue intersection or promote travel demand management strategies to minimize project impacts to Francis Avenue. Thus, this TIA should successfully support the zone change and comprehensive plan modifications being sought with the 750 unit apartment project proposal being sought for Windhaven, as project impacts will be addressed.

No further recommendations are provided by this TIA.

Appendix A

Glossary of Terms

This section of the Technical Appendix provides a glossary of terms. The *Highway Capacity Manual* (TRB, 2010) and the *Transportation Impact Analyses for Site Development* (ITE, 2005) were used to help with the development of the following definitions:

- **Access point** – An intersection, driveway, or opening on a roadway that provides access to a land use or facility.
- **All-way stop-controlled** – An intersection with stop signs located on all approaches.
- **Arterial** – (General Definition) A signalized street that primarily serves through-traffic and secondarily provides access to abutting properties.
- **Average daily traffic (ADT)** – The average 24 hour traffic volume at a given location on a roadway.
- **Capacity** – The number of vehicles or persons that can be accommodated on a roadway, roadway section, or at an intersection over a specified period of time. Capacity is also a term used to define limits for transit, pedestrian, and bicycle facilities. Concept typically expressed as vehicles per hour, vehicles per day, or persons per hour or per day.
- **Collector street** – (General Definition) A surface street providing land access and traffic circulation within residential, commercial, and industrial areas.
- **Cycle** – A complete sequence of cycle indicators.
- **Cycle length** – The total time for a signal to complete one cycle.
- **Delay** – The additional travel time experienced by a driver, passenger, or pedestrian.
- **Demand** – The number of users desiring service on a highway system or street over a specified time period. Concept typically expressed as vehicles per hour, vehicles per day, or persons per hour or per day.
- **Departing sight distance** – The length of road required for a vehicle to turn from a stopped position at an intersection (or driveway) and accelerate to travel speed.
- **Downstream** – The direction of traffic flow.
- **Functional class** – A transportation facility defined by the traffic service it provides.
- **Growth factor** – A percentage increase applied to current traffic demands or counts to estimate future demands/volumes.
- **Level of Service** – The standard used to evaluate traffic operating conditions of the transportation system. This is a qualitative assessment of the quantitative effect of factors such as speed, volume of traffic, geometric features, traffic interruptions, delays and freedom to maneuver. Operating conditions are categorized as LOS A through LOS "F". LOS A generally represents the most favorable driving conditions and LOS F represents the least favorable conditions.
- **Mainline** – The primary through roadway as distinct from ramps, auxiliary lanes, and collector-distributor roads.
- **Major Street** – The street not controlled by stop signs at a two-way stop-controlled intersection.
- **Minor arterial** – (General Definition) A functional category of a street allowing trips of moderate length within a relatively small geographical area.
- **Operational analysis** – A use of capacity analysis to determine the level of service on an existing or projected facility, with known or projected traffic, roadway, and control conditions.

- **Peak Generator Hour** – The single hour (or hours) in a day during which trip generation for a development or land use is highest.
- **Peak hour** – Single hour (or hours) in a day during which the maximum traffic volume occurs on a given facility (roadway, intersection, etc.). Typically the peak hour is known as the "rush" hour that occurs during the AM or PM work commutes of the typical weekday. The absolute peak hour of the day can also be referred to as the design hour.
- **Peak Generator Hour** – The peak hourly volume generated by a particular development or land use. In the context of traffic reports, the generator hour can occur in the morning and afternoon, described as AM and PM peak generator hours, respectively.
- **Peak hour factor** – The hourly volume during the maximum-volume hour of the day divided by the peak 15-minute flow rate within the peak hour; a measure of traffic demand fluctuation within the peak hour.
- **Principal Arterial** - (General Definition) A major surface street with relatively long trips between major points, and with through-trips entering, leaving, and passing through the urban area.
- **Queue** – A line of vehicles, bicycles, or persons waiting to be served by the system in which the flow rate from the front of the queue determines the average speed within the queue. Slower moving vehicles or people joining the rear of the queue are usually considered a part of the queue.
- **Roadside obstruction** – An object or barrier along a roadside or median that affects traffic flow, whether continuous (e.g., a retaining wall) or not continuous (e.g., light supports or a bridge abutment).
- **Road characteristic** – A geometric characteristic of a street or highway, including the type of facility, number and width of lanes, shoulder widths and lateral clearances, design speed, and horizontal and vertical alignment.
- **Roundabout** – An unsignalized intersection with a circulatory roadway around a central island with all entering vehicles yielding to the circulating traffic.
- **Shoulder** – A portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles, emergency use, and lateral support of the subbase, base, and surface courses.
- **Stopping sight distance** – The length of road needed for a moving vehicle to come to a complete stop prior to an obstruction sighted on the road.
- **Traffic conditions** – A characteristic of traffic flow, including distribution of vehicle types in the traffic stream, directional distribution of traffic, lane use distribution of traffic, and type of driver population on a given facility.
- **Travel speed** – The average speed, in miles per hour, of a traffic computed as the length of roadway segment divided by the average travel time of the vehicles traversing the segment.
- **Travel time** – The average time spent by vehicles traversing a highway segment, including control delay, in seconds per vehicle of minutes per vehicle.
- **Trip Distribution and Assignment** – The predicted travel patterns of vehicle trips as they approach and depart a land use. Distribution refers to the travel pattern, usually defined in percentages or fractions, and assignment refers to vehicle trip ends.

- **Traffic forecast** – The predicted traffic volume of the analysis horizon year or time period. Most typically predicted for the weekday, AM peak hour, PM peak hour, or AM or PM peak generator hours of the typical weekday.
- **Traffic impact analysis** – A *traffic impact analysis* (TIA) is an engineering and planning study that forecasts the potential traffic and transportation impacts of a proposed development on an area, neighborhood, or community. Reports can also be referred to as a traffic impact study (TIS).
- **Trip generation** – The number of vehicle trips generated by a development or land use. Most typically predicted for the weekday, AM peak hour, PM peak hour, or AM or PM peak generator hours of the typical weekday.
- **Two-way left-turn lane** – A lane in the median area that extends continuously along a street or highway and is marked to provide a deceleration and storage area, out of the through-traffic stream, for vehicles traveling in either direction to use in marking left turns at intersections and driveways.
- **Two-way stop-controlled** – The type of traffic control at an intersection where drivers on the minor street or driver turning left from the major street wait for a gap in the major-street traffic to complete a maneuver. Typically the minor approaches are stop-controlled.
- **Unsignalized intersection** – An intersection not controlled by traffic signals.
- **Upstream** – The direction from which traffic is flowing.
- **Volume** – The number of persons or vehicles passing a point on a lane, roadway, or other traffic-way during some time interval, often one hour, expressed in vehicles, bicycles, or persons per hour.
- **Volume-to-capacity ratio** – The ratio of flow rate to capacity for a transportation facility.
- **Walkway** – A facility provided for pedestrian movement and segregated from vehicle traffic by a curb, or provide for on a separate right-of-way.

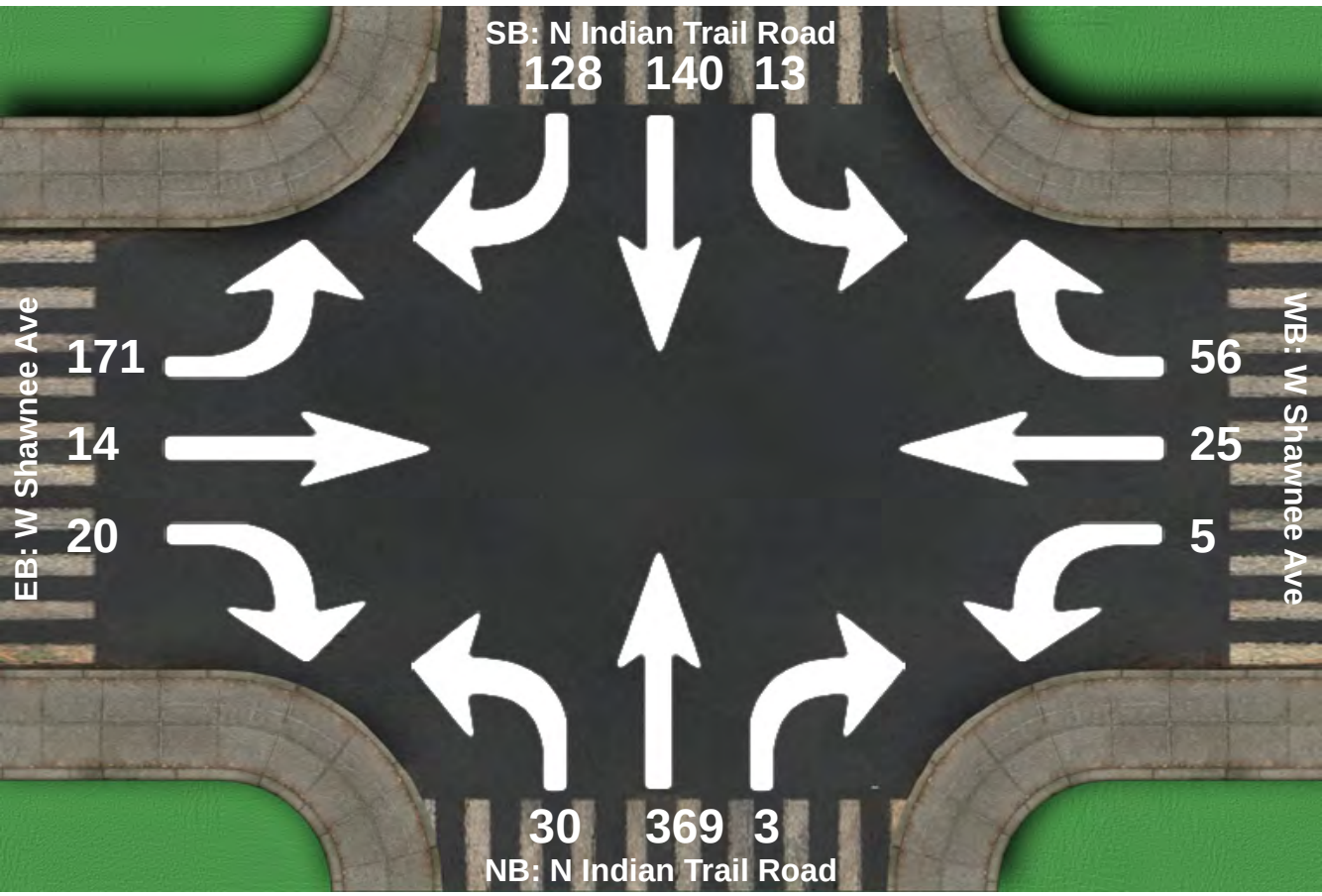
Appendix B

Summary Traffic Counts

Intersection Peak Hour

Location: N Indian Trail Road at W Shawnee Ave, Spokane, WA
GPS Coordinates:
Date: 2016-04-28
Day of week: Thursday
Weather:
Analyst: MMI

NORTH
(COUNT BOARD
REVERSED)



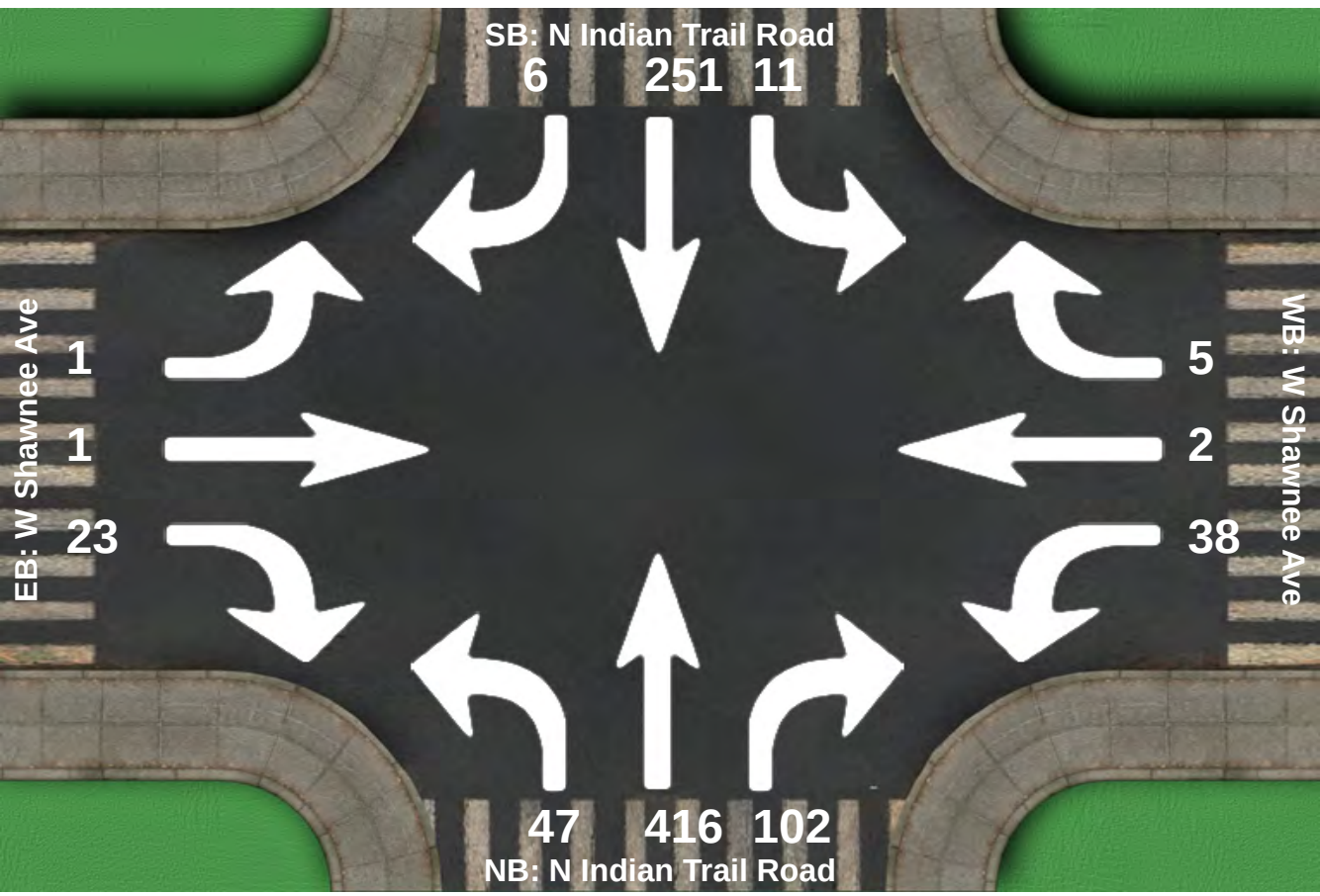
Intersection Peak Hour

07:45 - 08:45

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	13	140	128	5	25	56	30	369	3	171	14	20	974
Factor	0.65	0.71	0.71	0.62	0.37	0.74	0.75	0.81	0.75	0.59	0.44	0.62	0.73
Approach Factor	0.76			0.72			0.81			0.58			

Intersection Peak Hour

Location: N Indian Trail Road at W Shawnee Ave, Spokane, WA
GPS Coordinates:
Date: 2016-04-27
Day of week: Wednesday
Weather:
Analyst: MMI



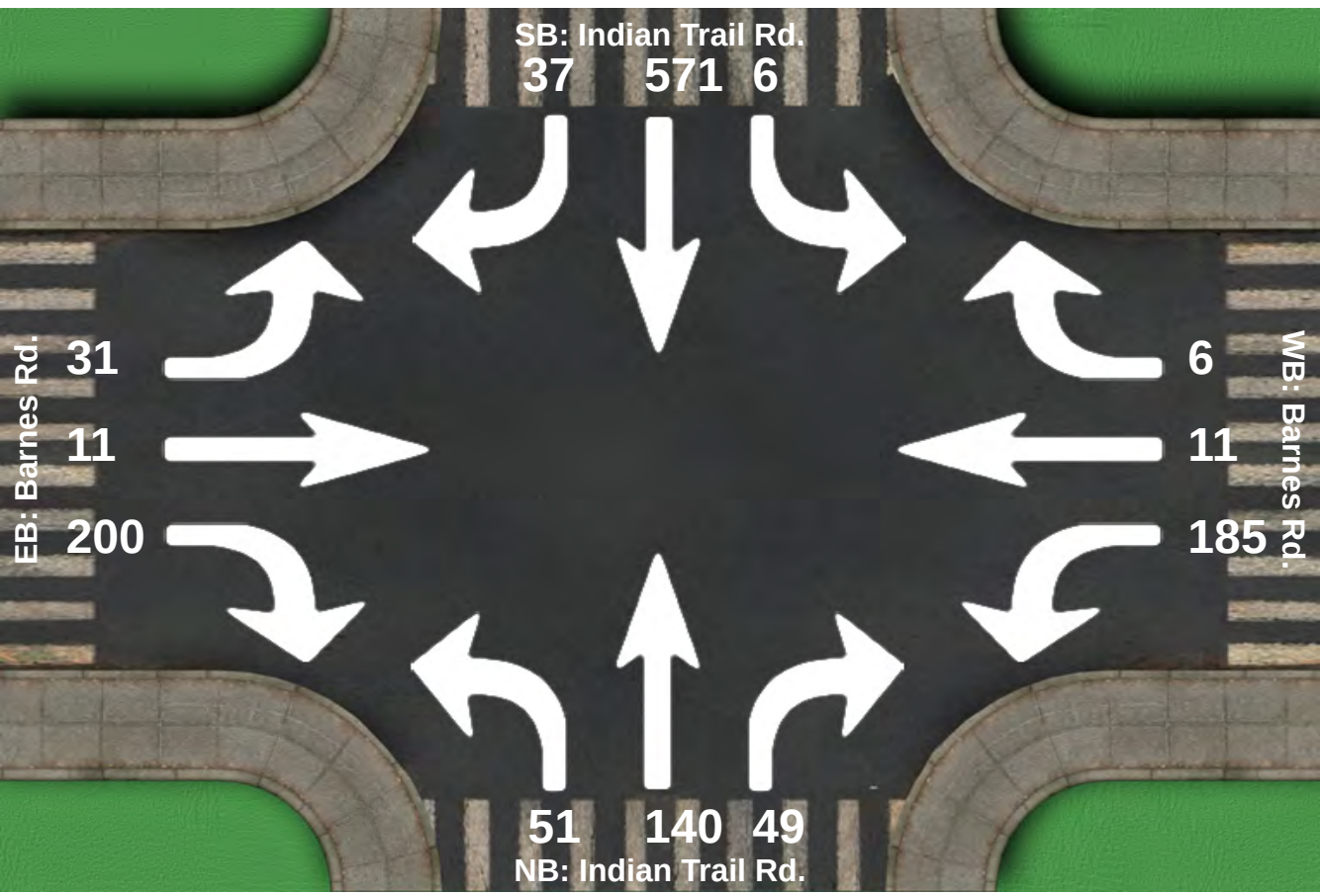
Intersection Peak Hour

16:45 - 17:45

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	11	251	6	38	2	5	47	416	102	1	1	23	903
Factor	0.55	0.92	0.50	0.79	0.50	0.42	0.69	0.94	0.82	0.25	0.25	0.57	0.93
Approach Factor	0.96			0.80			0.94			0.62			

Intersection Peak Hour

Location: Indian Trail Rd. at Barnes Rd., Spokane, WA.
GPS Coordinates:
Date: 2016-03-02
Day of week: Wednesday
Weather: Showers
Analyst: Mike McCluskey



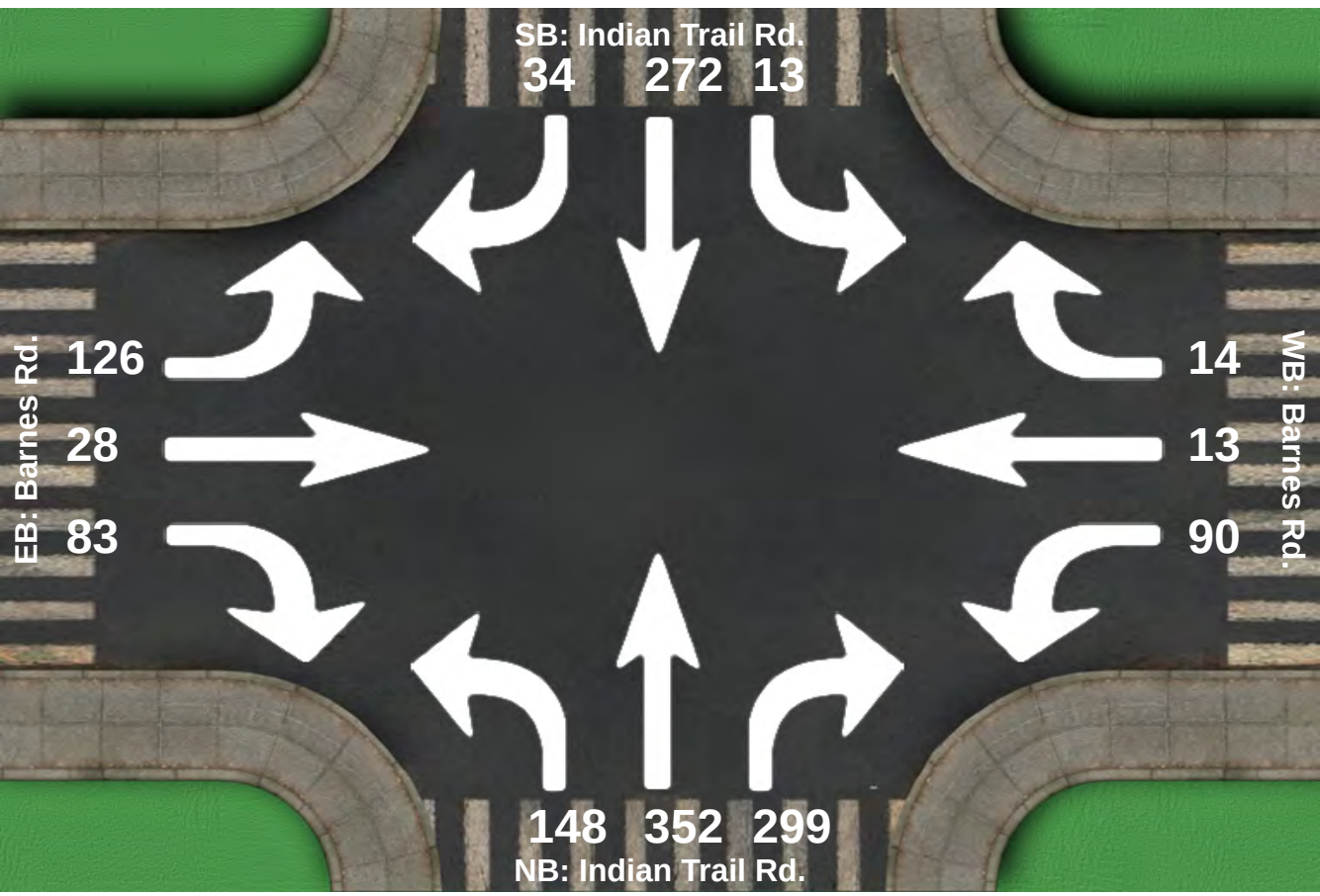
Intersection Peak Hour

07:00 - 08:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	6	571	37	185	11	6	51	140	49	31	11	200	1298
Factor	0.75	0.86	0.77	0.89	0.55	0.50	0.75	0.80	0.58	0.60	0.55	0.85	0.92
Approach Factor	0.86			0.89			0.78			0.89			

Intersection Peak Hour

Location: Indian Trail Rd. at Barnes Rd., Spokane, WA.
GPS Coordinates:
Date: 2016-03-02
Day of week: Wednesday
Weather: Cloudy
Analyst: Mike McCluskey



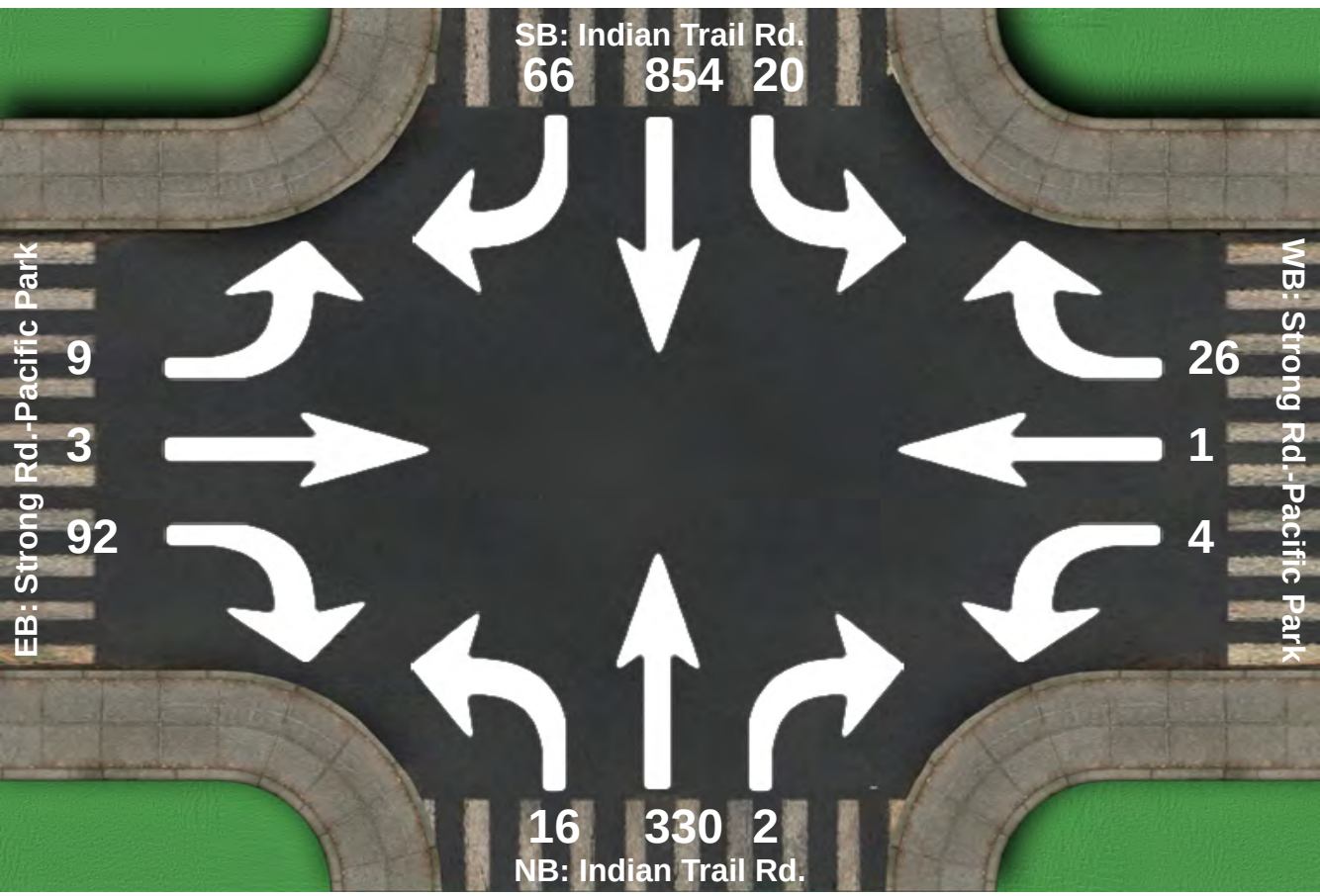
Intersection Peak Hour

17:00 - 18:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	13	272	34	90	13	14	148	352	299	126	28	83	1472
Factor	0.65	0.80	0.77	0.83	0.54	0.70	0.82	0.81	0.79	0.88	0.58	0.90	0.92
Approach Factor	0.82			0.94			0.89			0.83			

Intersection Peak Hour

Location: Indian Trail Rd. at Strong Rd.-Pacific Park, Spokane, WA.
GPS Coordinates:
Date: 2016-03-03
Day of week: Thursday
Weather: Rain
Analyst: Mike McCluskey



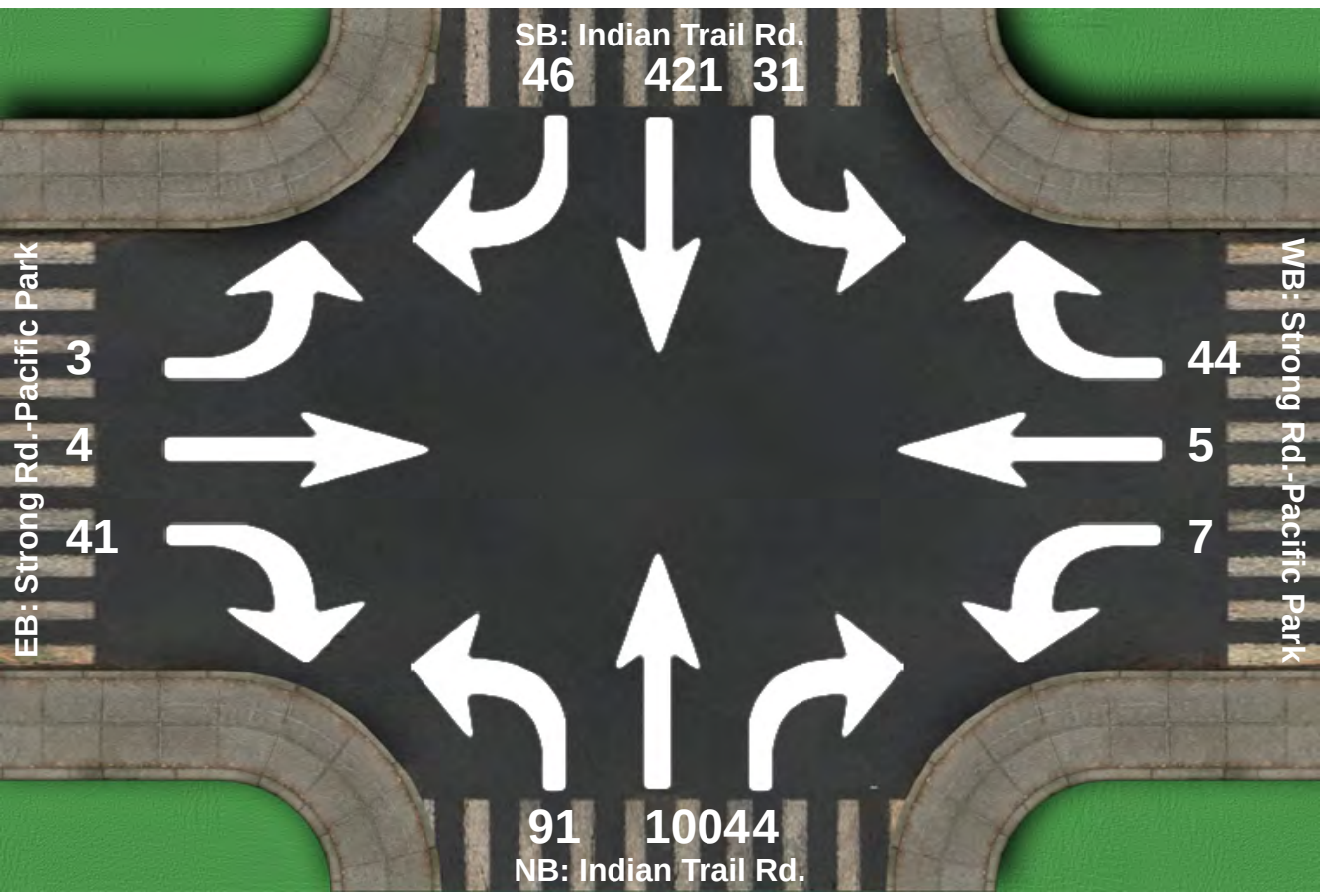
Intersection Peak Hour

07:30 - 08:30

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	20	854	66	4	1	26	16	330	2	9	3	92	1423
Factor	0.50	0.86	0.53	0.33	0.25	0.72	0.57	0.91	0.25	0.75	0.38	0.79	0.90
Approach Factor	0.84			0.70			0.92			0.81			

Intersection Peak Hour

Location: Indian Trail Rd. at Strong Rd.-Pacific Park, Spokane, WA.
GPS Coordinates:
Date: 2016-03-03
Day of week: Thursday
Weather: Cloudy
Analyst: Mike McCluskey



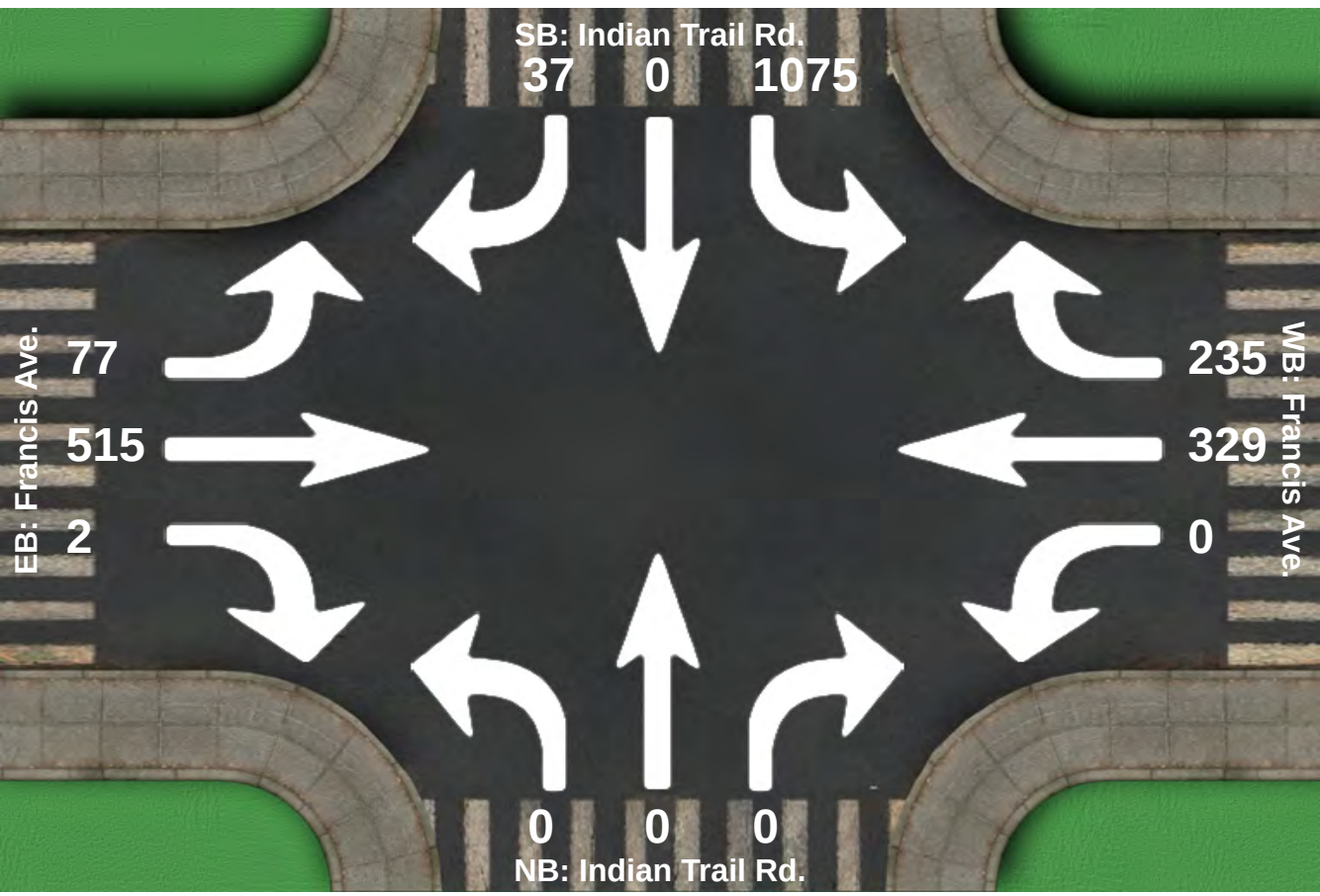
Intersection Peak Hour

17:00 - 18:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	31	421	46	7	5	44	91	1004	4	3	4	41	1701
Factor	0.77	0.92	0.77	0.58	0.42	0.73	0.84	0.87	0.50	0.25	0.50	0.68	0.94
Approach Factor	0.94			0.74			0.89			0.75			

Intersection Peak Hour

Location: Indian Trail Rd. at Francis Ave., Spokane WA.
GPS Coordinates:
Date: 2016-03-08
Day of week: Tuesday
Weather: Sunny
Analyst: Mike McCluskey



Intersection Peak Hour

07:00 - 08:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	1075	0	37	0	329	235	0	0	0	77	515	2	2270
Factor	0.88	0.00	0.51	0.00	0.89	0.74	0.00	0.00	0.00	0.64	0.84	0.25	0.90
Approach Factor	0.86			0.83			0.00			0.89			

Intersection:	Indian Trail Rd/Francis Ave	Date:	3/8/2016
Project:	Windhaven	Time:	5:00 PM
City:	Spokane, WA	Analysist:	MMI

Francis Avenue	N - S Street:				Indian Trail Road							Francis Avenue
					IN	0.84	OUT					
					522	0%	1149					
						0						
					77	SBT	445					
					SBR		SBL					
	OUT	705	141	EBL				WBR	1008	1636	IN	
	0.93	0%	454	EBT				WBT	628	0.0067	0.98	
	IN	595	0	EBR				WBL	0	900	OUT	
					NBL		NBR					
E - W Street					0	NBT	1					E - W Street
	Total PHF:	0.94				0						
	Total Trucks:	0			0	100%	1					
	Total Entering:	2754			OUT	0.25	IN					
	N - S Street:				Indian Trail Road							

Total Volumes:

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Total
0 - 15	0	0	1	90	0	17	42	110	0	0	154	242	656
15 - 30	0	0	0	109	0	28	34	117	0	0	170	244	702
30 - 45	0	0	0	134	0	21	42	118	0	0	147	270	732
45 - 60	0	0	0	112	0	11	23	109	0	0	157	252	664
Total	0	0	1	445	0	77	141	454	0	0	628	1008	2754

Automobiles:

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Total
0 - 15				90		17	42	109			152	241	651
15 - 30				109		28	34	116			168	243	698
30 - 45				134		21	42	118			147	269	731
45 - 60				112		11	23	109			156	249	660
Total	0	0	0	445	0	77	141	452	0	0	623	1002	2740

Heavy Vehicles: Aproach Entered only - TM not correct

	NB Approach			SB Approach			EB Approach			WB Approach			Total
0 - 15	0		1				0	1			2	1	5
15 - 30	0		0				0	1			2	1	4
30 - 45	0		0				0	0			0	1	1
45 - 60	0		0				0	0			1	3	4
Total	0	0	1	0	0	0	0	2	0	0	5	6	14

Intersection:	Alberta St/Francis Ave	Date:	3/15/2016
Project:	Windhaven	Time:	7:15 AM
City:	Spokane, WA	Analysist:	MMI

Francis Avenue	N - S Street:				Alberta Street							Francis Avenue
					IN	0.70	OUT					
					221	0%	65					
						114						
					29	SBT	78					
					SBR		SBL					
	OUT	712	15	EBL				WBR	27	716	IN	
	0.88	1%	1036	EBT				WBT	536	0.0307	0.86	
	IN	1175	124	EBR				WBL	153	1212	OUT	
					NBL		NBR					
E - W Street					147	NBT	98					E - W Street
	Total PHF:	0.93				23						
	Total Trucks:	0			391	4%	268					
	Total Entering:	2380			OUT	0.77	IN					
	N - S Street:				Alberta Street							

Total Volumes:

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Total
0 - 15	19	2	16	24	27	7	4	286	45	33	102	10	575
15 - 30	30	7	24	29	43	7	2	298	35	32	126	7	640
30 - 45	47	4	36	14	26	10	5	254	26	47	147	3	619
45 - 60	51	10	22	11	18	5	4	198	18	41	161	7	546
Total	147	23	98	78	114	29	15	1036	124	153	536	27	2380

Automobiles:

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Total
0 - 15	17	2	15	24	26	7	4	286	45	33	98	10	567
15 - 30	30	7	24	29	43	7	2	294	35	31	120	7	629
30 - 45	42	3	36	14	26	10	5	252	26	45	144	3	606
45 - 60	48	10	22	11	18	5	4	194	18	40	156	7	533
Total	137	22	97	78	113	29	15	1026	124	149	518	27	2335

Heavy Vehicles: Aproach Entered only - TM not correct

	NB Approach			SB Approach			EB Approach			WB Approach			Total
0 - 15	2	0	1	0	1	0	0	0	0	0	4	0	8
15 - 30	0	0	0	0	0	0	0	4	0	1	6	0	11
30 - 45	5	1	0	0	0	0	0	2	0	2	3	0	13
45 - 60	3	0	0	0	0	0	0	4	0	1	5	0	13
Total	10	1	1	0	1	0	0	10	0	4	18	0	45

Intersection:	Alberta St/Francis Ave	Date:	3/15/2016
Project:	Windhaven	Time:	5:00 PM
City:	Spokane, WA	Analysist:	MMI

Francis Avenue	N - S Street:				Alberta Street							Francis Avenue
					IN	0.69	OUT					
					113	1%	159					
						49						
					25	SBT	39					
					SBR		SBL					
	OUT	1637	33	EBL				WBR	18	1399	IN	
	0.87	0%	862	EBT				WBT	1240	0.0214	0.97	
	IN	972	77	EBR				WBL	141	1025	OUT	
					NBL		NBR					
E - W Street					372	NBT	124					E - W Street
	Total PHF:	0.96				108						
	Total Trucks:	0			267	0%	604					
	Total Entering:	3088			OUT	0.95	IN					
	N - S Street:				Alberta Street							

Total Volumes:

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Total
0 - 15	96	28	27	6	8	7	6	206	12	30	313	7	746
15 - 30	88	29	40	11	14	7	10	207	18	39	298	4	765
30 - 45	85	28	24	16	21	4	5	206	22	34	326	2	773
45 - 60	103	23	33	6	6	7	12	243	25	38	303	5	804
Total	372	108	124	39	49	25	33	862	77	141	1240	18	3088

Automobiles:

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Total
0 - 15	96	28	27	6	8	6	6	206	12	30	303	7	735
15 - 30	87	29	40	11	14	7	10	207	18	39	295	4	761
30 - 45	84	28	24	16	21	4	5	206	22	34	317	2	763
45 - 60	102	23	33	6	6	7	12	243	25	38	295	5	795
Total	369	108	124	39	49	24	33	862	77	141	1210	18	3054

Heavy Vehicles: Aproach Entered only - TM not correct

	NB Approach			SB Approach			EB Approach			WB Approach			Total
0 - 15	0		0			1		0			10		11
15 - 30	1		0			0		0			3		4
30 - 45	1		0			0		0			9		10
45 - 60	1		0			0		0			8		9
Total	3	0	0	0	0	1	0	0	0	0	30	0	34

Intersection:	Ash St/Francis Ave	Date:	3/10/2016
Project:	Windhaven	Time:	7:15 AM
City:	Spokane, WA	Analysist:	MMI

Francis Avenue	N - S Street:				Ash Street							Francis Avenue
					IN	0.95	OUT					
					1374	3%	0					
						673						
					393	SBT	308					
					SBR		SBL					
	OUT	895	0	EBL				WBR	0	610	IN	
	0.87	1%	1053	EBT				WBT	502	0.0656	0.83	
	IN	1234	181	EBR				WBL	108	1361	OUT	
					NBL		NBR					
E - W Street					0	NBT	0					E - W Street
	Total PHF:	0.93				0						
	Total Trucks:	0			962	#DIV/0!	0					
	Total Entering:	3218			OUT	#DIV/0!	IN					
	N - S Street:				Ash Street							

Total Volumes:

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Total
0 - 15	0	0	0	86	185	88	0	260	50	24	99	0	792
15 - 30	0	0	0	92	171	98	0	299	56	23	130	0	869
30 - 45	0	0	0	63	172	88	0	293	37	34	150	0	837
45 - 60	0	0	0	67	145	119	0	201	38	27	123	0	720
Total	0	0	0	308	673	393	0	1053	181	108	502	0	3218

Automobiles:

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Total
0 - 15				84	183	86		258	50	24	89		774
15 - 30				89	165	96		295	53	20	124		842
30 - 45				60	159	86		292	37	34	141		809
45 - 60				65	142	117		201	38	27	111		701
Total	0	0	0	298	649	385	0	1046	178	105	465	0	3126

Heavy Vehicles: Aproach Entered only - TM not correct

	NB Approach			SB Approach			EB Approach			WB Approach			Total
0 - 15				2	2	2		2	0	0	10		18
15 - 30				3	6	2		4	3	3	6		27
30 - 45				3	13	2		1	0	0	9		28
45 - 60				2	3	2		0	0	0	12		19
Total	0	0	0	10	24	8	0	7	3	3	37	0	92

Intersection:	Ash St/Francis Ave	Date:	3/10/2016
Project:	Windhaven	Time:	5:00 PM
City:	Spokane, WA	Analysist:	MMI

Francis Avenue	N - S Street:				Ash Street							Francis Avenue
					IN	0.94	OUT					
					1140	4%	0					
						562						
					362	SBT	216					
					SBR		SBL					
	OUT	1666	0	EBL				WBR	0	1523	IN	
	0.98	1%	961	EBT				WBT	1304	0.0492	0.96	
	IN	1054	93	EBR				WBL	219	1177	OUT	
					NBL		NBR					
E - W Street					0	NBT	0					E - W Street
	Total PHF:	0.98				0						
	Total Trucks:	0			874	#DIV/0!	0					
	Total Entering:	3717			OUT	#DIV/0!	IN					
	N - S Street:				Ash Street							

Total Volumes:

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Total
0 - 15	0	0	0	53	144	85	0	238	17	62	333	0	932
15 - 30	0	0	0	56	145	102	0	246	24	54	311	0	938
30 - 45	0	0	0	66	143	85	0	244	26	46	339	0	949
45 - 60	0	0	0	41	130	90	0	233	26	57	321	0	898
Total	0	0	0	216	562	362	0	961	93	219	1304	0	3717

Automobiles:

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Total
0 - 15				53	136	83		238	15	62	314		901
15 - 30				55	132	102		246	24	54	271		884
30 - 45				63	131	84		244	25	44	333		924
45 - 60				41	126	89		232	24	57	313		882
Total	0	0	0	212	525	358	0	960	88	217	1231	0	3591

Heavy Vehicles: Aproach Entered only - TM not correct

	NB Approach			SB Approach			EB Approach			WB Approach			Total
0 - 15				0	8	2		0	2	0	19		31
15 - 30				1	13	0		0	0	0	40		54
30 - 45				3	12	1		0	1	2	6		25
45 - 60				0	4	1		1	2	0	8		16
Total	0	0	0	4	37	4	0	1	5	2	73	0	126

Intersection:	Maple St/Francis Ave	Date:	3/9/2016
Project:	Windhaven	Time:	7:15 AM
City:	Spokane, WA	Analysist:	MMI

Francis Avenue	N - S Street:				Maple Street							Francis Avenue
					IN	#DIV/0!	OUT					
					0	#DIV/0!	788					
						0						
					0	SBT	0					
					SBR		SBL					
	OUT	510	235	EBL				WBR	78	582	IN	
	0.88	1%	1089	EBT				WBT	504	0.0275	0.87	
	IN	1324	0	EBR				WBL	0	1234	OUT	
					NBL		NBR					
E - W Street					6	NBT	145					E - W Street
	Total PHF:	0.93				475						
	Total Trucks:	0			0	4%	626					
	Total Entering:	2532			OUT	0.97	IN					
	N - S Street:				Maple Street							

Total Volumes:

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Total
0 - 15	2	120	33	0	0	0	40	293	0	0	117	17	622
15 - 30	2	122	34	0	0	0	70	308	0	0	110	14	660
30 - 45	0	118	44	0	0	0	69	283	0	0	141	26	681
45 - 60	2	115	34	0	0	0	56	205	0	0	136	21	569
Total	6	475	145	0	0	0	235	1089	0	0	504	78	2532

Automobiles:

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Total
0 - 15		118	32				39	290			114	14	607
15 - 30		116	33				69	306			106	13	643
30 - 45		116	43				68	278			141	23	669
45 - 60		115	31				56	203			135	20	560
Total	0	465	139	0	0	0	232	1077	0	0	496	70	2479

Heavy Vehicles: Aproach Entered only - TM not correct

	NB Approach			SB Approach			EB Approach			WB Approach			Total
0 - 15	2	2	1				1	3			3	3	15
15 - 30	2	6	1				1	2			4	1	17
30 - 45	0	2	1				1	5			0	3	12
45 - 60	2	0	3				0	2			1	1	9
Total	6	10	6	0	0	0	3	12	0	0	8	8	53

Intersection:	Maple St/Francis Ave	Date:	3/9/2016
Project:	Windhaven	Time:	5:00 PM
City:	Spokane, WA	Analysist:	MMI

Francis Avenue	N - S Street:				Maple Street							Francis Avenue
					IN	#DIV/0!	OUT					
					0	#DIV/0!	1378					
						0						
					0	SBT	0					
					SBR		SBL					
	OUT	1501	308	EBL				WBR	207	1362	IN	
	0.96	1%	879	EBT				WBT	1155	0.0338	0.96	
	IN	1187	0	EBR				WBL	0	1044	OUT	
					NBL		NBR					
E - W Street					346	NBT	165					E - W Street
	Total PHF:	0.97				863						
	Total Trucks:	0			0	0%	1374					
	Total Entering:	3923			OUT	0.95	IN					
	N - S Street:				Maple Street							

Total Volumes:

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Total
0 - 15	83	202	35	0	0	0	72	222	0	0	295	48	957
15 - 30	81	221	50	0	0	0	80	228	0	0	297	58	1015
30 - 45	96	231	36	0	0	0	83	221	0	0	284	49	1000
45 - 60	86	209	44	0	0	0	73	208	0	0	279	52	951
Total	346	863	165	0	0	0	308	879	0	0	1155	207	3923

Automobiles:

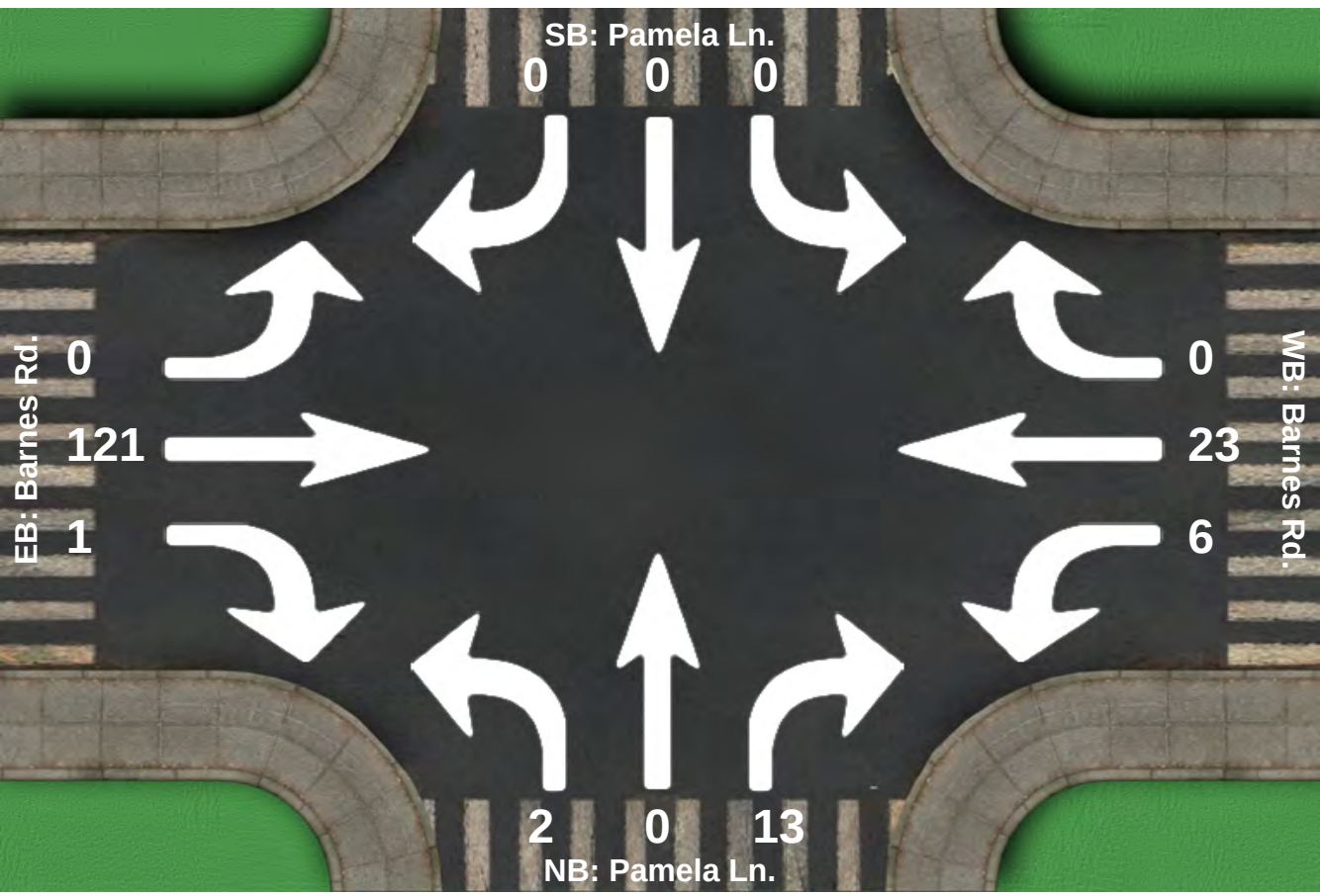
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Total
0 - 15	83	202	34				71	221			288	45	944
15 - 30	81	221	50				79	228			285	56	1000
30 - 45	96	230	36				83	221			274	48	988
45 - 60	86	208	44				71	205			270	50	934
Total	346	861	164	0	0	0	304	875	0	0	1117	199	3866

Heavy Vehicles: Aproach Entered only - TM not correct

	NB Approach			SB Approach			EB Approach			WB Approach			Total
0 - 15	0	0	1				1	1			7	3	13
15 - 30	0	0	0				1	0			12	2	15
30 - 45	0	1	0				0	0			10	1	12
45 - 60	0	1	0				2	3			9	2	17
Total	0	2	1	0	0	0	4	4	0	0	38	8	57

Intersection Peak Hour

Location: Pamela Ln. at Barnes Rd., Spokane, WA.
GPS Coordinates:
Date: 2016-03-01
Day of week: Tuesday
Weather: Clear
Analyst: Mike McCluskey



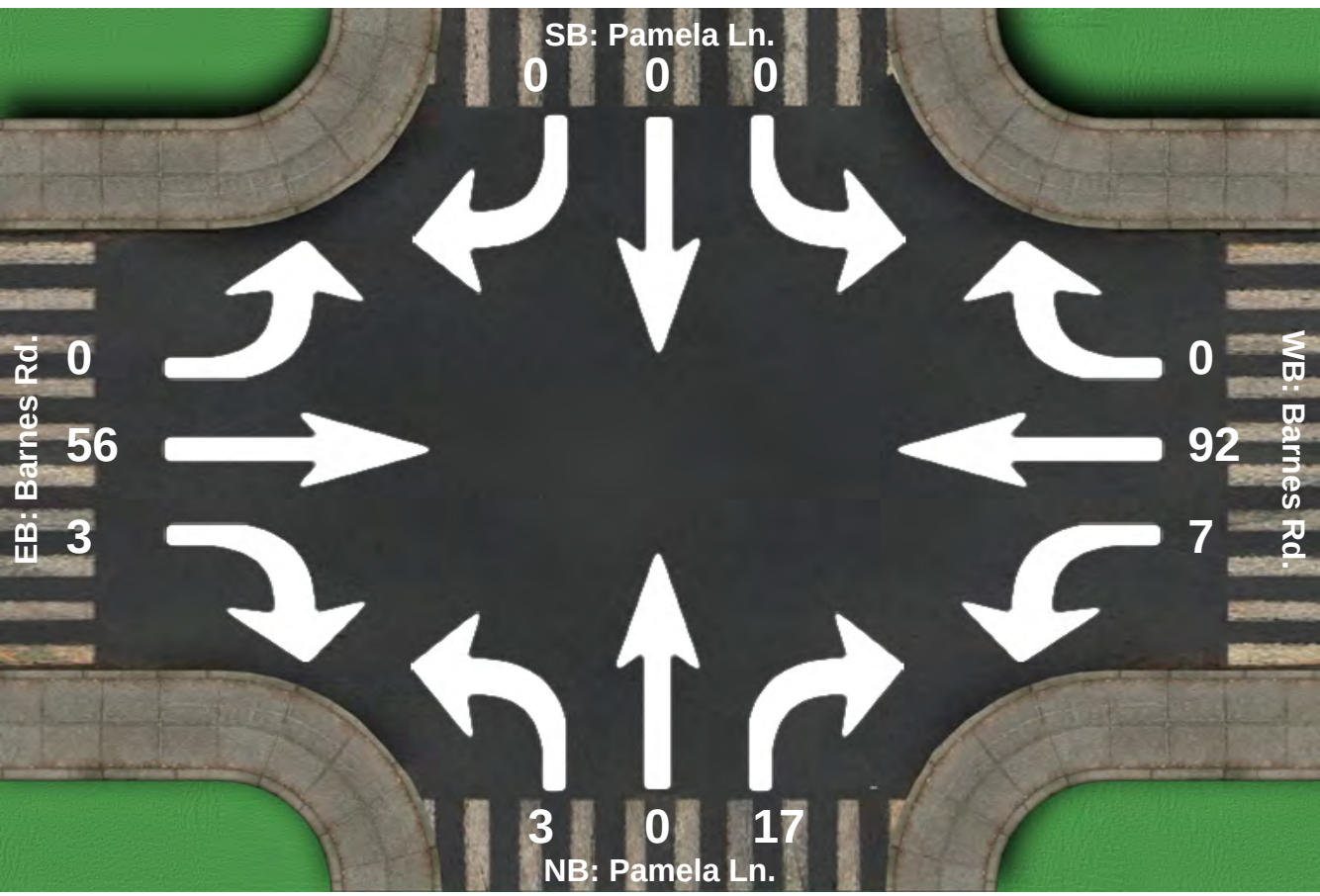
Intersection Peak Hour

07:00 - 08:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	0	0	0	6	23	0	2	0	13	0	121	1	166
Factor	0.00	0.00	0.00	0.38	0.64	0.00	0.50	0.00	0.81	0.00	0.70	0.25	0.74
Approach Factor	0.00			0.66			0.94			0.71			

Intersection Peak Hour

Location: Pamela Ln. at Barnes Rd., Spokane, WA.
GPS Coordinates:
Date: 2016-03-01
Day of week: Tuesday
Weather: Rain
Analyst: Mike McCluskey



Intersection Peak Hour

17:00 - 18:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	0	0	0	7	92	0	3	0	17	0	56	3	178
Factor	0.00	0.00	0.00	0.44	0.77	0.00	0.38	0.00	0.71	0.00	0.88	0.38	0.95
Approach Factor	0.00			0.82			0.83			0.82			

Appendix C

LOS Summary Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	25	56	171	14	20	13	140	128	30	363	3
Future Volume (veh/h)	5	25	56	171	14	20	13	140	128	30	363	3
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1748	1800	1800	1800	1800	1872	1800	1782	1872
Adj Flow Rate, veh/h	7	34	77	234	19	27	18	192	175	41	497	4
Adj No. of Lanes	1	1	0	1	1	0	1	1	1	1	1	1
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Percent Heavy Veh, %	0	0	0	3	0	0	0	0	0	0	1	0
Cap, veh/h	418	126	286	348	174	247	480	945	835	659	966	862
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.03	0.52	0.52	0.05	0.54	0.54
Sat Flow, veh/h	1369	488	1105	1255	670	952	1714	1800	1591	1714	1782	1591
Grp Volume(v), veh/h	7	0	111	234	0	46	18	192	175	41	497	4
Grp Sat Flow(s),veh/h/ln	1369	0	1592	1255	0	1621	1714	1800	1591	1714	1782	1591
Q Serve(g_s), s	0.3	0.0	4.3	14.2	0.0	1.7	0.4	4.4	4.6	0.8	13.8	0.1
Cycle Q Clear(g_c), s	2.0	0.0	4.3	18.6	0.0	1.7	0.4	4.4	4.6	0.8	13.8	0.1
Prop In Lane	1.00		0.69	1.00		0.59	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	418	0	413	348	0	420	480	945	835	659	966	862
V/C Ratio(X)	0.02	0.00	0.27	0.67	0.00	0.11	0.04	0.20	0.21	0.06	0.51	0.00
Avail Cap(c_a), veh/h	418	0	413	348	0	420	664	945	835	815	966	862
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.8	0.0	23.0	30.4	0.0	22.1	8.7	9.9	9.9	7.4	11.3	8.2
Incr Delay (d2), s/veh	0.0	0.0	0.3	5.0	0.0	0.1	0.0	0.5	0.6	0.0	2.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	2.0	5.4	0.0	0.8	0.2	2.3	2.1	0.4	7.3	0.0
LnGrp Delay(d),s/veh	22.8	0.0	23.4	35.4	0.0	22.2	8.8	10.3	10.5	7.4	13.3	8.2
LnGrp LOS	C		C	D		C	A	B	B	A	B	A
Approach Vol, veh/h		118			280			385			542	
Approach Delay, s/veh		23.4			33.2			10.3			12.8	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.9	45.0		25.0	6.6	46.3		25.0
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	10.0	40.0		20.0	10.0	40.0		20.0
Max Q Clear Time (g_c+I1), s	2.8	6.6		20.6	2.4	15.8		6.3
Green Ext Time (p_c), s	0.0	6.4		0.0	0.0	5.9		1.8

Intersection Summary	
HCM 2010 Ctrl Delay	17.3
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	11	200	185	11	6	51	140	49	6	571	37
Future Volume (veh/h)	31	11	200	185	11	6	51	140	49	6	571	37
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1588	1588	1588	1588	1652	1685	1543	1605	1543	1543	1543	1620
Adj Flow Rate, veh/h	34	12	217	201	12	7	55	152	53	7	621	40
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	5	5	5
Cap, veh/h	457	349	294	545	306	179	314	611	499	476	951	61
Arrive On Green	0.04	0.22	0.22	0.14	0.31	0.30	0.06	0.38	0.38	0.02	0.34	0.34
Sat Flow, veh/h	1513	1588	1341	1513	978	570	1469	1605	1310	1469	2796	180
Grp Volume(v), veh/h	34	12	217	201	0	19	55	152	53	7	325	336
Grp Sat Flow(s),veh/h/ln	1513	1588	1341	1513	0	1548	1469	1605	1310	1469	1466	1510
Q Serve(g_s), s	1.0	0.4	9.2	5.7	0.0	0.5	1.4	4.0	1.6	0.2	11.5	11.6
Cycle Q Clear(g_c), s	1.0	0.4	9.2	5.7	0.0	0.5	1.4	4.0	1.6	0.2	11.5	11.6
Prop In Lane	1.00		1.00	1.00		0.37	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	457	349	294	545	0	485	314	611	499	476	499	514
V/C Ratio(X)	0.07	0.03	0.74	0.37	0.00	0.04	0.18	0.25	0.11	0.01	0.65	0.65
Avail Cap(c_a), veh/h	797	674	569	745	0	657	625	1074	877	846	981	1010
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.0	18.8	22.3	13.2	0.0	14.7	11.9	13.0	12.2	12.5	17.1	17.1
Incr Delay (d2), s/veh	0.1	0.0	3.6	0.4	0.0	0.0	0.3	0.3	0.1	0.0	2.1	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.2	3.7	2.4	0.0	0.2	0.6	1.8	0.6	0.1	4.9	5.0
LnGrp Delay(d),s/veh	17.1	18.8	25.9	13.6	0.0	14.7	12.2	13.3	12.4	12.5	19.2	19.2
LnGrp LOS	B	B	C	B		B	B	B	B	B	B	B
Approach Vol, veh/h		263			220			260			668	
Approach Delay, s/veh		24.4			13.7			12.9			19.1	
Approach LOS		C			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.6	27.3	6.2	23.2	7.0	24.8	11.9	17.5
Change Period (Y+Rc), s	4.0	4.9	4.0	4.5	4.0	4.9	4.0	4.5
Max Green Setting (Gmax), s	16.0	40.1	16.0	25.5	16.0	40.1	16.0	25.5
Max Q Clear Time (g_c+I1), s	2.2	6.0	3.0	2.5	3.4	13.6	7.7	11.2
Green Ext Time (p_c), s	0.0	6.1	0.0	1.1	0.1	5.8	0.5	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	18.1
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	3	92	4	1	26	16	330	2	20	854	66
Future Volume (veh/h)	9	3	92	4	1	26	16	330	2	20	854	66
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1765	1765	1800	1765	1765	1714	1714	1714	1714	1714	1714
Adj Flow Rate, veh/h	10	3	102	4	1	29	18	367	2	22	949	73
Adj No. of Lanes	0	1	1	0	1	1	1	1	1	1	1	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	5	5	5
Cap, veh/h	278	66	223	280	55	221	309	1187	1007	739	1187	1006
Arrive On Green	0.15	0.15	0.15	0.15	0.15	0.15	0.69	0.69	0.69	0.69	0.69	0.69
Sat Flow, veh/h	1017	446	1500	1014	372	1486	534	1714	1455	979	1714	1453
Grp Volume(v), veh/h	13	0	102	5	0	29	18	367	2	22	949	73
Grp Sat Flow(s),veh/h/ln	1463	0	1500	1385	0	1486	534	1714	1455	979	1714	1453
Q Serve(g_s), s	0.0	0.0	3.1	0.0	0.0	0.9	1.2	4.2	0.0	0.5	19.2	0.8
Cycle Q Clear(g_c), s	0.3	0.0	3.1	0.1	0.0	0.9	20.4	4.2	0.0	4.7	19.2	0.8
Prop In Lane	0.77		1.00	0.80		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	344	0	223	335	0	221	309	1187	1007	739	1187	1006
V/C Ratio(X)	0.04	0.00	0.46	0.01	0.00	0.13	0.06	0.31	0.00	0.03	0.80	0.07
Avail Cap(c_a), veh/h	875	0	777	837	0	770	323	1230	1044	764	1230	1042
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.3	0.0	19.5	18.3	0.0	18.6	12.4	3.0	2.4	3.9	5.3	2.5
Incr Delay (d2), s/veh	0.0	0.0	1.5	0.0	0.0	0.3	0.4	0.7	0.0	0.1	5.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	1.4	0.1	0.0	0.4	0.2	2.2	0.0	0.1	10.6	0.4
LnGrp Delay(d),s/veh	18.4	0.0	21.0	18.3	0.0	18.8	12.7	3.7	2.4	4.0	11.0	2.6
LnGrp LOS	B		C	B		B	B	A	A	A	B	A
Approach Vol, veh/h		115			34			387			1044	
Approach Delay, s/veh		20.7			18.7			4.1			10.3	
Approach LOS		C			B			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		38.7		11.5		38.7		11.5
Change Period (Y+Rc), s		4.9		* 4.2		4.9		* 4.2
Max Green Setting (Gmax), s		35.1		* 26		35.1		* 26
Max Q Clear Time (g_c+I1), s		22.4		2.9		21.2		5.1
Green Ext Time (p_c), s		11.5		0.6		12.5		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	9.7
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (veh/h)	77	517	329	235	1111	38
Future Volume (veh/h)	77	517	329	235	1111	38
Number	1	6	2	12	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	0.99	1.00	1.00
Adj Sat Flow, veh/h/ln	1714	1714	1714	1714	1714	1800
Adj Flow Rate, veh/h	86	574	366	0	1234	0
Adj No. of Lanes	1	2	2	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	5	5	5	5	5	0
Cap, veh/h	422	1154	1154	512	1546	695
Arrive On Green	0.35	0.35	0.35	0.00	0.47	0.00
Sat Flow, veh/h	981	3343	3343	1445	3265	1530
Grp Volume(v), veh/h	86	574	366	0	1234	0
Grp Sat Flow(s),veh/h/ln	981	1629	1629	1445	1633	1530
Q Serve(g_s), s	3.2	6.4	3.8	0.0	14.9	0.0
Cycle Q Clear(g_c), s	7.0	6.4	3.8	0.0	14.9	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	422	1154	1154	512	1546	695
V/C Ratio(X)	0.20	0.50	0.32	0.00	0.80	0.00
Avail Cap(c_a), veh/h	835	2524	2524	1120	1828	827
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	13.5	11.8	10.9	0.0	10.4	0.0
Incr Delay (d2), s/veh	0.3	0.4	0.2	0.0	2.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	2.9	1.7	0.0	7.0	0.0
LnGrp Delay(d),s/veh	13.8	12.2	11.1	0.0	12.6	0.0
LnGrp LOS	B	B	B		B	
Approach Vol, veh/h		660	366		1234	
Approach Delay, s/veh		12.4	11.1		12.6	
Approach LOS		B	B		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		20.5				20.5		26.0
Change Period (Y+Rc), s		4.9				4.9		4.9
Max Green Setting (Gmax), s		35.1				35.1		25.1
Max Q Clear Time (g_c+I1), s		5.8				9.0		16.9
Green Ext Time (p_c), s		6.7				6.5		4.2

Intersection Summary	
HCM 2010 Ctrl Delay	12.3
HCM 2010 LOS	B

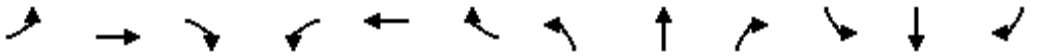
Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	1246	149	153	536	27	147	23	98	78	114	29
Future Volume (veh/h)	18	1246	149	153	536	27	147	23	98	78	114	29
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1767	1800	1731	1800	1800	1800	1832	1872	1800	1872	1872
Adj Flow Rate, veh/h	19	1340	160	165	576	29	144	45	105	84	123	31
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	2	2	4	0	0	0	0	0	0	0	0
Cap, veh/h	494	1425	169	240	1681	85	258	72	168	237	198	50
Arrive On Green	0.06	0.47	0.46	0.10	0.51	0.50	0.15	0.15	0.13	0.14	0.14	0.12
Sat Flow, veh/h	1714	3022	359	1648	3314	167	1714	479	1117	1714	1433	361
Grp Volume(v), veh/h	19	741	759	165	297	308	144	0	150	84	0	154
Grp Sat Flow(s),veh/h/ln	1714	1678	1702	1648	1710	1770	1714	0	1595	1714	0	1794
Q Serve(g_s), s	0.6	43.3	44.1	4.9	10.7	10.8	8.1	0.0	9.2	4.6	0.0	8.4
Cycle Q Clear(g_c), s	0.6	43.3	44.1	4.9	10.7	10.8	8.1	0.0	9.2	4.6	0.0	8.4
Prop In Lane	1.00		0.21	1.00		0.09	1.00		0.70	1.00		0.20
Lane Grp Cap(c), veh/h	494	791	803	240	867	898	258	0	240	237	0	248
V/C Ratio(X)	0.04	0.94	0.95	0.69	0.34	0.34	0.56	0.00	0.62	0.35	0.00	0.62
Avail Cap(c_a), veh/h	576	816	828	256	867	898	445	0	414	362	0	379
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.5	25.9	26.3	22.1	15.2	15.3	40.8	0.0	41.9	40.4	0.0	42.2
Incr Delay (d2), s/veh	0.0	17.2	18.8	5.6	0.1	0.1	0.7	0.0	1.0	0.3	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	23.7	24.9	2.6	5.1	5.2	3.9	0.0	4.1	2.2	0.0	4.2
LnGrp Delay(d),s/veh	12.5	43.1	45.0	27.7	15.3	15.3	41.5	0.0	42.9	40.8	0.0	43.2
LnGrp LOS	B	D	D	C	B	B	D		D	D		D
Approach Vol, veh/h		1519			770			294			238	
Approach Delay, s/veh		43.7			18.0			42.2			42.3	
Approach LOS		D			B			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.0	57.5		18.7	14.0	53.5		17.5
Change Period (Y+Rc), s	4.0	6.0		5.0	4.0	6.0		5.0
Max Green Setting (Gmax), s	11.0	49.0		25.0	11.0	49.0		20.0
Max Q Clear Time (g_c+I1), s	2.6	12.8		11.2	6.9	46.1		10.4
Green Ext Time (p_c), s	0.0	6.3		0.8	0.1	1.3		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	36.4
HCM 2010 LOS	D

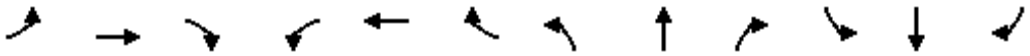
Notes



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	855	181	108	502	0	0	0	0	308	673	393
Future Volume (vph)	0	855	181	108	502	0	0	0	0	308	673	393
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	12	12	11	12	12	12	12	12	13	12	13
Total Lost time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95		1.00	0.95					1.00	0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	0.98
Flpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	1.00
Frt		0.97		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3175		1605	3353					1716	3307	1523
Flt Permitted		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3175		1605	3353					1716	3307	1523
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	919	195	116	540	0	0	0	0	331	724	423
RTOR Reduction (vph)	0	18	0	0	0	0	0	0	0	0	0	198
Lane Group Flow (vph)	0	1096	0	116	540	0	0	0	0	331	724	225
Confl. Peds. (#/hr)			3	3					1			4
Heavy Vehicles (%)	0%	4%	5%	3%	2%	0%	2%	2%	2%	3%	3%	2%
Bus Blockages (#/hr)	0	2	0	0	0	0	0	0	0	0	2	0
Turn Type		NA		Prot	NA					Perm	NA	Perm
Protected Phases		5		6	2						4	
Permitted Phases										4		4
Actuated Green, G (s)		38.0		9.1	52.0					28.5	28.5	28.5
Effective Green, g (s)		38.9		10.0	52.9					29.1	29.1	29.1
Actuated g/C Ratio		0.43		0.11	0.59					0.32	0.32	0.32
Clearance Time (s)		4.9		4.9	4.9					4.6	4.6	4.6
Vehicle Extension (s)		3.0		2.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1372		178	1970					554	1069	492
v/s Ratio Prot		c0.35		c0.07	0.16						c0.22	
v/s Ratio Perm										0.19		0.15
v/c Ratio		0.80		0.65	0.27					0.60	0.68	0.46
Uniform Delay, d1		22.2		38.3	9.1					25.5	26.4	24.2
Progression Factor		1.00		0.94	0.39					0.85	0.86	0.94
Incremental Delay, d2		4.9		6.2	0.3					1.6	1.6	0.6
Delay (s)		27.1		42.2	3.9					23.3	24.4	23.3
Level of Service		C		D	A					C	C	C
Approach Delay (s)		27.1			10.7			0.0			23.8	
Approach LOS		C			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	235	1089	0	0	396	78	6	475	145	0	0	0
Future Volume (vph)	235	1089	0	0	396	78	6	475	145	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0				
Lane Util. Factor	1.00	0.95			0.95		0.86	*0.80				
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00				
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.98		1.00	0.96				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1621	3288			3260		1454	4104				
Flt Permitted	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	1621	3288			3260		1454	4104				
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	253	1171	0	0	426	84	6	511	156	0	0	0
RTOR Reduction (vph)	0	0	0	0	17	0	0	56	0	0	0	0
Lane Group Flow (vph)	253	1171	0	0	493	0	5	612	0	0	0	0
Confl. Peds. (#/hr)			2			4	1					1
Confl. Bikes (#/hr)						1			2			
Heavy Vehicles (%)	2%	4%	0%	0%	2%	2%	1%	1%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	4	0	0	0	0	0	0
Turn Type	Prot	NA			NA		Perm	NA				
Protected Phases	2	6			1			4				
Permitted Phases							4					
Actuated Green, G (s)	24.1	60.5			31.5		20.0	20.0				
Effective Green, g (s)	25.0	61.4			32.4		20.6	20.6				
Actuated g/C Ratio	0.28	0.68			0.36		0.23	0.23				
Clearance Time (s)	4.9	4.9			4.9		4.6	4.6				
Vehicle Extension (s)	2.0	3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)	450	2243			1173		332	939				
v/s Ratio Prot	0.16	c0.36			0.15							
v/s Ratio Perm							0.00	0.15				
v/c Ratio	0.56	0.52			0.42		0.02	0.65				
Uniform Delay, d1	27.8	7.1			21.7		26.9	31.4				
Progression Factor	0.91	0.61			1.00		1.00	1.00				
Incremental Delay, d2	0.7	0.7			1.1		0.0	1.6				
Delay (s)	26.0	5.0			22.8		26.9	33.1				
Level of Service	C	A			C		C	C				
Approach Delay (s)		8.7			22.8			33.0			0.0	
Approach LOS		A			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Count Date 7/20/09			

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	121	1	6	23	0	2	0	13	0	0	0
Future Vol, veh/h	0	121	1	6	23	0	2	0	13	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	74	74	74	74	74	74	74	74	74	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	164	1	8	31	0	3	0	18	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	31	0	0	165	0	0	211	211	164	220	212	31
Stage 1	-	-	-	-	-	-	164	164	-	47	47	-
Stage 2	-	-	-	-	-	-	47	47	-	173	165	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1582	-	-	1413	-	-	746	686	881	736	685	1043
Stage 1	-	-	-	-	-	-	838	762	-	967	856	-
Stage 2	-	-	-	-	-	-	967	856	-	829	762	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1582	-	-	1413	-	-	743	682	881	718	681	1043
Mov Cap-2 Maneuver	-	-	-	-	-	-	743	682	-	718	681	-
Stage 1	-	-	-	-	-	-	838	762	-	967	851	-
Stage 2	-	-	-	-	-	-	962	851	-	812	762	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.6	9.3	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	860	1582	-	-	1413	-	-	-
HCM Lane V/C Ratio	0.024	-	-	-	0.006	-	-	-
HCM Control Delay (s)	9.3	0	-	-	7.6	-	-	0
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	23	38	2	5	47	416	102	11	251	6
Future Volume (veh/h)	1	1	23	38	2	5	47	416	102	11	251	6
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.98	0.98		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1748	1800	1800	1800	1800	1872	1800	1782	1872
Adj Flow Rate, veh/h	1	1	25	41	2	5	51	447	110	12	270	6
Adj No. of Lanes	1	1	0	1	1	0	1	1	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	3	0	0	0	0	0	0	1	0
Cap, veh/h	289	8	193	265	60	149	820	1160	1025	613	1093	976
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.06	0.64	0.64	0.03	0.61	0.61
Sat Flow, veh/h	1405	58	1456	1342	451	1128	1714	1800	1591	1714	1782	1591
Grp Volume(v), veh/h	1	0	26	41	0	7	51	447	110	12	270	6
Grp Sat Flow(s),veh/h/ln	1405	0	1514	1342	0	1579	1714	1800	1591	1714	1782	1591
Q Serve(g_s), s	0.0	0.0	1.0	1.9	0.0	0.3	0.7	7.8	1.8	0.2	4.6	0.1
Cycle Q Clear(g_c), s	0.3	0.0	1.0	2.9	0.0	0.3	0.7	7.8	1.8	0.2	4.6	0.1
Prop In Lane	1.00		0.96	1.00		0.71	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	289	0	201	265	0	209	820	1160	1025	613	1093	976
V/C Ratio(X)	0.00	0.00	0.13	0.15	0.00	0.03	0.06	0.39	0.11	0.02	0.25	0.01
Avail Cap(c_a), veh/h	528	0	459	494	0	478	998	1160	1025	844	1093	976
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.3	0.0	25.6	26.8	0.0	25.3	3.9	5.6	4.5	4.6	5.9	5.0
Incr Delay (d2), s/veh	0.0	0.0	0.3	0.3	0.0	0.1	0.0	1.0	0.2	0.0	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.4	0.7	0.0	0.1	0.3	4.2	0.8	0.1	2.4	0.0
LnGrp Delay(d),s/veh	25.3	0.0	25.9	27.1	0.0	25.3	3.9	6.6	4.7	4.6	6.4	5.0
LnGrp LOS	C		C	C		C	A	A	A	A	A	A
Approach Vol, veh/h		27			48			608			288	
Approach Delay, s/veh		25.9			26.8			6.0			6.3	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.0	47.1		13.6	8.1	45.0		13.6
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	10.0	40.0		20.0	10.0	40.0		20.0
Max Q Clear Time (g_c+I1), s	2.2	9.8		4.9	2.7	6.6		3.0
Green Ext Time (p_c), s	0.0	5.8		0.2	0.0	5.9		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	7.7
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	28	126	90	13	14	148	352	299	13	272	34
Future Volume (veh/h)	83	28	126	90	13	14	148	352	299	13	272	34
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1588	1588	1588	1588	1652	1685	1543	1605	1543	1543	1543	1620
Adj Flow Rate, veh/h	90	30	137	98	14	15	161	383	325	14	296	37
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	5	5	5
Cap, veh/h	498	336	283	471	156	167	515	641	524	322	833	103
Arrive On Green	0.08	0.21	0.21	0.08	0.21	0.20	0.12	0.40	0.40	0.03	0.32	0.32
Sat Flow, veh/h	1513	1588	1340	1513	728	780	1469	1605	1310	1469	2624	325
Grp Volume(v), veh/h	90	30	137	98	0	29	161	383	325	14	164	169
Grp Sat Flow(s),veh/h/ln	1513	1588	1340	1513	0	1507	1469	1605	1310	1469	1466	1483
Q Serve(g_s), s	2.4	0.8	4.8	2.6	0.0	0.8	3.5	10.0	10.6	0.3	4.6	4.7
Cycle Q Clear(g_c), s	2.4	0.8	4.8	2.6	0.0	0.8	3.5	10.0	10.6	0.3	4.6	4.7
Prop In Lane	1.00		1.00	1.00		0.52	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	498	336	283	471	0	323	515	641	524	322	465	471
V/C Ratio(X)	0.18	0.09	0.48	0.21	0.00	0.09	0.31	0.60	0.62	0.04	0.35	0.36
Avail Cap(c_a), veh/h	847	774	653	816	0	735	809	1233	1007	737	1126	1140
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.3	16.9	18.5	14.3	0.0	16.9	8.9	12.6	12.8	11.6	14.0	14.0
Incr Delay (d2), s/veh	0.2	0.1	1.3	0.2	0.0	0.1	0.3	1.3	1.7	0.1	0.6	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.4	1.9	1.1	0.0	0.4	1.4	4.6	4.0	0.1	1.9	2.0
LnGrp Delay(d),s/veh	14.5	17.0	19.8	14.5	0.0	17.0	9.2	13.9	14.5	11.7	14.6	14.7
LnGrp LOS	B	B	B	B		B	A	B	B	B	B	B
Approach Vol, veh/h		257			127			869			347	
Approach Delay, s/veh		17.6			15.1			13.3			14.5	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.9	25.3	7.7	15.4	9.3	20.9	7.8	15.3
Change Period (Y+Rc), s	4.0	4.9	4.0	4.5	4.0	4.9	4.0	4.5
Max Green Setting (Gmax), s	16.0	40.1	16.0	25.5	16.0	40.1	16.0	25.5
Max Q Clear Time (g_c+I1), s	2.3	12.6	4.4	2.8	5.5	6.7	4.6	6.8
Green Ext Time (p_c), s	0.0	7.5	0.2	0.8	0.4	7.9	0.2	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	14.4
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	4	41	7	5	44	91	1004	4	31	421	46
Future Volume (veh/h)	3	4	41	7	5	44	91	1004	4	31	421	46
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1765	1765	1800	1765	1765	1714	1714	1714	1714	1714	1714
Adj Flow Rate, veh/h	3	4	44	7	5	47	97	1068	4	33	448	49
Adj No. of Lanes	0	1	1	0	1	1	1	1	1	1	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	5	5	5
Cap, veh/h	196	218	299	256	154	297	595	1123	953	174	1123	951
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.65	0.65	0.65	0.65	0.65	0.65
Sat Flow, veh/h	511	1090	1500	761	771	1490	870	1714	1455	509	1714	1453
Grp Volume(v), veh/h	7	0	44	12	0	47	97	1068	4	33	448	49
Grp Sat Flow(s),veh/h/ln	1602	0	1500	1532	0	1490	870	1714	1455	509	1714	1453
Q Serve(g_s), s	0.0	0.0	1.3	0.0	0.0	1.4	3.2	31.3	0.1	3.5	6.7	0.7
Cycle Q Clear(g_c), s	0.2	0.0	1.3	0.3	0.0	1.4	9.9	31.3	0.1	34.8	6.7	0.7
Prop In Lane	0.43		1.00	0.58		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	413	0	299	410	0	297	595	1123	953	174	1123	951
V/C Ratio(X)	0.02	0.00	0.15	0.03	0.00	0.16	0.16	0.95	0.00	0.19	0.40	0.05
Avail Cap(c_a), veh/h	838	0	709	819	0	705	595	1123	953	174	1123	951
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.7	0.0	18.1	17.7	0.0	18.2	6.8	8.7	3.3	24.6	4.4	3.4
Incr Delay (d2), s/veh	0.0	0.0	0.2	0.0	0.0	0.2	0.6	17.4	0.0	2.4	1.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.6	0.1	0.0	0.6	0.9	19.7	0.0	0.6	3.4	0.3
LnGrp Delay(d),s/veh	17.7	0.0	18.4	17.8	0.0	18.4	7.3	26.1	3.3	27.0	5.5	3.5
LnGrp LOS	B		B	B		B	A	C	A	C	A	A
Approach Vol, veh/h		51			59			1169			530	
Approach Delay, s/veh		18.3			18.3			24.5			6.6	
Approach LOS		B			B			C			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		40.0		15.0		40.0		15.0
Change Period (Y+Rc), s		4.9		* 4.2		4.9		* 4.2
Max Green Setting (Gmax), s		35.1		* 26		35.1		* 26
Max Q Clear Time (g_c+I1), s		33.3		3.4		36.8		3.3
Green Ext Time (p_c), s		1.7		0.4		0.0		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	18.9
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (veh/h)	141	454	628	1008	445	77
Future Volume (veh/h)	141	454	628	1008	445	77
Number	1	6	2	12	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	0.99	1.00	1.00
Adj Sat Flow, veh/h/ln	1714	1714	1714	1714	1714	1800
Adj Flow Rate, veh/h	150	483	668	0	473	0
Adj No. of Lanes	1	2	2	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	5	5	5	5	5	0
Cap, veh/h	495	1795	1795	797	844	363
Arrive On Green	0.55	0.55	0.55	0.00	0.26	0.00
Sat Flow, veh/h	743	3343	3343	1445	3265	1530
Grp Volume(v), veh/h	150	483	668	0	473	0
Grp Sat Flow(s),veh/h/ln	743	1629	1629	1445	1633	1530
Q Serve(g_s), s	6.0	3.3	4.9	0.0	5.3	0.0
Cycle Q Clear(g_c), s	10.9	3.3	4.9	0.0	5.3	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	495	1795	1795	797	844	363
V/C Ratio(X)	0.30	0.27	0.37	0.00	0.56	0.00
Avail Cap(c_a), veh/h	810	3178	3178	1411	2409	1096
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	8.4	5.0	5.3	0.0	13.5	0.0
Incr Delay (d2), s/veh	0.4	0.1	0.2	0.0	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	1.5	2.2	0.0	2.4	0.0
LnGrp Delay(d),s/veh	8.8	5.1	5.5	0.0	14.1	0.0
LnGrp LOS	A	A	A		B	
Approach Vol, veh/h		633	668		473	
Approach Delay, s/veh		6.0	5.5		14.1	
Approach LOS		A	A		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		27.2				27.2		14.9
Change Period (Y+Rc), s		4.9				4.9		4.9
Max Green Setting (Gmax), s		40.1				40.1		30.1
Max Q Clear Time (g_c+I1), s		6.9				12.9		7.3
Green Ext Time (p_c), s		10.0				9.4		2.3

Intersection Summary	
HCM 2010 Ctrl Delay	7.9
HCM 2010 LOS	A

Notes

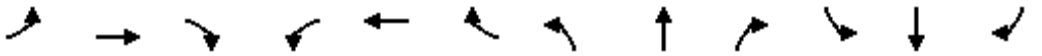
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	862	77	141	1240	18	372	108	124	39	49	25
Future Volume (veh/h)	33	862	77	141	1240	18	372	108	124	39	49	25
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1766	1800	1731	1800	1800	1800	1849	1872	1800	1872	1872
Adj Flow Rate, veh/h	34	898	80	147	1292	19	314	215	129	41	51	26
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	2	4	0	0	0	0	0	0	0	0
Cap, veh/h	213	1200	107	317	1463	22	425	267	160	182	122	62
Arrive On Green	0.06	0.39	0.37	0.11	0.42	0.41	0.25	0.25	0.23	0.11	0.11	0.09
Sat Flow, veh/h	1714	3116	278	1648	3450	51	1714	1076	646	1714	1150	586
Grp Volume(v), veh/h	34	483	495	147	640	671	314	0	344	41	0	77
Grp Sat Flow(s),veh/h/ln	1714	1678	1716	1648	1710	1791	1714	0	1722	1714	0	1736
Q Serve(g_s), s	1.1	23.7	23.7	4.7	32.8	32.8	16.0	0.0	17.9	2.1	0.0	4.0
Cycle Q Clear(g_c), s	1.1	23.7	23.7	4.7	32.8	32.8	16.0	0.0	17.9	2.1	0.0	4.0
Prop In Lane	1.00		0.16	1.00		0.03	1.00		0.38	1.00		0.34
Lane Grp Cap(c), veh/h	213	646	661	317	725	759	425	0	427	182	0	184
V/C Ratio(X)	0.16	0.75	0.75	0.46	0.88	0.88	0.74	0.00	0.81	0.23	0.00	0.42
Avail Cap(c_a), veh/h	393	801	820	421	811	850	575	0	578	395	0	400
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.3	25.2	25.4	17.9	25.2	25.2	32.9	0.0	34.0	38.9	0.0	40.1
Incr Delay (d2), s/veh	0.1	2.2	2.1	0.4	9.7	9.3	1.9	0.0	4.3	0.2	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	11.3	11.5	2.1	17.2	18.2	7.8	0.0	9.0	1.0	0.0	1.9
LnGrp Delay(d),s/veh	20.4	27.4	27.5	18.3	34.9	34.6	34.9	0.0	38.2	39.1	0.0	40.6
LnGrp LOS	C	C	C	B	C	C	C		D	D		D
Approach Vol, veh/h		1012			1458			658			118	
Approach Delay, s/veh		27.2			33.1			36.6			40.1	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.0	45.2		26.7	14.0	41.2		13.2
Change Period (Y+Rc), s	4.0	6.0		5.0	4.0	6.0		5.0
Max Green Setting (Gmax), s	16.0	44.0		30.0	16.0	44.0		20.0
Max Q Clear Time (g_c+I1), s	3.1	34.8		19.9	6.7	25.7		6.0
Green Ext Time (p_c), s	0.0	4.4		1.7	0.2	6.0		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	32.2
HCM 2010 LOS	C

Notes

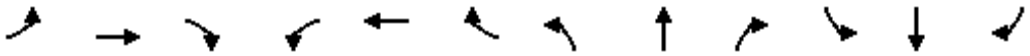
Synchro 9 Report



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	653	93	219	1304	0	0	0	0	216	562	362
Future Volume (vph)	0	653	93	219	1304	0	0	0	0	216	562	362
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	12	12	11	12	12	12	12	12	13	12	13
Total Lost time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95		1.00	0.95					1.00	0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	0.98
Flpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	1.00
Frt		0.98		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3203		1605	3353					1716	3307	1524
Flt Permitted		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3203		1605	3353					1716	3307	1524
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	666	95	223	1331	0	0	0	0	220	573	369
RTOR Reduction (vph)	0	11	0	0	0	0	0	0	0	0	0	54
Lane Group Flow (vph)	0	750	0	223	1331	0	0	0	0	220	573	315
Confl. Peds. (#/hr)			3	3					1			4
Heavy Vehicles (%)	0%	4%	5%	3%	2%	0%	2%	2%	2%	3%	3%	2%
Bus Blockages (#/hr)	0	2	0	0	0	0	0	0	0	0	2	0
Turn Type		NA		Prot	NA					Perm	NA	Perm
Protected Phases		5		6	2						4	
Permitted Phases										4		4
Actuated Green, G (s)		38.6		20.1	63.6					26.9	26.9	26.9
Effective Green, g (s)		39.5		21.0	64.5					27.5	27.5	27.5
Actuated g/C Ratio		0.40		0.21	0.64					0.28	0.28	0.28
Clearance Time (s)		4.9		4.9	4.9					4.6	4.6	4.6
Vehicle Extension (s)		3.0		2.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1265		337	2162					471	909	419
v/s Ratio Prot		0.23		0.14	c0.40						0.17	
v/s Ratio Perm										0.13		c0.21
v/c Ratio		0.59		0.66	0.62					0.47	0.63	0.75
Uniform Delay, d1		23.9		36.2	10.5					30.2	31.8	33.1
Progression Factor		1.00		0.83	0.40					0.90	0.91	0.90
Incremental Delay, d2		2.1		2.2	0.8					0.7	1.4	7.3
Delay (s)		25.9		32.2	5.0					27.9	30.5	37.0
Level of Service		C		C	A					C	C	D
Approach Delay (s)		25.9			8.9			0.0			32.1	
Approach LOS		C			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	85.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	308	897	0	0	960	211	362	903	172	0	0	0
Future Volume (vph)	308	897	0	0	960	211	362	903	172	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0				
Lane Util. Factor	1.00	0.95			0.95		0.86	*0.80				
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00				
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.97		1.00	0.98				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1621	3288			3251		1454	4156				
Flt Permitted	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	1621	3288			3251		1454	4156				
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	318	925	0	0	990	218	373	931	177	0	0	0
RTOR Reduction (vph)	0	0	0	0	19	0	0	22	0	0	0	0
Lane Group Flow (vph)	318	925	0	0	1189	0	336	1123	0	0	0	0
Confl. Peds. (#/hr)			2			4	1					1
Confl. Bikes (#/hr)						1			2			
Heavy Vehicles (%)	2%	4%	0%	0%	2%	2%	1%	1%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	4	0	0	0	0	0	0
Turn Type	Prot	NA			NA		Perm	NA				
Protected Phases	2	6			1			4				
Permitted Phases							4					
Actuated Green, G (s)	20.1	63.1			38.1		27.4	27.4				
Effective Green, g (s)	21.0	64.0			39.0		28.0	28.0				
Actuated g/C Ratio	0.21	0.64			0.39		0.28	0.28				
Clearance Time (s)	4.9	4.9			4.9		4.6	4.6				
Vehicle Extension (s)	2.0	3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)	340	2104			1267		407	1163				
v/s Ratio Prot	c0.20	0.28			c0.37							
v/s Ratio Perm							0.23	0.27				
v/c Ratio	0.94	0.44			0.94		0.83	0.97				
Uniform Delay, d1	38.8	9.0			29.3		33.7	35.5				
Progression Factor	1.19	1.14			1.00		1.00	1.00				
Incremental Delay, d2	30.5	0.6			14.3		12.8	18.6				
Delay (s)	76.7	10.9			43.6		46.5	54.1				
Level of Service	E	B			D		D	D				
Approach Delay (s)		27.8			43.6			52.4			0.0	
Approach LOS		C			D			D			A	

Intersection Summary			
HCM 2000 Control Delay	41.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	85.9%	ICU Level of Service	E
Analysis Period (min)	15		
Description: Count Date 7/20/09			

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	56	3	7	92	0	3	0	17	0	0	0
Future Vol, veh/h	0	56	3	7	92	0	3	0	17	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	59	3	7	97	0	3	0	18	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	97	0	0	62	0	0	173	173	61	181	174	97
Stage 1	-	-	-	-	-	-	61	61	-	112	112	-
Stage 2	-	-	-	-	-	-	112	112	-	69	62	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1496	-	-	1541	-	-	790	720	1004	781	719	959
Stage 1	-	-	-	-	-	-	950	844	-	893	803	-
Stage 2	-	-	-	-	-	-	893	803	-	941	843	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1496	-	-	1541	-	-	787	717	1004	764	716	959
Mov Cap-2 Maneuver	-	-	-	-	-	-	787	717	-	764	716	-
Stage 1	-	-	-	-	-	-	950	844	-	893	799	-
Stage 2	-	-	-	-	-	-	889	799	-	924	843	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.5	8.8	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	964	1496	-	-	1541	-	-	-
HCM Lane V/C Ratio	0.022	-	-	-	0.005	-	-	-
HCM Control Delay (s)	8.8	0	-	-	7.3	-	-	0
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	26	57	181	14	21	13	169	140	31	387	3
Future Volume (veh/h)	5	26	57	181	14	21	13	169	140	31	387	3
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1748	1800	1800	1800	1800	1872	1800	1782	1872
Adj Flow Rate, veh/h	7	36	78	248	19	29	18	232	192	42	530	4
Adj No. of Lanes	1	1	0	1	1	0	1	1	1	1	1	1
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Percent Heavy Veh, %	0	0	0	3	0	0	0	0	0	0	1	0
Cap, veh/h	415	130	283	345	166	253	455	944	834	622	966	863
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.03	0.52	0.52	0.05	0.54	0.54
Sat Flow, veh/h	1367	504	1091	1252	640	977	1714	1800	1591	1714	1782	1591
Grp Volume(v), veh/h	7	0	114	248	0	48	18	232	192	42	530	4
Grp Sat Flow(s),veh/h/ln	1367	0	1595	1252	0	1616	1714	1800	1591	1714	1782	1591
Q Serve(g_s), s	0.3	0.0	4.5	15.4	0.0	1.8	0.4	5.5	5.1	0.8	15.1	0.1
Cycle Q Clear(g_c), s	2.1	0.0	4.5	19.8	0.0	1.8	0.4	5.5	5.1	0.8	15.1	0.1
Prop In Lane	1.00		0.68	1.00		0.60	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	415	0	413	345	0	419	455	944	834	622	966	863
V/C Ratio(X)	0.02	0.00	0.28	0.72	0.00	0.11	0.04	0.25	0.23	0.07	0.55	0.00
Avail Cap(c_a), veh/h	415	0	413	345	0	419	640	944	834	776	966	863
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.9	0.0	23.1	31.0	0.0	22.1	9.0	10.1	10.0	7.4	11.6	8.2
Incr Delay (d2), s/veh	0.0	0.0	0.4	7.1	0.0	0.1	0.0	0.6	0.6	0.0	2.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	2.0	6.0	0.0	0.8	0.2	2.9	2.4	0.4	8.0	0.0
LnGrp Delay(d),s/veh	22.9	0.0	23.5	38.0	0.0	22.2	9.0	10.7	10.7	7.5	13.9	8.2
LnGrp LOS	C		C	D		C	A	B	B	A	B	A
Approach Vol, veh/h		121			296			442			576	
Approach Delay, s/veh		23.4			35.5			10.6			13.4	
Approach LOS		C			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.0	45.0		25.0	6.6	46.4		25.0
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	10.0	40.0		20.0	10.0	40.0		20.0
Max Q Clear Time (g_c+I1), s	2.8	7.5		21.8	2.4	17.1		6.5
Green Ext Time (p_c), s	0.0	7.2		0.0	0.0	6.5		1.9

Intersection Summary	
HCM 2010 Ctrl Delay	17.9
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	41	304	256	30	40	95	131	93	34	573	43
Future Volume (veh/h)	44	41	304	256	30	40	95	131	93	34	573	43
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1588	1588	1588	1588	1652	1685	1543	1605	1543	1543	1543	1620
Adj Flow Rate, veh/h	48	45	330	278	33	43	103	142	101	37	623	47
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	5	5	5
Cap, veh/h	486	441	373	556	253	329	273	550	449	430	863	65
Arrive On Green	0.05	0.28	0.28	0.16	0.39	0.38	0.08	0.34	0.34	0.05	0.31	0.31
Sat Flow, veh/h	1513	1588	1343	1513	651	848	1469	1605	1310	1469	2762	208
Grp Volume(v), veh/h	48	45	330	278	0	76	103	142	101	37	330	340
Grp Sat Flow(s),veh/h/ln	1513	1588	1343	1513	0	1498	1469	1605	1310	1469	1466	1505
Q Serve(g_s), s	1.8	1.7	19.4	10.0	0.0	2.7	3.7	5.3	4.5	1.4	16.5	16.5
Cycle Q Clear(g_c), s	1.8	1.7	19.4	10.0	0.0	2.7	3.7	5.3	4.5	1.4	16.5	16.5
Prop In Lane	1.00		1.00	1.00		0.57	1.00		1.00	1.00		0.14
Lane Grp Cap(c), veh/h	486	441	373	556	0	582	273	550	449	430	458	470
V/C Ratio(X)	0.10	0.10	0.88	0.50	0.00	0.13	0.38	0.26	0.23	0.09	0.72	0.72
Avail Cap(c_a), veh/h	718	501	424	621	0	582	463	798	652	664	729	748
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.4	22.1	28.5	14.9	0.0	16.3	18.0	19.5	19.3	17.5	25.2	25.2
Incr Delay (d2), s/veh	0.1	0.1	18.0	0.7	0.0	0.1	0.9	0.4	0.4	0.1	3.1	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.8	9.1	4.3	0.0	1.1	1.5	2.4	1.7	0.6	7.0	7.2
LnGrp Delay(d),s/veh	19.5	22.2	46.5	15.6	0.0	16.4	18.9	19.9	19.7	17.6	28.2	28.2
LnGrp LOS	B	C	D	B		B	B	B	B	B	C	C
Approach Vol, veh/h		423			354			346			707	
Approach Delay, s/veh		40.9			15.8			19.5			27.6	
Approach LOS		D			B			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.9	32.2	7.3	36.0	9.3	29.8	16.4	26.9
Change Period (Y+Rc), s	4.0	4.9	4.0	4.5	4.0	4.9	4.0	4.5
Max Green Setting (Gmax), s	16.0	40.1	16.0	25.5	16.0	40.1	16.0	25.5
Max Q Clear Time (g_c+I1), s	3.4	7.3	3.8	4.7	5.7	18.5	12.0	21.4
Green Ext Time (p_c), s	0.0	6.5	0.1	2.1	0.2	5.8	0.4	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	26.9
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	1	144	1	2	5	38	406	1	4	1031	81
Future Volume (veh/h)	36	1	144	1	2	5	38	406	1	4	1031	81
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1765	1765	1800	1765	1765	1714	1714	1714	1714	1714	1714
Adj Flow Rate, veh/h	40	1	160	1	2	6	42	451	1	4	1146	90
Adj No. of Lanes	0	1	1	0	1	1	1	1	1	1	1	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	5	5	5
Cap, veh/h	347	7	234	140	206	232	167	1184	1005	665	1184	1003
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.69	0.69	0.69	0.69	0.69	0.69
Sat Flow, veh/h	1349	45	1500	309	1318	1486	436	1714	1455	908	1714	1453
Grp Volume(v), veh/h	41	0	160	3	0	6	42	451	1	4	1146	90
Grp Sat Flow(s),veh/h/ln	1394	0	1500	1627	0	1486	436	1714	1455	908	1714	1453
Q Serve(g_s), s	1.3	0.0	5.3	0.0	0.0	0.2	3.5	5.8	0.0	0.1	32.5	1.1
Cycle Q Clear(g_c), s	1.3	0.0	5.3	0.1	0.0	0.2	36.0	5.8	0.0	5.9	32.5	1.1
Prop In Lane	0.98		1.00	0.33		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	354	0	234	346	0	232	167	1184	1005	665	1184	1003
V/C Ratio(X)	0.12	0.00	0.68	0.01	0.00	0.03	0.25	0.38	0.00	0.01	0.97	0.09
Avail Cap(c_a), veh/h	832	0	748	872	0	741	167	1184	1005	665	1184	1003
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.1	0.0	20.8	18.6	0.0	18.6	24.9	3.4	2.5	4.6	7.5	2.7
Incr Delay (d2), s/veh	0.1	0.0	3.5	0.0	0.0	0.0	3.6	0.9	0.0	0.0	19.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	2.4	0.0	0.0	0.1	0.8	2.9	0.0	0.0	21.1	0.5
LnGrp Delay(d),s/veh	19.3	0.0	24.3	18.6	0.0	18.7	28.4	4.3	2.5	4.6	27.0	2.8
LnGrp LOS	B		C	B		B	C	A	A	A	C	A
Approach Vol, veh/h		201			9			494			1240	
Approach Delay, s/veh		23.3			18.7			6.4			25.2	
Approach LOS		C			B			A			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		40.0		12.1		40.0		12.1
Change Period (Y+Rc), s		4.9		* 4.2		4.9		* 4.2
Max Green Setting (Gmax), s		35.1		* 26		35.1		* 26
Max Q Clear Time (g_c+I1), s		38.0		2.2		34.5		7.3
Green Ext Time (p_c), s		0.0		0.9		0.6		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	20.2
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (veh/h)	89	530	337	342	1385	64
Future Volume (veh/h)	89	530	337	342	1385	64
Number	1	6	2	12	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	0.99	1.00	1.00
Adj Sat Flow, veh/h/ln	1714	1714	1714	1714	1714	1800
Adj Flow Rate, veh/h	99	589	374	0	1539	0
Adj No. of Lanes	1	2	2	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	5	5	5	5	5	0
Cap, veh/h	397	1141	1141	507	1622	734
Arrive On Green	0.35	0.35	0.35	0.00	0.50	0.00
Sat Flow, veh/h	974	3343	3343	1445	3265	1530
Grp Volume(v), veh/h	99	589	374	0	1539	0
Grp Sat Flow(s),veh/h/ln	974	1629	1629	1445	1633	1530
Q Serve(g_s), s	4.3	7.5	4.4	0.0	23.5	0.0
Cycle Q Clear(g_c), s	8.8	7.5	4.4	0.0	23.5	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	397	1141	1141	507	1622	734
V/C Ratio(X)	0.25	0.52	0.33	0.00	0.95	0.00
Avail Cap(c_a), veh/h	725	2240	2240	994	1622	734
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	15.7	13.5	12.5	0.0	12.5	0.0
Incr Delay (d2), s/veh	0.4	0.4	0.2	0.0	12.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	3.4	2.0	0.0	13.3	0.0
LnGrp Delay(d),s/veh	16.1	13.9	12.7	0.0	24.9	0.0
LnGrp LOS	B	B	B		C	
Approach Vol, veh/h		688	374		1539	
Approach Delay, s/veh		14.2	12.7		24.9	
Approach LOS		B	B		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		22.3				22.3		30.0
Change Period (Y+Rc), s		4.9				4.9		4.9
Max Green Setting (Gmax), s		35.1				35.1		25.1
Max Q Clear Time (g_c+I1), s		6.4				10.8		25.5
Green Ext Time (p_c), s		7.0				6.7		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	20.3
HCM 2010 LOS	C

Notes

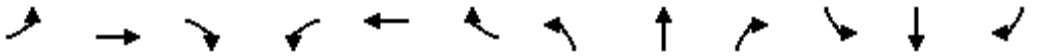
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	1444	196	157	617	28	168	24	101	80	117	34
Future Volume (veh/h)	27	1444	196	157	617	28	168	24	101	80	117	34
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1767	1800	1731	1800	1800	1800	1833	1872	1800	1872	1872
Adj Flow Rate, veh/h	29	1553	211	169	663	30	158	58	109	86	126	37
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	2	2	4	0	0	0	0	0	0	0	0
Cap, veh/h	447	1400	187	221	1683	76	269	88	165	242	195	57
Arrive On Green	0.06	0.47	0.46	0.09	0.51	0.49	0.16	0.16	0.14	0.14	0.14	0.12
Sat Flow, veh/h	1714	2976	398	1648	3332	151	1714	560	1052	1714	1380	405
Grp Volume(v), veh/h	29	866	898	169	340	353	158	0	167	86	0	163
Grp Sat Flow(s),veh/h/ln	1714	1678	1695	1648	1710	1773	1714	0	1611	1714	0	1785
Q Serve(g_s), s	0.9	50.4	50.4	6.2	13.2	13.2	9.2	0.0	10.5	4.9	0.0	9.3
Cycle Q Clear(g_c), s	0.9	50.4	50.4	6.2	13.2	13.2	9.2	0.0	10.5	4.9	0.0	9.3
Prop In Lane	1.00		0.23	1.00		0.08	1.00		0.65	1.00		0.23
Lane Grp Cap(c), veh/h	447	790	798	221	864	896	269	0	252	242	0	252
V/C Ratio(X)	0.06	1.10	1.13	0.76	0.39	0.39	0.59	0.00	0.66	0.36	0.00	0.65
Avail Cap(c_a), veh/h	527	790	798	237	864	896	431	0	405	351	0	365
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.3	28.3	28.5	27.3	16.4	16.4	42.0	0.0	43.1	41.6	0.0	43.7
Incr Delay (d2), s/veh	0.0	61.4	72.4	11.3	0.1	0.1	0.8	0.0	1.1	0.3	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	36.7	39.6	5.5	6.2	6.4	4.4	0.0	4.7	2.3	0.0	4.7
LnGrp Delay(d),s/veh	13.3	89.8	101.0	38.6	16.5	16.5	42.7	0.0	44.2	41.9	0.0	44.7
LnGrp LOS	B	F	F	D	B	B	D		D	D		D
Approach Vol, veh/h		1793			862			325			249	
Approach Delay, s/veh		94.1			20.8			43.5			43.8	
Approach LOS		F			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.0	59.0		19.9	14.0	55.0		18.2
Change Period (Y+Rc), s	4.0	6.0		5.0	4.0	6.0		5.0
Max Green Setting (Gmax), s	11.0	49.0		25.0	11.0	49.0		20.0
Max Q Clear Time (g_c+I1), s	2.9	15.2		12.5	8.2	52.4		11.3
Green Ext Time (p_c), s	0.0	8.4		0.8	0.1	0.0		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	65.6
HCM 2010 LOS	E

Notes

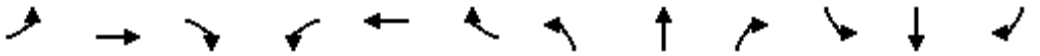
Synchro 9 Report



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	966	233	111	571	0	0	0	0	322	697	414
Future Volume (vph)	0	966	233	111	571	0	0	0	0	322	697	414
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	12	12	11	12	12	12	12	12	13	12	13
Total Lost time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95		1.00	0.95					1.00	0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	0.98
Flpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	1.00
Frt		0.97		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3164		1605	3353					1716	3307	1523
Flt Permitted		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3164		1605	3353					1716	3307	1523
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	1039	251	119	614	0	0	0	0	346	749	445
RTOR Reduction (vph)	0	22	0	0	0	0	0	0	0	0	0	163
Lane Group Flow (vph)	0	1268	0	119	614	0	0	0	0	346	749	282
Confl. Peds. (#/hr)			3	3					1			4
Heavy Vehicles (%)	0%	4%	5%	3%	2%	0%	2%	2%	2%	3%	3%	2%
Bus Blockages (#/hr)	0	2	0	0	0	0	0	0	0	0	2	0
Turn Type		NA		Prot	NA					Perm	NA	Perm
Protected Phases		5		6	2						4	
Permitted Phases										4		4
Actuated Green, G (s)		37.6		9.1	51.6					28.9	28.9	28.9
Effective Green, g (s)		38.5		10.0	52.5					29.5	29.5	29.5
Actuated g/C Ratio		0.43		0.11	0.58					0.33	0.33	0.33
Clearance Time (s)		4.9		4.9	4.9					4.6	4.6	4.6
Vehicle Extension (s)		3.0		2.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1353		178	1955					562	1083	499
v/s Ratio Prot		c0.40		c0.07	0.18						c0.23	
v/s Ratio Perm										0.20		0.18
v/c Ratio		0.94		0.67	0.31					0.62	0.69	0.56
Uniform Delay, d1		24.6		38.4	9.6					25.5	26.3	25.0
Progression Factor		1.00		0.94	0.44					0.86	0.87	0.79
Incremental Delay, d2		13.5		6.9	0.4					1.9	1.8	1.4
Delay (s)		38.1		43.2	4.6					23.7	24.7	21.0
Level of Service		D		D	A					C	C	C
Approach Delay (s)		38.1			10.9			0.0			23.4	
Approach LOS		D			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	267	1212	0	0	443	83	25	490	149	0	0	0
Future Volume (vph)	267	1212	0	0	443	83	25	490	149	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0				
Lane Util. Factor	1.00	0.95			0.95		0.86	*0.80				
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00				
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.98		1.00	0.97				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1621	3288			3264		1454	4105				
Flt Permitted	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	1621	3288			3264		1454	4105				
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	287	1303	0	0	476	89	27	527	160	0	0	0
RTOR Reduction (vph)	0	0	0	0	16	0	0	48	0	0	0	0
Lane Group Flow (vph)	287	1303	0	0	549	0	24	642	0	0	0	0
Confl. Peds. (#/hr)			2			4	1					1
Confl. Bikes (#/hr)						1			2			
Heavy Vehicles (%)	2%	4%	0%	0%	2%	2%	1%	1%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	4	0	0	0	0	0	0
Turn Type	Prot	NA			NA		Perm	NA				
Protected Phases	2	6			1			4				
Permitted Phases							4					
Actuated Green, G (s)	24.1	59.9			30.9		20.6	20.6				
Effective Green, g (s)	25.0	60.8			31.8		21.2	21.2				
Actuated g/C Ratio	0.28	0.68			0.35		0.24	0.24				
Clearance Time (s)	4.9	4.9			4.9		4.6	4.6				
Vehicle Extension (s)	2.0	3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)	450	2221			1153		342	966				
v/s Ratio Prot	0.18	c0.40			0.17							
v/s Ratio Perm							0.02	0.16				
v/c Ratio	0.64	0.59			0.48		0.07	0.66				
Uniform Delay, d1	28.5	7.8			22.6		26.7	31.2				
Progression Factor	0.87	0.55			1.00		1.00	1.00				
Incremental Delay, d2	1.5	0.8			1.4		0.1	1.7				
Delay (s)	26.4	5.1			24.0		26.8	32.9				
Level of Service	C	A			C		C	C				
Approach Delay (s)		8.9			24.0			32.7			0.0	
Approach LOS		A			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Count Date 7/20/09			

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	1	173	53	17	39	1
Future Vol, veh/h	1	173	53	17	39	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	75	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	234	72	23	53	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	95	0	-	0	319	83
Stage 1	-	-	-	-	83	-
Stage 2	-	-	-	-	236	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1499	-	-	-	674	976
Stage 1	-	-	-	-	940	-
Stage 2	-	-	-	-	803	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1499	-	-	-	674	976
Mov Cap-2 Maneuver	-	-	-	-	694	-
Stage 1	-	-	-	-	940	-
Stage 2	-	-	-	-	802	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1499	-	-	-	699
HCM Lane V/C Ratio	0.001	-	-	-	0.077
HCM Control Delay (s)	7.4	-	-	-	10.6
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	1	212	1	6	68	25	2	1	13	59	1	1
Future Vol, veh/h	1	212	1	6	68	25	2	1	13	59	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	74	74	74	74	74	74	74	74	74	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	286	1	8	92	34	3	1	18	80	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	126	0	0	288	0	0	416	432	287	424	416	109
Stage 1	-	-	-	-	-	-	290	290	-	125	125	-
Stage 2	-	-	-	-	-	-	126	142	-	299	291	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1460	-	-	1274	-	-	547	516	752	540	527	945
Stage 1	-	-	-	-	-	-	718	672	-	879	792	-
Stage 2	-	-	-	-	-	-	878	779	-	710	672	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1460	-	-	1274	-	-	542	512	752	524	523	945
Mov Cap-2 Maneuver	-	-	-	-	-	-	542	512	-	524	523	-
Stage 1	-	-	-	-	-	-	718	672	-	878	787	-
Stage 2	-	-	-	-	-	-	870	774	-	692	672	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.5	10.3	13.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	698	1460	-	-	1274	-	-	528
HCM Lane V/C Ratio	0.031	0.001	-	-	0.006	-	-	0.156
HCM Control Delay (s)	10.3	7.5	-	-	7.8	-	-	13.1
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	24	49	2	5	48	446	112	11	286	6
Future Volume (veh/h)	1	1	24	49	2	5	48	446	112	11	286	6
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.98	0.98		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1748	1800	1800	1800	1800	1872	1800	1782	1872
Adj Flow Rate, veh/h	1	1	26	53	2	5	52	480	120	12	308	6
Adj No. of Lanes	1	1	0	1	1	0	1	1	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	3	0	0	0	0	0	0	1	0
Cap, veh/h	297	8	203	273	63	157	779	1151	1017	578	1084	968
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.06	0.64	0.64	0.03	0.61	0.61
Sat Flow, veh/h	1406	56	1457	1342	451	1127	1714	1800	1591	1714	1782	1591
Grp Volume(v), veh/h	1	0	27	53	0	7	52	480	120	12	308	6
Grp Sat Flow(s),veh/h/ln	1406	0	1513	1342	0	1578	1714	1800	1591	1714	1782	1591
Q Serve(g_s), s	0.0	0.0	1.1	2.4	0.0	0.3	0.7	8.8	2.0	0.2	5.5	0.1
Cycle Q Clear(g_c), s	0.3	0.0	1.1	3.5	0.0	0.3	0.7	8.8	2.0	0.2	5.5	0.1
Prop In Lane	1.00		0.96	1.00		0.71	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	297	0	210	273	0	219	779	1151	1017	578	1084	968
V/C Ratio(X)	0.00	0.00	0.13	0.19	0.00	0.03	0.07	0.42	0.12	0.02	0.28	0.01
Avail Cap(c_a), veh/h	524	0	455	489	0	474	954	1151	1017	808	1084	968
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.2	0.0	25.5	26.9	0.0	25.1	4.1	6.0	4.7	4.8	6.2	5.2
Incr Delay (d2), s/veh	0.0	0.0	0.3	0.3	0.0	0.1	0.0	1.1	0.2	0.0	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.5	0.9	0.0	0.1	0.3	4.6	0.9	0.1	2.9	0.0
LnGrp Delay(d),s/veh	25.2	0.0	25.7	27.3	0.0	25.2	4.1	7.1	5.0	4.8	6.9	5.2
LnGrp LOS	C		C	C		C	A	A	A	A	A	A
Approach Vol, veh/h		28			60			652			326	
Approach Delay, s/veh		25.7			27.0			6.5			6.8	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.0	47.1		14.2	8.1	45.0		14.2
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	10.0	40.0		20.0	10.0	40.0		20.0
Max Q Clear Time (g_c+I1), s	2.2	10.8		5.5	2.7	7.5		3.1
Green Ext Time (p_c), s	0.0	6.5		0.3	0.0	6.6		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	8.2
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	92	52	189	153	49	64	269	330	374	52	264	49
Future Volume (veh/h)	92	52	189	153	49	64	269	330	374	52	264	49
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1588	1588	1588	1588	1652	1685	1543	1605	1543	1543	1543	1620
Adj Flow Rate, veh/h	100	57	205	166	53	70	292	359	407	57	287	53
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	5	5	5
Cap, veh/h	424	334	282	458	161	213	537	655	535	334	732	133
Arrive On Green	0.08	0.21	0.21	0.12	0.25	0.24	0.17	0.41	0.41	0.06	0.30	0.30
Sat Flow, veh/h	1513	1588	1340	1513	644	851	1469	1605	1310	1469	2475	451
Grp Volume(v), veh/h	100	57	205	166	0	123	292	359	407	57	168	172
Grp Sat Flow(s),veh/h/ln	1513	1588	1340	1513	0	1495	1469	1605	1310	1469	1466	1460
Q Serve(g_s), s	3.6	2.1	10.2	5.8	0.0	4.8	8.9	12.2	19.0	1.9	6.5	6.7
Cycle Q Clear(g_c), s	3.6	2.1	10.2	5.8	0.0	4.8	8.9	12.2	19.0	1.9	6.5	6.7
Prop In Lane	1.00		1.00	1.00		0.57	1.00		1.00	1.00		0.31
Lane Grp Cap(c), veh/h	424	334	282	458	0	374	537	655	535	334	434	432
V/C Ratio(X)	0.24	0.17	0.73	0.36	0.00	0.33	0.54	0.55	0.76	0.17	0.39	0.40
Avail Cap(c_a), veh/h	657	579	489	632	0	545	632	923	754	594	843	839
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.4	23.0	26.2	17.3	0.0	22.0	12.1	16.1	18.1	15.5	20.0	20.0
Incr Delay (d2), s/veh	0.3	0.2	3.6	0.5	0.0	0.5	0.9	1.0	3.8	0.2	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.9	4.0	2.4	0.0	2.0	3.6	5.6	7.4	0.8	2.7	2.8
LnGrp Delay(d),s/veh	19.7	23.3	29.8	17.7	0.0	22.5	12.9	17.1	21.9	15.8	20.8	20.9
LnGrp LOS	B	C	C	B		C	B	B	C	B	C	C
Approach Vol, veh/h		362			289			1058			397	
Approach Delay, s/veh		26.0			19.8			17.8			20.1	
Approach LOS		C			B			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.4	33.1	9.0	21.8	15.4	25.1	11.8	19.0
Change Period (Y+Rc), s	4.0	4.9	4.0	4.5	4.0	4.9	4.0	4.5
Max Green Setting (Gmax), s	16.0	40.1	16.0	25.5	16.0	40.1	16.0	25.5
Max Q Clear Time (g_c+I1), s	3.9	21.0	5.6	6.8	10.9	8.7	7.8	12.2
Green Ext Time (p_c), s	0.1	7.1	0.2	1.6	0.5	8.5	0.4	1.4

Intersection Summary	
HCM 2010 Ctrl Delay	19.9
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	2	72	1	2	9	152	1200	1	6	528	81
Future Volume (veh/h)	22	2	72	1	2	9	152	1200	1	6	528	81
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1765	1765	1800	1765	1765	1714	1714	1714	1714	1714	1714
Adj Flow Rate, veh/h	23	2	77	1	2	10	162	1277	1	6	562	86
Adj No. of Lanes	0	1	1	0	1	1	1	1	1	1	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	5	5	5
Cap, veh/h	384	28	303	160	260	302	496	1119	950	131	1119	948
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.65	0.65	0.65	0.65	0.65	0.65
Sat Flow, veh/h	1278	139	1500	358	1284	1490	757	1714	1455	419	1714	1453
Grp Volume(v), veh/h	25	0	77	3	0	10	162	1277	1	6	562	86
Grp Sat Flow(s),veh/h/ln	1416	0	1500	1642	0	1490	757	1714	1455	419	1714	1453
Q Serve(g_s), s	0.6	0.0	2.4	0.0	0.0	0.3	7.8	36.0	0.0	0.0	9.3	1.2
Cycle Q Clear(g_c), s	0.7	0.0	2.4	0.1	0.0	0.3	17.1	36.0	0.0	36.0	9.3	1.2
Prop In Lane	0.92		1.00	0.33		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	412	0	303	419	0	302	496	1119	950	131	1119	948
V/C Ratio(X)	0.06	0.00	0.25	0.01	0.00	0.03	0.33	1.14	0.00	0.05	0.50	0.09
Avail Cap(c_a), veh/h	791	0	707	845	0	703	496	1119	950	131	1119	948
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.8	0.0	18.5	17.6	0.0	17.7	9.4	9.6	3.3	27.6	5.0	3.5
Incr Delay (d2), s/veh	0.1	0.0	0.4	0.0	0.0	0.0	1.7	74.7	0.0	0.7	1.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	1.0	0.0	0.0	0.1	1.9	39.7	0.0	0.1	4.9	0.5
LnGrp Delay(d),s/veh	17.9	0.0	18.9	17.6	0.0	17.7	11.1	84.3	3.3	28.2	6.6	3.7
LnGrp LOS	B		B	B		B	B	F	A	C	A	A
Approach Vol, veh/h		102			13			1440			654	
Approach Delay, s/veh		18.7			17.7			76.0			6.4	
Approach LOS		B			B			E			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		40.0		15.2		40.0		15.2
Change Period (Y+Rc), s		4.9		* 4.2		4.9		* 4.2
Max Green Setting (Gmax), s		35.1		* 26		35.1		* 26
Max Q Clear Time (g_c+I1), s		38.0		2.3		38.0		4.4
Green Ext Time (p_c), s		0.0		0.4		0.0		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	52.4
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (veh/h)	172	465	644	1310	598	93
Future Volume (veh/h)	172	465	644	1310	598	93
Number	1	6	2	12	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	0.99	1.00	1.00
Adj Sat Flow, veh/h/ln	1714	1714	1714	1714	1714	1800
Adj Flow Rate, veh/h	183	495	685	0	636	0
Adj No. of Lanes	1	2	2	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	5	5	5	5	5	0
Cap, veh/h	459	1796	1796	797	947	417
Arrive On Green	0.55	0.55	0.55	0.00	0.29	0.00
Sat Flow, veh/h	731	3343	3343	1445	3265	1530
Grp Volume(v), veh/h	183	495	685	0	636	0
Grp Sat Flow(s),veh/h/ln	731	1629	1629	1445	1633	1530
Q Serve(g_s), s	9.6	4.1	6.0	0.0	8.7	0.0
Cycle Q Clear(g_c), s	15.6	4.1	6.0	0.0	8.7	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	459	1796	1796	797	947	417
V/C Ratio(X)	0.40	0.28	0.38	0.00	0.67	0.00
Avail Cap(c_a), veh/h	649	2644	2644	1173	2004	912
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	10.9	6.0	6.4	0.0	15.8	0.0
Incr Delay (d2), s/veh	0.7	0.1	0.2	0.0	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	1.8	2.7	0.0	4.0	0.0
LnGrp Delay(d),s/veh	11.5	6.1	6.6	0.0	16.6	0.0
LnGrp LOS	B	A	A		B	
Approach Vol, veh/h		678	685		636	
Approach Delay, s/veh		7.6	6.6		16.6	
Approach LOS		A	A		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		31.9				31.9		18.7
Change Period (Y+Rc), s		4.9				4.9		4.9
Max Green Setting (Gmax), s		40.1				40.1		30.1
Max Q Clear Time (g_c+I1), s		8.0				17.6		10.7
Green Ext Time (p_c), s		10.7				9.4		3.1

Intersection Summary	
HCM 2010 Ctrl Delay	10.1
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	979	104	145	1456	18	430	111	128	40	50	36
Future Volume (veh/h)	39	979	104	145	1456	18	430	111	128	40	50	36
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1766	1800	1731	1800	1800	1800	1850	1872	1800	1872	1872
Adj Flow Rate, veh/h	41	1020	108	151	1517	19	348	255	133	42	52	38
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	2	4	0	0	0	0	0	0	0	0
Cap, veh/h	97	1165	123	181	1490	19	450	299	156	186	107	78
Arrive On Green	0.06	0.38	0.37	0.11	0.43	0.42	0.26	0.26	0.24	0.11	0.11	0.09
Sat Flow, veh/h	1714	3062	324	1648	3459	43	1714	1140	594	1714	986	721
Grp Volume(v), veh/h	41	559	569	151	749	787	348	0	388	42	0	90
Grp Sat Flow(s),veh/h/ln	1714	1678	1708	1648	1710	1792	1714	0	1734	1714	0	1707
Q Serve(g_s), s	2.5	32.9	33.0	9.6	45.8	45.8	20.0	0.0	22.7	2.4	0.0	5.3
Cycle Q Clear(g_c), s	2.5	32.9	33.0	9.6	45.8	45.8	20.0	0.0	22.7	2.4	0.0	5.3
Prop In Lane	1.00		0.19	1.00		0.02	1.00		0.34	1.00		0.42
Lane Grp Cap(c), veh/h	97	638	650	181	737	772	450	0	455	186	0	185
V/C Ratio(X)	0.42	0.88	0.88	0.84	1.02	1.02	0.77	0.00	0.85	0.23	0.00	0.49
Avail Cap(c_a), veh/h	258	716	729	248	737	772	514	0	520	353	0	351
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	48.5	30.6	30.8	46.4	30.3	30.3	36.3	0.0	37.6	43.3	0.0	45.0
Incr Delay (d2), s/veh	1.1	10.0	9.9	12.2	37.6	37.2	5.3	0.0	10.6	0.2	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	17.0	17.3	5.0	29.2	30.5	10.1	0.0	12.2	1.1	0.0	2.5
LnGrp Delay(d),s/veh	49.6	40.7	40.7	58.7	67.9	67.5	41.6	0.0	48.2	43.6	0.0	45.7
LnGrp LOS	D	D	D	E	F	F	D		D	D		D
Approach Vol, veh/h		1169			1687			736			132	
Approach Delay, s/veh		41.0			66.9			45.1			45.0	
Approach LOS		D			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.0	50.7		31.0	15.7	45.1		14.7
Change Period (Y+Rc), s	4.0	6.0		5.0	4.0	6.0		5.0
Max Green Setting (Gmax), s	16.0	44.0		30.0	16.0	44.0		20.0
Max Q Clear Time (g_c+I1), s	4.5	47.8		24.7	11.6	35.0		7.3
Green Ext Time (p_c), s	0.0	0.0		1.4	0.1	4.1		0.3

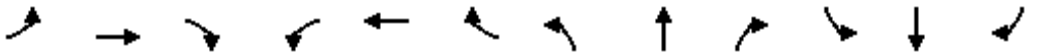
Intersection Summary	
HCM 2010 Ctrl Delay	53.7
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	722	122	225	1490	0	0	0	0	224	580	400
Future Volume (vph)	0	722	122	225	1490	0	0	0	0	224	580	400
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	12	12	11	12	12	12	12	12	13	12	13
Total Lost time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95		1.00	0.95					1.00	0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	0.98
Flpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	1.00
Frt		0.98		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3192		1605	3353					1716	3307	1524
Flt Permitted		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3192		1605	3353					1716	3307	1524
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	737	124	230	1520	0	0	0	0	229	592	408
RTOR Reduction (vph)	0	14	0	0	0	0	0	0	0	0	0	53
Lane Group Flow (vph)	0	847	0	230	1520	0	0	0	0	229	592	355
Confl. Peds. (#/hr)			3	3					1			4
Heavy Vehicles (%)	0%	4%	5%	3%	2%	0%	2%	2%	2%	3%	3%	2%
Bus Blockages (#/hr)	0	2	0	0	0	0	0	0	0	0	2	0
Turn Type		NA		Prot	NA					Perm	NA	Perm
Protected Phases		5		6	2						4	
Permitted Phases										4		4
Actuated Green, G (s)		37.7		20.1	62.7					27.8	27.8	27.8
Effective Green, g (s)		38.6		21.0	63.6					28.4	28.4	28.4
Actuated g/C Ratio		0.39		0.21	0.64					0.28	0.28	0.28
Clearance Time (s)		4.9		4.9	4.9					4.6	4.6	4.6
Vehicle Extension (s)		3.0		2.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1232		337	2132					487	939	432
v/s Ratio Prot		0.27		0.14	c0.45						0.18	
v/s Ratio Perm										0.13		c0.23
v/c Ratio		0.69		0.68	0.71					0.47	0.63	0.82
Uniform Delay, d1		25.7		36.4	12.1					29.6	31.2	33.4
Progression Factor		1.00		0.82	0.43					0.89	0.90	0.89
Incremental Delay, d2		3.1		1.8	0.8					0.7	1.3	11.6
Delay (s)		28.8		31.6	6.1					27.0	29.5	41.3
Level of Service		C		C	A					C	C	D
Approach Delay (s)		28.8			9.5			0.0			32.9	
Approach LOS		C			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	331	956	0	0	1086	222	422	933	176	0	0	0
Future Volume (vph)	331	956	0	0	1086	222	422	933	176	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0				
Lane Util. Factor	1.00	0.95			0.95		0.86	*0.80				
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00				
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.97		1.00	0.98				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1621	3288			3257		1454	4156				
Flt Permitted	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	1621	3288			3257		1454	4156				
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	341	986	0	0	1120	229	435	962	181	0	0	0
RTOR Reduction (vph)	0	0	0	0	17	0	0	21	0	0	0	0
Lane Group Flow (vph)	341	986	0	0	1332	0	387	1170	0	0	0	0
Confl. Peds. (#/hr)			2			4	1					1
Confl. Bikes (#/hr)						1			2			
Heavy Vehicles (%)	2%	4%	0%	0%	2%	2%	1%	1%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	4	0	0	0	0	0	0
Turn Type	Prot	NA			NA		Perm	NA				
Protected Phases	2	6			1			4				
Permitted Phases							4					
Actuated Green, G (s)	20.1	63.1			38.1		27.4	27.4				
Effective Green, g (s)	21.0	64.0			39.0		28.0	28.0				
Actuated g/C Ratio	0.21	0.64			0.39		0.28	0.28				
Clearance Time (s)	4.9	4.9			4.9		4.6	4.6				
Vehicle Extension (s)	2.0	3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)	340	2104			1270		407	1163				
v/s Ratio Prot	c0.21	0.30			c0.41							
v/s Ratio Perm							0.27	0.28				
v/c Ratio	1.00	0.47			1.05		0.95	1.01				
Uniform Delay, d1	39.5	9.3			30.5		35.3	36.0				
Progression Factor	1.16	1.04			1.00		1.00	1.00				
Incremental Delay, d2	47.1	0.7			39.1		32.1	27.9				
Delay (s)	92.9	10.3			69.6		67.4	63.9				
Level of Service	F	B			E		E	E				
Approach Delay (s)		31.5			69.6			64.8			0.0	
Approach LOS		C			E			E			A	

Intersection Summary			
HCM 2000 Control Delay	55.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.8%	ICU Level of Service	F
Analysis Period (min)	15		
Description: Count Date 7/20/09			

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	1	95	155	47	24	1
Future Vol, veh/h	1	95	155	47	24	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	75	-	-	-	0	-
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	2	2	2
Mvmt Flow	1	103	168	51	26	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	220	0	-	0	299	194
Stage 1	-	-	-	-	194	-
Stage 2	-	-	-	-	105	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1349	-	-	-	692	847
Stage 1	-	-	-	-	839	-
Stage 2	-	-	-	-	919	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1349	-	-	-	691	847
Mov Cap-2 Maneuver	-	-	-	-	713	-
Stage 1	-	-	-	-	839	-
Stage 2	-	-	-	-	918	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1349	-	-	-	718
HCM Lane V/C Ratio	0.001	-	-	-	0.038
HCM Control Delay (s)	7.7	-	-	-	10.2
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	1	116	3	7	199	70	3	1	17	36	1	1
Future Vol, veh/h	1	116	3	7	199	70	3	1	17	36	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	122	3	7	209	74	3	1	18	38	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	283	0	0	125	0	0	388	424	124	396	388	246
Stage 1	-	-	-	-	-	-	126	126	-	261	261	-
Stage 2	-	-	-	-	-	-	262	298	-	135	127	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1279	-	-	1462	-	-	571	522	927	564	547	793
Stage 1	-	-	-	-	-	-	878	792	-	744	692	-
Stage 2	-	-	-	-	-	-	743	667	-	868	791	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1279	-	-	1462	-	-	567	519	927	550	544	793
Mov Cap-2 Maneuver	-	-	-	-	-	-	567	519	-	550	544	-
Stage 1	-	-	-	-	-	-	877	791	-	743	689	-
Stage 2	-	-	-	-	-	-	737	664	-	849	790	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	9.5	12
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	822	1279	-	-	1462	-	-	554
HCM Lane V/C Ratio	0.027	0.001	-	-	0.005	-	-	0.072
HCM Control Delay (s)	9.5	7.8	-	-	7.5	-	-	12
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	26	57	182	14	21	13	178	144	31	388	3
Future Volume (veh/h)	5	26	57	182	14	21	13	178	144	31	388	3
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1748	1800	1800	1800	1800	1872	1800	1782	1872
Adj Flow Rate, veh/h	7	36	78	249	19	29	18	244	197	42	532	4
Adj No. of Lanes	1	1	0	1	1	0	1	1	1	1	1	1
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Percent Heavy Veh, %	0	0	0	3	0	0	0	0	0	0	1	0
Cap, veh/h	415	130	283	345	166	253	454	944	834	611	966	863
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.03	0.52	0.52	0.05	0.54	0.54
Sat Flow, veh/h	1367	504	1091	1252	640	977	1714	1800	1591	1714	1782	1591
Grp Volume(v), veh/h	7	0	114	249	0	48	18	244	197	42	532	4
Grp Sat Flow(s),veh/h/ln	1367	0	1595	1252	0	1616	1714	1800	1591	1714	1782	1591
Q Serve(g_s), s	0.3	0.0	4.5	15.5	0.0	1.8	0.4	5.8	5.2	0.8	15.2	0.1
Cycle Q Clear(g_c), s	2.1	0.0	4.5	19.9	0.0	1.8	0.4	5.8	5.2	0.8	15.2	0.1
Prop In Lane	1.00		0.68	1.00		0.60	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	415	0	413	345	0	419	454	944	834	611	966	863
V/C Ratio(X)	0.02	0.00	0.28	0.72	0.00	0.11	0.04	0.26	0.24	0.07	0.55	0.00
Avail Cap(c_a), veh/h	415	0	413	345	0	419	638	944	834	765	966	863
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.9	0.0	23.1	31.0	0.0	22.1	9.0	10.2	10.1	7.5	11.7	8.2
Incr Delay (d2), s/veh	0.0	0.0	0.4	7.2	0.0	0.1	0.0	0.7	0.7	0.0	2.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	2.0	6.0	0.0	0.8	0.2	3.0	2.5	0.4	8.0	0.0
LnGrp Delay(d),s/veh	22.9	0.0	23.5	38.2	0.0	22.2	9.0	10.9	10.7	7.5	13.9	8.2
LnGrp LOS	C		C	D		C	A	B	B	A	B	A
Approach Vol, veh/h		121			297			459			578	
Approach Delay, s/veh		23.4			35.6			10.7			13.4	
Approach LOS		C			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.0	45.0		25.0	6.6	46.4		25.0
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	10.0	40.0		20.0	10.0	40.0		20.0
Max Q Clear Time (g_c+I1), s	2.8	7.8		21.9	2.4	17.2		6.5
Green Ext Time (p_c), s	0.0	7.3		0.0	0.0	6.7		1.9

Intersection Summary	
HCM 2010 Ctrl Delay	17.9
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	69	410	256	32	40	101	131	93	34	573	44
Future Volume (veh/h)	57	69	410	256	32	40	101	131	93	34	573	44
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1588	1588	1588	1588	1652	1685	1543	1605	1543	1543	1543	1620
Adj Flow Rate, veh/h	62	75	446	278	35	43	110	142	101	37	623	48
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	5	5	5
Cap, veh/h	508	471	399	518	268	330	267	547	446	421	845	65
Arrive On Green	0.05	0.30	0.30	0.15	0.40	0.39	0.08	0.34	0.34	0.04	0.31	0.31
Sat Flow, veh/h	1513	1588	1343	1513	674	828	1469	1605	1310	1469	2757	212
Grp Volume(v), veh/h	62	75	446	278	0	78	110	142	101	37	331	340
Grp Sat Flow(s),veh/h/ln	1513	1588	1343	1513	0	1502	1469	1605	1310	1469	1466	1504
Q Serve(g_s), s	2.4	3.1	26.0	10.4	0.0	2.9	4.2	5.6	4.8	1.5	17.7	17.8
Cycle Q Clear(g_c), s	2.4	3.1	26.0	10.4	0.0	2.9	4.2	5.6	4.8	1.5	17.7	17.8
Prop In Lane	1.00		1.00	1.00		0.55	1.00		1.00	1.00		0.14
Lane Grp Cap(c), veh/h	508	471	399	518	0	598	267	547	446	421	449	461
V/C Ratio(X)	0.12	0.16	1.12	0.54	0.00	0.13	0.41	0.26	0.23	0.09	0.74	0.74
Avail Cap(c_a), veh/h	717	471	399	573	0	598	435	751	613	639	686	704
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.5	22.7	30.8	15.2	0.0	16.8	19.3	20.9	20.6	19.0	27.2	27.2
Incr Delay (d2), s/veh	0.1	0.2	81.5	0.9	0.0	0.1	1.0	0.4	0.4	0.1	3.4	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	1.4	18.6	4.4	0.0	1.2	1.8	2.5	1.8	0.6	7.6	7.8
LnGrp Delay(d),s/veh	19.6	22.9	112.3	16.1	0.0	16.9	20.3	21.2	21.0	19.1	30.6	30.5
LnGrp LOS	B	C	F	B		B	C	C	C	B	C	C
Approach Vol, veh/h		583			356			353			708	
Approach Delay, s/veh		90.9			16.3			20.9			30.0	
Approach LOS		F			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	33.9	7.9	38.9	10.0	30.8	16.8	30.0
Change Period (Y+Rc), s	4.0	4.9	4.0	4.5	4.0	4.9	4.0	4.5
Max Green Setting (Gmax), s	16.0	40.1	16.0	25.5	16.0	40.1	16.0	25.5
Max Q Clear Time (g_c+I1), s	3.5	7.6	4.4	4.9	6.2	19.8	12.4	28.0
Green Ext Time (p_c), s	0.0	6.5	0.1	2.9	0.2	5.7	0.4	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	43.7
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	1	144	1	2	5	38	412	1	4	1138	81
Future Volume (veh/h)	36	1	144	1	2	5	38	412	1	4	1138	81
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1765	1765	1800	1765	1765	1714	1714	1714	1714	1714	1714
Adj Flow Rate, veh/h	40	1	160	1	2	6	42	458	1	4	1264	90
Adj No. of Lanes	0	1	1	0	1	1	1	1	1	1	1	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	5	5	5
Cap, veh/h	347	7	234	140	206	232	138	1184	1005	659	1184	1003
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.69	0.69	0.69	0.69	0.69	0.69
Sat Flow, veh/h	1349	45	1500	309	1318	1486	389	1714	1455	902	1714	1453
Grp Volume(v), veh/h	41	0	160	3	0	6	42	458	1	4	1264	90
Grp Sat Flow(s),veh/h/ln	1394	0	1500	1627	0	1486	389	1714	1455	902	1714	1453
Q Serve(g_s), s	1.3	0.0	5.3	0.0	0.0	0.2	0.0	5.9	0.0	0.1	36.0	1.1
Cycle Q Clear(g_c), s	1.3	0.0	5.3	0.1	0.0	0.2	36.0	5.9	0.0	6.0	36.0	1.1
Prop In Lane	0.98		1.00	0.33		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	354	0	234	346	0	232	138	1184	1005	659	1184	1003
V/C Ratio(X)	0.12	0.00	0.68	0.01	0.00	0.03	0.30	0.39	0.00	0.01	1.07	0.09
Avail Cap(c_a), veh/h	832	0	748	872	0	741	138	1184	1005	659	1184	1003
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.1	0.0	20.8	18.6	0.0	18.6	26.1	3.4	2.5	4.7	8.1	2.7
Incr Delay (d2), s/veh	0.1	0.0	3.5	0.0	0.0	0.0	5.6	1.0	0.0	0.0	46.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	2.4	0.0	0.0	0.1	0.8	3.0	0.0	0.0	31.7	0.5
LnGrp Delay(d),s/veh	19.3	0.0	24.3	18.6	0.0	18.7	31.7	4.4	2.5	4.7	54.3	2.8
LnGrp LOS	B		C	B		B	C	A	A	A	F	A
Approach Vol, veh/h		201			9			501			1358	
Approach Delay, s/veh		23.3			18.7			6.6			50.8	
Approach LOS		C			B			A			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		40.0		12.1		40.0		12.1
Change Period (Y+Rc), s		4.9		* 4.2		4.9		* 4.2
Max Green Setting (Gmax), s		35.1		* 26		35.1		* 26
Max Q Clear Time (g_c+I1), s		38.0		2.2		38.0		7.3
Green Ext Time (p_c), s		0.0		0.9		0.0		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	37.3
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (veh/h)	90	530	337	348	1483	73
Future Volume (veh/h)	90	530	337	348	1483	73
Number	1	6	2	12	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	0.99	1.00	1.00
Adj Sat Flow, veh/h/ln	1714	1714	1714	1714	1714	1800
Adj Flow Rate, veh/h	100	589	374	0	1648	0
Adj No. of Lanes	1	2	2	1	2	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	5	5	5	5	5	0
Cap, veh/h	397	1144	1144	508	1620	733
Arrive On Green	0.35	0.35	0.35	0.00	0.50	0.00
Sat Flow, veh/h	974	3343	3343	1445	3265	1530
Grp Volume(v), veh/h	100	589	374	0	1648	0
Grp Sat Flow(s),veh/h/ln	974	1629	1629	1445	1633	1530
Q Serve(g_s), s	4.4	7.5	4.4	0.0	26.0	0.0
Cycle Q Clear(g_c), s	8.8	7.5	4.4	0.0	26.0	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	397	1144	1144	508	1620	733
V/C Ratio(X)	0.25	0.52	0.33	0.00	1.02	0.00
Avail Cap(c_a), veh/h	724	2238	2238	993	1620	733
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	15.7	13.5	12.5	0.0	13.2	0.0
Incr Delay (d2), s/veh	0.4	0.4	0.2	0.0	26.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	3.4	2.0	0.0	17.5	0.0
LnGrp Delay(d),s/veh	16.1	13.9	12.7	0.0	39.9	0.0
LnGrp LOS	B	B	B		F	
Approach Vol, veh/h		689	374		1648	
Approach Delay, s/veh		14.2	12.7		39.9	
Approach LOS		B	B		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		22.4				22.4		30.0
Change Period (Y+Rc), s		4.9				4.9		4.9
Max Green Setting (Gmax), s		35.1				35.1		25.1
Max Q Clear Time (g_c+I1), s		6.4				10.8		28.0
Green Ext Time (p_c), s		7.0				6.7		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	29.6
HCM 2010 LOS	C

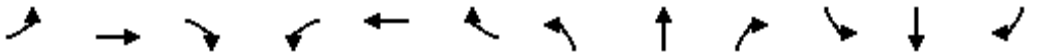
Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	1506	214	157	621	28	170	24	101	80	117	34
Future Volume (veh/h)	32	1506	214	157	621	28	170	24	101	80	117	34
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1767	1800	1731	1800	1800	1800	1833	1872	1800	1872	1872
Adj Flow Rate, veh/h	34	1619	230	169	668	30	159	60	109	86	126	37
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	2	2	4	0	0	0	0	0	0	0	0
Cap, veh/h	444	1391	194	221	1682	76	270	90	164	242	195	57
Arrive On Green	0.06	0.47	0.46	0.09	0.50	0.49	0.16	0.16	0.14	0.14	0.14	0.12
Sat Flow, veh/h	1714	2959	412	1648	3334	150	1714	573	1041	1714	1380	405
Grp Volume(v), veh/h	34	905	944	169	342	356	159	0	169	86	0	163
Grp Sat Flow(s),veh/h/ln	1714	1679	1693	1648	1710	1773	1714	0	1614	1714	0	1785
Q Serve(g_s), s	1.1	50.4	50.4	6.2	13.3	13.3	9.2	0.0	10.6	4.9	0.0	9.3
Cycle Q Clear(g_c), s	1.1	50.4	50.4	6.2	13.3	13.3	9.2	0.0	10.6	4.9	0.0	9.3
Prop In Lane	1.00		0.24	1.00		0.08	1.00		0.64	1.00		0.23
Lane Grp Cap(c), veh/h	444	789	796	221	863	895	270	0	254	242	0	252
V/C Ratio(X)	0.08	1.15	1.19	0.77	0.40	0.40	0.59	0.00	0.66	0.36	0.00	0.65
Avail Cap(c_a), veh/h	524	789	796	236	863	895	430	0	405	350	0	365
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.4	28.4	28.6	27.3	16.5	16.5	41.9	0.0	43.1	41.6	0.0	43.7
Incr Delay (d2), s/veh	0.0	80.5	96.5	11.4	0.1	0.1	0.8	0.0	1.1	0.3	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	40.9	44.8	5.5	6.3	6.6	4.4	0.0	4.8	2.3	0.0	4.7
LnGrp Delay(d),s/veh	13.4	108.9	125.1	38.7	16.6	16.6	42.7	0.0	44.2	42.0	0.0	44.8
LnGrp LOS	B	F	F	D	B	B	D		D	D		D
Approach Vol, veh/h		1883			867			328			249	
Approach Delay, s/veh		115.3			20.9			43.5			43.8	
Approach LOS		F			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.0	59.0		20.0	14.0	55.0		18.2
Change Period (Y+Rc), s	4.0	6.0		5.0	4.0	6.0		5.0
Max Green Setting (Gmax), s	11.0	49.0		25.0	11.0	49.0		20.0
Max Q Clear Time (g_c+I1), s	3.1	15.3		12.6	8.2	52.4		11.3
Green Ext Time (p_c), s	0.0	9.1		0.8	0.1	0.0		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	78.3
HCM 2010 LOS	E

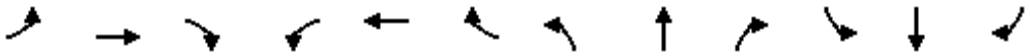
Notes



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1004	247	111	574	0	0	0	0	322	697	415
Future Volume (vph)	0	1004	247	111	574	0	0	0	0	322	697	415
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	12	12	11	12	12	12	12	12	13	12	13
Total Lost time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95		1.00	0.95					1.00	0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	0.98
Flpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	1.00
Frt		0.97		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3162		1605	3353					1716	3307	1523
Flt Permitted		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3162		1605	3353					1716	3307	1523
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	1080	266	119	617	0	0	0	0	346	749	446
RTOR Reduction (vph)	0	22	0	0	0	0	0	0	0	0	0	162
Lane Group Flow (vph)	0	1324	0	119	617	0	0	0	0	346	749	284
Confl. Peds. (#/hr)			3	3					1			4
Heavy Vehicles (%)	0%	4%	5%	3%	2%	0%	2%	2%	2%	3%	3%	2%
Bus Blockages (#/hr)	0	2	0	0	0	0	0	0	0	0	2	0
Turn Type		NA		Prot	NA					Perm	NA	Perm
Protected Phases		5		6	2						4	
Permitted Phases										4		4
Actuated Green, G (s)		37.6		9.1	51.6					28.9	28.9	28.9
Effective Green, g (s)		38.5		10.0	52.5					29.5	29.5	29.5
Actuated g/C Ratio		0.43		0.11	0.58					0.33	0.33	0.33
Clearance Time (s)		4.9		4.9	4.9					4.6	4.6	4.6
Vehicle Extension (s)		3.0		2.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1352		178	1955					562	1083	499
v/s Ratio Prot		c0.42		c0.07	0.18						c0.23	
v/s Ratio Perm										0.20		0.19
v/c Ratio		0.98		0.67	0.32					0.62	0.69	0.57
Uniform Delay, d1		25.4		38.4	9.6					25.5	26.3	25.0
Progression Factor		1.00		0.95	0.44					0.84	0.86	0.78
Incremental Delay, d2		20.0		6.9	0.4					1.9	1.8	1.4
Delay (s)		45.3		43.2	4.6					23.4	24.4	20.9
Level of Service		D		D	A					C	C	C
Approach Delay (s)		45.3			10.9			0.0			23.2	
Approach LOS		D			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	276	1250	0	0	556	83	26	490	149	0	0	0
Future Volume (vph)	276	1250	0	0	556	83	26	490	149	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0				
Lane Util. Factor	1.00	0.95			0.95		0.86	*0.80				
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00				
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.98		1.00	0.97				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1621	3288			3280		1454	4105				
Flt Permitted	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	1621	3288			3280		1454	4105				
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	297	1344	0	0	598	89	28	527	160	0	0	0
RTOR Reduction (vph)	0	0	0	0	12	0	0	44	0	0	0	0
Lane Group Flow (vph)	297	1344	0	0	675	0	25	646	0	0	0	0
Confl. Peds. (#/hr)			2			4	1					1
Confl. Bikes (#/hr)						1			2			
Heavy Vehicles (%)	2%	4%	0%	0%	2%	2%	1%	1%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	4	0	0	0	0	0	0
Turn Type	Prot	NA			NA		Perm	NA				
Protected Phases	2	6			1			4				
Permitted Phases							4					
Actuated Green, G (s)	24.1	59.8			30.8		20.7	20.7				
Effective Green, g (s)	25.0	60.7			31.7		21.3	21.3				
Actuated g/C Ratio	0.28	0.67			0.35		0.24	0.24				
Clearance Time (s)	4.9	4.9			4.9		4.6	4.6				
Vehicle Extension (s)	2.0	3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)	450	2217			1155		344	971				
v/s Ratio Prot	0.18	c0.41			0.21							
v/s Ratio Perm							0.02	0.16				
v/c Ratio	0.66	0.61			0.58		0.07	0.67				
Uniform Delay, d1	28.7	8.1			23.8		26.7	31.1				
Progression Factor	0.76	0.39			1.00		1.00	1.00				
Incremental Delay, d2	0.3	0.1			2.2		0.1	1.7				
Delay (s)	22.1	3.2			25.9		26.8	32.9				
Level of Service	C	A			C		C	C				
Approach Delay (s)		6.7			25.9			32.6			0.0	
Approach LOS		A			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		
Description: Count Date 7/20/09			

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	1	173	54	20	99	2
Future Vol, veh/h	1	173	54	20	99	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	75	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	234	73	27	134	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	100	0	-	0	322	86
Stage 1	-	-	-	-	86	-
Stage 2	-	-	-	-	236	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1493	-	-	-	672	973
Stage 1	-	-	-	-	937	-
Stage 2	-	-	-	-	803	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1493	-	-	-	672	973
Mov Cap-2 Maneuver	-	-	-	-	693	-
Stage 1	-	-	-	-	937	-
Stage 2	-	-	-	-	802	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1493	-	-	-	697
HCM Lane V/C Ratio	0.001	-	-	-	0.196
HCM Control Delay (s)	7.4	-	-	-	11.4
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.7

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	1	271	1	6	71	31	2	1	13	149	1	2
Future Vol, veh/h	1	271	1	6	71	31	2	1	13	149	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	74	74	74	74	74	74	74	74	74	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	366	1	8	96	42	3	1	18	201	1	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	138	0	0	368	0	0	505	524	367	512	503	117
Stage 1	-	-	-	-	-	-	370	370	-	133	133	-
Stage 2	-	-	-	-	-	-	135	154	-	379	370	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1446	-	-	1191	-	-	478	458	678	472	471	935
Stage 1	-	-	-	-	-	-	650	620	-	870	786	-
Stage 2	-	-	-	-	-	-	868	770	-	643	620	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1446	-	-	1191	-	-	473	455	678	456	468	935
Mov Cap-2 Maneuver	-	-	-	-	-	-	473	455	-	456	468	-
Stage 1	-	-	-	-	-	-	650	620	-	869	781	-
Stage 2	-	-	-	-	-	-	858	765	-	625	620	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.4	11	19
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	625	1446	-	-	1191	-	-	459
HCM Lane V/C Ratio	0.035	0.001	-	-	0.007	-	-	0.448
HCM Control Delay (s)	11	7.5	-	-	8	-	-	19
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	24	52	2	5	48	450	114	11	292	6
Future Volume (veh/h)	1	1	24	52	2	5	48	450	114	11	292	6
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.98	0.98		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1748	1800	1800	1800	1800	1872	1800	1782	1872
Adj Flow Rate, veh/h	1	1	26	56	2	5	52	484	123	12	314	6
Adj No. of Lanes	1	1	0	1	1	0	1	1	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	3	0	0	0	0	0	0	1	0
Cap, veh/h	299	8	205	274	63	158	772	1149	1016	573	1082	966
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.06	0.64	0.64	0.03	0.61	0.61
Sat Flow, veh/h	1406	56	1457	1342	451	1127	1714	1800	1591	1714	1782	1591
Grp Volume(v), veh/h	1	0	27	56	0	7	52	484	123	12	314	6
Grp Sat Flow(s),veh/h/ln	1406	0	1513	1342	0	1578	1714	1800	1591	1714	1782	1591
Q Serve(g_s), s	0.0	0.0	1.1	2.6	0.0	0.3	0.7	9.0	2.0	0.2	5.7	0.1
Cycle Q Clear(g_c), s	0.3	0.0	1.1	3.6	0.0	0.3	0.7	9.0	2.0	0.2	5.7	0.1
Prop In Lane	1.00		0.96	1.00		0.71	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	299	0	212	274	0	222	772	1149	1016	573	1082	966
V/C Ratio(X)	0.00	0.00	0.13	0.20	0.00	0.03	0.07	0.42	0.12	0.02	0.29	0.01
Avail Cap(c_a), veh/h	523	0	454	488	0	473	947	1149	1016	802	1082	966
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.1	0.0	25.4	26.9	0.0	25.1	4.1	6.0	4.8	4.9	6.3	5.2
Incr Delay (d2), s/veh	0.0	0.0	0.3	0.4	0.0	0.1	0.0	1.1	0.2	0.0	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.5	1.0	0.0	0.1	0.3	4.8	1.0	0.1	2.9	0.0
LnGrp Delay(d),s/veh	25.1	0.0	25.7	27.3	0.0	25.1	4.1	7.2	5.0	4.9	7.0	5.2
LnGrp LOS	C		C	C		C	A	A	A	A	A	A
Approach Vol, veh/h		28			63			659			332	
Approach Delay, s/veh		25.7			27.1			6.5			6.9	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.0	47.1		14.3	8.1	45.0		14.3
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	10.0	40.0		20.0	10.0	40.0		20.0
Max Q Clear Time (g_c+I1), s	2.2	11.0		5.6	2.7	7.7		3.1
Green Ext Time (p_c), s	0.0	6.6		0.3	0.0	6.8		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	8.3
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	97	63	229	153	68	64	339	330	374	52	264	58
Future Volume (veh/h)	97	63	229	153	68	64	339	330	374	52	264	58
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1588	1588	1588	1588	1652	1685	1543	1605	1543	1543	1543	1620
Adj Flow Rate, veh/h	105	68	249	166	74	70	368	359	407	57	287	63
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	5	5	5
Cap, veh/h	423	373	315	452	210	198	537	658	537	322	619	134
Arrive On Green	0.08	0.23	0.23	0.11	0.27	0.26	0.21	0.41	0.41	0.06	0.26	0.26
Sat Flow, veh/h	1513	1588	1341	1513	779	737	1469	1605	1310	1469	2395	518
Grp Volume(v), veh/h	105	68	249	166	0	144	368	359	407	57	174	176
Grp Sat Flow(s),veh/h/ln	1513	1588	1341	1513	0	1517	1469	1605	1310	1469	1466	1447
Q Serve(g_s), s	4.0	2.7	13.7	6.2	0.0	6.0	13.3	13.3	20.8	2.2	7.8	8.0
Cycle Q Clear(g_c), s	4.0	2.7	13.7	6.2	0.0	6.0	13.3	13.3	20.8	2.2	7.8	8.0
Prop In Lane	1.00		1.00	1.00		0.49	1.00		1.00	1.00		0.36
Lane Grp Cap(c), veh/h	423	373	315	452	0	408	537	658	537	322	379	374
V/C Ratio(X)	0.25	0.18	0.79	0.37	0.00	0.35	0.68	0.55	0.76	0.18	0.46	0.47
Avail Cap(c_a), veh/h	624	527	445	601	0	504	548	840	686	556	767	758
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.0	24.0	28.2	18.0	0.0	23.2	14.6	17.6	19.8	19.1	24.4	24.5
Incr Delay (d2), s/veh	0.3	0.2	6.3	0.5	0.0	0.5	3.4	1.0	4.4	0.3	1.2	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	1.2	5.6	2.6	0.0	2.6	5.7	6.1	8.1	0.9	3.3	3.4
LnGrp Delay(d),s/veh	20.3	24.2	34.4	18.5	0.0	23.7	18.0	18.6	24.2	19.4	25.7	25.8
LnGrp LOS	C	C	C	B		C	B	B	C	B	C	C
Approach Vol, veh/h		422			310			1134			407	
Approach Delay, s/veh		29.2			20.9			20.4			24.8	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.6	36.1	9.6	25.1	19.4	24.2	12.3	22.4
Change Period (Y+Rc), s	4.0	4.9	4.0	4.5	4.0	4.9	4.0	4.5
Max Green Setting (Gmax), s	16.0	40.1	16.0	25.5	16.0	40.1	16.0	25.5
Max Q Clear Time (g_c+I1), s	4.2	22.8	6.0	8.0	15.3	10.0	8.2	15.7
Green Ext Time (p_c), s	0.1	6.9	0.2	1.9	0.1	8.5	0.3	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	22.9
HCM 2010 LOS	C

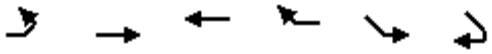
Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	2	72	1	2	9	152	1271	1	6	569	81
Future Volume (veh/h)	22	2	72	1	2	9	152	1271	1	6	569	81
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1765	1765	1800	1765	1765	1714	1714	1714	1714	1714	1714
Adj Flow Rate, veh/h	23	2	77	1	2	10	162	1352	1	6	605	86
Adj No. of Lanes	0	1	1	0	1	1	1	1	1	1	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	5	5	5	5	5	5
Cap, veh/h	384	28	303	160	260	302	468	1119	950	131	1119	948
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.65	0.65	0.65	0.65	0.65	0.65
Sat Flow, veh/h	1278	139	1500	358	1284	1490	727	1714	1455	390	1714	1453
Grp Volume(v), veh/h	25	0	77	3	0	10	162	1352	1	6	605	86
Grp Sat Flow(s),veh/h/ln	1416	0	1500	1642	0	1490	727	1714	1455	390	1714	1453
Q Serve(g_s), s	0.6	0.0	2.4	0.0	0.0	0.3	8.5	36.0	0.0	0.0	10.4	1.2
Cycle Q Clear(g_c), s	0.7	0.0	2.4	0.1	0.0	0.3	18.9	36.0	0.0	36.0	10.4	1.2
Prop In Lane	0.92		1.00	0.33		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	412	0	303	419	0	302	468	1119	950	131	1119	948
V/C Ratio(X)	0.06	0.00	0.25	0.01	0.00	0.03	0.35	1.21	0.00	0.05	0.54	0.09
Avail Cap(c_a), veh/h	791	0	707	845	0	703	468	1119	950	131	1119	948
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.8	0.0	18.5	17.6	0.0	17.7	10.2	9.6	3.3	27.6	5.1	3.5
Incr Delay (d2), s/veh	0.1	0.0	0.4	0.0	0.0	0.0	2.0	102.3	0.0	0.7	1.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	1.0	0.0	0.0	0.1	1.9	48.3	0.0	0.1	5.5	0.5
LnGrp Delay(d),s/veh	17.9	0.0	18.9	17.6	0.0	17.7	12.3	111.9	3.3	28.2	7.0	3.7
LnGrp LOS	B		B	B		B	B	F	A	C	A	A
Approach Vol, veh/h		102			13			1515			697	
Approach Delay, s/veh		18.7			17.7			101.2			6.8	
Approach LOS		B			B			F			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		40.0		15.2		40.0		15.2
Change Period (Y+Rc), s		4.9		* 4.2		4.9		* 4.2
Max Green Setting (Gmax), s		35.1		* 26		35.1		* 26
Max Q Clear Time (g_c+I1), s		38.0		2.3		38.0		4.4
Green Ext Time (p_c), s		0.0		0.4		0.0		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	68.8
HCM 2010 LOS	E

Notes



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (veh/h)	178	465	644	1375	635	97
Future Volume (veh/h)	178	465	644	1375	635	97
Number	1	6	2	12	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	0.99	1.00	1.00
Adj Sat Flow, veh/h/ln	1714	1714	1714	1714	1714	1800
Adj Flow Rate, veh/h	189	495	685	0	676	0
Adj No. of Lanes	1	2	2	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	5	5	5	5	5	0
Cap, veh/h	450	1787	1787	793	979	432
Arrive On Green	0.55	0.55	0.55	0.00	0.30	0.00
Sat Flow, veh/h	731	3343	3343	1445	3265	1530
Grp Volume(v), veh/h	189	495	685	0	676	0
Grp Sat Flow(s),veh/h/ln	731	1629	1629	1445	1633	1530
Q Serve(g_s), s	10.5	4.3	6.3	0.0	9.6	0.0
Cycle Q Clear(g_c), s	16.8	4.3	6.3	0.0	9.6	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	450	1787	1787	793	979	432
V/C Ratio(X)	0.42	0.28	0.38	0.00	0.69	0.00
Avail Cap(c_a), veh/h	617	2533	2533	1124	1920	874
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	11.6	6.3	6.8	0.0	16.3	0.0
Incr Delay (d2), s/veh	0.8	0.1	0.2	0.0	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	1.9	2.8	0.0	4.4	0.0
LnGrp Delay(d),s/veh	12.4	6.4	7.0	0.0	17.2	0.0
LnGrp LOS	B	A	A		B	
Approach Vol, veh/h		684	685		676	
Approach Delay, s/veh		8.1	7.0		17.2	
Approach LOS		A	A		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		32.9				32.9		19.8
Change Period (Y+Rc), s		4.9				4.9		4.9
Max Green Setting (Gmax), s		40.1				40.1		30.1
Max Q Clear Time (g_c+I1), s		8.3				18.8		11.6
Green Ext Time (p_c), s		10.8				9.2		3.3

Intersection Summary	
HCM 2010 Ctrl Delay	10.7
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	1003	111	145	1498	18	442	111	128	40	50	39
Future Volume (veh/h)	41	1003	111	145	1498	18	442	111	128	40	50	39
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1766	1800	1731	1800	1800	1800	1851	1872	1800	1872	1872
Adj Flow Rate, veh/h	43	1045	116	151	1560	19	354	264	133	42	52	41
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	2	2	4	0	0	0	0	0	0	0	0
Cap, veh/h	95	1154	128	180	1487	18	455	306	154	188	104	82
Arrive On Green	0.06	0.38	0.37	0.11	0.43	0.42	0.27	0.27	0.25	0.11	0.11	0.09
Sat Flow, veh/h	1714	3046	338	1648	3460	42	1714	1155	582	1714	951	750
Grp Volume(v), veh/h	43	575	586	151	770	809	354	0	397	42	0	93
Grp Sat Flow(s),veh/h/ln	1714	1678	1706	1648	1710	1792	1714	0	1737	1714	0	1701
Q Serve(g_s), s	2.6	35.0	35.1	9.7	46.5	46.5	20.7	0.0	23.6	2.4	0.0	5.6
Cycle Q Clear(g_c), s	2.6	35.0	35.1	9.7	46.5	46.5	20.7	0.0	23.6	2.4	0.0	5.6
Prop In Lane	1.00		0.20	1.00		0.02	1.00		0.34	1.00		0.44
Lane Grp Cap(c), veh/h	95	636	646	180	735	770	455	0	461	188	0	186
V/C Ratio(X)	0.45	0.91	0.91	0.84	1.05	1.05	0.78	0.00	0.86	0.22	0.00	0.50
Avail Cap(c_a), veh/h	254	705	716	244	735	770	506	0	513	347	0	345
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.4	31.7	31.9	47.2	30.8	30.8	36.8	0.0	38.1	43.9	0.0	45.7
Incr Delay (d2), s/veh	1.2	13.6	13.5	13.1	46.4	46.2	5.9	0.0	11.9	0.2	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	18.5	18.9	5.1	31.3	32.8	10.5	0.0	12.8	1.2	0.0	2.7
LnGrp Delay(d),s/veh	50.7	45.3	45.4	60.3	77.3	77.0	42.6	0.0	50.0	44.1	0.0	46.5
LnGrp LOS	D	D	D	E	F	F	D		D	D		D
Approach Vol, veh/h		1204			1730			751			135	
Approach Delay, s/veh		45.6			75.7			46.6			45.8	
Approach LOS		D			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.0	51.4		31.8	15.8	45.5		15.0
Change Period (Y+Rc), s	4.0	6.0		5.0	4.0	6.0		5.0
Max Green Setting (Gmax), s	16.0	44.0		30.0	16.0	44.0		20.0
Max Q Clear Time (g_c+I1), s	4.6	48.5		25.6	11.7	37.1		7.6
Green Ext Time (p_c), s	0.0	0.0		1.2	0.1	2.4		0.3

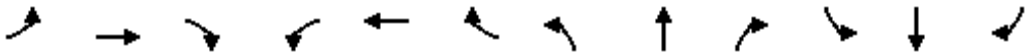
Intersection Summary	
HCM 2010 Ctrl Delay	59.4
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	736	127	225	1524	0	0	0	0	224	580	406
Future Volume (vph)	0	736	127	225	1524	0	0	0	0	224	580	406
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	12	12	11	12	12	12	12	12	13	12	13
Total Lost time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95		1.00	0.95					1.00	0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	0.98
Flpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	1.00
Frt		0.98		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3190		1605	3353					1716	3307	1524
Flt Permitted		1.00		0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3190		1605	3353					1716	3307	1524
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	751	130	230	1555	0	0	0	0	229	592	414
RTOR Reduction (vph)	0	14	0	0	0	0	0	0	0	0	0	53
Lane Group Flow (vph)	0	867	0	230	1555	0	0	0	0	229	592	361
Confl. Peds. (#/hr)			3	3					1			4
Heavy Vehicles (%)	0%	4%	5%	3%	2%	0%	2%	2%	2%	3%	3%	2%
Bus Blockages (#/hr)	0	2	0	0	0	0	0	0	0	0	2	0
Turn Type		NA		Prot	NA					Perm	NA	Perm
Protected Phases		5		6	2						4	
Permitted Phases										4		4
Actuated Green, G (s)		37.6		20.1	62.6					27.9	27.9	27.9
Effective Green, g (s)		38.5		21.0	63.5					28.5	28.5	28.5
Actuated g/C Ratio		0.38		0.21	0.64					0.28	0.28	0.28
Clearance Time (s)		4.9		4.9	4.9					4.6	4.6	4.6
Vehicle Extension (s)		3.0		2.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1228		337	2129					489	942	434
v/s Ratio Prot		0.27		0.14	c0.46						0.18	
v/s Ratio Perm										0.13		c0.24
v/c Ratio		0.71		0.68	0.73					0.47	0.63	0.83
Uniform Delay, d1		26.0		36.4	12.4					29.5	31.1	33.5
Progression Factor		1.00		0.81	0.44					0.88	0.90	0.88
Incremental Delay, d2		3.4		1.7	0.8					0.7	1.3	12.4
Delay (s)		29.4		31.4	6.3					26.8	29.2	42.0
Level of Service		C		C	A					C	C	D
Approach Delay (s)		29.4			9.6			0.0			33.0	
Approach LOS		C			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	93.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	335	971	0	0	1111	222	431	933	176	0	0	0
Future Volume (vph)	335	971	0	0	1111	222	431	933	176	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0				
Lane Util. Factor	1.00	0.95			0.95		0.86	*0.80				
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00				
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.97		1.00	0.98				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1621	3288			3259		1454	4156				
Flt Permitted	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	1621	3288			3259		1454	4156				
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	345	1001	0	0	1145	229	444	962	181	0	0	0
RTOR Reduction (vph)	0	0	0	0	16	0	0	21	0	0	0	0
Lane Group Flow (vph)	345	1001	0	0	1358	0	391	1175	0	0	0	0
Confl. Peds. (#/hr)			2			4	1					1
Confl. Bikes (#/hr)						1			2			
Heavy Vehicles (%)	2%	4%	0%	0%	2%	2%	1%	1%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	4	0	0	0	0	0	0
Turn Type	Prot	NA			NA		Perm	NA				
Protected Phases	2	6			1			4				
Permitted Phases							4					
Actuated Green, G (s)	20.1	63.1			38.1		27.4	27.4				
Effective Green, g (s)	21.0	64.0			39.0		28.0	28.0				
Actuated g/C Ratio	0.21	0.64			0.39		0.28	0.28				
Clearance Time (s)	4.9	4.9			4.9		4.6	4.6				
Vehicle Extension (s)	2.0	3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)	340	2104			1271		407	1163				
v/s Ratio Prot	c0.21	0.30			c0.42							
v/s Ratio Perm							0.27	0.28				
v/c Ratio	1.01	0.48			1.07		0.96	1.01				
Uniform Delay, d1	39.5	9.3			30.5		35.5	36.0				
Progression Factor	1.15	1.02			1.00		1.00	1.00				
Incremental Delay, d2	50.0	0.7			45.6		34.4	29.0				
Delay (s)	95.5	10.2			76.1		69.8	65.0				
Level of Service	F	B			E		E	E				
Approach Delay (s)		32.1			76.1			66.2			0.0	
Approach LOS		C			E			E			A	

Intersection Summary			
HCM 2000 Control Delay	58.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	93.9%	ICU Level of Service	F
Analysis Period (min)	15		
Description: Count Date 7/20/09			

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	1	96	155	86	46	1
Future Vol, veh/h	1	96	155	86	46	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	75	-	-	-	0	-
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	2	2	2
Mvmt Flow	1	104	168	93	50	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	262	0	-	0	322	215
Stage 1	-	-	-	-	215	-
Stage 2	-	-	-	-	107	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1302	-	-	-	672	825
Stage 1	-	-	-	-	821	-
Stage 2	-	-	-	-	917	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1302	-	-	-	671	825
Mov Cap-2 Maneuver	-	-	-	-	697	-
Stage 1	-	-	-	-	821	-
Stage 2	-	-	-	-	916	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1302	-	-	-	699
HCM Lane V/C Ratio	0.001	-	-	-	0.073
HCM Control Delay (s)	7.8	-	-	-	10.6
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

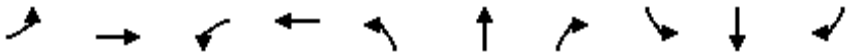
Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	1	138	3	7	238	130	3	1	17	70	1	1
Future Vol, veh/h	1	138	3	7	238	130	3	1	17	70	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	145	3	7	251	137	3	1	18	74	1	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	387	0	0	148	0	0	484	551	147	492	485	319
Stage 1	-	-	-	-	-	-	149	149	-	334	334	-
Stage 2	-	-	-	-	-	-	335	402	-	158	151	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1171	-	-	1434	-	-	493	442	900	487	482	722
Stage 1	-	-	-	-	-	-	854	774	-	680	643	-
Stage 2	-	-	-	-	-	-	679	600	-	844	772	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1171	-	-	1434	-	-	489	439	900	474	479	722
Mov Cap-2 Maneuver	-	-	-	-	-	-	489	439	-	474	479	-
Stage 1	-	-	-	-	-	-	853	773	-	679	640	-
Stage 2	-	-	-	-	-	-	674	597	-	825	771	-

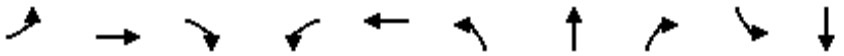
Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	9.8	14
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	769	1171	-	-	1434	-	-	476
HCM Lane V/C Ratio	0.029	0.001	-	-	0.005	-	-	0.159
HCM Control Delay (s)	9.8	8.1	-	-	7.5	-	-	14
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.6



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	7	111	234	46	18	192	175	41	497	4
v/c Ratio	0.02	0.22	0.75	0.10	0.04	0.20	0.19	0.06	0.50	0.00
Control Delay	21.6	10.3	42.7	12.9	8.2	13.8	3.1	8.0	16.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	10.3	42.7	12.9	8.2	13.8	3.1	8.0	16.1	0.0
Queue Length 50th (ft)	3	13	113	7	3	51	0	7	111	0
Queue Length 95th (ft)	10	34	151	24	11	90	17	19	235	0
Internal Link Dist (ft)		582		639		1510			2454	
Turn Bay Length (ft)	75		100		110		110	80		125
Base Capacity (vph)	360	521	327	497	548	946	914	742	992	948
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.21	0.72	0.09	0.03	0.20	0.19	0.06	0.50	0.00

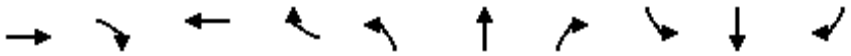
Intersection Summary
Description: Northwest TSA



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	34	12	217	201	19	55	152	53	7	661
v/c Ratio	0.07	0.03	0.46	0.38	0.03	0.19	0.24	0.09	0.02	0.68
Control Delay	16.3	29.2	7.8	20.7	19.5	16.8	19.7	1.6	15.8	29.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.3	29.2	7.8	20.7	19.5	16.8	19.7	1.6	15.8	29.7
Queue Length 50th (ft)	9	5	0	83	5	13	38	0	2	137
Queue Length 95th (ft)	33	22	58	150	23	46	131	8	11	291
Internal Link Dist (ft)		645			932		1282			1510
Turn Bay Length (ft)	115			125		125		125	150	
Base Capacity (vph)	634	623	654	541	658	417	951	802	545	1666
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.02	0.33	0.37	0.03	0.13	0.16	0.07	0.01	0.40

Intersection Summary

Description: Count Date: 6/23/2009
Northwest TSA



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	13	102	5	29	18	367	2	22	949	73
v/c Ratio	0.05	0.30	0.02	0.10	0.07	0.29	0.00	0.03	0.75	0.07
Control Delay	17.7	8.2	17.0	7.9	5.4	5.0	0.0	4.5	13.6	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.7	8.2	17.0	7.9	5.4	5.0	0.0	4.5	13.6	2.7
Queue Length 50th (ft)	4	3	1	0	1	33	0	2	151	2
Queue Length 95th (ft)	14	32	8	15	12	118	0	12	#584	19
Internal Link Dist (ft)	592		788			1204			76	
Turn Bay Length (ft)		100		75	125		100	125		100
Base Capacity (vph)	665	727	676	683	265	1273	1061	686	1273	1064
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.14	0.01	0.04	0.07	0.29	0.00	0.03	0.75	0.07

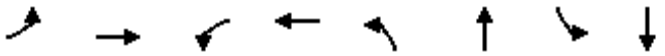
Intersection Summary

Description: Count Date 6/3/09
Northwest TSA
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	SEL
Lane Group Flow (vph)	86	574	366	261	1276
v/c Ratio	0.30	0.54	0.34	0.40	0.80
Control Delay	15.2	15.7	13.3	3.8	17.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.2	15.7	13.3	3.8	17.5
Queue Length 50th (ft)	19	72	42	0	139
Queue Length 95th (ft)	45	107	67	35	#360
Internal Link Dist (ft)		1085	1073		1042
Turn Bay Length (ft)	75			255	
Base Capacity (vph)	596	2202	2278	1078	1602
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.14	0.26	0.16	0.24	0.80

Intersection Summary

Description: Count Date 6/12/15
Northwest TSA
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

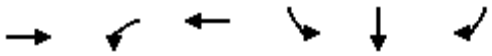


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	19	1500	165	605	142	146	84	154
v/c Ratio	0.04	0.99	0.74	0.32	0.56	0.45	0.33	0.55
Control Delay	12.9	51.2	44.5	16.3	52.7	21.9	46.2	48.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.9	51.2	44.5	16.3	52.7	21.9	46.2	48.9
Queue Length 50th (ft)	5	500	62	94	96	33	53	94
Queue Length 95th (ft)	19	#868	#206	217	177	103	107	171
Internal Link Dist (ft)		1154		1366		1768		464
Turn Bay Length (ft)	175		175		150		100	
Base Capacity (vph)	526	1519	227	1896	399	451	353	390
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.99	0.73	0.32	0.36	0.32	0.24	0.39

Intersection Summary

Description: Northwest TSA

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



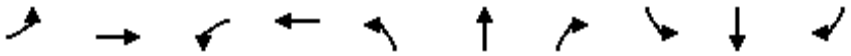
Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1114	116	540	331	724	423
v/c Ratio	0.80	0.65	0.27	0.60	0.68	0.61
Control Delay	28.4	54.2	4.2	25.6	25.6	10.6
Queue Delay	0.0	0.0	0.3	0.0	0.0	0.0
Total Delay	28.4	54.2	4.5	25.6	25.6	10.6
Queue Length 50th (ft)	280	70	25	157	187	89
Queue Length 95th (ft)	#438	#143	37	230	233	187
Internal Link Dist (ft)	1572		250		508	
Turn Bay Length (ft)						400
Base Capacity (vph)	1390	178	1970	648	1249	757
Starvation Cap Reductn	0	0	810	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.65	0.47	0.51	0.58	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	NBL	NBT
Lane Group Flow (vph)	253	1171	510	5	668
v/c Ratio	0.56	0.52	0.42	0.02	0.64
Control Delay	29.7	5.3	22.6	24.0	29.8
Queue Delay	0.7	0.7	0.0	0.0	0.0
Total Delay	30.5	6.0	22.6	24.0	29.8
Queue Length 50th (ft)	146	99	104	2	118
Queue Length 95th (ft)	m194	128	167	11	145
Internal Link Dist (ft)		250	280		1251
Turn Bay Length (ft)				115	
Base Capacity (vph)	450	2265	1211	436	1383
Starvation Cap Reductn	49	677	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.63	0.74	0.42	0.01	0.48

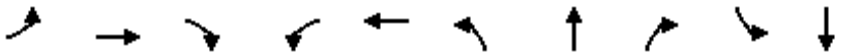
Intersection Summary
Description: Count Date 7/20/09
Northwest TSA
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1	26	41	7	51	447	110	12	270	6
v/c Ratio	0.00	0.07	0.15	0.02	0.06	0.33	0.09	0.02	0.22	0.01
Control Delay	22.0	9.8	24.6	15.4	6.9	10.0	3.1	7.6	12.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.0	9.8	24.6	15.4	6.9	10.0	3.1	7.6	12.2	0.0
Queue Length 50th (ft)	0	0	16	1	5	54	0	1	54	0
Queue Length 95th (ft)	4	18	41	10	28	276	28	10	163	0
Internal Link Dist (ft)		582		639		1510			2454	
Turn Bay Length (ft)	75		100		110		110	80		125
Base Capacity (vph)	405	498	385	511	848	1357	1218	773	1230	1154
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.05	0.11	0.01	0.06	0.33	0.09	0.02	0.22	0.01

Intersection Summary

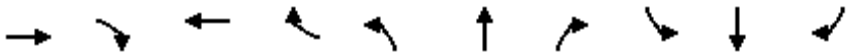
Description: Northwest TSA



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	90	30	137	98	29	161	383	325	14	333
v/c Ratio	0.20	0.08	0.33	0.23	0.07	0.33	0.51	0.44	0.04	0.39
Control Delay	17.3	26.8	7.6	17.6	17.5	15.7	23.4	8.2	14.8	25.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.3	26.8	7.6	17.6	17.5	15.7	23.4	8.2	14.8	25.7
Queue Length 50th (ft)	21	10	0	24	4	30	88	14	2	52
Queue Length 95th (ft)	69	39	46	75	29	111	338	119	17	141
Internal Link Dist (ft)		645			932		1282			1510
Turn Bay Length (ft)	115			125		125		125	150	
Base Capacity (vph)	557	648	623	519	620	552	956	869	577	1714
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.05	0.22	0.19	0.05	0.29	0.40	0.37	0.02	0.19

Intersection Summary

Description: Count Date: 6/23/2009
Northwest TSA



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	7	44	12	47	97	1068	4	33	448	49
v/c Ratio	0.02	0.11	0.03	0.12	0.15	0.81	0.00	0.17	0.34	0.04
Control Delay	16.4	6.8	16.6	6.7	5.8	18.3	0.5	8.6	5.9	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.4	6.8	16.6	6.7	5.8	18.3	0.5	8.6	5.9	2.1
Queue Length 50th (ft)	2	0	3	0	12	300	0	4	64	0
Queue Length 95th (ft)	10	19	14	20	38	#690	1	22	151	11
Internal Link Dist (ft)	592		788			1204			76	
Turn Bay Length (ft)		100		75	125		100	125		100
Base Capacity (vph)	729	701	700	693	637	1314	1095	191	1314	1099
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.06	0.02	0.07	0.15	0.81	0.00	0.17	0.34	0.04

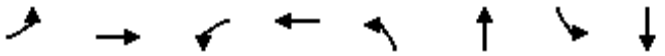
Intersection Summary

Description: Count Date 6/3/09
Northwest TSA
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	SEL
Lane Group Flow (vph)	150	483	668	1072	555
v/c Ratio	0.48	0.29	0.39	0.85	0.57
Control Delay	14.5	7.5	8.1	9.4	18.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.5	7.5	8.1	9.4	18.0
Queue Length 50th (ft)	23	34	51	0	61
Queue Length 95th (ft)	82	76	108	#177	144
Internal Link Dist (ft)		1085	1073		1042
Turn Bay Length (ft)	75			255	
Base Capacity (vph)	485	2560	2648	1359	2015
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.31	0.19	0.25	0.79	0.28

Intersection Summary

Description: Count Date 6/12/15
Northwest TSA
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

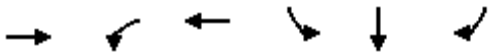


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	34	978	147	1311	318	312	41	77
v/c Ratio	0.20	0.73	0.52	0.85	0.82	0.75	0.19	0.31
Control Delay	18.7	34.1	21.8	35.6	58.7	49.4	46.7	40.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.7	34.1	21.8	35.6	58.7	49.4	46.7	40.0
Queue Length 50th (ft)	10	284	47	412	203	180	26	38
Queue Length 95th (ft)	33	497	109	#720	#426	#360	64	91
Internal Link Dist (ft)		1154		1366		1768		464
Turn Bay Length (ft)	175		175		150		100	
Base Capacity (vph)	327	1431	344	1544	494	519	367	402
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.68	0.43	0.85	0.64	0.60	0.11	0.19

Intersection Summary

Description: Northwest TSA

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



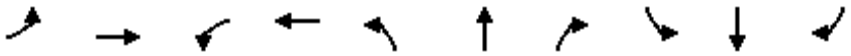
Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	761	223	1331	220	573	369
v/c Ratio	0.60	0.66	0.62	0.47	0.63	0.78
Control Delay	26.2	36.6	5.2	30.3	32.2	35.8
Queue Delay	0.1	0.0	1.9	0.0	0.0	0.0
Total Delay	26.3	36.6	7.2	30.3	32.2	35.8
Queue Length 50th (ft)	196	150	141	117	169	177
Queue Length 95th (ft)	267	m175	m159	185	223	284
Internal Link Dist (ft)	1572		250		508	
Turn Bay Length (ft)						400
Base Capacity (vph)	1275	337	2161	514	992	509
Starvation Cap Reductn	0	0	635	0	0	0
Spillback Cap Reductn	47	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.66	0.87	0.43	0.58	0.72

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

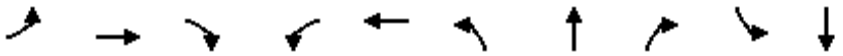
Lane Group	EBL	EBT	WBT	NBL	NBT
Lane Group Flow (vph)	318	925	1208	336	1145
v/c Ratio	0.94	0.44	0.94	0.83	0.90
Control Delay	80.4	11.1	43.6	52.2	44.4
Queue Delay	0.0	1.4	0.9	0.0	0.0
Total Delay	80.4	12.5	44.5	52.2	44.4
Queue Length 50th (ft)	216	164	375	232	265
Queue Length 95th (ft)	#378	177	#523	#405	#353
Internal Link Dist (ft)		250	280		1251
Turn Bay Length (ft)				115	
Base Capacity (vph)	340	2104	1286	407	1274
Starvation Cap Reductn	0	918	0	0	0
Spillback Cap Reductn	0	0	15	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.94	0.78	0.95	0.83	0.90

Intersection Summary
Description: Count Date 7/20/09
Northwest TSA
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	7	114	248	48	18	232	192	42	530	4
v/c Ratio	0.02	0.22	0.78	0.10	0.04	0.25	0.21	0.06	0.54	0.00
Control Delay	21.6	10.3	44.7	12.6	8.2	14.2	3.1	8.0	16.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	10.3	44.7	12.6	8.2	14.2	3.1	8.0	16.9	0.0
Queue Length 50th (ft)	3	14	122	7	3	63	0	7	121	0
Queue Length 95th (ft)	10	35	161	24	11	107	17	19	254	0
Internal Link Dist (ft)		582		639		1510			2454	
Turn Bay Length (ft)	75		100		110		110	80		125
Base Capacity (vph)	358	521	326	495	518	933	912	700	981	938
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.22	0.76	0.10	0.03	0.25	0.21	0.06	0.54	0.00

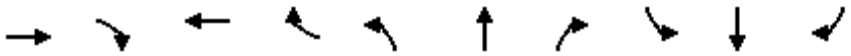
Intersection Summary
Description: Northwest TSA



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	51	330	278	79	103	142	101	37	670
v/c Ratio	0.12	0.15	0.61	0.52	0.13	0.34	0.23	0.18	0.08	0.72
Control Delay	18.6	32.3	9.0	23.2	14.7	17.9	22.9	5.9	15.3	33.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.6	32.3	9.0	23.2	14.7	17.9	22.9	5.9	15.3	33.5
Queue Length 50th (ft)	14	22	0	96	13	24	46	0	8	145
Queue Length 95th (ft)	46	63	76	225	57	76	125	36	34	311
Internal Link Dist (ft)		645			932		1282			1510
Turn Bay Length (ft)	115			125		125		125	150	
Base Capacity (vph)	557	563	685	539	610	396	840	724	561	1494
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.09	0.48	0.52	0.13	0.26	0.17	0.14	0.07	0.45

Intersection Summary

Description: Count Date: 6/23/2009
Northwest TSA



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	41	160	3	6	42	451	1	4	1146	90
v/c Ratio	0.16	0.48	0.01	0.02	0.34	0.36	0.00	0.01	0.93	0.09
Control Delay	19.1	18.0	16.3	0.2	17.7	6.0	0.0	4.8	27.2	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.1	18.0	16.3	0.2	17.7	6.0	0.0	4.8	27.2	3.2
Queue Length 50th (ft)	11	30	1	0	4	48	0	0	273	4
Queue Length 95th (ft)	31	72	6	1	#50	152	0	4	#758	24
Internal Link Dist (ft)	592		788			1204			76	
Turn Bay Length (ft)		100		75	125		100	125		100
Base Capacity (vph)	613	721	762	698	123	1236	1031	592	1236	1035
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.22	0.00	0.01	0.34	0.36	0.00	0.01	0.93	0.09

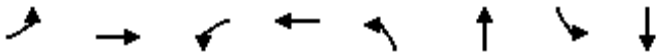
Intersection Summary

Description: Count Date 6/3/09
Northwest TSA
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	SEL
Lane Group Flow (vph)	99	589	374	380	1610
v/c Ratio	0.35	0.55	0.34	0.52	1.01
Control Delay	16.0	15.7	13.2	4.3	43.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	16.0	15.7	13.2	4.3	43.6
Queue Length 50th (ft)	22	74	43	0	217
Queue Length 95th (ft)	52	111	68	41	#508
Internal Link Dist (ft)		1085	1073		1042
Turn Bay Length (ft)	75			255	
Base Capacity (vph)	584	2185	2260	1108	1587
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.17	0.27	0.17	0.34	1.01

Intersection Summary

Description: Count Date 6/12/15
Northwest TSA
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



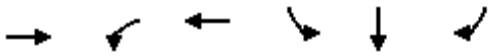
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	29	1764	169	693	163	153	86	163
v/c Ratio	0.08	1.18	0.75	0.41	0.62	0.47	0.34	0.57
Control Delay	13.4	116.0	45.3	20.5	54.8	23.6	46.8	50.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	116.0	45.3	20.5	54.8	23.6	46.8	50.1
Queue Length 50th (ft)	8	~765	64	150	113	40	55	101
Queue Length 95th (ft)	26	#1125	#213	262	201	112	110	182
Internal Link Dist (ft)		1154		1366		1768		464
Turn Bay Length (ft)	175		175		150		100	
Base Capacity (vph)	461	1500	228	1676	395	445	349	385
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	1.18	0.74	0.41	0.41	0.34	0.25	0.42

Intersection Summary

Description: Northwest TSA

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



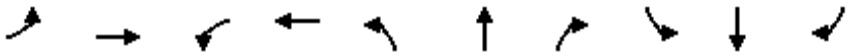
Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1290	119	614	346	749	445
v/c Ratio	0.94	0.67	0.31	0.61	0.69	0.67
Control Delay	39.9	55.5	5.0	26.0	25.9	13.6
Queue Delay	0.4	0.0	0.4	0.0	0.0	0.0
Total Delay	40.4	55.5	5.4	26.0	25.9	13.6
Queue Length 50th (ft)	360	72	34	165	193	110
Queue Length 95th (ft)	#555	#147	47	243	243	210
Internal Link Dist (ft)	1572		250		508	
Turn Bay Length (ft)						400
Base Capacity (vph)	1373	178	1954	648	1249	726
Starvation Cap Reductn	0	0	778	0	0	0
Spillback Cap Reductn	8	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.67	0.52	0.53	0.60	0.61

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	NBL	NBT
Lane Group Flow (vph)	287	1303	565	24	690
v/c Ratio	0.64	0.58	0.48	0.07	0.65
Control Delay	30.2	5.4	23.9	25.3	30.9
Queue Delay	1.2	1.4	0.0	0.0	0.0
Total Delay	31.4	6.8	23.9	25.3	30.9
Queue Length 50th (ft)	159	107	120	12	127
Queue Length 95th (ft)	m201	m128	187	33	156
Internal Link Dist (ft)		250	280		1251
Turn Bay Length (ft)				115	
Base Capacity (vph)	450	2241	1188	436	1368
Starvation Cap Reductn	49	678	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.72	0.83	0.48	0.06	0.50

Intersection Summary
Description: Count Date 7/20/09
Northwest TSA
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1	27	53	7	52	480	120	12	308	6
v/c Ratio	0.00	0.08	0.20	0.02	0.07	0.35	0.10	0.02	0.25	0.01
Control Delay	22.0	9.6	25.4	15.4	6.9	10.2	3.4	7.6	12.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.0	9.6	25.4	15.4	6.9	10.2	3.4	7.6	12.5	0.0
Queue Length 50th (ft)	0	0	21	1	5	60	1	1	63	0
Queue Length 95th (ft)	4	19	50	10	28	303	33	10	187	0
Internal Link Dist (ft)		582		639		1510			2454	
Turn Bay Length (ft)	75		100		110		110	80		125
Base Capacity (vph)	405	499	384	511	818	1357	1219	749	1230	1154
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.05	0.14	0.01	0.06	0.35	0.10	0.02	0.25	0.01

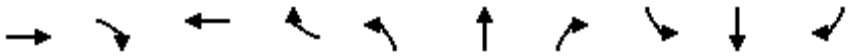
Intersection Summary

Description: Northwest TSA

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	100	61	205	166	132	292	359	407	57	340
v/c Ratio	0.25	0.18	0.46	0.36	0.29	0.60	0.54	0.56	0.15	0.45
Control Delay	18.6	30.8	8.1	19.8	20.4	22.0	27.9	9.3	16.0	28.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.6	30.8	8.1	19.8	20.4	22.0	27.9	9.3	16.0	28.6
Queue Length 50th (ft)	28	24	0	49	32	71	128	22	12	64
Queue Length 95th (ft)	77	69	57	122	99	214	337	145	47	145
Internal Link Dist (ft)		645			932		1282			1510
Turn Bay Length (ft)	115			125		125		125	150	
Base Capacity (vph)	520	558	600	492	571	500	811	815	534	1464
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.11	0.34	0.34	0.23	0.58	0.44	0.50	0.11	0.23

Intersection Summary

Description: Count Date: 6/23/2009
Northwest TSA



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	25	77	3	10	162	1277	1	6	562	86
v/c Ratio	0.07	0.18	0.01	0.03	0.30	0.97	0.00	0.05	0.43	0.08
Control Delay	17.2	6.1	16.0	2.4	7.4	36.2	0.0	6.7	6.8	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.2	6.1	16.0	2.4	7.4	36.2	0.0	6.7	6.8	2.0
Queue Length 50th (ft)	7	0	1	0	22	~546	0	1	88	1
Queue Length 95th (ft)	22	25	6	4	72	#873	0	6	206	16
Internal Link Dist (ft)	592		788			1204			76	
Turn Bay Length (ft)		100		75	125		100	125		100
Base Capacity (vph)	626	721	748	685	543	1312	1094	123	1312	1105
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.11	0.00	0.01	0.30	0.97	0.00	0.05	0.43	0.08

Intersection Summary

Description: Count Date 6/3/09

Northwest TSA

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

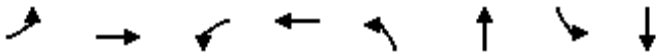
Lane Group	EBL	EBT	WBT	WBR	SEL
Lane Group Flow (vph)	183	495	685	1394	735
v/c Ratio	0.55	0.27	0.37	1.09	0.75
Control Delay	19.3	8.8	9.5	60.1	26.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	8.8	9.5	60.1	26.4
Queue Length 50th (ft)	45	51	76	~476	142
Queue Length 95th (ft)	#140	97	138	#757	198
Internal Link Dist (ft)		1085	1073		1042
Turn Bay Length (ft)	75			255	
Base Capacity (vph)	330	1810	1873	1283	1373
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.55	0.27	0.37	1.09	0.54

Intersection Summary

Description: Count Date 6/12/15
Northwest TSA

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

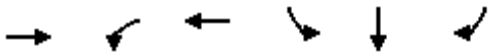


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	41	1128	151	1536	354	343	42	90
v/c Ratio	0.36	0.91	0.76	1.01	0.86	0.79	0.20	0.37
Control Delay	65.7	47.9	76.8	59.3	64.9	54.0	49.4	40.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.7	47.9	76.8	59.3	64.9	54.0	49.4	40.4
Queue Length 50th (ft)	31	418	112	604	267	236	31	48
Queue Length 95th (ft)	72	#660	#234	#978	#501	#440	66	100
Internal Link Dist (ft)		1154		1366		1768		464
Turn Bay Length (ft)	175		175		150		100	
Base Capacity (vph)	238	1304	228	1522	450	475	336	370
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.87	0.66	1.01	0.79	0.72	0.13	0.24

Intersection Summary

Description: Northwest TSA

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	861	230	1520	229	592	408
v/c Ratio	0.69	0.68	0.71	0.47	0.63	0.84
Control Delay	29.0	35.1	6.4	29.4	31.2	40.4
Queue Delay	0.2	0.0	11.3	0.0	0.0	0.0
Total Delay	29.2	35.1	17.7	29.4	31.2	40.4
Queue Length 50th (ft)	238	153	170	120	172	203
Queue Length 95th (ft)	312	m162	m169	192	230	#357
Internal Link Dist (ft)	1572		250		508	
Turn Bay Length (ft)						400
Base Capacity (vph)	1243	337	2130	514	992	509
Starvation Cap Reductn	0	0	605	0	0	0
Spillback Cap Reductn	46	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.68	1.00	0.45	0.60	0.80

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

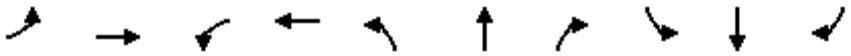
Lane Group	EBL	EBT	WBT	NBL	NBT
Lane Group Flow (vph)	341	986	1349	387	1191
v/c Ratio	1.00	0.47	1.05	0.95	0.94
Control Delay	93.6	10.5	69.0	70.8	48.7
Queue Delay	0.0	2.0	15.8	0.0	0.0
Total Delay	93.6	12.5	84.8	70.8	48.7
Queue Length 50th (ft)	~234	128	~490	281	280
Queue Length 95th (ft)	#414	182	#627	#495	#378
Internal Link Dist (ft)		250	280		1251
Turn Bay Length (ft)				115	
Base Capacity (vph)	340	2104	1287	407	1273
Starvation Cap Reductn	0	925	0	0	0
Spillback Cap Reductn	0	0	47	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.00	0.84	1.09	0.95	0.94

Intersection Summary

Description: Count Date 7/20/09
Northwest TSA

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

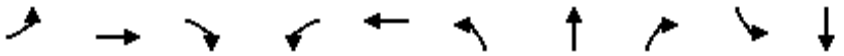
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	7	114	249	48	18	244	197	42	532	4
v/c Ratio	0.02	0.22	0.78	0.10	0.04	0.26	0.22	0.06	0.54	0.00
Control Delay	21.6	10.3	44.8	12.6	8.2	14.4	3.1	8.0	17.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	10.3	44.8	12.6	8.2	14.4	3.1	8.0	17.0	0.0
Queue Length 50th (ft)	3	14	123	7	3	67	0	7	122	0
Queue Length 95th (ft)	10	35	162	24	11	112	17	19	255	0
Internal Link Dist (ft)		582		639		1510			2454	
Turn Bay Length (ft)	75		100		110		110	80		125
Base Capacity (vph)	358	520	326	495	517	932	914	690	979	937
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.22	0.76	0.10	0.03	0.26	0.22	0.06	0.54	0.00

Intersection Summary

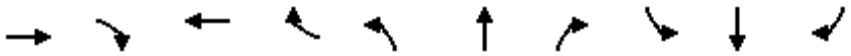
Description: Northwest TSA



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	62	83	446	278	81	110	142	101	37	671
v/c Ratio	0.16	0.24	0.78	0.53	0.15	0.35	0.23	0.18	0.08	0.72
Control Delay	18.9	33.8	17.5	23.6	15.6	18.2	23.0	5.9	15.4	33.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	33.8	17.5	23.6	15.6	18.2	23.0	5.9	15.4	33.8
Queue Length 50th (ft)	19	38	35	99	15	27	48	0	9	152
Queue Length 95th (ft)	56	94	176	225	60	81	125	36	34	311
Internal Link Dist (ft)		645			932		1282			1510
Turn Bay Length (ft)	115			125		125		125	150	
Base Capacity (vph)	556	558	707	530	584	395	834	719	561	1480
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.15	0.63	0.52	0.14	0.28	0.17	0.14	0.07	0.45

Intersection Summary

Description: Count Date: 6/23/2009
Northwest TSA



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	41	160	3	6	42	458	1	4	1264	90
v/c Ratio	0.15	0.49	0.01	0.02	0.34	0.37	0.00	0.01	1.03	0.09
Control Delay	18.9	19.8	16.3	0.2	17.8	6.2	0.0	5.0	49.1	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	19.8	16.3	0.2	17.8	6.2	0.0	5.0	49.1	3.4
Queue Length 50th (ft)	11	35	1	0	5	52	0	0	~480	4
Queue Length 95th (ft)	31	78	6	1	#50	155	0	4	#861	25
Internal Link Dist (ft)	592		788			1204			76	
Turn Bay Length (ft)		100		75	125		100	125		100
Base Capacity (vph)	613	710	759	695	123	1231	1027	584	1231	1029
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.23	0.00	0.01	0.34	0.37	0.00	0.01	1.03	0.09

Intersection Summary

Description: Count Date 6/3/09

Northwest TSA

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

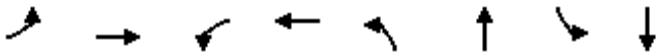
Lane Group	EBL	EBT	WBT	WBR	SEL
Lane Group Flow (vph)	100	589	374	387	1729
v/c Ratio	0.35	0.55	0.34	0.52	1.09
Control Delay	16.1	15.7	13.2	4.3	68.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	16.1	15.7	13.2	4.3	68.4
Queue Length 50th (ft)	22	74	43	0	~306
Queue Length 95th (ft)	52	111	68	41	#561
Internal Link Dist (ft)		1085	1073		1042
Turn Bay Length (ft)	75			255	
Base Capacity (vph)	584	2185	2260	1110	1589
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.17	0.27	0.17	0.35	1.09

Intersection Summary

Description: Count Date 6/12/15
Northwest TSA

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



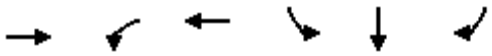
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	34	1849	169	698	165	153	86	163
v/c Ratio	0.09	1.23	0.75	0.42	0.62	0.47	0.34	0.57
Control Delay	13.4	140.4	45.5	20.6	55.0	23.5	46.9	50.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	140.4	45.5	20.6	55.0	23.5	46.9	50.1
Queue Length 50th (ft)	9	~834	65	152	114	40	55	101
Queue Length 95th (ft)	30	#1202	#214	266	203	112	110	183
Internal Link Dist (ft)		1154		1366		1768		464
Turn Bay Length (ft)	175		175		150		100	
Base Capacity (vph)	458	1498	227	1672	394	444	349	385
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	1.23	0.74	0.42	0.42	0.34	0.25	0.42

Intersection Summary

Description: Northwest TSA

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1346	119	617	346	749	446
v/c Ratio	0.98	0.67	0.32	0.61	0.69	0.67
Control Delay	47.3	55.5	5.0	25.7	25.5	13.6
Queue Delay	1.7	0.0	0.4	0.0	0.0	0.0
Total Delay	49.0	55.5	5.4	25.7	25.5	13.6
Queue Length 50th (ft)	~395	72	34	165	193	112
Queue Length 95th (ft)	#591	#148	47	241	243	215
Internal Link Dist (ft)	1572		250		508	
Turn Bay Length (ft)						400
Base Capacity (vph)	1373	178	1954	648	1249	725
Starvation Cap Reductn	0	0	777	0	0	0
Spillback Cap Reductn	13	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.67	0.52	0.53	0.60	0.62

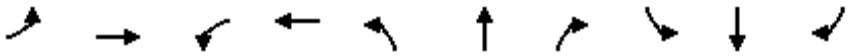
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

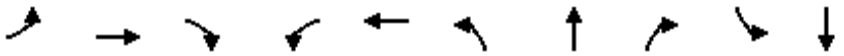
Lane Group	EBL	EBT	WBT	NBL	NBT
Lane Group Flow (vph)	297	1344	567	25	690
v/c Ratio	0.66	0.60	0.48	0.07	0.65
Control Delay	30.2	5.4	24.0	25.3	31.2
Queue Delay	1.4	1.7	0.0	0.0	0.0
Total Delay	31.7	7.1	24.0	25.3	31.2
Queue Length 50th (ft)	162	109	121	12	128
Queue Length 95th (ft)	m201	m126	188	33	157
Internal Link Dist (ft)		250	280		1251
Turn Bay Length (ft)				115	
Base Capacity (vph)	450	2238	1185	436	1363
Starvation Cap Reductn	49	677	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.74	0.86	0.48	0.06	0.51

Intersection Summary
Description: Count Date 7/20/09
Northwest TSA
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1	27	56	7	52	484	123	12	314	6
v/c Ratio	0.00	0.08	0.21	0.02	0.07	0.36	0.10	0.02	0.26	0.01
Control Delay	22.0	9.6	25.6	15.4	6.9	10.3	3.4	7.6	12.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.0	9.6	25.6	15.4	6.9	10.3	3.4	7.6	12.5	0.0
Queue Length 50th (ft)	0	0	23	1	5	60	1	1	65	0
Queue Length 95th (ft)	4	19	52	10	28	306	33	10	192	0
Internal Link Dist (ft)		582		639		1510			2454	
Turn Bay Length (ft)	75		100		110		110	80		125
Base Capacity (vph)	405	499	384	511	812	1357	1219	746	1230	1154
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.05	0.15	0.01	0.06	0.36	0.10	0.02	0.26	0.01

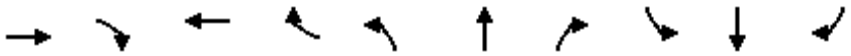
Intersection Summary
Description: Northwest TSA



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	105	73	249	166	153	368	359	407	57	350
v/c Ratio	0.26	0.22	0.52	0.37	0.35	0.74	0.53	0.56	0.15	0.46
Control Delay	18.8	31.3	8.3	20.0	24.1	29.1	27.6	9.2	16.0	28.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.8	31.3	8.3	20.0	24.1	29.1	27.6	9.2	16.0	28.6
Queue Length 50th (ft)	29	29	0	49	45	95	128	22	12	65
Queue Length 95th (ft)	80	80	62	122	126	#353	337	145	47	147
Internal Link Dist (ft)		645			932		1282			1510
Turn Bay Length (ft)	115			125		125		125	150	
Base Capacity (vph)	508	550	623	483	561	497	797	807	529	1435
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.13	0.40	0.34	0.27	0.74	0.45	0.50	0.11	0.24

Intersection Summary

Description: Count Date: 6/23/2009
Northwest TSA
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	25	77	3	10	162	1352	1	6	605	86
v/c Ratio	0.07	0.18	0.01	0.03	0.32	1.03	0.00	0.05	0.46	0.08
Control Delay	17.2	6.1	16.0	2.4	7.9	50.6	0.0	6.7	7.2	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.2	6.1	16.0	2.4	7.9	50.6	0.0	6.7	7.2	2.2
Queue Length 50th (ft)	7	0	1	0	23	~601	0	1	99	1
Queue Length 95th (ft)	22	25	6	4	75	#938	0	6	231	17
Internal Link Dist (ft)	592		788			1204			76	
Turn Bay Length (ft)		100		75	125		100	125		100
Base Capacity (vph)	626	721	748	685	510	1312	1094	123	1312	1104
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.11	0.00	0.01	0.32	1.03	0.00	0.05	0.46	0.08

Intersection Summary

Description: Count Date 6/3/09

Northwest TSA

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

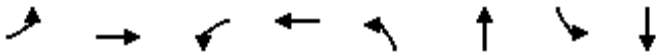
Lane Group	EBL	EBT	WBT	WBR	SEL
Lane Group Flow (vph)	189	495	685	1463	779
v/c Ratio	0.59	0.28	0.37	1.14	0.77
Control Delay	21.9	9.4	10.1	83.5	26.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	21.9	9.4	10.1	83.5	26.7
Queue Length 50th (ft)	50	54	80	~549	154
Queue Length 95th (ft)	#171	102	145	#843	213
Internal Link Dist (ft)		1085	1073		1042
Turn Bay Length (ft)	75			255	
Base Capacity (vph)	321	1779	1840	1279	1348
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.59	0.28	0.37	1.14	0.58

Intersection Summary

Description: Count Date 6/12/15
Northwest TSA

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



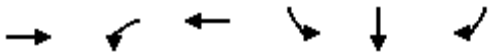
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	43	1161	151	1579	359	350	42	93
v/c Ratio	0.38	0.92	0.78	1.02	0.88	0.81	0.20	0.39
Control Delay	66.5	48.2	79.2	63.1	68.2	56.7	49.5	39.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.5	48.2	79.2	63.1	68.2	56.7	49.5	39.8
Queue Length 50th (ft)	32	437	112	~682	272	244	31	49
Queue Length 95th (ft)	75	#692	#234	#1021	#512	#456	66	101
Internal Link Dist (ft)		1154		1366		1768		464
Turn Bay Length (ft)	175		175		150		100	
Base Capacity (vph)	232	1270	223	1542	439	463	327	362
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.91	0.68	1.02	0.82	0.76	0.13	0.26

Intersection Summary

Description: Northwest TSA

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	881	230	1555	229	592	414
v/c Ratio	0.71	0.68	0.73	0.47	0.63	0.85
Control Delay	29.6	34.7	6.7	29.2	30.9	41.2
Queue Delay	0.2	0.0	16.8	0.0	0.0	0.0
Total Delay	29.8	34.7	23.5	29.2	30.9	41.2
Queue Length 50th (ft)	246	153	173	120	171	207
Queue Length 95th (ft)	322	m157	m171	192	231	#366
Internal Link Dist (ft)	1572		250		508	
Turn Bay Length (ft)						400
Base Capacity (vph)	1240	337	2127	514	992	509
Starvation Cap Reductn	0	0	600	0	0	0
Spillback Cap Reductn	47	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.68	1.02	0.45	0.60	0.81

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	NBL	NBT
Lane Group Flow (vph)	345	1001	1374	391	1196
v/c Ratio	1.01	0.48	1.07	0.96	0.94
Control Delay	95.8	10.4	75.4	72.8	49.2
Queue Delay	0.0	2.3	13.4	0.0	0.0
Total Delay	95.8	12.6	88.8	72.8	49.2
Queue Length 50th (ft)	~241	132	~507	284	281
Queue Length 95th (ft)	#420	184	#645	#502	#380
Internal Link Dist (ft)		250	280		1251
Turn Bay Length (ft)				115	
Base Capacity (vph)	340	2104	1287	407	1273
Starvation Cap Reductn	0	925	0	0	0
Spillback Cap Reductn	0	0	59	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.01	0.85	1.12	0.96	0.94

Intersection Summary

Description: Count Date 7/20/09

Northwest TSA

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Appendix D

Individual Pipeline Project Assignments

Windhaven Apartments

TAZ29 Assignment Total - AM Peak Hour

Indian Trail Road/Shawnee Road

				12	30	17					
				IN		OUT					
				0	12	0					
				SBR	SBT	SBL					
0	OUT	0	EBL	TEV =			WBR	0	IN	6	
0		0	EBT	42			WBT	0		13	
0	IN	0	EBR				WBL	6	OUT	7	
				NBL	NBT	NBR					
				0	17	7					
				OUT		IN					
				18	42	25					

Forest Lane/Barnes Road

				39	56	17					
				IN		OUT					
				0	0	39					
				SBR	SBT	SBL					
19	OUT	0	EBL	TEV =			WBR	17	IN	36	
65		45	EBT	121			WBT	19		121	
45	IN	0	EBR				WBL	0	OUT	85	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				0	0	0					

Pamela Lane/Barnes Road

				59	85	25					
				IN		OUT					
				0	0	59					
				SBR	SBT	SBL					
36	OUT	0	EBL	TEV =			WBR	25	IN	62	
121		85	EBT	206			WBT	36		206	
85	IN	0	EBR				WBL	0	OUT	144	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				0	0	0					

Indian Trail Road/Barnes Road

				17	41	24					
				IN		OUT					
				5	4	8					
				SBR	SBT	SBL					
59	OUT	12	EBL	TEV =			WBR	3	IN	24	
196		27	EBT	250			WBT	11		79	
137	IN	99	EBR				WBL	9	OUT	55	
				NBL	NBT	NBR					
				42	9	21					
				OUT		IN					
				111	183	72					

Indian Trail Road/Strong Road

				111	183	72					
				IN		OUT					
				11	101	0					
				SBR	SBT	SBL					
32	OUT	25	EBL	TEV =			WBR	0	IN	0	
106		0	EBT	254			WBT	0		0	
74	IN	49	EBR				WBL	0	OUT	0	
				NBL	NBT	NBR					
				21	47	0					
				OUT		IN					
				150	219	68					

Indian Trail Road/Multiple Middle

				150	219	68					
				IN		OUT					
				2	148	0					
				SBR	SBT	SBL					
28	OUT	5	EBL	TEV =			WBR	0	IN	0	
92		0	EBT	303			WBT	0		0	
64	IN	59	EBR				WBL	0	OUT	0	
				NBL	NBT	NBR					
				25	64	0					
				OUT		IN					
				207	296	89					

Indian Trail Road/Francis Avenue

				207	296	89					
				IN		OUT					
				18	0	189					
				SBR	SBT	SBL					
18	OUT	8	EBL	TEV =			WBR	81	IN	81	
25		0	EBT	296			WBT	0		271	
8	IN	0	EBR				WBL	0	OUT	189	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				0	0	0					

Alberta Avenue/Francis Avenue

				4	13	9					
				IN		OUT					
				4	0	0					
				SBR	SBT	SBL					
71	OUT	9	EBL	TEV =			WBR	0	IN	52	
237		121	EBT	237			WBT	52		173	
166	IN	36	EBR				WBL	0	OUT	121	
				NBL	NBT	NBR					
				15	0	0					
				OUT		IN					
				36	51	15					

Ash Street/Francis Avenue

				8	8	0					
				IN		OUT					
				8	0	0					
				SBR	SBT	SBL					
51	OUT	0	EBL	TEV =			WBR	0	IN	43	
169		92	EBT	169			WBT	43		135	
118	IN	27	EBR				WBL	0	OUT	92	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				27	27	0					

Maple Street/Francis Avenue

				0	18	18					
				IN		OUT					
				0	0	0					
				SBR	SBT	SBL					
43	OUT	18	EBL	TEV =			WBR	0	IN	32	
135		74	EBT	135			WBT	32		106	
92	IN	0	EBR				WBL	0	OUT	74	
				NBL	NBT	NBR					
				11	0	0					
				OUT		IN					
				0	11	11					

Windhaven Apartments

TAZ29 Assignment Total - PM Peak Hour

Indian Trail Road/Shawnee Avenue

				21	37	16					
				IN		OUT					
				0	21	0					
				SBR	SBT	SBL					
0	OUT	0	EBL	TEV =			WBR	0	IN	9	
0		0	EBT	53			WBT	0		16	
0	IN	0	EBR				WBL	9	OUT	7	
				NBL	NBT	NBR					
				0	16	7					
				OUT		IN					
				30	53	23					

Forest Lane/Barnes Road

				24	71	47					
				IN		OUT					
				0	0	24					
				SBR	SBT	SBL					
54	OUT	0	EBL	TEV =			WBR	47	IN	101	
81		27	EBT	152			WBT	54		152	
27	IN	0	EBR				WBL	0	OUT	51	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				0	0	0					

Pamela Lane/Barnes Road

				36	106	70					
				IN		OUT					
				0	0	36					
				SBR	SBT	SBL					
101	OUT	0	EBL	TEV =			WBR	70	IN	171	
152		51	EBT	258			WBT	101		258	
51	IN	0	EBR				WBL	0	OUT	87	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				0	0	0					

Indian Trail Road/Barnes Road

				29	51	22					
				IN		OUT					
				14	11	5					
				SBR	SBT	SBL					
163	OUT	7	EBL	TEV =			WBR	9	IN	66	
246		16	EBT	313			WBT	32		99	
83	IN	60	EBR				WBL	25	OUT	33	
				NBL	NBT	NBR					
				117	5	13					
				OUT		IN					
				95	230	135					

Indian Trail Road/Strong Road

				95	230	135					
				IN		OUT					
				29	66	0					
				SBR	SBT	SBL					
88	OUT	15	EBL	TEV =			WBR	0	IN	0	
133		0	EBT	318			WBT	0		0	
45	IN	30	EBR				WBL	0	OUT	0	
				NBL	NBT	NBR					
				59	120	0					
				OUT		IN					
				95	274	178					

Indian Trail Road/Multiple Middle

				95	274	178					
				IN		OUT					
				6	90	0					
				SBR	SBT	SBL					
76	OUT	3	EBL	TEV =			WBR	0	IN	0	
115		0	EBT	380			WBT	0		0	
39	IN	36	EBR				WBL	0	OUT	0	
				NBL	NBT	NBR					
				70	176	0					
				OUT		IN					
				125	371	246					

Indian Trail Road/Francis Avenue

				125	371	246					
				IN		OUT					
				11	0	115					
				SBR	SBT	SBL					
11	OUT	21	EBL	TEV =			WBR	225	IN	225	
32		0	EBT	371			WBT	0		339	
21	IN	0	EBR				WBL	0	OUT	115	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				0	0	0					

Alberta Avenue/Francis Avenue

				11	16	5					
				IN		OUT					
				11	0	0					
				SBR	SBT	SBL					
197	OUT	5	EBL	TEV =			WBR	0	IN	144	
297		73	EBT	297			WBT	144		217	
100	IN	21	EBR				WBL	0	OUT	73	
				NBL	NBT	NBR					
				42	0	0					
				OUT		IN					
				21	64	42					

Ash Street/Francis Avenue

				21	21	0					
				IN		OUT					
				21	0	0					
				SBR	SBT	SBL					
140	OUT	0	EBL	TEV =			WBR	0	IN	119	
212		55	EBT	212			WBT	119		175	
72	IN	16	EBR				WBL	0	OUT	55	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				16	16	0					

Maple Street/Francis Avenue

				0	11	11					
				IN		OUT					
				0	0	0					
				SBR	SBT	SBL					
119	OUT	11	EBL	TEV =			WBR	0	IN	88	
175		45	EBT	175			WBT	88		133	
55	IN	0	EBR				WBL	0	OUT	45	
				NBL	NBT	NBR					
				32	0	0					
				OUT		IN					
				0	32	32					

Windhaven Apartments

TAZ30 Assignment Total - AM Peak Hour

Indian Trail Road/Shawnee Road

				2	9	7					
				IN		OUT					
				0	2	0					
				SBR	SBT	SBL					
0	OUT	0	EBL	TEV =			WBR	0	IN	0	
0		0	EBT	11			WBT	0		2	
0	IN	0	EBR				WBL	0	OUT	1	
				NBL	NBT	NBR					
				0	7	1					
				OUT		IN					
				3	11	8					

Forest Lane/Barnes Road

				0	0	0					
				IN		OUT					
				0	0	0					
				SBR	SBT	SBL					
7	OUT	0	EBL	TEV =			WBR	0	IN	7	
9		2	EBT	9			WBT	7		9	
2	IN	0	EBR				WBL	0	OUT	2	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				0	0	0					

Pamela Lane/Barnes Road

				0	0	0					
				IN		OUT					
				0	0	0					
				SBR	SBT	SBL					
7	OUT	0	EBL	TEV =			WBR	0	IN	7	
9		2	EBT	9			WBT	7		9	
2	IN	0	EBR				WBL	0	OUT	2	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				0	0	0					

Indian Trail Road/Barnes Road

				3	11	8					
				IN		OUT					
				0	0	3					
				SBR	SBT	SBL					
7	OUT	0	EBL	TEV =			WBR	8	IN	66	
9		2	EBT	89			WBT	7		89	
2	IN	0	EBR				WBL	51	OUT	23	
				NBL	NBT	NBR					
				0	0	18					
				OUT		IN					
				51	69	18					

Indian Trail Road/Strong Road

				51	69	18					
				IN		OUT					
				1	50	0					
				SBR	SBT	SBL					
2	OUT	0	EBL	TEV =			WBR	0	IN	1	
3		0	EBT	70			WBT	1		2	
1	IN	0	EBR				WBL	0	OUT	0	
				NBL	NBT	NBR					
				0	17	0					
				OUT		IN					
				50	67	17					

Indian Trail Road/Multiple Middle

				50	67	17					
				IN		OUT					
				0	50	0					
				SBR	SBT	SBL					
0	OUT	0	EBL	TEV =			WBR	0	IN	12	
0		0	EBT	83			WBT	0		16	
0	IN	0	EBR				WBL	12	OUT	4	
				NBL	NBT	NBR					
				0	17	4					
				OUT		IN					
				61	83	21					

Indian Trail Road/Francis Avenue

				61	83	21					
				IN		OUT					
				6	0	56					
				SBR	SBT	SBL					
6	OUT	2	EBL	TEV =			WBR	19	IN	19	
8		0	EBT	83			WBT	0		75	
2	IN	0	EBR				WBL	0	OUT	56	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				0	0	0					

Alberta Avenue/Francis Avenue

				0	0	0					
				IN		OUT					
				0	0	0					
				SBR	SBT	SBL					
18	OUT	0	EBL	TEV =			WBR	0	IN	15	
69		44	EBT	69			WBT	15		59	
51	IN	7	EBR				WBL	0	OUT	44	
				NBL	NBT	NBR					
				2	0	0					
				OUT		IN					
				7	9	2					

Ash Street/Francis Avenue

				3	3	0					
				IN		OUT					
				3	0	0					
				SBR	SBT	SBL					
15	OUT	0	EBL	TEV =			WBR	0	IN	12	
59		23	EBT	59			WBT	12		36	
44	IN	21	EBR				WBL	0	OUT	23	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				21	21	0					

Maple Street/Francis Avenue

				0	8	8					
				IN		OUT					
				0	0	0					
				SBR	SBT	SBL					
12	OUT	8	EBL	TEV =			WBR	0	IN	5	
36		15	EBT	36			WBT	5		20	
23	IN	0	EBR				WBL	0	OUT	15	
				NBL	NBT	NBR					
				7	0	0					
				OUT		IN					
				0	7	7					

Windhaven Apartments

TAZ30 Assignment Total - PM Peak Hour

Indian Trail Road/Shawnee Avenue

				6	10	3					
				IN		OUT					
				0	6	0					
				SBR	SBT	SBL					
0	OUT	0	EBL	TEV =			WBR	0	IN	1	
0		0	EBT	11			WBT	0		2	
0	IN	0	EBR				WBL	1	OUT	1	
				NBL	NBT	NBR					
				0	3	1					
				OUT		IN					
				7	11	4					

Forest Lane/Barnes Road

				0	0	0					
				IN		OUT					
				0	0	0					
				SBR	SBT	SBL					
3	OUT	0	EBL	TEV =			WBR	0	IN	3	
10		6	EBT	10			WBT	3		10	
6	IN	0	EBR				WBL	0	OUT	6	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				0	0	0					

Pamela Lane/Barnes Road

				0	0	0					
				IN		OUT					
				0	0	0					
				SBR	SBT	SBL					
3	OUT	0	EBL	TEV =			WBR	0	IN	3	
10		6	EBT	10			WBT	3		10	
6	IN	0	EBR				WBL	0	OUT	6	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				0	0	0					

Indian Trail Road/Barnes Road

				7	11	4					
				IN		OUT					
				0	0	7					
				SBR	SBT	SBL					
3	OUT	0	EBL	TEV =			WBR	4	IN	32	
10		6	EBT	92			WBT	3		92	
6	IN	0	EBR				WBL	25	OUT	60	
				NBL	NBT	NBR					
				0	0	47					
				OUT		IN					
				25	71	47					

Indian Trail Road/Strong Road

				25	71	47					
				IN		OUT					
				1	24	0					
				SBR	SBT	SBL					
1	OUT	1	EBL	TEV =			WBR	0	IN	1	
3		1	EBT	73			WBT	1		2	
2	IN	0	EBR				WBL	0	OUT	1	
				NBL	NBT	NBR					
				0	46	0					
				OUT		IN					
				24	70	46					

Indian Trail Road/Multiple Middle

				24	70	46					
				IN		OUT					
				0	24	0					
				SBR	SBT	SBL					
0	OUT	0	EBL	TEV =			WBR	0	IN	6	
0		0	EBT	86			WBT	0		16	
0	IN	0	EBR				WBL	6	OUT	11	
				NBL	NBT	NBR					
				0	46	11					
				OUT		IN					
				30	86	56					

Indian Trail Road/Francis Avenue

				30	86	56					
				IN		OUT					
				3	0	27					
				SBR	SBT	SBL					
3	OUT	5	EBL	TEV =			WBR	51	IN	51	
8		0	EBT	86			WBT	0		78	
5	IN	0	EBR				WBL	0	OUT	27	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				0	0	0					

Alberta Avenue/Francis Avenue

				0	0	0					
				IN		OUT					
				0	0	0					
				SBR	SBT	SBL					
47	OUT	0	EBL	TEV =			WBR	0	IN	40	
71		21	EBT	71			WBT	40		62	
25	IN	3	EBR				WBL	0	OUT	21	
				NBL	NBT	NBR					
				6	0	0					
				OUT		IN					
				3	10	6					

Ash Street/Francis Avenue

				7	7	0					
				IN		OUT					
				7	0	0					
				SBR	SBT	SBL					
40	OUT	0	EBL	TEV =			WBR	0	IN	33	
62		11	EBT	62			WBT	33		44	
21	IN	10	EBR				WBL	0	OUT	11	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				10	10	0					

Maple Street/Francis Avenue

				0	4	4					
				IN		OUT					
				0	0	0					
				SBR	SBT	SBL					
33	OUT	4	EBL	TEV =			WBR	0	IN	14	
44		7	EBT	44			WBT	14		21	
11	IN	0	EBR				WBL	0	OUT	7	
				NBL	NBT	NBR					
				19	0	0					
				OUT		IN					
				0	19	19					

Windhaven Apartments

TAZ31 Assignment Total - AM Peak Hour

Indian Trail Road/Shawnee Road

				0	1	1					
				IN		OUT					
				0	0	0					
				SBR	SBT	SBL					
0	OUT	0	EBL	TEV =			WBR	0	IN	0	
0		0	EBT	2			WBT	0		0	
0	IN	0	EBR				WBL	0	OUT	0	
				NBL	NBT	NBR					
				0	1	0					
				OUT		IN					
				1	2	1					

Forest Lane/Barnes Road

				0	0	0					
				IN		OUT					
				0	0	0					
				SBR	SBT	SBL					
1	OUT	0	EBL	TEV =			WBR	0	IN	1	
1		0	EBT	1			WBT	1		1	
0	IN	0	EBR				WBL	0	OUT	0	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				0	0	0					

Pamela Lane/Barnes Road

				0	0	0					
				IN		OUT					
				0	0	0					
				SBR	SBT	SBL					
1	OUT	0	EBL	TEV =			WBR	0	IN	1	
1		0	EBT	1			WBT	1		1	
0	IN	0	EBR				WBL	0	OUT	0	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				0	0	0					

Indian Trail Road/Barnes Road

				1	2	1					
				IN		OUT					
				0	0	1					
				SBR	SBT	SBL					
1	OUT	0	EBL	TEV =			WBR	1	IN	4	
1		0	EBT	6			WBT	1		6	
0	IN	0	EBR				WBL	2	OUT	2	
				NBL	NBT	NBR					
				0	0	1					
				OUT		IN					
				2	3	1					

Indian Trail Road/Strong Road

				2	3	1					
				IN		OUT					
				0	2	0					
				SBR	SBT	SBL					
1	OUT	0	EBL	TEV =			WBR	0	IN	0	
1		0	EBT	4			WBT	0		0	
0	IN	0	EBR				WBL	0	OUT	0	
				NBL	NBT	NBR					
				0	1	0					
				OUT		IN					
				2	3	1					

Indian Trail Road/Multiple Middle

				2	3	1					
				IN		OUT					
				0	2	0					
				SBR	SBT	SBL					
0	OUT	0	EBL	TEV =			WBR	0	IN	1	
0		0	EBT	4			WBT	0		1	
0	IN	0	EBR				WBL	1	OUT	0	
				NBL	NBT	NBR					
				0	1	0					
				OUT		IN					
				3	4	1					

Indian Trail Road/Francis Avenue

				3	4	1					
				IN		OUT					
				2	0	1					
				SBR	SBT	SBL					
2	OUT	1	EBL	TEV =			WBR	1	IN	1	
2		0	EBT	4			WBT	0		2	
1	IN	0	EBR				WBL	0	OUT	1	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				0	0	0					

Alberta Avenue/Francis Avenue

				0	0	0					
				IN		OUT					
				0	0	0					
				SBR	SBT	SBL					
1	OUT	0	EBL	TEV =			WBR	0	IN	1	
2		1	EBT	3			WBT	0		2	
1	IN	0	EBR				WBL	1	OUT	1	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				1	1	0					

Ash Street/Francis Avenue

				14	14	0					
				IN		OUT					
				1	8	6					
				SBR	SBT	SBL					
1	OUT	0	EBL	TEV =			WBR	0	IN	0	
2		1	EBT	16			WBT	0		7	
1	IN	0	EBR				WBL	0	OUT	7	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				8	8	0					

Maple Street/Francis Avenue

				0	6	6					
				IN		OUT					
				0	0	0					
				SBR	SBT	SBL					
0	OUT	1	EBL	TEV =			WBR	3	IN	3	
7		6	EBT	13			WBT	0		9	
7	IN	0	EBR				WBL	0	OUT	6	
				NBL	NBT	NBR					
				0	3	0					
				OUT		IN					
				0	3	3					

Windhaven Apartments

TAZ31 Assignment Total - PM Peak Hour

Indian Trail Road/Shawnee Avenue

				1	1	0					
				IN		OUT					
				0	1	0					
				SBR	SBT	SBL					
0	OUT	0	EBL	TEV =			WBR	0	IN	0	
0		0	EBT	2			WBT	0		0	
0	IN	0	EBR				WBL	0	OUT	0	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				1	2	1					

Forest Lane/Barnes Road

				0	0	0					
				IN		OUT					
				0	0	0					
				SBR	SBT	SBL					
0	OUT	0	EBL	TEV =			WBR	0	IN	0	
1		1	EBT	1			WBT	0		1	
1	IN	0	EBR				WBL	0	OUT	1	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				0	0	0					

Pamela Lane/Barnes Road

				0	0	0					
				IN		OUT					
				0	0	0					
				SBR	SBT	SBL					
0	OUT	0	EBL	TEV =			WBR	0	IN	0	
1		1	EBT	1			WBT	0		1	
1	IN	0	EBR				WBL	0	OUT	1	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				0	0	0					

Indian Trail Road/Barnes Road

				1	2	1					
				IN		OUT					
				0	0	1					
				SBR	SBT	SBL					
0	OUT	0	EBL	TEV =			WBR	1	IN	2	
1		1	EBT	6			WBT	0		6	
1	IN	0	EBR				WBL	1	OUT	4	
				NBL	NBT	NBR					
				0	0	2					
				OUT		IN					
				1	4	2					

Indian Trail Road/Strong Road

				1	4	2					
				IN		OUT					
				0	1	0					
				SBR	SBT	SBL					
0	OUT	0	EBL	TEV =			WBR	0	IN	0	
1		0	EBT	4			WBT	0		0	
1	IN	0	EBR				WBL	0	OUT	0	
				NBL	NBT	NBR					
				0	2	0					
				OUT		IN					
				1	3	2					

Indian Trail Road/Multiple Middle

				1	3	2					
				IN		OUT					
				0	1	0					
				SBR	SBT	SBL					
0	OUT	0	EBL	TEV =			WBR	0	IN	0	
0		0	EBT	4			WBT	0		1	
0	IN	0	EBR				WBL	0	OUT	1	
				NBL	NBT	NBR					
				0	2	1					
				OUT		IN					
				1	4	3					

Indian Trail Road/Francis Avenue

				1	4	3					
				IN		OUT					
				1	0	1					
				SBR	SBT	SBL					
1	OUT	1	EBL	TEV =			WBR	1	IN	1	
2		0	EBT	4			WBT	0		2	
1	IN	0	EBR				WBL	0	OUT	1	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				0	0	0					

Alberta Avenue/Francis Avenue

				0	0	0					
				IN		OUT					
				0	0	0					
				SBR	SBT	SBL					
1	OUT	0	EBL	TEV =			WBR	0	IN	1	
2		0	EBT	3			WBT	1		2	
1	IN	0	EBR				WBL	0	OUT	1	
				NBL	NBT	NBR					
				0	0	1					
				OUT		IN					
				0	1	1					

Ash Street/Francis Avenue

				7	7	0					
				IN		OUT					
				1	4	3					
				SBR	SBT	SBL					
1	OUT	0	EBL	TEV =			WBR	0	IN	1	
2		1	EBT	9			WBT	1		4	
1	IN	0	EBR				WBL	0	OUT	4	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				4	4	0					

Maple Street/Francis Avenue

				0	14	14					
				IN		OUT					
				0	0	0					
				SBR	SBT	SBL					
1	OUT	1	EBL	TEV =			WBR	6	IN	6	
4		3	EBT	18			WBT	0		9	
4	IN	0	EBR				WBL	0	OUT	3	
				NBL	NBT	NBR					
				0	7	0					
				OUT		IN					
				0	8	8					

Appendix E

Microsimulation Analysis

Morrison Maierle
engineers • surveyors • planners • scientists

memo

TO: Inga Note, P.E. - City of Spokane Street Department
Lisa Key - City of Spokane Planning and Development
Tirrell Black - City of Spokane Planning Department

FROM: Bill White
Kennet Bertelsen, P.E.

DATE: May 23, 2016

JOB NO.: 5594.002

RE: Windhaven Apartments, Summary Micro-simulation/SimTraffic Analysis

CC: Jay Bonnet, P.E. - Bonnett Engineering
Del Stratton - Douglass Properties
Greg Figg - WSDOT

☐**Urgent** ☒**For Review** ☒**Please Comment** ☒**Please Reply** ☐**For Your Use**

This memorandum summarizes the micro-simulation analysis developed in SimTraffic for the Windhaven Apartments project proposed in Spokane, WA. Provided is additional information to support the *Windhaven Apartments Traffic Impact Analysis* (MMI, May 2016), as developed per the request of officials with the Washington State Department of Transportation (WSDOT) specifically for Francis Avenue study intersections. Source material such as project data, traffic forecasts, and comparative analyses can be reviewed with the project Traffic Impact Analysis (TIA), as this provides analytical results only and is not intended as a stand-alone document.

SIMTRAFFIC ANALYSIS

SimTraffic (Trafficware, 2016) is a micro-simulation program used to review the cumulative impact of traffic within the context of roadway and intersection networks. This is somewhat different than the "spot" analyses provided through Highway Capacity Manual (HCM) methodologies and the software that generates HCM results (such as Synchro used with the Windhaven TIA). Cumulative results can be different with micro-simulation because the effect of the traffic influences from upstream and downstream intersections are addressed, whereas spot analysis focuses on traffic conditions predominantly at an intersection only. Spillback between intersections, spillback beyond turning bays, forced lane changes, unbalanced lane use for downstream turns, and other traffic flow interactions are examples of traffic conditions that can have a cumulative impact upon the operation of a single intersection.

Intersection delay, block time, and queue penalties are micro-simulation results requested by WSDOT for Francis Avenue study intersections. A description of intersection delay, block time, and queue penalties are as follows:

- **Block Time.** This represents the proportion of time during the peak hour that a turn lane is queued at the top or back of a storage area (i.e. lane length), thus access to the lane is effectively blocked. Or this represents the proportion of time that a turn lane is blocked due to queues in the adjacent through lane. Results are presented in terms of a percentage of time blocked during the peak hour. Block time is shown in Table 2.
- **Intersection Delay.** Presented by Table 1, this is the average delay experienced by vehicles at an intersection. Different than control delay (as presented by the TIA), this includes the effects of vehicle slow-downs and arrival/departure influences caused by

the factors mentioned previously (spillback, etc.). The information is presented as the average delay experienced by vehicles/drivers at an intersection in seconds.

- **Queue Penalty.** This is a rough measure of how many vehicles are impacted by blocking throughout the peak hour. As a quick way to quantify the effects of queuing at an intersection, this represents the vehicles that cannot access a turn lane because of queues or cannot make it through the intersection, because of volume/queuing, during the peak hour. The queue penalty is shown in Table 2.

Delay, block time, and queue penalty analyses were developed in SimTraffic assuming a 60 minute analysis using a 10 minute "seed" time. Five micro-simulation runs/iterations were performed for all analysis conditions. The results of these five runs where then averaged to generate information shown on the following pages. Note that summary worksheets and PDF reports for each run are attached to this memorandum for existing, future without, and future-with project analysis conditions.

The results of the delay analyses are provided on Table 1 for the AM and PM peak hours of the typical weekday. The analysis was prepared based on existing traffic counts, future without-project traffic forecasts, and future with-project traffic forecasts. The "spot" HCM delay results are shown for from the TIA as a means for comparing/quantifying the incidental delay associated with off-intersection traffic impacts/influences. However, please note these are not direct comparisons as they are quantifying somewhat different aspects of intersection operation.

Table 1. Existing and Forecast Micro-Simulation Intersection Delays

Year 2021 Condition	Existing Condition				Future Without Project Traffic				Future With Project Traffic			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
Signalized Intersections	Sim[1]	HCM[2]	Sim[1]	HCM[2]	Sim[1]	HCM[2]	Sim[1]	HCM[2]	Sim[1]	HCM[2]	Sim[1]	HCM[2]
Indian Trail Rd/Francis Ave	14.3	12.3	15.3	7.9	38.1	20.3	33.2	10.4	43.5	29.6	36.7	10.7
Alberta St/Francis Ave	56.6	36.4	92.4	32.2	76.3	65.6	132.3	53.7	76.0	78.3	149.9	59.4
Ash St/Francis Ave	16.9	22.3	17.1	20.4	16.6	26.1	19.0	21.3	19.5	28.9	20.6	21.5
Maple St/Francis Ave	14.5	17.4	78.5	38.8	11.3	17.6	117.9	51.4	11.8	17.6	116.8	54.0

1. Sim = SimTraffic Results
2. HCM = Highway Capacity Manual Comparison

A comparison confirms that future without-project intersection delays are nearly 10 seconds higher, on average between intersections, versus existing intersection delays during the AM peak hour. Futures without project delays are nearly 25 seconds higher, as averaged between intersections, during the PM peak hour. This means the typical driver will experience an average delay of between 10 and 25 additional seconds per intersection by year 2021, assuming no project development.

Comparatively, a comparison of without and with-project conditions confirms a 2 second increase of average delay, between intersection, during the AM peak hour. Also an approximate 5 second increase is forecast between intersections during the PM peak hour. This means the typical driver will experience an average delay of between 2 and 5 additional seconds per intersection by year 2021, assuming no project development.

Also note that SimTraffic delays do tend to exceed HCM control delays, as one would expect, when other incidental delays are considered for study intersections.

Block time and queue penalty data are shown in Table 2. The analysis was prepared initially based on existing counts, future without-project forecasts, and future-with project forecasts. However, there were minimal differences noted in results between the future without and future with-project conditions. As such, only existing and future-with project conditions are shown for the peak hours. Also, SimTraffic did not note blockage or excessive queues for a number of intersection movements. Thus, data was reported only for reasonably impacted movements at study intersections. Note the attached summary sheets and SimTraffic reports can be reviewed for all analysis conditions and all movements, as desired.

Table 2. Existing and Forecast Micro-Simulation Block Time and Queue Penalties

	Existing Condition				Future-With Project			
	AM Peak		PM Peak		AM Peak		PM Peak	
Signalized Intersections	Queue[1]	%Block[2]	Queue[1]	%Block[2]	Queue[1]	%Block[2]	Queue[1]	%Block[2]
Indian Trail Rd/Francis Ave								
- Westbound Right-Turn Lane	0%	0	3%	9	0%	0	17%	53
- Eastbound Through	5%	4	2%	3	5%	4	2%	4
- Eastbound Left-Turn Lane	2%	5	19%	42	5%	13	25%	58
Alberta St/Francis Ave								
- Northbound Left-Turn	0%	0	4%	18	0%	0	4%	18
- Northbound Left-Turn/Through	8%	5	68%	127	8%	7	72%	158
- Southbound Through	13%	8	2%	1	13%	10	2%	1
- Southbound Left-Turn	3%	4	0%	0	3%	4	0%	0
- Westbound Through	0%	1	49%	69	1%	1	50%	75
- Westbound Left-Turn	1%	4	1%	6	5%	16	3%	24
- Eastbound Through	51%	9	21%	7	60%	19	33%	14
Ash St/Francis Ave								
- Eastbound Through	0%	0	1%	2	2%	8	2%	4
Maple St/Francis Ave								
- Northbound Left-Turn/Through	1%	1	65%	118	2%	1	72%	155
- Westbound Through	0%	0	5%	15	0%	0	36%	133

1. Queue = Queue Penalty
2. %Block = Block Time

As shown, queue penalties and block time increase between the existing and future with-project condition. A general description is provided on the intersection basis as follows:

- **Indian Trail Road/Francis Avenue.** There is an existing average block time of 2 percent (between movements) during the AM peak hour and 8 percent during the PM peak hour. This increases overall in the future condition to 3 percent during the AM peak hour and 15 percent during the PM peak hour. There are currently a total of 9 vehicles impacted by queues in the AM peak hour and 54 vehicles during the PM peak hour (i.e. the queue penalty). This impact increases to 17 vehicles during the AM peak hour and 115 vehicles during the PM peak hour, in total.

- **Alberta Street/Francis Avenue.** The average intersection block time is 31 percent during the AM peak hour and 21 percent during the PM peak hour; increasing in the forecast condition to 13 percent and 23 percent between the AM and PM peak hours, respectively. There are 31 total vehicles impacted by queues during the AM peak hour and 228 during the PM peak hour. This increases to 57 AM peak hour and 290 PM peak hour vehicles impacted by queues, as based on the future condition.

- **Ash Street/Francis Avenue.** No block time or queue penalties were currently identified during the AM peak hour. However, there is an average 2 percent block and 8 vehicle queue penalty forecast during the AM peak hour, averaged at the intersection. The

existing block time increases from 1 to 2 percent, on average, between existing and forecast conditions with an associated queue penalty increase of 2 to 4 vehicles during the PM peak hour.

- **Maple Street/Francis Avenue.** The AM peak hour block time and queue penalty, at 1 percent and 1 vehicle, does not increase between the existing and future conditions. The PM peak hour block time does increase from 35 to 54 percent between the existing and future condition. The 133 vehicles currently impacted by queues increases to 288 vehicles during the forecast PM peak hour.

SUMMARY

SimTraffic analyses confirms traffic growth will increase cumulative impacts upon study intersections located along Francis Avenue, as measured by gains in intersection delay, block time, and queue penalty. The typical driver will experience an average delay of between 12 and 30 additional seconds per intersection by year 2021, assuming development of all projected specified within the TIA. On average, blockage time is anticipated to increase between the peak hours by: up to 7 percent at the Indian Trail Road/Francis Avenue intersection, up to 3 percent at the Alberta Street/Francis Avenue intersection, up to 2 percent at the Ash Street/Francis Avenue intersection, and up to 19 percent at the Maple Street/Francis Avenue intersection, assuming; assuming development of all projected specified within the TIA. Finally, the number of vehicles impacted by queues between peak hours will elevate by up to: 61 for the Indian Trail Road/Francis Avenue intersection, 62 for the Alberta Street/Francis Avenue intersection, 8 for the Ash Street/Francis Avenue intersection, and 155 for the Maple Street/Francis Avenue intersection, assuming development of all projected specified within the TIA.

However, the analysis confirms marginal changes between the future without and with project conditions. Drivers are forecast to potentially experience an average delay increase of between 2 and 5 additional seconds per intersection by year 2021, along Francis Avenue, which is a moderate change. The difference in block time and queue penalties was not summarized as the differences were negligible (although they are attached for review, as needed). Thus, the SimTraffic analysis also confirms the project proposal will have a minimal impact upon cumulative traffic operations for intersections located along Francis Avenue.

We hope this provides sufficient information to help WSDOT with their consideration and comment on the Windhaven project. Please contact our office with questions or comments.

Existing

	AM Peak Hour, Run/Seed							PM Peak Hour, Run/Seed						
	1	2	3	4	5	Avg	HCM	1	2	3	4	5	Avg	HCM
Indian Trail/Francis Avenue	13.5	13.7	14.0	14.6	15.7	14.3	12.3	15.4	14.8	13.8	14.5	17.8	15.3	7.9
Alberta Street/Francis Avenue	44.3	37.2	87.8	57.1	56.8	56.6	36.4	105.0	86.5	74.8	87.7	107.8	92.4	32.2
Ash Street/Francis Avenue	17.2	16.9	16.7	17.2	16.6	16.9	22.3	18.0	16.0	16.7	17.3	17.7	17.1	20.4
Maple Street/Francis Avenue	14.4	13.6	15.4	14.2	14.7	14.5	17.4	48.9	120.3	55.7	61.0	106.7	78.5	38.8

Indian Trail/Francis Avenue		AM Peak Hour EB-L	EB-TT	WB-TT	WB-R	SB-L	SB-LR
AM-1	- Queuing Penalty (%)	1%	7%	0%	0%	0%	0%
	- Blocking Report (veh)	3	5	0	0	0	0
AM-2	- Queuing Penalty (%)	2%	5%	0%	0%	0%	0%
	- Blocking Report (veh)	5	4	0	0	0	0
AM-3	- Queuing Penalty (%)	2%	6%	0%	0%	0%	0%
	- Blocking Report (veh)	5	5	0	0	0	0
AM-4	- Queuing Penalty (%)	2%	6%	0%	0%	0%	0%
	- Blocking Report (veh)	5	5	0	0	0	0
AM-5	- Queuing Penalty (%)	2%	3%	0%	0%	0%	0%
	- Blocking Report (veh)	6	2	0	0	0	0
AM-Avg	- Queuing Penalty (%)	2%	5%	0%	0%	0%	0%
	- Blocking Report (veh)	5	4	0	0	0	0

Indian Trail/Francis Avenue		PM Peak Hour EB-L	EB-TT	WB-TT	WB-R	SB-L	SB-LR
PM-1	- Queuing Penalty (%)	20%	2%	1%	4%	0%	0%
	- Blocking Report (veh)	45	3	1	11	0	0
PM-2	- Queuing Penalty (%)	29%	2%	0%	3%	0%	0%
	- Blocking Report (veh)	65	2	0	9	0	0
PM-3	- Queuing Penalty (%)	8%	2%	0%	2%	0%	0%
	- Blocking Report (veh)	18	3	1	6	0	0
PM-4	- Queuing Penalty (%)	21%	2%	0%	2%	0%	0%
	- Blocking Report (veh)	49	3	1	5	0	0
PM-5	- Queuing Penalty (%)	15%	2%	0%	5%	0%	0%
	- Blocking Report (veh)	33	2	1	16	0	0
PM-Avg	- Queuing Penalty (%)	19%	2%	0%	3%	0%	0%
	- Blocking Report (veh)	42	3	1	9	0	0

Alberts Street/Francis Avenue		AM Peak Hour EB-L	EB-T	EB-TR	WB-L	WB-T	WB-TR	NB-L	NB-LTR	SB-L	SB-TR
AM-1	- Queuing Penalty (%)	0%	51%	0%	2%	0%	0%	0%	11%	3%	11%
	- Blocking Report (veh)	0	9	0	5	0	0	0	8	4	8
AM-2	- Queuing Penalty (%)	0%	42%	0%	2%	0%	0%	0%	4%	2%	14%
	- Blocking Report (veh)	0	8	0	7	1	0	0	3	3	11
AM-3	- Queuing Penalty (%)	0%	59%	0%	2%	0%	0%	0%	8%	3%	13%
	- Blocking Report (veh)	0	11	0	5	1	0	0	5	4	10
AM-4	- Queuing Penalty (%)	0%	49%	0%	1%	0%	0%	0%	8%	2%	14%
	- Blocking Report (veh)	0	9	0	2	1	0	0	6	3	0.11
AM-5	- Queuing Penalty (%)	0%	54%	0%	0%	0%	0%	0%	7%	3%	15%
	- Blocking Report (veh)	0	10	0	0	1	0	0	5	5	12
AM-Avg	- Queuing Penalty (%)	0%	51%	0%	1%	0%	0%	0%	8%	3%	13%
	- Blocking Report (veh)	0	9	0	4	1	0	0	5	4	8

Alberts Street/Francis Avenue		PM Peak Hour EB-L	EB-T	EB-TR	WB-L	WB-T	WB-TR	NB-L	NB-LTR	SB-L	SB-TR
PM-1	- Queuing Penalty (%)	0%	22%	0%	2%	55%	0%	6%	73%	1%	4%
	- Blocking Report (veh)	0	7	0	13	78	0	25	136	1	1
PM-2	- Queuing Penalty (%)	0%	13%	0%	0%	54%	0%	2%	69%	0%	1%
	- Blocking Report (veh)	0	4	0	0	77	0	9	128	0	0
PM-3	- Queuing Penalty (%)	0%	18%	0%	1%	40%	0%	5%	63%	0%	1%
	- Blocking Report (veh)	0	6	0	6	57	0	22	116	0	0
PM-4	- Queuing Penalty (%)	0%	27%	0%	2%	45%	0%	5%	71%	0%	1%
	- Blocking Report (veh)	0	9	0	13	64	0	21	132	0	1
PM-5	- Queuing Penalty (%)	0%	23%	0%	0%	50%	0%	3%	65%	0%	2%
	- Blocking Report (veh)	0	8	0	0	70	0	14	122	0	1
PM-Avg	- Queuing Penalty (%)	0%	21%	0%	1%	49%	0%	4%	68%	0%	2%
	- Blocking Report (veh)	0	7	0	6	69	0	18	127	0	1

Alberta Street/Francis Avenue		AM Peak Hour EB-TT	EB-TR	WB-L	WB-TT	SB-L	SB-TT	SB-R
AM-1	- Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%
	- Blocking Report (veh)	1	0	0	0	0	0	0
AM-2	- Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%
	- Blocking Report (veh)	1	0	0	0	0	0	0
AM-3	- Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%
	- Blocking Report (veh)	0	0	0	0	0	0	0
AM-4	- Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%
	- Blocking Report (veh)	0	0	0	0	0	0	0
AM-5	- Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%
	- Blocking Report (veh)	0	0	0	0	0	0	0
AM-Avg	- Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%
	- Blocking Report (veh)	0	0	0	0	0	0	0

Alberta Street/Francis Avenue		PM Peak Hour EB-TT	EB-TR	WB-L	WB-TT	SB-L	SB-TT	SB-R
PM-1	- Queuing Penalty (%)	5%	0%	0%	0%	0%	0%	0%
	- Blocking Report (veh)	10	0	0	0	0	0	0
PM-2	- Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%
	- Blocking Report (veh)	0	0	2	0	0	0	0
PM-3	- Queuing Penalty (%)	0%	0%	1%	0%	0%	0%	0%
	- Blocking Report (veh)	0	0	3	0	0	0	0
PM-4	- Queuing Penalty (%)	1%	0%	0%	0%	0%	0%	0%
	- Blocking Report (veh)	2	0	0	0	0	0	0
PM-5	- Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%
	- Blocking Report (veh)	0	0	1	0	0	0	0
PM-Avg	- Queuing Penalty (%)	1%	0%	0%	0%	0%	0%	0%
	- Blocking Report (veh)	2	0	1	0	0	0	0

Alberta Street/Francis Avenue		AM Peak Hour EB-L	EB-TT	WB-T	WB-TR	NB-L	NB-LT	NB-T	NB-TR
AM-1	- Queuing Penalty (%)	0%	0%	0%	0%	0%	1%	0%	0%
	- Blocking Report (veh)	0	0	0	0	0	0	0	0
AM-2	- Queuing Penalty (%)	0%	0%	0%	0%	0%	0%	0%	0%
	- Blocking Report (veh)	0	0	0	0	0	0	0	0
AM-3	- Queuing Penalty (%)	1%	0%	0%	0%	0%	2%	0%	0%
	- Blocking Report (veh)	2	0	0	0	0	0	0	0
AM-4	- Queuing Penalty (%)	0%	0%	0%	0%	0%	1%	0%	0%
	- Blocking Report (veh)	0	0	0	0	0	0	0	0
AM-5	- Queuing Penalty (%)	0%	0%	0%	0%	0%	2%	0%	0%
	- Blocking Report (veh)	0	0	0	0	0	0	0	0
AM-Avg	- Queuing Penalty (%)	0%	0%	0%	0%	0%	1%	0%	0%
	- Blocking Report (veh)	0	0	0	0	0	0	0	0

Alberta Street/Francis Avenue		PM Peak Hour EB-L	EB-TT	WB-T	WB-TR	NB-L	NB-LT	NB-T	NB-TR
PM-1	- Queuing Penalty (%)	0%	0%	4%	0%	0%	65%	0%	0%
	- Blocking Report (veh)	0	0	13	0	0	118	0	0
PM-2	- Queuing Penalty (%)	0%	0%	10%	0%	0%	67%	0%	0%
	- Blocking Report (veh)	0	0	33	0	0	121	0	0
PM-3	- Queuing Penalty (%)	0%	0%	2%	0%	0%	62%	0%	0%
	- Blocking Report (veh)	0	0	7	0	0	113	0	0
PM-4	- Queuing Penalty (%)	0%	0%	4%	0%	0%	66%	0%	0%
	- Blocking Report (veh)	0	0	12	0	0	119	0	0
PM-5	- Queuing Penalty (%)	0%	0%	3%	0%	0%	66%	0%	0%
	- Blocking Report (veh)	0	0	10	0	0	119	0	0
PM-Avg	- Queuing Penalty (%)	0%	0%	5%	0%	0%	65%	0%	0%
	- Blocking Report (veh)	0	0	15	0	0	118	0	0

Future Without-Project

	AM Peak Hour, Run/Seed							PM Peak Hour, Run/Seed						
	1	2	3	4	5	Avg	HCM	1	2	3	4	5	Avg	HCM
Indian Trail/Francis Avenue	38.5	24.4	30.1	54.4	43.3	38.1	20.3	40.5	30.5	33.0	33.0	29.0	33.2	10.4
Alberta Street/Francis Avenue	71.8	80.6	74.4	78.5	76.3	76.3	65.6	142.6	120.1	135.6	131.6	131.5	132.3	53.7
Ash Street/Francis Avenue	15.5	16.9	16.5	16.9	16.6	16.5	26.1	18.5	19.5	19.6	18.8	18.5	19.0	21.3
Maple Street/Francis Avenue	11.3	10.9	11.5	10.9	12	11.3	17.6	117.6	102.3	114.0	130.8	124.8	117.9	51.4

	AM Peak Hour							PM Peak Hour							
Indian Trail/Francis Avenue		EB-L	EB-TT	WB-TT	WB-R	SB-L	SB-LR	Indian Trail/Francis Avenue		EB-L	EB-TT	WB-TT	WB-R	SB-L	SB-LR
AM-1	- Queuing Penailty (%)	5%	1%	0%	0%	0%	0%	PM-1	- Queuing Penailty (%)	31%	2%	0%	24%	0%	0%
	- Blocking Report (veh)	13	1	0	0	0	0		- Blocking Report (veh)	71	4	0	76	0	0
AM-2	- Queuing Penailty (%)	4%	4%	0%	0%	0%	0%	PM-2	- Queuing Penailty (%)	14%	2%	0%	11%	0%	0%
	- Blocking Report (veh)	12	3	0	0	0	0		- Blocking Report (veh)	34	3	4	34	0	0
AM-3	- Queuing Penailty (%)	2%	2%	0%	0%	0%	0%	PM-3	- Queuing Penailty (%)	23%	3%	1%	14%	0%	0%
	- Blocking Report (veh)	5	2	0	0	0	0		- Blocking Report (veh)	53	5	10	46	0	0
AM-4	- Queuing Penailty (%)	2%	2%	0%	0%	0%	0%	PM-4	- Queuing Penailty (%)	22%	3%	0%	13%	0%	0%
	- Blocking Report (veh)	7	2	0	0	0	0		- Blocking Report (veh)	51	4	2	41	0	0
AM-5	- Queuing Penailty (%)	1%	2%	0%	0%	0%	0%	PM-5	- Queuing Penailty (%)	29%	3%	0%	8%	0%	0%
	- Blocking Report (veh)	2	2	0	0	0	0		- Blocking Report (veh)	67	5	5	25	0	0
AM-Avg	- Queuing Penailty (%)	3%	2%	0%	0%	0%	0%	PM-Avg	- Queuing Penailty (%)	24%	3%	0%	14%	0%	0%
	- Blocking Report (veh)	8	2	0	0	0	0		- Blocking Report (veh)	55	4	4	44	0	0

	AM Peak Hour										PM Peak Hour									
Alberts Street/Francis Avenue		EB-L	EB-T	EB-TR	WB-L	WB-T	WB-TR	NB-L	NB-LTR	SB-L	SB-TR	Alberts Street/Francis Avenue		EB-L	EB-T	EB-TR	WB-L	WB-T	WB-TR	NB-L	NB-LTR	SB-L	SB-TR
AM-1	- Queuing Penailty (%)	0%	58%	0%	13%	0%	0%	0%	9%	4%	10%	PM-1	- Queuing Penailty (%)	0%	27%	0%	4%	51%	0%	3%	73%	0%	0%
	- Blocking Report (veh)	0	16	0	40	1	0	0	8	5	8		- Blocking Report (veh)	0	11	0	28	74	0	15	157	0	0
AM-2	- Queuing Penailty (%)	0%	59%	0%	1%	1%	0%	0%	4%	3%	15%	PM-2	- Queuing Penailty (%)	0%	32%	0%	7%	48%	0%	4%	70%	0%	0%
	- Blocking Report (veh)	0	16	0	2	2	0	0	4	4	12		- Blocking Report (veh)	0	12	0	51	70	0	18	151	0	0
AM-3	- Queuing Penailty (%)	0%	60%	0%	0%	1%	0%	0%	10%	8%	4%	PM-3	- Queuing Penailty (%)	0%	43%	0%	8%	46%	0%	2%	68%	0%	4%
	- Blocking Report (veh)	0	16	0	1	1	0	0	9	7	4		- Blocking Report (veh)	0	17	0	59	66	0	8	147	0	2
AM-4	- Queuing Penailty (%)	0%	57%	0%	1%	2%	0%	0%	10%	2%	17%	PM-4	- Queuing Penailty (%)	0%	34%	0%	3%	52%	0%	8%	71%	2%	7%
	- Blocking Report (veh)	0	15	0	3	3	0	0	9	4	13		- Blocking Report (veh)	0	13	0	23	75	0	37	154	2	3
AM-5	- Queuing Penailty (%)	0%	57%	0%	1%	2%	0%	0%	9%	0%	17%	PM-5	- Queuing Penailty (%)	0%	36%	0%	3%	48%	0%	6%	72%	0%	4%
	- Blocking Report (veh)	0	15	0	3	2	0	0	8	0	14		- Blocking Report (veh)	0	14	0	25	70	0	27	154	0	1
AM-Avg	- Queuing Penailty (%)	0%	58%	0%	3%	1%	0%	0%	8%	3%	13%	PM-Avg	- Queuing Penailty (%)	0%	34%	0%	5%	49%	0%	5%	71%	0%	3%
	- Blocking Report (veh)	0	16	0	10	2	0	0	8	4	10		- Blocking Report (veh)	0	13	0	37	71	0	21	153	0	1

	AM Peak Hour							PM Peak Hour							
Alberta Street/Francis Avenue		EB-TT	EB-TR	WB-L	WB-TT	SB-L	SB-TT	SB-R	Alberta Street/Francis Avenue		EB-TT	EB-TR	WB-L	WB-TT	SB-L	SB-TT	SB-R
AM-1	- Queuing Penailty (%)	0%	0%	0%	0%	0%	0%	0%	PM-1	- Queuing Penailty (%)	0%	0%	0%	0%	0%	0%	0%
	- Blocking Report (veh)	0	0	0	0	0	0	0		- Blocking Report (veh)	0	0	0	0	0	0	0
AM-2	- Queuing Penailty (%)	0%	0%	0%	0%	0%	0%	0%	PM-2	- Queuing Penailty (%)	1%	0%	0%	0%	0%	0%	0%
	- Blocking Report (veh)	0	0	0	0	0	0	0		- Blocking Report (veh)	1	0	0	0	0	0	0
AM-3	- Queuing Penailty (%)	0%	0%	0%	0%	0%	0%	0%	PM-3	- Queuing Penailty (%)	0%	0%	0%	0%	0%	0%	0%
	- Blocking Report (veh)	0	0	0	0	0	0	0		- Blocking Report (veh)	1	0	0	0	0	0	0
AM-4	- Queuing Penailty (%)	0%	0%	0%	0%	0%	0%	0%	PM-4	- Queuing Penailty (%)	0%	0%	0%	0%	0%	0%	0%
	- Blocking Report (veh)	0	0	0	0	0	0	0		- Blocking Report (veh)	0	0	1	0	0	0	0
AM-5	- Queuing Penailty (%)	0%	0%	0%	0%	0%	0%	0%	PM-5	- Queuing Penailty (%)	0%	0%	0%	0%	0%	0%	0%
	- Blocking Report (veh)	0	0	0	0	0	0	0		- Blocking Report (veh)	0	0	0	0	0	0	0
AM-Avg	- Queuing Penailty (%)	0%	0%	0%	0%	0%	0%	0%	PM-Avg	- Queuing Penailty (%)	0%	0%	0%	0%	0%	0%	0%
	- Blocking Report (veh)	0	0	0	0	0	0	0		- Blocking Report (veh)	0	0	0	0	0	0	0

	AM Peak Hour								PM Peak Hour								
Alberta Street/Francis Avenue		EB-L	EB-TT	WB-T	WB-TR	NB-L	NB-LT	NB-T	NB-TR	Alberta Street/Francis Avenue		EB-L	EB-TT	WB-T	WB-TR	NB-L	NB-LT	NB-T	NB-TR
AM-1	- Queuing Penailty (%)	0%	0%	0%	0%	0%	2%	0%	0%	PM-1	- Queuing Penailty (%)	0%	0%	0%	0%	0%	73%	0%	0%
	- Blocking Report (veh)	0	0	0	0	0	0	0	0		- Blocking Report (veh)	0	0	137	0	0	154	0	0
AM-2	- Queuing Penailty (%)	0%	0%	0%	0%	0%	0%	0%	0%	PM-2	- Queuing Penailty (%)	0%	0%	35%	0%	0%	65%	0%	0%
	- Blocking Report (veh)	2	0	0	0	0	0	0	0		- Blocking Report (veh)	0	0	127	0	0	137	0	0
AM-3	- Queuing Penailty (%)	0%	0%	0%	0%	0%	0%	0%	0%	PM-3	- Queuing Penailty (%)	0%	0%	39%	0%	0%	69%	0%	0%
	- Blocking Report (veh)	0	0	0	0	0	0	0	0		- Blocking Report (veh)	0	0	144	0	0	146	0	0
AM-4	- Queuing Penailty (%)	0%	0%	0%	0%	0%	0%	2%	0%	PM-4	- Queuing Penailty (%)	0%	0%	52%	0%	0%	72%	0%	0%
	- Blocking Report (veh)	2	0	0	0	0	0	0	0		- Blocking Report (veh)	0	0	188	0	0	152	0	0
AM-5	- Queuing Penailty (%)	0%	0%	0%	0%	0%	1%	0%	0%	PM-5	- Queuing Penailty (%)	0%	0%	20%	0%	0%	64%	0%	0%
	- Blocking Report (veh)	0	0	0	0	0	0	0	0		- Blocking Report (veh)	0	0	74	0	0	135	0	0
AM-Avg	- Queuing Penailty (%)	0%	0%	0%	0%	0%	1%	0%	0%	PM-Avg	- Queuing Penailty (%)	0%	0%	29%	0%	0%	69%	0%	0%
	- Blocking Report (veh)	1	0	0	0	0	0	0	0		- Blocking Report (veh)	0	0	134	0	0	145	0	0

Future Wit-Project

	AM Peak Hour, Run/Seed							PM Peak Hour, Run/Seed						
	1	2	3	4	5	Avg	HCM	1	2	3	4	5	Avg	HCM
Indian Trail/Francis Avenue	35.7	52.8	46.8	41.9	40.2	43.5	29.6	36.2	40.4	35.3	37.5	34.3	36.7	10.7
Alberta Street/Francis Avenue	69.8	82.2	75.3	78.2	74.7	76.0	78.3	128.6	162.9	155.6	172.7	129.7	149.9	59.4
Ash Street/Francis Avenue	21.2	17.7	19.2	19.1	20.1	19.5	28.9	17.8	27.2	22.3	17.1	18.8	20.6	21.5
Maple Street/Francis Avenue	12.6	11.8	11.2	11.9	11.6	11.8	17.6	115.8	97.0	135.5	115.9	119.9	116.8	54.0

		AM Peak Hour								PM Peak Hour						
Indian Trail/Francis Avenue		EB-L	EB-TT	WB-TT	WB-R	SB-L	SB-LR		Indian Trail/Francis Avenue		EB-L	EB-TT	WB-TT	WB-R	SB-L	SB-LR
AM-1	- Queuing Penailty (%)	4%	3%	0%	0%	0%	0%		PM-1	- Queuing Penailty (%)	16%	3%	0%	16%	0%	0%
	- Blocking Report (veh)	10	2	0	0	0	0			- Blocking Report (veh)	37	6	3	50	0	0
AM-2	- Queuing Penailty (%)	6%	3%	0%	0%	0%	0%		PM-2	- Queuing Penailty (%)	32%	2%	0%	20%	0%	0%
	- Blocking Report (veh)	16	3	0	0	0	0			- Blocking Report (veh)	74	3	5	63	0	0
AM-3	- Queuing Penailty (%)	8%	1%	0%	0%	0%	0%		PM-3	- Queuing Penailty (%)	32%	2%	1%	16%	0%	0%
	- Blocking Report (veh)	22	1	0	0	0	0			- Blocking Report (veh)	74	4	11	52	0	0
AM-4	- Queuing Penailty (%)	5%	2%	0%	0%	0%	0%		PM-4	- Queuing Penailty (%)	21%	2%	0%	16%	0%	0%
	- Blocking Report (veh)	15	2	0	0	0	0			- Blocking Report (veh)	48	4	5	52	0	0
AM-5	- Queuing Penailty (%)	2%	3%	0%	0%	0%	0%		PM-5	- Queuing Penailty (%)	25%	1%	1%	16%	0%	0%
	- Blocking Report (veh)	4	3	0	0	0	0			- Blocking Report (veh)	57	3	8	50	0	0
AM-Avg	- Queuing Penailty (%)	5%	2%	0%	0%	0%	0%		PM-Avg	- Queuing Penailty (%)	25%	2%	0%	17%	0%	0%
	- Blocking Report (veh)	13	2	0	0	0	0			- Blocking Report (veh)	58	4	6	53	0	0

		AM Peak Hour										PM Peak Hour									
Alberts Street/Francis Avenue		EB-L	EB-T	EB-TR	WB-L	WB-T	WB-TR	NB-L	NB-LTR	SB-L	SB-TR	Alberts Street/Francis Avenue		EB-L	EB-T	EB-TR	WB-L	WB-T	WB-TR	NB-L	NB-LTR	SB-L	SB-TR
AM-1	- Queuing Penailty (%)	0%	59%	0%	3%	1%	0%	1%	9%	3%	9%	PM-1	- Queuing Penailty (%)	0%	36%	0%	0%	48%	0%	2%	71%	0%	1%
	- Blocking Report (veh)	0	19	0	10	1	0	2	8	5	7		- Blocking Report (veh)	0	15	0	0	78	0	11	157	0	1
AM-2	- Queuing Penailty (%)	0%	60%	0%	9%	1%	0%	0%	9%	2%	13%	PM-2	- Queuing Penailty (%)	0%	36%	0%	3%	52%	0%	4%	74%	1%	2%
	- Blocking Report (veh)	0	19	0	29	1	0	0	8	3	10		- Blocking Report (veh)	0	15	0	23	75	0	18	163	1	1
AM-3	- Queuing Penailty (%)	0%	59%	0%	7%	1%	0%	0%	5%	4%	17%	PM-3	- Queuing Penailty (%)	0%	36%	0%	3%	54%	0%	4%	69%	0%	3%
	- Blocking Report (veh)	0	19	0	22	1	0	0	4	6	14		- Blocking Report (veh)	0	15	0	23	79	0	17	152	0	1
AM-4	- Queuing Penailty (%)	0%	60%	0%	5%	0%	0%	0%	10%	3%	11%	PM-4	- Queuing Penailty (%)	0%	34%	0%	4%	54%	0%	0%	73%	0%	2%
	- Blocking Report (veh)	0	19	0	15	0	0	0	9	4	9		- Blocking Report (veh)	0	14	0	28	78	0	1	162	0	1
AM-5	- Queuing Penailty (%)	0%	60%	0%	1%	3%	0%	0%	7%	1%	15%	PM-5	- Queuing Penailty (%)	0%	24%	0%	6%	44%	0%	6%	71%	0%	1%
	- Blocking Report (veh)	0	19	0	2	4	0	0	6	2	12		- Blocking Report (veh)	0	10	0	45	65	0	28	157	0	0
AM-Avg	- Queuing Penailty (%)	0%	60%	0%	5%	1%	0%	0%	8%	3%	13%	PM-Avg	- Queuing Penailty (%)	0%	33%	0%	3%	50%	0%	3%	72%	0%	2%
	- Blocking Report (veh)	0	19	0	16	1	0	0	7	4	10		- Blocking Report (veh)	0	14	0	24	75	0	15	158	0	1

		AM Peak Hour							PM Peak Hour							
Alberta Street/Francis Avenue		EB-TT	EB-TR	WB-L	WB-TT	SB-L	SB-TT	SB-R	Alberta Street/Francis Avenue		EB-TT	EB-TR	WB-L	WB-TT	SB-L	SB-TT	SB-R
AM-1	- Queuing Penailty (%)	0%	2%	0%	0%	0%	0%	0%	PM-1	- Queuing Penailty (%)	0%	0%	0%	0%	0%	0%	0%
	- Blocking Report (veh)	0	9	0	0	0	0	0		- Blocking Report (veh)	0	0	2	0	0	0	0
AM-2	- Queuing Penailty (%)	0%	1%	0%	0%	0%	0%	0%	PM-2	- Queuing Penailty (%)	7%	0%	0%	0%	0%	0%	6%
	- Blocking Report (veh)	0	4	0	0	0	0	0		- Blocking Report (veh)	17	0	0	0	0	2	17
AM-3	- Queuing Penailty (%)	0%	2%	0%	0%	0%	0%	0%	PM-3	- Queuing Penailty (%)	0%	0%	0%	0%	0%	0%	1%
	- Blocking Report (veh)	1	10	0	0	0	0	0		- Blocking Report (veh)	0	0	0	0	0	0	3
AM-4	- Queuing Penailty (%)	0%	1%	0%	0%	0%	0%	0%	PM-4	- Queuing Penailty (%)	0%	0%	0%	0%	0%	0%	0%
	- Blocking Report (veh)	0	4	0	0	0	0	0		- Blocking Report (veh)	0	0	0	0	0	0	0
AM-5	- Queuing Penailty (%)	0%	2%	0%	0%	0%	0%	0%	PM-5	- Queuing Penailty (%)	2%	0%	0%	0%	0%	0%	0%
	- Blocking Report (veh)	1	11	0	0	0	0	0		- Blocking Report (veh)	4	0	0	0	0	0	0
AM-Avg	- Queuing Penailty (%)	0%	2%	0%	0%	0%	0%	0%	PM-Avg	- Queuing Penailty (%)	2%	0%	0%	0%	0%	0%	1%
	- Blocking Report (veh)	0	8	0	0	0	0	0		- Blocking Report (veh)	4	0	0	0	0	0	4

		AM Peak Hour								PM Peak Hour							
Alberta Street/Francis Avenue		EB-L	EB-TT	WB-T	WB-TR	NB-L	NB-LT	NB-T	NB-TR	Alberta Street/Francis Avenue		EB-L	EB-TT	WB-T	WB-TR	NB-L	NB-LT	NB-T	NB-TR
AM-1	- Queuing Penailty (%)	0%	0%	0%	0%	0%	2%	0%	0%	PM-1	- Queuing Penailty (%)	0%	0%	14%	0%	0%	75%	0%	0%
	- Blocking Report (veh)	0	0	0	0	0	0	0	0		- Blocking Report (veh)	0	0	51	0	0	162	0	0
AM-2	- Queuing Penailty (%)	0%	0%	0%	0%	0%	2%	0%	0%	PM-2	- Queuing Penailty (%)	0%	0%	53%	0%	0%	76%	0%	0%
	- Blocking Report (veh)	0	0	0	0	0	0	0	0		- Blocking Report (veh)	0	0	196	0	0	163	0	0
AM-3	- Queuing Penailty (%)	0%	0%	0%	0%	0%	2%	0%	0%	PM-3	- Queuing Penailty (%)	0%	0%	42%	0%	0%	72%	0%	0%
	- Blocking Report (veh)	0	0	0	0	0	0	0	0		- Blocking Report (veh)	0	0	158	0	0	154	0	0
AM-4	- Queuing Penailty (%)	0%	0%	0%	0%	0%	3%	0%	0%	PM-4	- Queuing Penailty (%)	0%	0%	37%	0%	0%	70%	0%	0%
	- Blocking Report (veh)	0	0	0	0	0	0	0	0		- Blocking Report (veh)	0	0	141	0	0	150	0	0
AM-5	- Queuing Penailty (%)	0%	0%	0%	0%	0%	2%	0%	0%	PM-5	- Queuing Penailty (%)	0%	0%	33%	0%	0%	67%	0%	0%
	- Blocking Report (veh)	0	0	0	0	0	0	0	0		- Blocking Report (veh)	0	0	118	0	0	145	0	0
AM-Avg	- Queuing Penailty (%)	0%	0%	0%	0%	0%	2%	0%	0%	PM-Avg	- Queuing Penailty (%)	0%	0%	36%	0%	0%	72%	0%	0%
	- Blocking Report (veh)	0	0	0	0	0	0	0	0		- Blocking Report (veh)	0	0	133	0	0	155	0	0

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.7	0.0	0.0	0.2	0.0	0.0	0.0	0.1
Total Del/Veh (s)	19.6	11.7	6.7	4.8	19.5	1.2	11.0	13.5

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.3	3.9	0.4	0.4
Total Del/Veh (s)	49.1	58.5	65.3	42.2	12.8	18.1	48.4	49.8	45.8	43.8	47.8	27.5

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	44.3

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	20.1	23.9	37.9	8.2	25.1	16.4	8.2	17.2

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	24.8	5.4	12.5	5.8	45.9	29.7	24.7	14.4

Total Zone Performance

Denied Del/Veh (s)	0.8
Total Del/Veh (s)	210.7

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	99	158	145	120	98	281	273
Average Queue (ft)	39	76	78	48	51	179	186
95th Queue (ft)	79	127	117	91	82	263	259
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	1	7					
Queuing Penalty (veh)	3	5					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	788	837	199	262	181	175	254	125	249
Average Queue (ft)	20	496	520	86	98	118	87	146	58	94
95th Queue (ft)	81	698	715	156	178	173	180	230	112	185
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		51		2	0		0	11	3	11
Queuing Penalty (veh)		9		5	0		0	8	4	8

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	153	340	318	153	137	132	293	201	190	218
Average Queue (ft)	54	170	201	73	71	41	143	136	133	82
95th Queue (ft)	115	304	323	130	124	114	217	196	192	140
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)		0								
Queuing Penalty (veh)		1								

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	189	136	115	93	136	132	30	168	227	265
Average Queue (ft)	109	66	61	31	71	63	2	69	110	143
95th Queue (ft)	184	126	116	63	117	114	14	146	184	219
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								1		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 44

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.7	0.0	0.0	0.2	0.0	0.0	0.2	0.0
Total Del/Veh (s)	20.9	11.5	7.6	4.8	19.6	0.8	13.6	13.7

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.2	3.9	0.4	0.4
Total Del/Veh (s)	46.8	48.4	56.4	39.7	12.8	18.5	42.2	49.6	31.9	40.1	46.5	22.5

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	37.2

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	18.9	24.1	37.3	7.3	24.8	16.4	9.0	16.9

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	25.2	5.2	13.5	11.9	18.0	25.9	19.8	13.6

Total Zone Performance

Denied Del/Veh (s)	0.7
Total Del/Veh (s)	199.2

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	99	137	158	95	116	338	306
Average Queue (ft)	43	72	80	46	61	168	176
95th Queue (ft)	84	123	135	91	105	268	270
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	2	5					
Queuing Penalty (veh)	5	4					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	679	732	200	238	240	174	228	124	216
Average Queue (ft)	28	420	442	98	92	119	55	117	64	87
95th Queue (ft)	125	643	670	185	186	195	131	187	111	167
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		42		2	0		0	4	2	14
Queuing Penalty (veh)		8		7	1		0	3	3	11

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	158	306	391	132	155	152	320	180	208	141
Average Queue (ft)	50	154	185	81	57	36	157	127	137	84
95th Queue (ft)	126	266	322	126	122	106	262	180	203	136
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)		0								
Queuing Penalty (veh)		1								

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	LT	T	TR
Maximum Queue (ft)	265	162	164	92	138	194	129	183	220
Average Queue (ft)	114	77	77	34	90	89	52	95	133
95th Queue (ft)	197	132	136	74	129	161	105	156	199
Link Distance (ft)	256	256	256		287	287	1256	1256	1256
Upstream Blk Time (%)	0								
Queuing Penalty (veh)	1								
Storage Bay Dist (ft)				300					
Storage Blk Time (%)							0		
Queuing Penalty (veh)							0		

Zone Summary

Zone wide Queuing Penalty: 43

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.4	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Total Del/Veh (s)	18.6	11.8	7.5	4.3	20.3	1.0	15.7	14.0

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.3	3.8	0.4	0.2
Total Del/Veh (s)	127.3	139.9	167.8	47.3	12.6	15.2	43.3	53.1	36.0	49.8	45.4	29.5

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	87.8

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	18.9	20.8	38.0	7.0	26.7	16.9	7.0	16.7

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	28.1	5.8	14.0	11.5	26.3	28.5	27.2	15.4

Total Zone Performance

Denied Del/Veh (s)	0.7
Total Del/Veh (s)	326.7

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	98	134	129	134	144	339	354
Average Queue (ft)	49	78	83	53	60	185	191
95th Queue (ft)	89	126	126	99	107	278	272
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	2	6					
Queuing Penalty (veh)	5	5					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	1207	1191	197	330	290	174	250	124	233
Average Queue (ft)	36	1007	1041	96	105	120	80	139	70	109
95th Queue (ft)	142	1361	1380	168	205	206	186	228	134	195
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		6	8							
Queuing Penalty (veh)		44	64							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)	0	59		2	0		0	8	3	13
Queuing Penalty (veh)	0	11		5	1		0	5	4	10

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	301	263	322	132	165	128	254	214	214	130
Average Queue (ft)	77	162	178	74	61	24	143	131	137	72
95th Queue (ft)	195	281	309	113	127	84	229	186	180	108
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)	0									
Queuing Penalty (veh)	0									

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	271	156	154	75	141	142	30	161	201	239
Average Queue (ft)	121	75	83	37	89	86	3	76	111	149
95th Queue (ft)	225	132	137	73	136	149	17	145	167	225
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)	1									
Queuing Penalty (veh)	2									
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								2		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 157

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.5	0.0	0.0	0.2	0.0	0.0	0.3	0.0
Total Del/Veh (s)	21.6	11.8	6.9	5.4	20.9	1.3	15.3	14.6

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.3	3.9	0.5	0.3
Total Del/Veh (s)	71.8	83.2	88.1	36.9	14.0	10.4	44.5	56.8	36.2	46.5	48.4	32.7

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	57.1

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.9	0.2	0.0	0.0	0.0	0.1
Total Del/Veh (s)	18.2	22.2	50.2	6.9	25.3	16.2	9.7	17.2

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	27.6	5.1	12.5	10.5	19.4	28.0	25.7	14.2

Total Zone Performance

Denied Del/Veh (s)	1.0
Total Del/Veh (s)	249.1

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	74	136	188	116	140	320	309
Average Queue (ft)	44	76	86	53	56	189	199
95th Queue (ft)	73	127	142	106	101	297	283
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	2	6					
Queuing Penalty (veh)	5	5					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	1194	1182	199	229	264	174	268	125	185
Average Queue (ft)	26	638	656	87	92	122	66	149	80	107
95th Queue (ft)	123	1180	1197	163	169	212	165	245	136	174
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		2	4							
Queuing Penalty (veh)		19	32							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		49		1	0		0	8	2	14
Queuing Penalty (veh)		9		2	1		0	6	3	11

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	249	252	370	245	134	141	265	223	244	203
Average Queue (ft)	60	157	188	99	53	38	163	124	138	82
95th Queue (ft)	147	256	312	188	110	104	247	200	213	153
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)				0						
Queuing Penalty (veh)				0						
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	LT	T	TR
Maximum Queue (ft)	242	164	166	142	136	176	209	231	227
Average Queue (ft)	110	65	65	38	85	77	61	110	145
95th Queue (ft)	201	108	115	99	122	139	133	176	214
Link Distance (ft)	256	256	256		287	287	1256	1256	1256
Upstream Blk Time (%)	0								
Queuing Penalty (veh)	0								
Storage Bay Dist (ft)				300					
Storage Blk Time (%)							1		
Queuing Penalty (veh)							0		

Zone Summary

Zone wide Queuing Penalty: 91

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.4	0.0	0.0	0.1	0.0	0.0	0.1	0.0
Total Del/Veh (s)	23.0	10.8	6.8	4.3	23.8	1.1	17.1	15.7

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	3.8	0.4	0.4
Total Del/Veh (s)	84.3	83.5	99.7	42.3	13.7	18.6	40.8	45.6	33.3	33.7	47.1	23.8

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	56.8

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	18.8	26.8	37.1	6.6	24.1	16.4	7.7	16.6

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	28.7	5.0	14.1	8.3	24.5	26.4	22.3	14.7

Total Zone Performance

Denied Del/Veh (s)	0.7
Total Del/Veh (s)	247.5

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	100	112	100	80	94	381	348
Average Queue (ft)	42	63	62	45	49	193	202
95th Queue (ft)	77	97	96	76	86	310	304
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	2	3					
Queuing Penalty (veh)	6	2					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	1054	1099	156	202	237	174	263	125	194
Average Queue (ft)	28	655	668	96	84	112	67	132	77	100
95th Queue (ft)	107	1062	1084	155	163	189	158	217	133	179
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		54		0	0		0	7	3	15
Queuing Penalty (veh)		10		0	1		0	5	5	12

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	249	271	321	132	112	89	271	250	223	146
Average Queue (ft)	79	150	183	73	52	21	136	119	129	75
95th Queue (ft)	162	260	303	121	99	65	217	185	186	130
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	236	117	156	75	139	159	29	187	182	220
Average Queue (ft)	132	64	69	35	89	74	1	64	120	148
95th Queue (ft)	205	109	121	71	135	135	10	140	182	217
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								2		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 40

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.1	0.0	0.1	0.8	0.0	0.0	0.0	0.3
Total Del/Veh (s)	30.2	8.2	10.4	19.3	16.8	0.4	6.0	15.1

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	2.8	1.6	0.0	0.4	0.5	0.5	4.0	0.2	0.2
Total Del/Veh (s)	32.6	35.8	35.8	128.8	122.4	149.7	186.2	204.5	196.9	48.2	47.5	26.8

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	0.9
Total Del/Veh (s)	105.0

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	23.4	24.2	32.8	5.5	30.9	23.7	23.1	18.0

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	4.1	2.5	0.0	0.0	0.0	0.0	0.0	0.9
Total Del/Veh (s)	59.9	12.2	24.7	26.0	84.4	94.5	96.9	48.9

Total Zone Performance

Denied Del/Veh (s)	5.6
Total Del/Veh (s)	683.6

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	99	162	116	175	465	280	169	175
Average Queue (ft)	71	60	63	87	124	55	74	93
95th Queue (ft)	110	120	112	153	324	235	128	143
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	20	2			0	4		
Queuing Penalty (veh)	45	3			1	11		

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	406	383	200	1202	1243	174	1204	124	134
Average Queue (ft)	47	258	269	143	825	852	166	850	34	51
95th Queue (ft)	150	377	377	246	1229	1243	198	1221	78	105
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		22		2	55		6	73	1	4
Queuing Penalty (veh)		7		13	78		25	136	1	1

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	322	366	260	222	155	153	244	179	197	343
Average Queue (ft)	116	117	140	119	75	77	130	128	134	135
95th Queue (ft)	247	240	235	185	129	134	219	175	189	244
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)	5									
Queuing Penalty (veh)	10									

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	T	L	LT	T	TR
Maximum Queue (ft)	279	251	283	286	357	357	32	83	140	699	661	659
Average Queue (ft)	207	125	118	80	254	254	1	5	59	409	421	441
95th Queue (ft)	305	221	245	175	343	343	10	33	148	600	609	609
Link Distance (ft)	256	256	256		287	287	232	232		1256	1256	1256
Upstream Blk Time (%)	16	0	0	0	4	3						
Queuing Penalty (veh)	47	0	1	0	27	24						
Storage Bay Dist (ft)				300					115			
Storage Blk Time (%)				0	4					65		
Queuing Penalty (veh)				0	13					118		

Zone Summary

Zone wide Queuing Penalty: 561

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.3	0.0	0.0	0.0	0.1
Total Del/Veh (s)	42.4	7.8	8.5	17.8	17.6	0.8	7.0	14.8

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.2	0.0	0.5	0.5	0.6	3.7	0.3	0.4
Total Del/Veh (s)	32.7	33.4	28.5	93.2	101.1	106.5	141.0	139.1	135.7	49.2	44.3	25.3

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	86.5

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.7	0.2	0.0	0.0	0.0	0.1
Total Del/Veh (s)	15.1	18.3	35.7	6.2	25.9	23.6	21.0	16.0

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	2.1	0.7	0.0	0.0	0.0	0.0	0.0	0.3
Total Del/Veh (s)	45.9	10.1	28.9	28.1	264.2	294.1	299.5	120.3

Total Zone Performance

Denied Del/Veh (s)	2.0
Total Del/Veh (s)	830.0

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	100	290	133	162	543	280	148	214
Average Queue (ft)	77	86	63	74	110	42	64	91
95th Queue (ft)	109	198	109	127	296	203	125	163
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	29	2				3		
Queuing Penalty (veh)	65	2				9		

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	394	375	199	980	994	174	1324	92	116
Average Queue (ft)	32	220	238	138	677	713	167	715	32	49
95th Queue (ft)	111	349	359	230	910	946	208	1102	71	88
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		13		0	54		2	69	0	1
Queuing Penalty (veh)		4		0	77		9	128	0	0

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	153	192	212	264	187	172	183	237	258	322
Average Queue (ft)	62	86	114	151	91	86	102	138	145	129
95th Queue (ft)	132	170	205	264	156	162	164	203	215	228
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)				0						
Queuing Penalty (veh)				2						
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	T	L	LT	T	TR
Maximum Queue (ft)	279	188	194	286	376	364	216	205	140	1345	1335	1344
Average Queue (ft)	183	100	92	172	279	284	34	27	52	1102	1092	1091
95th Queue (ft)	262	172	173	346	404	394	136	126	143	1557	1558	1554
Link Distance (ft)	256	256	256		287	287	232	232		1256	1256	1256
Upstream Blk Time (%)	3			0	10	12	0			44	32	29
Queuing Penalty (veh)	8			0	71	81	0			0	0	0
Storage Bay Dist (ft)				300					115			
Storage Blk Time (%)				0	10				0	67		
Queuing Penalty (veh)				1	33				0	121		

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	B476	B476	B472	B472
Directions Served	T	T	T	T
Maximum Queue (ft)	765	766	234	234
Average Queue (ft)	255	265	21	17
95th Queue (ft)	731	749	117	97
Link Distance (ft)	691	691	219	219
Upstream Blk Time (%)	11	10	1	1
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 611

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.2	0.0	0.1	0.6	0.0	0.0	0.0	0.2
Total Del/Veh (s)	22.4	7.4	10.5	16.9	17.9	1.0	6.2	13.8

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0	0.0	0.6	0.6	0.5	3.9	0.3	0.2
Total Del/Veh (s)	31.9	36.1	31.7	54.5	55.1	53.5	186.5	196.6	159.1	45.1	47.2	38.0

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	74.8

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	18.8	20.3	34.5	5.4	28.7	24.1	19.8	16.7

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	4.8	3.3	0.0	0.0	0.0	0.0	0.0	1.1
Total Del/Veh (s)	56.6	11.8	25.5	24.2	103.8	116.6	114.7	55.7

Total Zone Performance

Denied Del/Veh (s)	4.1
Total Del/Veh (s)	584.9

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	100	162	122	429	593	280	156	180
Average Queue (ft)	61	60	62	92	121	44	82	100
95th Queue (ft)	98	117	101	208	362	209	146	164
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	8	2			0	2		
Queuing Penalty (veh)	18	3			1	6		

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	441	444	200	590	673	174	1588	95	115
Average Queue (ft)	47	244	255	137	386	421	173	943	38	54
95th Queue (ft)	136	370	383	244	570	599	182	1625	79	98
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		18		1	40		5	63	0	1
Queuing Penalty (veh)		6		6	57		22	116	0	0

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	218	236	235	264	160	173	231	202	203	302
Average Queue (ft)	73	102	126	142	65	69	118	138	142	139
95th Queue (ft)	181	202	229	236	116	132	196	197	199	244
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)				1						
Queuing Penalty (veh)				3						
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	L	LT	T	TR
Maximum Queue (ft)	274	194	245	286	357	341	31	140	836	737	777
Average Queue (ft)	197	120	102	102	249	250	1	65	478	479	495
95th Queue (ft)	288	181	179	229	327	341	10	151	733	719	726
Link Distance (ft)	256	256	256		287	287	232		1256	1256	1256
Upstream Blk Time (%)	8		0	0	2	4					
Queuing Penalty (veh)	24		0	0	14	25					
Storage Bay Dist (ft)				300				115			
Storage Blk Time (%)				0	2			0	62		
Queuing Penalty (veh)				1	6			0	113		

Zone Summary

Zone wide Queuing Penalty: 420

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.1	0.0	0.1	0.8	0.0	0.0	0.0	0.3
Total Del/Veh (s)	34.7	7.2	10.2	17.2	17.6	0.3	8.5	14.5

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	0.0	0.0	0.7	0.6	0.9	4.1	0.1	0.3
Total Del/Veh (s)	37.3	39.5	37.4	71.9	69.3	76.3	215.0	220.9	202.6	46.7	50.5	33.4

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	87.7

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.1	0.0	0.0	0.1	0.1
Total Del/Veh (s)	22.0	18.3	31.2	5.6	30.3	23.2	20.2	17.3

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	5.7	3.6	0.0	0.0	0.0	0.0	0.0	1.3
Total Del/Veh (s)	63.5	14.2	25.4	26.6	112.9	129.0	130.8	61.0

Total Zone Performance

Denied Del/Veh (s)	4.8
Total Del/Veh (s)	622.0

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	100	282	189	152	528	280	246	250
Average Queue (ft)	72	91	73	80	121	28	98	113
95th Queue (ft)	109	207	146	133	313	167	177	199
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	21	2			0	2		
Queuing Penalty (veh)	49	3			1	5		

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	386	398	200	800	824	175	1816	92	97
Average Queue (ft)	65	270	283	134	511	545	168	1071	41	50
95th Queue (ft)	190	377	393	248	743	792	205	1975	81	88
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)								3		
Queuing Penalty (veh)								0		
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		27		2	45		5	71	0	1
Queuing Penalty (veh)		9		13	64		21	132	0	1

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	306	339	255	214	137	167	285	200	243	243
Average Queue (ft)	115	111	120	130	82	72	123	135	138	116
95th Queue (ft)	251	239	225	205	129	130	214	201	210	208
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)	1									
Queuing Penalty (veh)	2									

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	T	L	LT	T	TR
Maximum Queue (ft)	279	260	274	286	357	394	61	139	139	808	820	804
Average Queue (ft)	235	143	137	106	248	262	3	6	55	534	533	547
95th Queue (ft)	303	229	242	269	363	371	24	48	145	752	743	749
Link Distance (ft)	256	256	256		287	287	232	232		1256	1256	1256
Upstream Blk Time (%)	18	0	0	0	4	7						
Queuing Penalty (veh)	51	1	1	0	26	48						
Storage Bay Dist (ft)				300					115			
Storage Blk Time (%)				0	4					66		
Queuing Penalty (veh)				0	12					119		

Zone Summary

Zone wide Queuing Penalty: 557

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.1	0.0	0.3	0.7	0.0	0.0	0.0	0.3
Total Del/Veh (s)	28.1	7.8	8.6	19.0	18.2	1.0	8.0	14.8

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.4	0.4	0.0	1.1	1.1	0.9	4.0	0.2	0.4
Total Del/Veh (s)	36.6	37.5	32.7	109.8	112.5	103.7	223.9	227.2	239.0	30.4	45.8	17.1

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	0.4
Total Del/Veh (s)	107.8

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.7	0.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)	18.3	18.3	33.1	5.7	26.7	24.1	31.3	17.7

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	5.5	3.2	0.0	0.0	0.0	0.0	0.0	1.1
Total Del/Veh (s)	51.3	11.5	23.5	22.2	234.8	260.2	255.9	106.7

Total Zone Performance

Denied Del/Veh (s)	5.1
Total Del/Veh (s)	822.7

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	100	220	129	362	505	280	187	208
Average Queue (ft)	66	70	61	78	152	65	80	95
95th Queue (ft)	106	153	108	179	418	261	143	157
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	15	2			0	5		
Queuing Penalty (veh)	33	2			1	16		

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	400	417	200	1314	1320	174	1840	74	116
Average Queue (ft)	50	252	252	115	706	742	164	1066	28	44
95th Queue (ft)	163	361	365	233	1291	1322	217	1895	59	82
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)								2		
Queuing Penalty (veh)								0		
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		23		0	50		3	65		2
Queuing Penalty (veh)		8		0	70		14	122		1

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	178	240	278	256	135	138	270	242	364	371
Average Queue (ft)	71	115	131	142	78	81	114	149	155	169
95th Queue (ft)	138	217	227	247	124	122	211	234	255	312
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)				0						
Queuing Penalty (veh)				1						
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	NB	NB	NB	NB	B476
Directions Served	L	T	T	T	T	TR	T	L	LT	T	TR	T
Maximum Queue (ft)	280	227	222	286	356	357	30	140	1326	1324	1282	81
Average Queue (ft)	185	116	108	92	241	253	2	75	1011	1001	1004	5
95th Queue (ft)	267	200	199	228	351	361	12	170	1328	1314	1276	34
Link Distance (ft)	256	256	256		287	287	232		1256	1256	1256	691
Upstream Blk Time (%)	4			0	3	5			2	1	1	
Queuing Penalty (veh)	11			0	21	32			0	0	0	
Storage Bay Dist (ft)				300				115				
Storage Blk Time (%)				0	3			0	66			
Queuing Penalty (veh)				0	10			0	119			

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	B476	B472
Directions Served	T	T
Maximum Queue (ft)	32	35
Average Queue (ft)	1	1
95th Queue (ft)	11	12
Link Distance (ft)	691	219
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 461

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	4.0	0.1	4.1
Total Delay (hr)	0.6	1.8	1.1	0.4	33.1	1.6	38.5

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.2	31.6	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	0.7	50.1	8.8	2.7	3.3	0.2	1.9	0.5	1.0	0.8	1.5	0.2

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Delay (hr)	37.8
Total Delay (hr)	71.8

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	5.3	1.2	1.1	1.0	2.1	3.9	0.9	15.5

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	2.0	1.7	2.2	0.1	0.2	3.7	1.2	11.3

Total Zone Performance

Denied Delay (hr)	42.0
Total Delay (hr)	137.0

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	99	142	174	121	119	1047	1058
Average Queue (ft)	47	60	104	59	58	597	638
95th Queue (ft)	95	117	161	111	111	1126	1124
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)						0	3
Queuing Penalty (veh)						3	17
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	5	1					
Queuing Penalty (veh)	13	1					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	1196	1196	200	304	297	174	226	124	258
Average Queue (ft)	31	936	958	112	139	144	69	138	54	95
95th Queue (ft)	127	1335	1339	208	255	233	161	218	114	189
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		7	8							
Queuing Penalty (veh)		55	62							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		58		13	0		0	9	4	10
Queuing Penalty (veh)		16		40	1		0	8	5	8

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	152	276	296	177	142	75	240	249	218	196
Average Queue (ft)	59	156	171	63	57	25	138	139	143	74
95th Queue (ft)	129	278	283	137	110	67	204	206	208	142
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	261	143	168	93	162	161	30	136	212	268
Average Queue (ft)	135	79	82	32	91	73	4	74	106	150
95th Queue (ft)	221	130	126	64	141	137	19	133	160	216
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)	0									
Queuing Penalty (veh)	2									
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								2		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 230

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay (hr)	0.6	1.8	1.0	0.5	19.6	0.9	24.4

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.0	41.1	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	0.9	59.9	8.0	1.7	3.9	0.2	2.2	0.2	0.9	0.9	1.5	0.3

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Delay (hr)	46.8
Total Delay (hr)	80.6

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	5.6	1.4	1.0	1.2	2.6	4.0	1.0	16.9

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.8	1.8	2.5	0.3	0.2	3.4	0.9	10.9

Total Zone Performance

Denied Delay (hr)	47.0
Total Delay (hr)	132.9

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	99	138	152	90	134	576	597
Average Queue (ft)	51	60	94	49	56	412	446
95th Queue (ft)	90	111	148	84	101	566	592
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	4	4					
Queuing Penalty (veh)	12	3					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	1197	1213	199	243	251	174	270	125	203
Average Queue (ft)	25	1046	1050	105	116	152	70	119	59	110
95th Queue (ft)	105	1442	1449	172	193	231	154	201	126	193
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		17	20							
Queuing Penalty (veh)		129	151							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)	0	59		1	1		0	4	3	15
Queuing Penalty (veh)	0	16		2	2		0	4	4	12

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	162	267	297	137	178	176	341	189	216	140
Average Queue (ft)	59	163	191	66	72	33	161	138	138	78
95th Queue (ft)	121	267	304	125	132	102	259	190	200	132
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	264	154	138	122	180	158	31	151	173	190
Average Queue (ft)	135	84	81	39	104	80	4	56	92	128
95th Queue (ft)	228	143	126	92	153	138	21	108	139	187
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)	0									
Queuing Penalty (veh)	2									
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								0		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 336

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Delay (hr)	0.0	0.0	0.0	0.1	0.5	0.0	0.5
Total Delay (hr)	0.4	1.8	1.3	0.5	25.0	1.1	30.1

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.2	28.3	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	1.2	52.4	8.5	1.5	3.9	0.2	2.7	0.3	1.1	1.1	1.2	0.2

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Delay (hr)	31.1
Total Delay (hr)	74.4

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	5.4	1.0	1.3	1.2	2.2	3.9	1.4	16.5

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay (hr)	1.8	1.7	2.2	0.2	0.2	4.1	1.3	11.5

Total Zone Performance

Denied Delay (hr)	31.8
Total Delay (hr)	132.5

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	90	144	159	149	135	827	826
Average Queue (ft)	42	59	105	63	65	478	518
95th Queue (ft)	87	108	155	117	112	779	790
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	2	2					
Queuing Penalty (veh)	5	2					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	1196	1193	197	217	230	174	303	124	219
Average Queue (ft)	52	960	976	90	128	157	92	147	65	82
95th Queue (ft)	163	1301	1314	145	188	227	187	234	121	159
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		7	8							
Queuing Penalty (veh)		52	64							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		60		0	1		0	10	5	4
Queuing Penalty (veh)		16		1	1		0	9	7	4

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	232	299	311	153	214	231	313	256	203	282
Average Queue (ft)	64	141	164	72	76	44	155	146	145	101
95th Queue (ft)	149	278	301	130	149	135	243	215	209	179
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)		0								
Queuing Penalty (veh)		0								

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	268	152	142	93	199	178	30	163	207	264
Average Queue (ft)	134	73	77	37	98	90	5	76	116	154
95th Queue (ft)	215	131	131	76	176	167	23	138	169	227
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)	0									
Queuing Penalty (veh)	1									
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								0		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 161

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	10.5	0.6	11.1
Total Delay (hr)	0.5	2.0	1.3	0.5	47.1	3.0	54.4

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.8	38.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	1.0	56.9	7.8	1.6	4.0	0.2	2.4	0.4	1.1	1.0	1.6	0.4

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Delay (hr)	42.8
Total Delay (hr)	78.5

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	5.9	1.5	1.4	1.4	2.4	3.3	1.1	16.9

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.9	1.5	2.4	0.2	0.2	3.7	1.0	10.9

Total Zone Performance

Denied Delay (hr)	53.9
Total Delay (hr)	160.7

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	100	124	166	142	122	1070	1061
Average Queue (ft)	43	61	111	71	69	819	842
95th Queue (ft)	84	111	160	120	114	1134	1133
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)						1	2
Queuing Penalty (veh)						9	14
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	2	2					
Queuing Penalty (veh)	7	2					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	1189	1205	199	254	248	174	313	124	313
Average Queue (ft)	50	1020	1034	95	129	156	72	151	69	126
95th Queue (ft)	175	1405	1422	166	219	238	172	257	130	221
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		13	16							
Queuing Penalty (veh)		101	121							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		57		1	2		0	10	2	17
Queuing Penalty (veh)		15		3	3		0	9	4	13

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	153	282	325	151	159	159	311	203	209	211
Average Queue (ft)	51	170	200	81	75	43	171	120	129	85
95th Queue (ft)	113	278	305	129	140	110	280	176	182	157
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)		0								
Queuing Penalty (veh)		0								

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	256	119	143	107	181	157	30	147	173	240
Average Queue (ft)	134	65	68	39	102	83	3	71	97	142
95th Queue (ft)	236	111	132	85	158	146	17	126	149	222
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)	0									
Queuing Penalty (veh)	1									
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								2		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 303

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	5.1	0.0	5.2
Total Delay (hr)	0.4	1.9	1.2	0.5	37.4	1.8	43.3

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.5	27.2	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	1.3	55.0	7.6	2.1	3.7	0.1	2.1	0.4	1.1	0.9	1.5	0.4

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Delay (hr)	31.5
Total Delay (hr)	76.3

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	5.8	1.4	1.2	1.1	2.4	3.6	1.1	16.6

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.7	1.9	2.5	0.3	0.2	3.9	1.4	12.0

Total Zone Performance

Denied Delay (hr)	36.7
Total Delay (hr)	148.1

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	93	149	205	132	115	1003	1012
Average Queue (ft)	45	69	109	68	66	668	716
95th Queue (ft)	69	127	174	111	104	976	986
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	1	2					
Queuing Penalty (veh)	2	2					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	1201	1203	200	253	252	174	266	125	205
Average Queue (ft)	57	993	1009	113	122	147	69	135	57	110
95th Queue (ft)	187	1420	1439	185	208	220	171	222	115	195
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		11	14							
Queuing Penalty (veh)		87	105							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)	0	57		1	2		0	9	0	17
Queuing Penalty (veh)	0	15		3	2		0	8	0	14

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	238	292	300	137	159	92	282	221	237	178
Average Queue (ft)	63	163	183	79	54	27	160	127	141	86
95th Queue (ft)	151	277	297	131	116	72	264	184	203	138
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)		0								
Queuing Penalty (veh)		0								

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	201	172	132	136	182	169	38	198	183	270
Average Queue (ft)	122	84	84	43	96	85	4	68	110	156
95th Queue (ft)	203	136	124	92	160	132	22	137	163	239
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								1		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 238

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Del/Veh (s)	0.2	0.0	77.0	85.5	0.0	0.1	46.5
Total Del/Veh (s)	32.8	10.0	10.9	82.2	18.0	7.5	40.5

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	6.2	22.2	68.1	17.6	22.3	15.6	4.0	0.3	0.3
Total Del/Veh (s)	52.8	40.0	37.9	192.8	169.3	187.9	262.8	261.8	274.4	48.2	37.5	29.4

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	13.3
Total Del/Veh (s)	142.6

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)	21.7	19.5	31.4	6.5	29.7	25.9	32.1	18.5

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	4.1	1.8	0.0	0.0	0.0	0.0	0.0	0.7
Total Del/Veh (s)	57.1	11.6	44.1	50.2	285.3	253.6	243.4	117.6

Total Zone Performance

Denied Del/Veh (s)	120.2
Total Del/Veh (s)	1176.4

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	100	323	266	1099	1097	280	208	201
Average Queue (ft)	84	101	79	525	958	261	103	110
95th Queue (ft)	114	230	162	1268	1404	376	184	183
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)				0	6			
Queuing Penalty (veh)				1	57			
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	31	2			0	24		
Queuing Penalty (veh)	71	4			5	76		

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	438	458	200	1416	1428	175	1840	73	94
Average Queue (ft)	51	279	287	133	1103	1120	173	1273	23	55
95th Queue (ft)	152	398	408	238	1711	1693	177	2039	56	93
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)					12	16		28		
Queuing Penalty (veh)					97	125		0		
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		27		4	51		3	73		0
Queuing Penalty (veh)		11		28	74		15	157		0

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	286	289	286	263	193	211	205	217	238	338
Average Queue (ft)	105	113	130	118	91	95	119	141	139	193
95th Queue (ft)	224	216	235	210	152	174	190	203	211	316
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)				1						
Queuing Penalty (veh)				3						
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)	0	0								
Queuing Penalty (veh)	0	0								

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	T	L	LT	T	TR
Maximum Queue (ft)	273	244	253	286	405	357	324	306	140	1336	1325	1326
Average Queue (ft)	212	117	107	209	340	343	174	164	71	1110	1081	1032
95th Queue (ft)	293	197	207	390	420	401	382	354	166	1581	1580	1534
Link Distance (ft)	256	256	256		287	287	232	232		1256	1256	1256
Upstream Blk Time (%)	11	0	0	0	38	44	16	12		36	22	18
Queuing Penalty (veh)	36	0	0	0	284	334	120	92		0	0	0
Storage Bay Dist (ft)				300					115			
Storage Blk Time (%)				0	38					73		
Queuing Penalty (veh)				1	136					154		

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	B476	B476	B472	B472
Directions Served	T	T	T	T
Maximum Queue (ft)	765	766	234	234
Average Queue (ft)	217	227	34	29
95th Queue (ft)	717	740	163	151
Link Distance (ft)	691	691	219	219
Upstream Blk Time (%)	14	14	7	7
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 1881

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Del/Veh (s)	0.1	0.0	19.0	21.0	0.0	0.0	11.7
Total Del/Veh (s)	28.8	8.8	13.1	54.6	20.2	10.8	30.5

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.5	0.0	0.0	0.9	0.5	0.1	93.7	80.2	90.2	3.9	0.3	0.1
Total Del/Veh (s)	61.7	40.7	35.5	120.0	91.6	114.9	329.4	336.3	332.9	31.8	41.6	23.4

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	18.0
Total Del/Veh (s)	120.1

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	23.3	22.1	30.1	5.4	30.0	25.0	36.8	19.5

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	7.2	3.4	0.0	0.0	0.0	0.0	0.0	1.3
Total Del/Veh (s)	61.0	13.1	42.3	45.0	223.8	224.9	233.2	102.3

Total Zone Performance

Denied Del/Veh (s)	68.1
Total Del/Veh (s)	1032.8

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	100	178	136	952	1091	280	208	202
Average Queue (ft)	70	65	65	193	457	140	117	133
95th Queue (ft)	103	126	108	568	1130	371	184	205
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)					1			
Queuing Penalty (veh)					5			
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	14	2			0	11		
Queuing Penalty (veh)	34	3			4	34		

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	396	433	200	930	984	175	1854	70	95
Average Queue (ft)	54	297	310	152	686	719	169	1656	26	45
95th Queue (ft)	152	392	398	241	966	1007	196	2274	61	85
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)								73		
Queuing Penalty (veh)								0		
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)	0	32		7	48		4	70		0
Queuing Penalty (veh)	0	12		51	70		18	151		0

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	320	321	286	262	141	118	222	242	237	369
Average Queue (ft)	108	135	146	134	80	63	135	135	136	229
95th Queue (ft)	248	262	252	223	125	113	213	203	196	371
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)				0						
Queuing Penalty (veh)				2						
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)	1	0								
Queuing Penalty (veh)	1	0								

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	T	L	LT	T	TR
Maximum Queue (ft)	297	251	266	286	376	394	305	344	140	1326	1325	1323
Average Queue (ft)	221	134	128	193	317	317	163	153	58	931	898	895
95th Queue (ft)	299	216	233	370	430	440	373	365	151	1513	1496	1463
Link Distance (ft)	256	256	256		287	287	232	232		1256	1256	1256
Upstream Blk Time (%)	14	0	0	0	35	39	16	13		16	7	5
Queuing Penalty (veh)	43	0	0	0	262	294	122	101		0	0	0
Storage Bay Dist (ft)				300					115			
Storage Blk Time (%)				0	35					65		
Queuing Penalty (veh)				2	125					137		

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	B476	B476
Directions Served	T	T
Maximum Queue (ft)	178	137
Average Queue (ft)	20	12
95th Queue (ft)	92	70
Link Distance (ft)	691	691
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 1472

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Del/Veh (s)	0.2	0.0	67.4	61.3	0.0	0.0	35.4
Total Del/Veh (s)	29.5	9.2	12.0	64.8	19.2	9.0	33.0

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.1	9.9	20.5	0.2	78.7	76.7	68.0	3.9	0.2	0.3
Total Del/Veh (s)	88.6	54.7	56.8	150.3	131.7	121.1	299.9	323.7	311.8	47.4	47.0	29.4

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	23.2
Total Del/Veh (s)	135.6

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.5	0.1	0.0	0.0	0.1	0.1
Total Del/Veh (s)	24.4	22.2	30.6	5.3	31.7	26.1	35.0	19.6

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	4.6	2.6	0.0	0.0	0.0	0.0	0.0	0.9
Total Del/Veh (s)	62.0	12.9	45.5	47.4	245.2	261.4	249.7	114.0

Total Zone Performance

Denied Del/Veh (s)	125.8
Total Del/Veh (s)	1112.1

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	99	184	141	1072	1087	280	234	249
Average Queue (ft)	79	77	74	345	775	242	109	135
95th Queue (ft)	109	146	124	910	1347	399	186	215
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)				0	1			
Queuing Penalty (veh)				0	14			
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	23	3			1	14		
Queuing Penalty (veh)	53	5			10	46		

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	635	585	199	1400	1401	174	1836	124	223
Average Queue (ft)	72	367	369	153	907	932	170	1427	32	69
95th Queue (ft)	197	551	548	243	1607	1606	189	2392	76	154
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)					6	7		62		
Queuing Penalty (veh)					43	58		0		
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		43		8	46		2	68		4
Queuing Penalty (veh)		17		59	66		8	147		2

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	298	292	295	203	157	120	280	262	284	391
Average Queue (ft)	117	125	138	111	76	62	131	135	149	209
95th Queue (ft)	240	249	259	184	132	114	220	216	220	344
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)	0	0								0
Queuing Penalty (veh)	1	0								0

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	T	L	LT	T	TR
Maximum Queue (ft)	282	266	258	286	395	376	324	305	140	1326	1336	1328
Average Queue (ft)	226	141	135	214	352	350	161	145	51	1004	998	996
95th Queue (ft)	299	239	241	387	394	388	347	339	148	1487	1482	1465
Link Distance (ft)	256	256	256		287	287	232	232		1256	1256	1256
Upstream Blk Time (%)	18	0	0	0	39	43	11	9		29	24	22
Queuing Penalty (veh)	58	1	0	0	298	322	81	66		0	0	0
Storage Bay Dist (ft)				300					115			
Storage Blk Time (%)				0	39				0	69		
Queuing Penalty (veh)				1	143				0	146		

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	B476	B476	B472	B472
Directions Served	T	T	T	T
Maximum Queue (ft)	765	803	234	253
Average Queue (ft)	224	224	45	38
95th Queue (ft)	771	771	194	180
Link Distance (ft)	691	691	219	219
Upstream Blk Time (%)	20	18	13	13
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 1647

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Del/Veh (s)	0.2	0.0	18.9	46.7	0.0	0.1	21.9
Total Del/Veh (s)	33.7	7.7	14.2	61.1	18.8	9.9	33.0

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	2.9	1.3	6.2	51.1	46.9	36.4	3.9	0.4	0.4
Total Del/Veh (s)	70.2	47.0	45.1	135.2	111.7	118.4	328.0	343.1	315.4	51.4	45.9	38.4

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	10.0
Total Del/Veh (s)	131.6

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.4	0.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)	24.5	24.2	32.5	5.4	30.2	25.2	27.5	18.8

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	8.0	4.0	0.0	0.0	0.0	0.0	0.0	1.5
Total Del/Veh (s)	67.5	14.8	51.6	56.1	271.1	309.9	307.3	130.8

Total Zone Performance

Denied Del/Veh (s)	64.9
Total Del/Veh (s)	1200.7

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	100	303	150	1064	1112	280	218	263
Average Queue (ft)	72	75	61	225	706	196	113	128
95th Queue (ft)	109	193	102	748	1427	408	184	210
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)				0	4			
Queuing Penalty (veh)				0	34			
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	22	3			0	13		
Queuing Penalty (veh)	51	4			2	41		

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	546	515	200	1193	1200	174	1840	124	183
Average Queue (ft)	65	320	340	126	835	857	168	1658	34	65
95th Queue (ft)	191	484	494	238	1038	1071	208	2089	84	134
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)								46		
Queuing Penalty (veh)								0		
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		34		3	52		8	71	2	7
Queuing Penalty (veh)		13		23	75		37	154	2	3

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	236	244	288	267	139	146	181	229	256	317
Average Queue (ft)	118	124	141	129	79	76	124	138	142	155
95th Queue (ft)	243	239	259	225	128	121	179	203	207	266
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)				0						
Queuing Penalty (veh)				1						
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	T	L	LT	T	TR
Maximum Queue (ft)	283	262	274	286	376	405	305	306	140	1345	1325	1345
Average Queue (ft)	238	139	134	234	359	364	249	249	70	1127	1132	1124
95th Queue (ft)	315	237	228	387	367	385	360	361	159	1605	1603	1568
Link Distance (ft)	256	256	256		287	287	232	232		1256	1256	1256
Upstream Blk Time (%)	22	0	0	0	52	60	25	24		49	39	31
Queuing Penalty (veh)	70	1	1	0	391	450	186	185		0	0	0
Storage Bay Dist (ft)				300					115			
Storage Blk Time (%)				0	52				0	72		
Queuing Penalty (veh)				1	187				0	152		

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	B476	B476	B472	B472
Directions Served	T	T	T	T
Maximum Queue (ft)	789	803	271	253
Average Queue (ft)	347	354	72	70
95th Queue (ft)	935	941	253	248
Link Distance (ft)	691	691	219	219
Upstream Blk Time (%)	29	30	25	26
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 2063

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Del/Veh (s)	0.1	0.0	15.4	19.0	0.0	0.0	10.1
Total Del/Veh (s)	33.9	9.1	12.2	50.7	20.3	10.1	29.0

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.8	2.2	9.3	122.6	116.3	111.9	4.0	0.2	0.2
Total Del/Veh (s)	72.8	45.7	45.0	132.6	105.9	122.2	347.1	369.9	344.2	29.8	48.3	35.8

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	24.3
Total Del/Veh (s)	131.5

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.1	0.3	0.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)	19.3	26.3	35.5	6.1	28.5	24.4	31.2	18.5

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	3.7	1.5	0.0	0.0	0.0	0.0	0.0	0.6
Total Del/Veh (s)	51.1	11.4	35.0	37.5	282.2	306.1	317.9	124.8

Total Zone Performance

Denied Del/Veh (s)	72.0
Total Del/Veh (s)	1166.7

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	99	206	171	1130	1096	280	185	244
Average Queue (ft)	80	87	62	234	537	170	111	127
95th Queue (ft)	112	183	107	788	1249	387	172	197
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)				1	3			
Queuing Penalty (veh)				5	25			
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	29	3			0	8		
Queuing Penalty (veh)	67	5			5	25		

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	448	477	200	1352	1357	175	1835	125	180
Average Queue (ft)	53	326	329	137	775	805	171	1680	32	70
95th Queue (ft)	149	443	452	228	1281	1322	193	2137	75	127
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)								75		
Queuing Penalty (veh)								0		
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)	0	36		3	48		6	72	0	4
Queuing Penalty (veh)	0	14		25	70		27	154	0	1

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	178	273	294	267	170	203	313	219	265	344
Average Queue (ft)	72	132	163	149	91	78	122	131	150	196
95th Queue (ft)	144	236	270	250	152	148	215	208	236	349
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)				0						
Queuing Penalty (veh)				2						
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	T	L	LT	T	TR
Maximum Queue (ft)	285	211	197	286	381	364	324	236	140	1350	1344	1340
Average Queue (ft)	205	121	105	180	316	313	63	53	81	1160	1149	1146
95th Queue (ft)	285	192	177	362	424	411	193	161	176	1535	1533	1520
Link Distance (ft)	256	256	256		287	287	232	232		1256	1256	1256
Upstream Blk Time (%)	6			0	20	23	1	0		50	37	34
Queuing Penalty (veh)	18			0	154	174	7	2		0	0	0
Storage Bay Dist (ft)				300					115			
Storage Blk Time (%)				0	20				0	64		
Queuing Penalty (veh)				1	74				0	135		

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	B476	B476	B472	B472
Directions Served	T	T	T	T
Maximum Queue (ft)	789	813	234	258
Average Queue (ft)	339	351	75	80
95th Queue (ft)	918	931	251	267
Link Distance (ft)	691	691	219	219
Upstream Blk Time (%)	33	33	24	25
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 992

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	22.3	0.7	23.1
Total Delay (hr)	0.6	1.8	1.3	0.6	38.7	1.7	44.6

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.9	59.3	10.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	1.0	55.9	8.4	1.9	4.1	0.1	2.3	0.3	1.1	1.3	1.8	0.4

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Delay (hr)	70.6
Total Delay (hr)	78.7

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	9.1	1.8	1.2	1.3	2.2	3.9	1.2	20.8

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.7	1.6	3.3	0.3	0.2	4.1	0.9	12.0

Total Zone Performance

Denied Delay (hr)	93.7
Total Delay (hr)	156.1

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	99	124	181	136	138	907	922
Average Queue (ft)	48	62	105	66	68	679	709
95th Queue (ft)	79	109	161	117	121	937	934
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	1	1					
Queuing Penalty (veh)	4	1					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	1195	1208	199	226	252	174	268	125	333
Average Queue (ft)	43	1020	1029	118	125	152	75	135	77	119
95th Queue (ft)	160	1320	1322	191	202	230	168	206	130	231
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		11	13							
Queuing Penalty (veh)		87	97							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		60		2	1		0	8	4	17
Queuing Penalty (veh)		19		5	2		0	7	6	13

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	324	423	468	189	136	168	309	257	269	138
Average Queue (ft)	111	242	261	79	55	36	151	135	154	85
95th Queue (ft)	273	364	389	152	106	98	262	213	222	139
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)	0	2								
Queuing Penalty (veh)	0	8								

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	221	104	117	96	229	194	48	155	225	244
Average Queue (ft)	132	59	58	42	135	120	5	79	113	147
95th Queue (ft)	209	92	104	97	200	179	24	143	187	231
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								2		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 249

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	5.9	0.2	6.2
Total Delay (hr)	0.5	1.8	1.2	0.6	33.4	1.4	39.0

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	1.1	67.8	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	1.3	52.7	8.7	1.8	4.1	0.1	2.8	0.4	1.4	1.3	1.3	0.3

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Delay (hr)	73.8
Total Delay (hr)	76.2

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	8.7	1.7	1.1	1.0	2.1	3.9	1.0	19.6

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.6	1.6	3.0	0.3	0.2	3.5	0.9	11.1

Total Zone Performance

Denied Delay (hr)	80.0
Total Delay (hr)	146.0

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	99	155	158	94	96	799	872
Average Queue (ft)	45	60	98	55	65	620	647
95th Queue (ft)	84	121	144	90	93	855	890
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	2	2					
Queuing Penalty (veh)	6	1					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	1200	1198	199	210	227	174	268	125	227
Average Queue (ft)	47	981	1004	105	123	163	91	154	74	103
95th Queue (ft)	147	1308	1318	171	191	228	196	235	133	202
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		7	7							
Queuing Penalty (veh)		52	55							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)	0	59		0	1		1	15	6	11
Queuing Penalty (veh)	0	19		1	2		1	13	8	9

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	324	462	405	148	147	139	263	256	279	205
Average Queue (ft)	97	216	226	76	54	37	158	138	151	81
95th Queue (ft)	233	370	365	130	101	103	230	216	235	150
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)		2								
Queuing Penalty (veh)		10								

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	231	117	100	121	190	227	31	136	164	221
Average Queue (ft)	136	59	65	40	113	106	4	70	102	128
95th Queue (ft)	217	99	109	91	170	174	20	121	153	202
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								1		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 177

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	14.6	0.4	15.0
Total Delay (hr)	0.5	1.9	0.9	0.5	36.8	1.5	42.2

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	1.4	61.1	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	1.0	50.2	7.4	2.1	4.0	0.2	2.1	0.5	1.1	1.1	1.3	0.2

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Delay (hr)	69.6
Total Delay (hr)	71.2

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	9.8	1.9	1.0	1.0	2.4	3.7	1.3	21.1

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.7	1.6	3.0	0.3	0.2	3.8	1.0	11.5

Total Zone Performance

Denied Delay (hr)	84.6
Total Delay (hr)	146.0

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	100	142	230	130	116	868	833
Average Queue (ft)	54	75	108	59	47	657	680
95th Queue (ft)	93	137	173	108	89	909	913
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	4	4					
Queuing Penalty (veh)	10	3					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	1172	1200	199	226	244	174	360	125	202
Average Queue (ft)	31	950	968	106	122	155	71	140	65	89
95th Queue (ft)	127	1269	1290	178	205	234	157	234	119	163
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		0	1							
Queuing Penalty (veh)		3	8							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)	0	58		2	1		0	8	5	8
Queuing Penalty (veh)	0	18		7	2		0	7	7	7

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	324	476	509	150	165	124	358	211	203	196
Average Queue (ft)	100	243	261	70	46	28	164	131	134	87
95th Queue (ft)	234	390	420	117	110	99	285	198	192	152
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)	0	2								
Queuing Penalty (veh)	0	8								

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	267	124	115	134	172	182	30	163	210	322
Average Queue (ft)	134	53	58	41	124	109	4	78	102	144
95th Queue (ft)	210	103	111	100	176	174	21	141	161	237
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)	1									
Queuing Penalty (veh)	3									
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								3		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 84

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	21.0	1.3	22.4
Total Delay (hr)	0.5	1.6	1.0	0.5	38.3	2.1	44.0

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	1.5	35.2	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	0.9	41.1	6.6	1.8	4.2	0.2	2.7	0.4	1.0	1.2	1.7	0.2

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Delay (hr)	43.9
Total Delay (hr)	61.9

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay (hr)	7.9	2.0	1.2	1.2	2.0	3.9	1.2	19.4

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.5	1.4	3.2	0.3	0.2	4.0	1.0	11.7

Total Zone Performance

Denied Delay (hr)	66.4
Total Delay (hr)	136.9

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	98	132	172	119	116	849	870
Average Queue (ft)	46	59	95	50	60	675	715
95th Queue (ft)	84	104	155	91	97	900	941
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	3	3					
Queuing Penalty (veh)	8	2					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	1169	1178	198	249	244	174	245	125	288
Average Queue (ft)	44	821	845	102	128	148	93	142	71	111
95th Queue (ft)	159	1242	1255	155	209	221	180	216	131	196
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		0	0							
Queuing Penalty (veh)		0	1							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)	0	56		0	0		0	6	4	15
Queuing Penalty (veh)	0	18		0	1		0	5	6	12

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	324	366	428	157	169	127	267	229	247	203
Average Queue (ft)	99	206	242	77	55	29	139	135	144	96
95th Queue (ft)	233	326	381	134	109	81	234	198	216	165
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)		1								
Queuing Penalty (veh)		6								

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	227	93	116	97	184	166	30	133	170	313
Average Queue (ft)	120	58	59	43	119	105	4	78	107	152
95th Queue (ft)	200	91	117	86	165	161	19	135	158	240
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								2		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 60

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Delay (hr)	0.0	0.0	0.0	0.1	16.3	0.6	17.0
Total Delay (hr)	0.5	1.8	1.2	0.6	36.9	1.9	42.8

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	0.6	39.9	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	0.9	47.9	5.9	1.8	3.9	0.2	2.3	0.3	1.0	0.7	1.4	0.3

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Delay (hr)	50.0
Total Delay (hr)	66.7

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	8.3	1.9	1.3	1.0	2.2	3.7	1.0	19.4

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.6	1.4	3.0	0.3	0.2	3.8	1.0	11.4

Total Zone Performance

Denied Delay (hr)	67.1
Total Delay (hr)	140.3

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	93	148	208	131	141	881	902
Average Queue (ft)	45	67	96	60	66	660	696
95th Queue (ft)	79	129	154	107	122	909	921
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	2	2					
Queuing Penalty (veh)	7	2					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	1174	1173	192	223	248	174	250	125	183
Average Queue (ft)	47	893	919	99	119	146	89	153	56	108
95th Queue (ft)	161	1155	1169	151	201	227	187	234	109	175
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		0	1							
Queuing Penalty (veh)		2	4							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)	0	59		0	1		0	9	1	14
Queuing Penalty (veh)	0	19		1	2		0	8	1	11

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	318	345	364	135	143	119	287	237	221	176
Average Queue (ft)	97	221	243	80	44	23	161	133	143	85
95th Queue (ft)	226	343	367	143	94	72	239	194	209	147
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)		1								
Queuing Penalty (veh)		4								

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	247	137	116	146	184	177	52	117	179	197
Average Queue (ft)	125	52	50	50	115	107	5	59	102	132
95th Queue (ft)	211	95	89	103	161	166	26	100	161	190
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)	0									
Queuing Penalty (veh)	0									
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								0		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 62

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.2	0.0	44.2	41.2	0.0	0.0	0.1	23.8
Total Del/Veh (s)	27.5	9.7	11.7	72.4	15.8	0.9	7.5	36.2

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	3.8	4.2	0.0	61.0	80.3	81.0	3.7	0.4	0.2
Total Del/Veh (s)	67.9	45.6	50.1	135.5	115.9	125.4	322.5	298.7	299.9	49.3	40.4	28.1

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	15.4
Total Del/Veh (s)	128.6

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.5	0.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)	21.5	26.2	32.9	5.4	30.4	23.4	26.6	17.8

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	4.7	1.6	0.0	0.0	0.0	0.0	0.0	0.7
Total Del/Veh (s)	50.0	11.7	31.1	34.0	290.3	277.4	284.0	115.8

Total Zone Performance

Denied Del/Veh (s)	83.3
Total Del/Veh (s)	971.4

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	100	284	136	1114	1091	280	208	210
Average Queue (ft)	71	89	72	231	895	252	91	105
95th Queue (ft)	111	200	112	813	1425	390	161	166
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)				1	4			
Queuing Penalty (veh)				5	41			
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	16	3			0	16		
Queuing Penalty (veh)	37	6			3	50		

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	483	491	200	1410	1415	175	1816	111	115
Average Queue (ft)	94	324	341	142	787	811	169	1536	34	58
95th Queue (ft)	229	458	474	248	1452	1461	211	2271	72	99
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)					5	7		52		
Queuing Penalty (veh)					41	54		0		
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		36		0	48		2	71	0	1
Queuing Penalty (veh)		15		0	70		11	157	0	1

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	198	254	290	260	160	154	266	257	233	362
Average Queue (ft)	86	140	161	142	74	64	133	145	141	163
95th Queue (ft)	165	252	278	241	137	122	226	219	209	282
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)				0						
Queuing Penalty (veh)				2						
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	T	L	LT	T	TR
Maximum Queue (ft)	268	228	247	286	376	378	250	216	140	1363	1325	1326
Average Queue (ft)	193	121	106	172	314	313	42	41	52	1121	1086	1079
95th Queue (ft)	265	200	197	362	419	420	151	136	147	1532	1537	1510
Link Distance (ft)	256	256	256		287	287	232	232		1256	1256	1256
Upstream Blk Time (%)	3		0	0	14	19	0	0		47	34	25
Queuing Penalty (veh)	10		0	0	105	148	3	0		0	0	0
Storage Bay Dist (ft)				300					115			
Storage Blk Time (%)				0	14				0	75		
Queuing Penalty (veh)				1	50				0	162		

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	B476	B476	B472	B472
Directions Served	T	T	T	T
Maximum Queue (ft)	784	803	271	253
Average Queue (ft)	311	319	58	62
95th Queue (ft)	898	911	226	229
Link Distance (ft)	691	691	219	219
Upstream Blk Time (%)	26	26	19	20
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 974

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.1	0.0	46.8	37.8	0.0	0.0	0.0	21.9
Total Del/Veh (s)	35.4	9.6	13.1	81.9	19.3	0.8	9.2	40.4

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	1.0	0.0	106.9	122.4	131.0	4.0	0.3	0.3
Total Del/Veh (s)	60.1	45.7	42.5	196.0	188.1	231.6	343.5	348.3	322.0	43.2	43.4	31.0

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	23.0
Total Del/Veh (s)	162.9

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	1.2	1.7	0.0	0.0	1.7	0.8
Total Del/Veh (s)	35.7	22.9	35.4	13.2	29.7	23.1	57.5	27.2

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	17.4	11.0	0.0	0.0	0.0	0.0	0.0	3.8
Total Del/Veh (s)	75.2	14.4	53.3	54.2	221.2	183.3	182.4	97.0

Total Zone Performance

Denied Del/Veh (s)	112.0
Total Del/Veh (s)	1014.3

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	100	339	276	1095	1109	280	183	195
Average Queue (ft)	83	97	77	251	1015	280	113	130
95th Queue (ft)	115	219	158	872	1278	280	179	187
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)				0	7			
Queuing Penalty (veh)				3	68			
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	32	2			0	20		
Queuing Penalty (veh)	74	3			5	63		

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	515	516	200	1432	1431	175	1840	110	136
Average Queue (ft)	63	320	323	149	1174	1193	166	1557	31	58
95th Queue (ft)	170	460	461	242	1774	1737	205	2185	69	107
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)					14	19		54		
Queuing Penalty (veh)					113	153		0		
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		36		3	52		4	74	1	2
Queuing Penalty (veh)		15		23	75		18	163	1	1

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	324	436	421	275	290	284	255	199	499	425
Average Queue (ft)	199	133	153	141	131	129	129	135	204	265
95th Queue (ft)	309	291	297	244	260	268	205	192	419	439
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)				1	2	4			0	
Queuing Penalty (veh)				5	9	18			2	
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)	7	0							0	6
Queuing Penalty (veh)	17	0							2	17

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	T	L	LT	T	TR
Maximum Queue (ft)	281	195	256	286	406	380	324	306	140	1326	1293	1256
Average Queue (ft)	262	125	129	247	359	359	280	273	67	827	790	788
95th Queue (ft)	301	198	231	389	396	370	388	389	167	1261	1209	1164
Link Distance (ft)	256	256	256		287	287	232	232		1256	1256	1256
Upstream Blk Time (%)	37		0	1	52	60	45	44		1	0	0
Queuing Penalty (veh)	120		0	0	409	465	352	343		0	0	0
Storage Bay Dist (ft)				300					115			
Storage Blk Time (%)				1	52					76		
Queuing Penalty (veh)				2	194					163		

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	B476	B472
Directions Served	T	T
Maximum Queue (ft)	25	33
Average Queue (ft)	1	1
95th Queue (ft)	8	11
Link Distance (ft)	691	219
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 2897

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.0	0.0	20.4	28.9	0.0	0.0	0.0	14.5
Total Del/Veh (s)	40.6	9.6	12.6	67.3	20.7	1.3	10.7	35.3

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	8.0	4.1	0.0	69.4	65.0	67.0	4.0	0.1	0.3
Total Del/Veh (s)	71.2	44.8	42.3	203.8	193.5	249.6	280.9	294.0	284.6	48.4	48.9	30.2

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	15.4
Total Del/Veh (s)	155.6

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	2.1	2.9	0.0	0.0	0.0	1.2
Total Del/Veh (s)	22.7	25.1	32.8	12.8	31.5	25.0	39.1	22.3

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	6.1	2.4	0.0	0.0	0.0	0.0	0.0	1.0
Total Del/Veh (s)	61.6	11.5	48.5	50.3	322.0	308.8	321.2	135.5

Total Zone Performance

Denied Del/Veh (s)	70.3
Total Del/Veh (s)	1155.3

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	100	197	137	1070	1096	280	222	272
Average Queue (ft)	79	91	63	224	867	252	122	139
95th Queue (ft)	114	179	107	711	1312	391	194	218
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)				0	2			
Queuing Penalty (veh)				0	18			
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	32	2			1	16		
Queuing Penalty (veh)	74	4			11	52		

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	486	458	200	1421	1430	175	1836	124	132
Average Queue (ft)	47	329	333	143	1273	1283	162	1328	42	50
95th Queue (ft)	141	431	422	244	1615	1613	212	2272	86	103
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)					15	17		37		
Queuing Penalty (veh)					124	141		0		
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		36		3	54		4	69	0	3
Queuing Penalty (veh)		15		23	79		17	152	0	1

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	193	274	295	265	298	301	247	229	217	422
Average Queue (ft)	89	131	150	137	138	133	135	139	146	205
95th Queue (ft)	174	244	272	229	260	262	217	207	201	355
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)				1	1	1				
Queuing Penalty (veh)				3	5	5				
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)										1
Queuing Penalty (veh)										3

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	T	L	LT	T	TR
Maximum Queue (ft)	295	176	193	286	405	376	310	275	140	1363	1325	1341
Average Queue (ft)	226	114	103	234	356	348	181	159	66	1236	1224	1210
95th Queue (ft)	305	174	172	383	401	387	356	311	163	1512	1498	1496
Link Distance (ft)	256	256	256		287	287	232	232		1256	1256	1256
Upstream Blk Time (%)	16			0	42	46	13	10		59	38	34
Queuing Penalty (veh)	51			0	329	362	104	78		0	0	0
Storage Bay Dist (ft)				300					115			
Storage Blk Time (%)				0	42					72		
Queuing Penalty (veh)				2	156					154		

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	B476	B476	B472	B472
Directions Served	T	T	T	T
Maximum Queue (ft)	765	789	234	234
Average Queue (ft)	343	334	24	24
95th Queue (ft)	836	827	140	140
Link Distance (ft)	691	691	219	219
Upstream Blk Time (%)	11	11	7	7
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 1962

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SER	All
Denied Delay (hr)	0.0	0.0	0.0	0.1	18.8	0.2	19.1
Total Delay (hr)	0.6	1.8	1.1	0.5	35.9	1.9	41.9

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Delay (hr)	2.1	66.2	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (hr)	1.0	55.1	8.7	2.2	4.1	0.1	3.0	0.4	1.0	1.0	1.3	0.4

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Delay (hr)	73.5
Total Delay (hr)	78.2

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	8.2	1.7	0.9	1.1	2.5	3.7	1.0	19.1

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.6	1.5	3.0	0.3	0.2	4.3	1.1	11.9

Total Zone Performance

Denied Delay (hr)	92.6
Total Delay (hr)	151.0

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	L	LR
Maximum Queue (ft)	100	122	173	140	116	882	966
Average Queue (ft)	49	66	110	55	60	652	688
95th Queue (ft)	84	114	161	94	98	908	939
Link Distance (ft)		1080	1080	1066	1066	1036	1036
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	75						
Storage Blk Time (%)	5	2					
Queuing Penalty (veh)	13	2					

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	200	1185	1198	199	272	304	174	395	125	223
Average Queue (ft)	37	1007	1019	109	131	148	86	169	64	104
95th Queue (ft)	144	1383	1391	196	238	237	160	289	112	191
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)		14	18							
Queuing Penalty (veh)		111	136							
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		60		5	2		0	10	3	11
Queuing Penalty (veh)		19		15	3		0	9	4	9

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	269	325	355	133	131	194	267	309	282	129
Average Queue (ft)	108	207	220	63	53	31	170	132	138	66
95th Queue (ft)	238	333	333	110	102	104	247	217	206	109
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)		1								
Queuing Penalty (veh)		4								

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	L	LT	T	TR
Maximum Queue (ft)	249	126	134	73	203	200	30	143	163	204
Average Queue (ft)	122	58	58	32	120	101	3	78	114	149
95th Queue (ft)	218	119	118	60	177	161	17	142	168	206
Link Distance (ft)	256	256	256		287	287		1256	1256	1256
Upstream Blk Time (%)	0									
Queuing Penalty (veh)	0									
Storage Bay Dist (ft)				300			115			
Storage Blk Time (%)								3		
Queuing Penalty (veh)								0		

Zone Summary

Zone wide Queuing Penalty: 325

4: Francis Ave #14 & Indian Trail Road Performance by movement

Movement	EBL	EBT	WBT	WBR	SEL	SET	SER	All
Denied Del/Veh (s)	0.2	0.0	28.4	27.5	0.0	0.0	0.0	15.8
Total Del/Veh (s)	34.4	8.1	14.1	66.0	17.8	0.9	6.9	34.3

5: Alberta St & Francis Ave #14 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	2.0	1.0	0.4	38.5	40.6	36.8	4.0	0.2	0.3
Total Del/Veh (s)	67.5	37.3	33.2	152.8	125.9	127.4	291.0	298.5	281.2	47.4	45.4	24.5

5: Alberta St & Francis Ave #14 Performance by movement

Movement	All
Denied Del/Veh (s)	8.1
Total Del/Veh (s)	129.7

6: Ash St #4S & Francis Ave #14 Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)	23.8	22.8	32.4	6.1	33.0	24.5	26.9	18.8

7: Maple St #3N & Francis Ave #14 Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBT	NBR	All
Denied Del/Veh (s)	15.6	10.4	0.0	0.0	0.0	0.0	0.0	3.4
Total Del/Veh (s)	61.4	12.7	41.0	43.6	271.5	275.4	270.4	119.9

Total Zone Performance

Denied Del/Veh (s)	60.9
Total Del/Veh (s)	954.4

Intersection: 4: Francis Ave #14 & Indian Trail Road

Movement	EB	EB	EB	WB	WB	WB	SE	SE
Directions Served	L	T	T	T	T	R	L	LR
Maximum Queue (ft)	100	173	158	1088	1106	280	174	222
Average Queue (ft)	81	73	59	363	769	243	98	112
95th Queue (ft)	114	150	110	995	1320	400	151	176
Link Distance (ft)		1080	1080	1066	1066		1036	1036
Upstream Blk Time (%)				0	2			
Queuing Penalty (veh)				2	25			
Storage Bay Dist (ft)	75					255		
Storage Blk Time (%)	25	1			1	16		
Queuing Penalty (veh)	57	3			8	50		

Intersection: 5: Alberta St & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LTR	L	TR
Maximum Queue (ft)	199	380	405	200	1394	1398	175	1835	71	106
Average Queue (ft)	48	254	272	147	907	936	170	1476	32	52
95th Queue (ft)	151	345	371	231	1597	1600	200	2130	66	90
Link Distance (ft)		1169	1169		1382	1382		1801		497
Upstream Blk Time (%)					3	4		40		
Queuing Penalty (veh)					27	30		0		
Storage Bay Dist (ft)	175			175			150		100	
Storage Blk Time (%)		24		6	44		6	71		1
Queuing Penalty (veh)		10		45	65		28	157		0

Intersection: 6: Ash St #4S & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	TR	L	T	T	L	T	T	R
Maximum Queue (ft)	305	233	278	256	176	142	274	247	242	325
Average Queue (ft)	114	129	139	143	96	88	126	155	158	173
95th Queue (ft)	245	235	255	237	146	144	218	222	229	281
Link Distance (ft)		1577	1577	256	256	256	499	499	499	
Upstream Blk Time (%)				0						
Queuing Penalty (veh)				0						
Storage Bay Dist (ft)	300									400
Storage Blk Time (%)	2									
Queuing Penalty (veh)	4									

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	EB	EB	EB	WB	WB	WB	B471	B471	NB	NB	NB	NB
Directions Served	L	T	T	T	T	TR	T	T	L	LT	T	TR
Maximum Queue (ft)	287	197	262	286	405	394	305	305	140	1350	1325	1344
Average Queue (ft)	222	118	121	212	346	338	131	116	64	1112	1095	1089
95th Queue (ft)	315	181	211	386	411	413	302	287	155	1469	1454	1438
Link Distance (ft)	256	256	256		287	287	232	232		1256	1256	1256
Upstream Blk Time (%)	15		0	1	32	35	8	7		29	17	18
Queuing Penalty (veh)	48		0	0	250	274	60	52		0	0	0
Storage Bay Dist (ft)				300					115			
Storage Blk Time (%)				1	32				0	67		
Queuing Penalty (veh)				3	118				0	145		

Intersection: 7: Maple St #3N & Francis Ave #14

Movement	B476	B476	B472	B472
Directions Served	T	T	T	T
Maximum Queue (ft)	765	793	59	134
Average Queue (ft)	143	143	3	9
95th Queue (ft)	577	572	24	64
Link Distance (ft)	691	691	219	219
Upstream Blk Time (%)	5	5		
Queuing Penalty (veh)	0	0		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 1461

Appendix F

Collision History Analysis

Morrison Maierle
engineers • surveyors • planners • scientists

memo

TO: Inga Note, P.E. - City of Spokane Street Department
Lisa Key - City of Spokane Planning and Development
Tirrell Black - City of Spokane Planning Department

FROM: Bill White
Kennet Bertelsen, P.E.

DATE: June 8, 2016

JOB NO.: 5594.002

RE: Windhaven Apartments, Indian Trail Safety/Collision Analysis

CC: Jay Bonnet, P.E. - Bonnett Engineering
Del Stratton - Douglass Properties

☐ **Urgent** ☒ **For Review** ☒ **Please Comment** ☒ **Please Reply** ☐ **For Your Use**

This memorandum summarizes the safety/collision analysis prepared for Indian Trail Road in north Spokane, WA. This has been provided the second supplement to the *Windhaven Apartments Traffic Impact Analysis* (MMI, May 2016), as prepared in response to citizen commentary/questions recorded at the Windhaven neighborhood public meeting performed on May 25, 2016 at Indian Trail Church. Source material such as project data, traffic forecasts, and comparative analyses can be reviewed with the project Traffic Impact Analysis (TIA).

METHODOLOGY

The purposes of collision analyses is to determine whether safety issues occur as a result of operational or design issues, such as signal phase issues, sight distance limitations, channelization alignment issues, etc. A location where numerous incidents occur could indicate a high accident location (HAL). A high number of collisions occurring along a street or street section may indicate a high accident corridor (HAC).

Any collision is important to consider and is relevant in safety analyses. However, collisions are reviewed on the basis of severity rates to help determine whether some form of remediation may be needed to address persistent, reoccurring collision issues within the context of traffic densities. An intersection or corridor section may have a high number of collisions/incidents, but this is not as statistically significant if the high traffic volumes are also experienced. Collision rates are calculated to provide a statistical means for quantifying collision density.

An intersection (or driveway) collision rate (ICR) quantifies severity based on the number of average accidents occurring per year, as compared with average daily traffic (ADT) entering the intersection per the following equation:

$$\text{Intersection Collision Rate (ICR)} = \frac{\text{Average Accidents per Year} * 1{,}000{,}000}{365 * \text{Total Entering Intersection ADT}}$$

(Collisions per million entering vehicles)

Similarly, the corridor collision rate (CCR) for a street or street section is based on the number of average accidents occurring per year compared with average daily traffic AND the length of the corridor, per the following equation:

$$\text{Corridor Collision Rate (CCR)} = \frac{\text{Average Accidents per Year} * 1{,}000{,}000}{365 * \text{Section ADT} * \text{Section Length}}$$

(Collisions per million miles of vehicle travel)

Typically jurisdictions such as Spokane have no set thresholds for identifying an HAL or HAC. However, a typical industry recommendation is that further evaluation/analysis should be considered if accident rates exceed 1.0 collisions per million entering vehicles for an intersection (or driveway).

The Washington State Department of Transportation provides collision statistics within annual summary reports. The "2014 Annual Collision Summary", the most current report available, indicates Spokane County experiences a system/network-wide rate of 168.7 collisions per 100 million miles of travel, or 1.687 collisions per million miles of travel. Thus, by comparison, the use of a 1.0 threshold is conservative at least on the basis of corridor analyses. This at least provides some local context to safety/collision analyses.

ANALYSIS

Collision histories were reviewed for 2.67 miles of Indian Trail Road between Navaho Avenue and Francis Avenue. Intersections, driveways, and mid-block locations were considered, as well as for the corridor section overall. Histories were reviewed for nearly a three and a half-year period extending between January 1, 2013 and May 31, 2016, the most current three-plus year timeframe available, as per standard industry practices. Collision data was provided by City of Spokane officials.

Note the histories/data reviewed reflects recorded collisions, as identified through evidentiary reports provided by City of Spokane, Spokane County, and/or State law enforcement officials. Unreported collisions do occur throughout a community on roadways such as Indian Trail Road. However, Safety studies can be performed only based on recorded data. Most typically, unreported collisions would involve minor property damage only (typically non-injury).

Total collisions, average collisions, collisions rates, and severity were determined for each intersection or driveway with summary data provided in Table 1 (next page). Also summarized in bold, final row, is the overall corridor collision data for the 2.67 mile street section. Other factors to note from this table include:

- 3.4-Year refers to total collisions collected for the 3 year and 5 months analysis timeframe.
- Average annual would then be the average year collisions, taken by dividing total collisions by 3 years and 5 months.
- ADT refers to traffic entering the intersection from Indian Trail Road. The resulting ICR rates should be considered conservative as no side-street ADT is reflected.
- The average corridor ADT (in bold) was taken from three count locations of 13,555, 16,821, and 17,299, as these were performed to support the TIA and are prevalent for the study corridor section.
- PDO is a property damage only collision without injuries. These were reviewed on the basis of each incident, as to compare with other severity incidents. Each incident may actually have two or more vehicles with property damage.
- Inj. is an injury-related incident. Property damage is likely, but the worse-severity is recorded for comparison. Note injuries were also reviewed on the basis of each incident, as to compare with other severity incidents. Each incident may actually have two or more persons with injuries.
- Fat. refers to a fatality. It is acknowledge a fatality, predating this study timeframe, may have occurred and is well-remembered by citizens of the neighborhood. However, the occurrence is not recorded as it again predates available collected from City officials between January 1, 2013 and May 31, 2016.

Table 1. Summary Intersection Collision							
	Traffic Control				Severity		
Intersection	3.4-Year Totals	Average Annual	ADT[1]	ICR[2] or CCR[3]	PDO[4]	Inj.[5]	Fat[6]
Navaho Avenue	3	0.9	4100	0.59	67%	33%	0%
Shawnee Avenue	2	0.6	13555	0.12	50%	50%	0%
Mid-Block S/of Shawnee	1	0.3	13555	0.06	0%	100%	0%
Selkirk Apts Drive	0	0.0	13555	0.00	0%	0%	0%
Chase Bank Drive	0	0.0	13555	0.00	0%	0%	0%
Barnes Road	8	2.3	13555	0.47	25%	75%	0%
Sundance Plaza North Drive	3	0.9	13555	0.18	33%	67%	0%
Sundance Plaza South Drive	0	0.0	13555	0.00	0%	0%	0%
STCU Drive	0	0.0	13555	0.00	0%	0%	0%
Lowell Avenue	2	0.6	16821	0.10	50%	50%	0%
Pacific Park Dr./Strong Rd	4	1.2	16821	0.19	25%	75%	0%
Christian School Drive	1	0.3	16821	0.05	0%	100%	0%
Kathleen Avenue	1	0.3	17299	0.05	100%	0%	0%
Excel Avenue	0	0.0	17299	0.00	0%	0%	0%
Fleming Street	1	0.3	17299	0.05	0%	100%	0%
Weile Avenue	0	0.0	17299	0.00	0%	0%	0%
Assumption Parish School	0	0.0	17299	0.00	0%	0%	0%
Woodside Avenue	6	1.8	17299	0.28	50%	50%	0%
Beacon Avenue	1	0.3	17299	0.05	100%	0%	0%
Holyoke Avenue	1	0.3	17299	0.05	100%	0%	0%
Yokes North Drive	0	0.0	17299	0.00	0%	0%	0%
Yokes Central Drive	0	0.0	17299	0.00	0%	0%	0%
Indian Trail Dental North Drive	0	0.0	17299	0.00	0%	0%	0%
Indian Trail Dental South Drive	0	0.0	17299	0.00	0%	0%	0%
Elmhurst Street	2	0.6	17299	0.09	0%	100%	0%
Francis Avenue	16	4.7	17299	0.74	50%	50%	0%
Total Collisions	52	15.2	15892	0.98	42%	58%	0%

1. ADT = Entering from Indian Trail for intersections, or as a count average for the corridor.
2. ICR = Intersection Collision Rate
3. CCR = Collision Corridor Rate
4. PDO = Property Damage Only
5. Inj. = Injury Incident
6. Fat. = Fatality

As shown, 52 recorded collisions occurred along Indian Trail Road between Indian Trail Road between January 1, 2013 and May 31, 2016. Overall, 42 percent of collisions involved vehicle property damage only with 58 percent involving injuries. There were no fatalities within the study timeframe. An average of 15.2 collisions occur along Indian Trail Road each year that, when compared with an average of 15,892 ADT, results in a CCR of 0.98 collisions per million miles of vehicle travel.

Three prevailing collision types along the corridor include:

1. **35% Rear-End Collisions** - A following vehicle collides with a preceding stopped or slowing vehicle);
2. **25% Left Angle** - A left turn "tee" collisions where a permissive left-turning vehicle crosses in front of a through vehicle at an intersection or driveway.
3. **19% Right Angle** - A right-turning vehicle at an intersection or driveway enters the roadway in front of a through vehicle.

The remaining 21 percent of collision types varied between same direction side-swipe, opposite direction side-swipe, opposite direction head-on, a collision with a fixed object (tree, pole, sign, or parked car), and a collision with a pedestrian or bicyclist.

A summary of intersection collision data for the highest three intersection locations, as determined on the basis of ICR comparisons, is summarized as follow:

1. **Francis Avenue/Indian Trail Road.** Sixteen collisions occurred over three years and five months with an average of 4.7 collisions occurring per year; calculating to an ICR of 0.74 collisions per million entering vehicles. Severities were equal between injury and property damage only collisions. The prevailing intersection types include left-angle (56-percent) and rear end (31 percent).
2. **Navaho Avenue/Indian Trail Road.** Three collisions occurred over three years and five months with an average of 0.9 collisions occurring per year; calculating to an ICR of 0.59 collisions per million entering vehicles. Two collisions involved property damage only with one injury accident. All collisions were right angle.
3. **Barnes Road/Indian Trail Road.** Eight collisions occurred over three years and five months with an average of 2.3 collisions occurring per year; calculating to an ICR of 0.47 collisions per million entering vehicles. 75 percent of collisions involved injuries with 25 percent property damage only. The prevailing intersection types include left and right-angle collisions (63 percent). A pedestrian was hit crossing at the intersection.

As shown on Table 1, respective intersection and driveway ICR do not exceed 1.0 collisions per million entering vehicles. Thus, it does not appear an HAL is prevalent on the basis of collision densities. Similarly, the CCR is just below 1.0 collisions per million entering vehicles, suggesting a HAC does not exist along Indian Trail Road. The rate is well below the average for roadways throughout Spokane County.

Other highlights and pertinent information from the safety analysis includes:

- No fatalities were noted within the three year and five month study timeframe.
- A pedestrian incident was noted at the Barnes Road intersections.
- A pedestrian incident was noted mid-block between Shawnee Avenue and Barnes Road.
- Nine collisions were attributed to "wet" roadway conditions, with four during rain, outside of snow/ice.
- Two additional collisions were attributed to snow/ice.
- Twelve collisions occurred at night (dark)

SUMMARY

The collision analysis does not highlight a potential HAL or HAC for Indian Trail Road; thus, no improvement considerations are recommended. With that said, the CCR is nearly at 1.0. Thus, it is recommended the City, via any staff study or through request of future private development

studies, continue to review collision rates to confirm that an HAL or HAC does not evolve for Indian Trail Road.

Note additional summary data on the intersection basis is provided on the next page for more detailed review, if/as needed.

Further Collision Summary Data

Location	Total Collisions	Average Annual	Mainline ADT	Corridor Intersection Rate	Property Damage Only	Injury Accident	Fatality	Rear End	Same Direction Sideswipe	Opposite Direction Left-Turn "Tee"	Drive/Intersect. Enter. Right Angle "Tee"	Opposite Direction Sideswipe	Opposite Direction Head On	Overturn Vehicle	Fixed Object or Parked Car	Pedestrian or Bicycle
Navaho Avenue	3	0.9	4100	0.59	2	1					3					
Shawnee Avenue	2	0.6	13555	0.12	1	1		1			1					
Mid-Block S/of Shawnee	1	0.3	13555	0.06		1										1
Selkirk Apts Drive	0	0.0	13555	0.00												
Chase Bank Drive	0	0.0	13555	0.00												
Barnes Road	8	2.3	13555	0.47	2	6				2	3		1		1	1
Sundance Plaza North Drive	3	0.9	13555	0.18	1	2		1							2	
Sundance Plaza South Drive	0	0.0	13555	0.00												
STCU Drive	0	0.0	13555	0.00												
Lowell Avenue	2	0.6	16821	0.10	1	1		1					1			
Pacific Park Dr/Strong Rd	4	1.2	16821	0.19	1	3		3	1							
Christian School Drive	1	0.3	16821	0.05		1		1								
Kathleen Avenue	1	0.3	17239	0.05	1			1								
Excel Avenue	0	0.0	17239	0.00												
Fleming Street	1	0.3	17239	0.05		1		1								
Weile Avenue	0	0.0	17239	0.00												
Assumption Parish School	0	0.0	17239	0.00												
Woodside Avenue	6	1.8	17239	0.28	3	3		3		2	1					
Beacon Avenue	1	0.3	17239	0.05	1										1	
Holyoke Avenue	1	0.3	17239	0.05	1						1					
Yokes North Drive	0	0.0	17239	0.00												
Yokes Central Drive	0	0.0	17239	0.00												
Indian Trail Dental North Drive	0	0.0	17239	0.00												
Indian Trail Dental South Drive	0	0.0	17239	0.00												
Elmhurst Street	2	0.6	17239	0.09		2		1							1	
Francis Avenue	16	4.7	17239	0.74	8	8		5	1	9	1					
Total Collisions	**52**	**15.2**	**15892**	**0.98**	**22**	**30**	**0**	**18**	**2**	**13**	**10**	**0**	**2**	**0**	**5**	**2**
- Percent Collisions					**42%**	**58%**	**0%**	**35%**	**4%**	**25%**	**19%**	**0%**	**4%**	**0%**	**10%**	**4%**
Location	**Total Collisions**	**Average Annual**	**Mainline ADT**		**Property Damage Only**	**Injury Accident**	**Fatality**	**Rear End**	**Same Direction Sideswipe**	**Opposite Direction Left-Turn "Tee"**	**Drive/Intersect. Enter. Right Angle "Tee"**	**Opposite Direction Sideswipe**	**Opposite Direction Head On**	**Overturn Vehicle**	**Fixed Object or Parked Car**	**Pedestrian or Bicycle**

MORRISON-MAIERLE, INC.

PLANNING & DEVELOPMENT
808 W. SPOKANE FALLS BLVD.
SPOKANE, WASHINGTON 99201-3329
509.625.6300
FAX 509.625.6013
my.spokanecity.org

MITIGATED DETERMINATION OF NON-SIGNIFICANCE "MDNS"

FILE NO(S): Z1500084COMP

PROPONENT: J.R. Bonnett Engineering, on behalf of Morningside Investment, LLC

DESCRIPTION OF THE PROPOSAL: The applicant is requesting to change the land use of a 45.5 acre area encompassed in the Windhaven First Addition PUD from "Residential, 4 to 10 units per acre" to "Residential 10-20 units per acre" and "Residential 15-30 units per acre". The proposed change to "Residential 10-20 units per acre" is for 3.87 acres. The balance of 41.63 acres is proposed to be changed to "Residential 15-30 units per acre". The applicant has proposed to limit development on the entirety of the undeveloped 49.5 acres of the Windhaven First Addition PUD to a maximum of 750 dwelling units. If the requested Comprehensive Plan amendment is approved, the zoning would be changed from RSF (Residential Single Family) to RTF (Residential Two Family) or RMF (Residential Multi Family). No specific development proposal is being considered at this time.

LOCATION OF PROPOSAL, INCLUDING STREET ADDRESSES, IF ANY: This proposal is located north of W. Barnes Road and is generally bounded by W. Youngstown Lane, N. Concord Lane, W Jamestown Lane, and N Camden Lane. The location may also be described as: All parcels and tracts within the Windhaven First Addition PUD, except lots 1-8 Block 4, lots 1-13 Block 5, lots 1-5 Block 6. The area is comprised of 260 platted lots on approximately 45.5 acres. Located within SW ¼ 15-26-42; SE ¼ 16-26-42; NE ¼ 21-26-42: NW ¼ 22-26-42

LEAD AGENCY: City of Spokane

The lead agency for this proposal has determined that it does not have a probable significant adverse impact on the environment if mitigated as stipulated below. An Environmental Impact Statement (EIS) is not required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public on request.

( ) There is no comment period for this MDNS.

(**X**) This MDNS is issued under WAC 197-11-350(2); the lead agency will not act on this proposal for at least 14 days from the date issued (below). Comments must be submitted no later than 5 p.m. on September 13, 2016, if they are intended to alter the MDNS.

MITIGATING MEASURES:
Please see Attachment "A" for the SEPA mitigation items attached to this proposal.

****

Responsible Official: Lisa D. Key
Position/Title: Director, Planning Services **Phone:** (509) 625- 6300
Address: 808 W. Spokane Falls Blvd., Spokane, WA 99201

Date Issued: August 23, 2016 **Signature:** Lisa D. Key

****

APPEAL OF THIS DETERMINATION, after it has become final, may be made to the City of Spokane Hearing Examiner, 808 West Spokane Falls Blvd., Spokane WA 99201. The appeal deadline is 5 p.m. on September 13, 2016 (21 days from the date of the signing of this MDNS). This appeal must be on forms provided by the Responsible Official, make specific factual objections, and be accompanied by the appeal fee. Contact the Responsible Official for assistance with the specifics of a SEPA appeal.
****

ATTACHMENT "A"
MITIGATED DETERMINATION OF NON-SIGNIFICANCE

FILE NO(S): Z1500084

PROPONENT: J.R. Bonnett Engineering, on behalf of Morningside Investment, LLC

PROJECT DESCRIPTION: The applicant is requesting to change the land use of a 45.5 acre area encompassed in the Windhaven First Addition PUD from "Residential, 4 to 10 units per acre" to "Residential 10-20 units per acre" and "Residential 15-30 units per acre". The proposed change to "Residential 10-20 units per acre" is for 3.87 acres. The balance of 41.63 acres is proposed to be changed to "Residential 15-30 units per acre". The applicant has proposed to limit development on the entirety of the undeveloped 49.5 acres of the Windhaven First Addition PUD to a maximum of 750 dwelling units. If the requested Comprehensive Plan amendment is approved, the zoning would be changed from RSF (Residential Single Family) to RTF (Residential Two Family) or RMF (Residential Multi Family). No specific development proposal is being considered at this time.

While a comprehensive plan amendment and zone change are considered nonproject actions under SEPA, and therefore, are not subject to a concurrency determination under State law, any subsequent development permit applications on the subject property will be reviewed for concurrency, as per State law and SMC §17D.010.020. Even though State law does not require a concurrency determination for nonproject actions, probable adverse environmental impacts associated with such potential future development do need to be considered, in making a threshold determination under SEPA. As such, the timing and/or trigger for each required mitigation is detailed below.

MITIGATIONS: The property owner and/or their representatives and assignees shall strictly adhere to the conditions in this Mitigated Determination of Non-Significance.

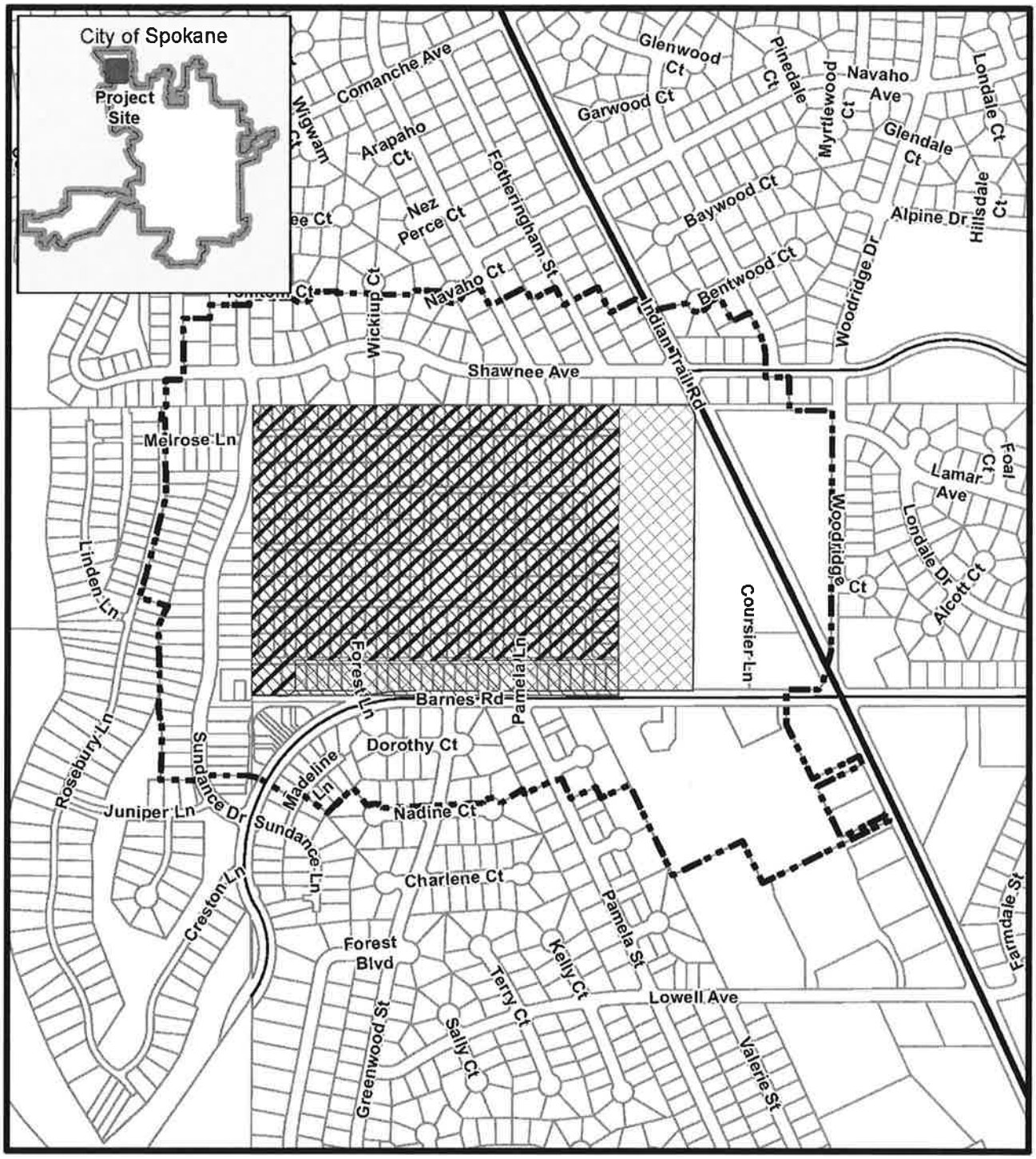
1. **Limitation on Dwelling Units.**

   In the Revised SEPA Environmental checklist dated May 4, 2016, the applicant included the following statement in project description (item number 11):

   > "The project is intended to place multiple multi-family dwellings on approximately 49.5 acres of land....The requested land use designation would provide for a housing density of approximately 15 units per acre, yielding up to 750 units."

   Further, the applicant's required traffic impact analysis (dated July 11, 2016), prepared as a requirement of this SEPA review, used traffic generation based upon a total of 750 multi-family dwelling units; because the traffic impacts evaluated "without the project" included the vested trips assigned to the 286 platted single-family lots on the entirety of the undeveloped Windhaven First Addition PUD (reference **Figure 1**, Windhaven First Addition PUD Area Map), the analysis "with the project" replaced those vested trips with the projected trip generation from the 750 multi-family units envisioned.

FIGURE 1. Windhaven First Addition PUD Area MAP



Applicant: Morningside Investments LLC

Proposal: Proposed Comprehensive Land designation from R4-10 to partially R15-30 and R10-20; and change zoning from RSF to RMF and RTF

SW 1/4 15-26-42; SE 1/4 16-26-42; NE 1/4 21-26-42; NW 1/4 22-26-42

Date: 7/26/2016

On this basis, if the requested Comprehensive Plan amendment and zone change are approved, any subsequent development on the entirety of the 49.5 acres of Windhaven First Addition PUD will need to be limited to a maximum of 750 dwelling units, as represented by the applicant in their SEPA documentation. The appropriate mechanism to address this mitigation is a development agreement that would need to be incorporated as a condition of approval for the Comprehensive Plan amendment and zone change.

2. Lane Capacity on North Indian Trail Road.

The Traffic Impact Analysis (TIA) prepared by the applicant's representative (dated July 11, 2016) included a lane capacity analysis on North Indian Trail Road, which indicates that additional through lanes will be needed in both the north and south directions on North Indian Trail Road between Kathleen Avenue and Lowell Avenue, to address the additional trips arising from the increased density that would be allowed, if the comprehensive plan amendment and zone change are approved. While the City has plans to widen North Indian Trail to a five lane road section long term, currently the project is unfunded.

The TIA proposed to mitigate capacity impacts through funding a partial widening of North Indian Trail Road that could be completed at the same time as the city's asphalt overlay scheduled for 2018. This widening project would provide two continuous southbound lanes from Barnes to Francis, and two continuous northbound lanes from Francis to Pacific Park. A two-way left turn lane would be provided in the vicinity of Kathleen. The cost for the partial widening is estimated to be at least $820,000. The developer has proposed to pre-pay the impact fees that are estimated to be owed on the apartments the developer intends to build if the Comprehensive Plan amendment and zone change are approved, which the City could apply towards the cost of the partial widening project. The city may be able to utilize recently collected Northwest District impact fees towards the project as well. The concept drawing for the proposed improvements is included as "Attachment B".

On this basis, funding for the partial widening of North Indian Trail Road, to allow for its completion concurrently with the scheduled 2018 City overlay project, will need to be incorporated as a mitigating condition, should the Comprehensive Plan amendment and zone change request be approved. The appropriate mechanism to address the timing and specific terms of the funding agreement would be through a development agreement that is incorporated as a condition of approval for the Comprehensive Plan amendment and zone change.

3. Intersection Levels of Service on West Francis Avenue.

The City's level of service standards are outlined in administrative policy and procedure ADMIN 0370-08-01. The required signalized level of service is LOS E at intersections along principal or minor arterials. This represents an average LOS for all movements at the intersection, and allows individual movements of the intersection to be at an LOS F, provided that overall, the average LOS of the intersections is LOS E or better. This standard applies to all signals along North Indian Trail and Francis corridors that are included in the study. The most current version of HCS (Highway Capacity Software) is required to be used for the analysis. However, the city may request the use of a different modeling software depending on the project proposal.

The TIA indicated that several intersections on West Francis Avenue will be nearing the threshold between LOS E and F with the addition of the background trips and the new trips that would be generated as a result of the potential development of the subject property, should the change in zoning be approved. Intersections of particular concern are Francis/Alberta during the AM and PM peaks and Francis/Maple during the PM peak. During the review of the draft traffic study both city staff and WSDOT staff expressed

concern that HCS may not be adequately modeling the level of service due to uneven lane utilization and queue spillback between signalized intersections. The applicant's engineer provided additional analysis using the Simtraffic software which showed that some intersections have issues with blocking and long queues. The intersections of Francis/Maple and Francis/Alberta are operating at LOS E and have some movements operating at LOS F and/or with long queues. Drivers on Francis often require multiple cycles to get through the signals. The intersections on Francis are essentially built-out, to the point where further expansions would be very costly and offer little in the way of additional capacity. The little remaining capacity will be needed to support other development already included in the Comprehensive Plan.

The impact of the Comprehensive Plan Amendment and rezone, if approved, and the subsequent development, can be offset and mitigated by implementing Travel Demand Management (TDM) strategies, which will shift existing or proposed trips from single occupant vehicles to transit or other High Occupancy Vehicle (HOV) options. This method would preserve the remaining intersection capacity for other development. TDM strategies are recognized in the city LOS policy (ADMIN 0370-01-01 Section 4.12), state law (WAC 365-196-840 (6)(a)(i)), and the SRTC Congestion Management Plan (Appendix D) as ways to mitigate for poor level of service. Commonly used TDM strategies include a bus pass program, vanpooling, providing bus stop amenities, establishing a park and ride, walking improvements and biking improvements. Any TDM strategies proposed for the development would need to be agreed to by the Spokane Transit Authority (STA), WSDOT and the City. The strategies would need to specifically mitigate the 89 new PM peak trips that are added to Francis Avenue (from Alberta eastward) as a result of the additional density from the rezone.

The appropriate mechanism to address the specific TDM strategies would be through a development agreement that is incorporated as a condition of approval for the Comprehensive Plan amendment and zone change, with said TDM strategies to be implemented at the time of development.

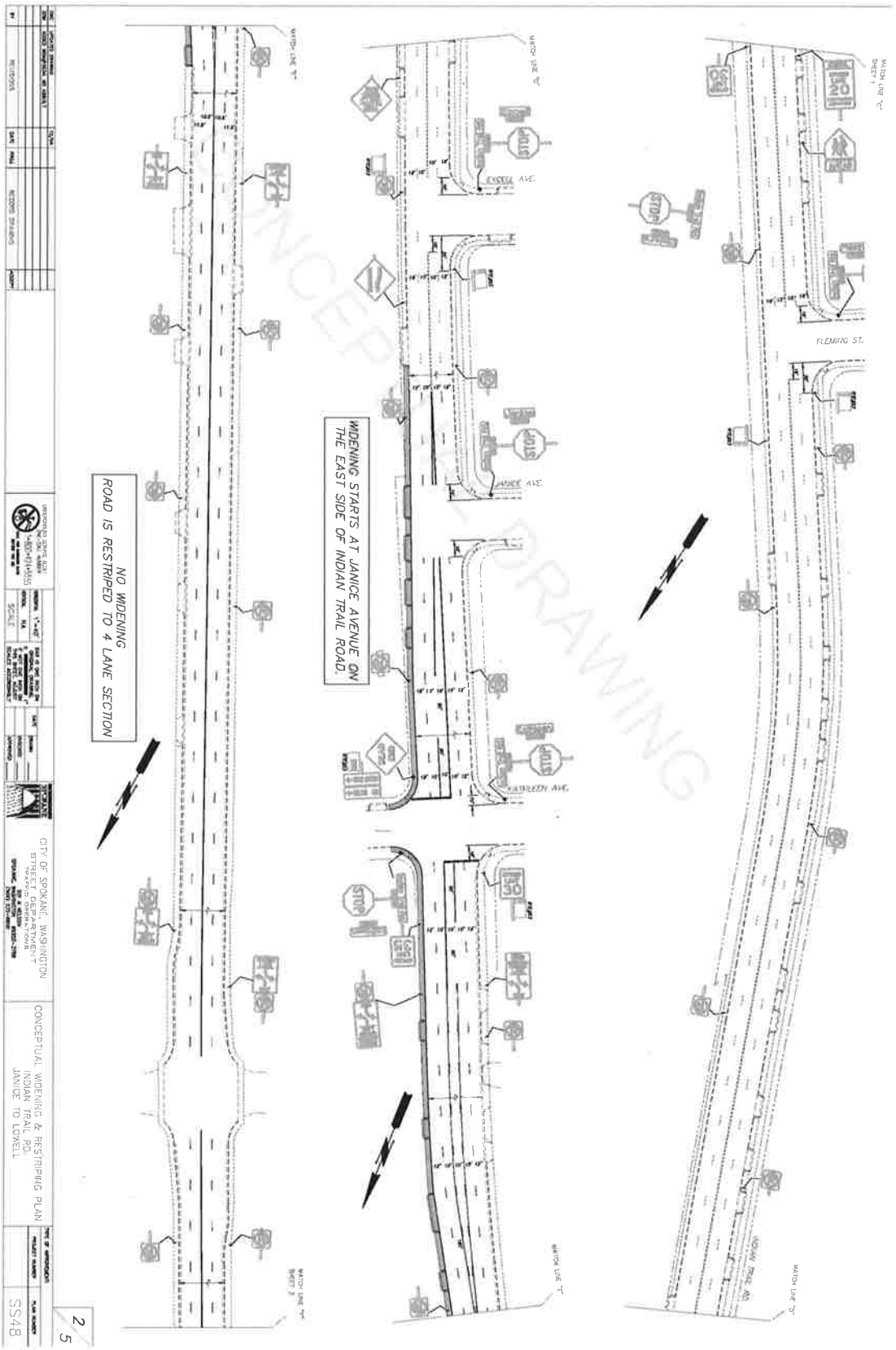
4. Concurrency.

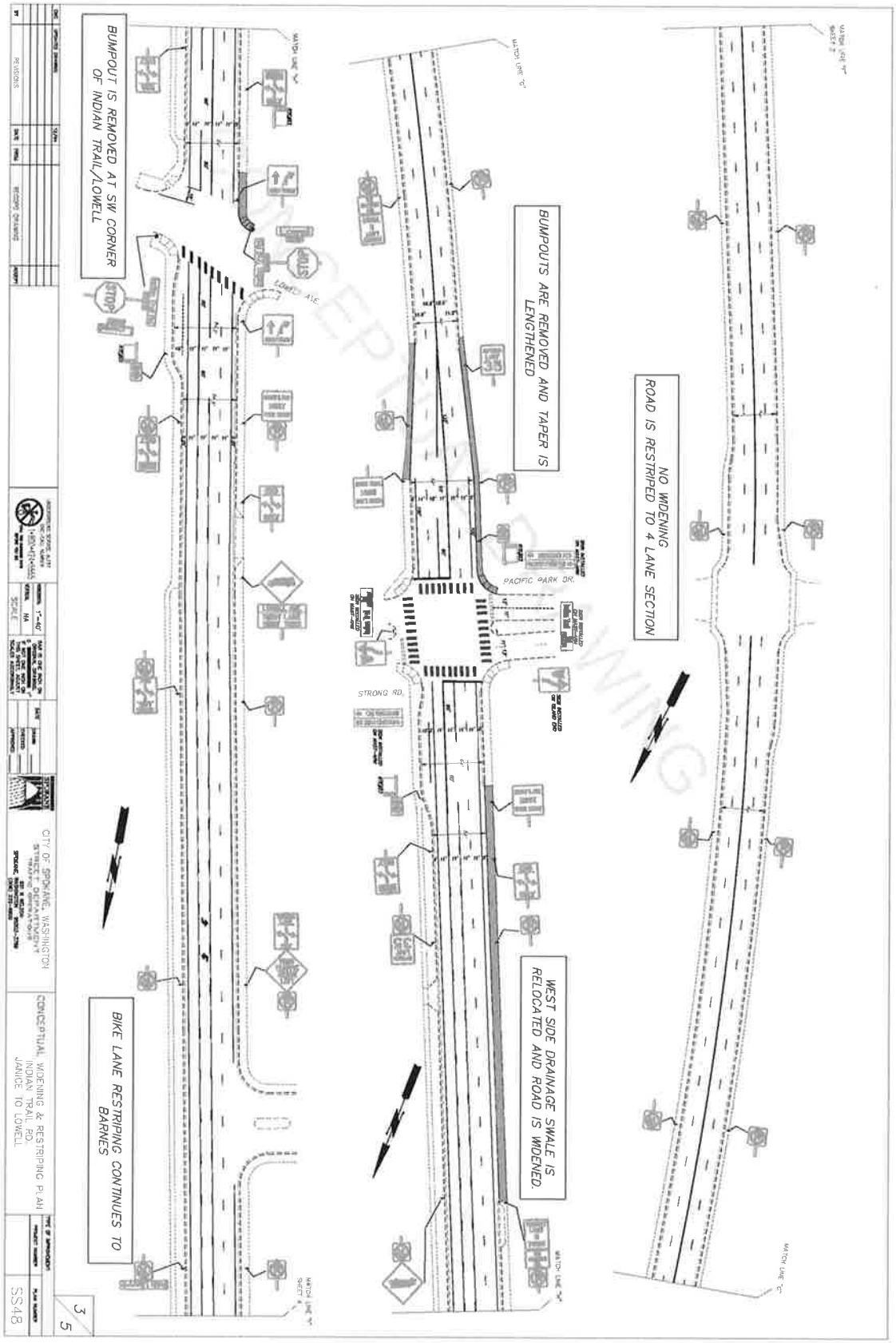
Because a Comp Plan amendment and zone change are considered non-project actions under SEPA, this threshold SEPA determination does not, per se, address concurrency. As per State law and SMC §17D.010.020, any subsequent development permit applications will require a concurrency determination.

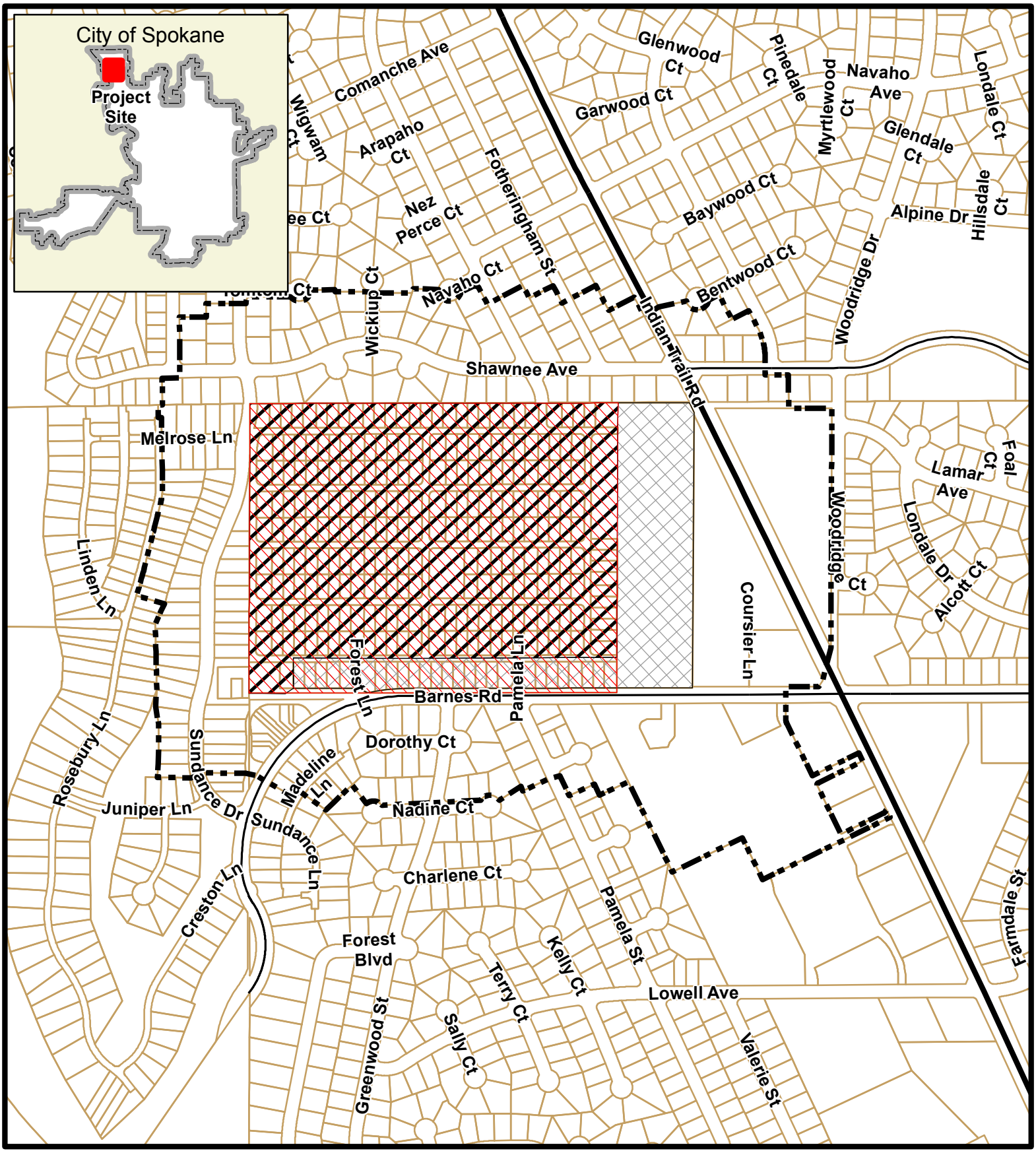
****

ATTACHMENT "B"

***DRAFT* CONCEPTUAL PLAND FOR NORTH INDIAN TRAIL PARTIAL WIDENING PROJECT**




BUMPOUT IS REMOVED AT SW CORNER OF INDIAN TRAIL/LOWELL
BUMPOUTS ARE REMOVED AND TAPER IS LENGTHENED
NO WIDENING ROAD IS RESTRIPED TO 4 LANE SECTION
WEST SIDE DRAINAGE SWALE IS RELOCATED AND ROAD IS WIDENED.
BIKE LANE RESTRIPING CONTINUES TO BARNES
PACIFIC PARK DR.
STRONG RD.
LOWELL AVE.
CONCEPTUAL WIDENING & RESTRIPING PLAN
INDIAN TRAIL RD.
JANICE TO LOWELL
CITY OF SPOKANE, WASHINGTON
STREET DEPARTMENT
SS48



Applicant: Morningside Investments LLC

Proposal: Proposed Comprehensive Land designation from R4-10 to partially R15-30 and R10-20; and change zoning from RSF to RMF and RTF

SW 1/4 15-26-42; SE 1/4 16-26-42; NE 1/4 21-26-42; NW 1/4 22-26-42

Date: 7/26/2016

WAC 197-11-960: Environmental checklist.

SEPA
ENVIRONMENTAL CHECKLIST

Purpose of checklist:

The State Environmental Policy Act (SEPA), chapter 43.21C RCW, requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. An environmental impact statement (EIS) must be prepared for all proposals with probable significant adverse impacts on the quality of the environment. The purpose of this checklist is to provide information to help you and the agency identify impacts from your proposal (and to reduce or avoid impacts from the proposal, if it can be done) and to help the agency decide whether an EIS is required.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Governmental agencies use this checklist to determine whether the environmental impacts of your proposal are significant, requiring preparation of an EIS. Answer the questions briefly, with the most precise information known, or give the best description you can.

You must answer each question accurately and carefully, to the best of your knowledge. In most cases, you should be able to answer the questions from your own observations or project plans without the need to hire experts. If you really do not know the answer, or if a question does not apply to your proposal, write "do not know" or "does not apply." Complete answers to the questions now may avoid unnecessary delays later.

Some questions ask about governmental regulations, such as zoning, shoreline, and landmark designations. Answer these questions if you can. If you have problems, the governmental agencies can assist you.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Use of checklist for nonproject proposals:

Complete this checklist for nonproject proposals, even though questions may be answered "does not apply." IN ADDITION, complete the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D).

For nonproject actions, the references in the checklist to the words "project," "applicant," and "property or site" should be read as "proposal," "proposer," and "affected geographic area," respectively.

A. BACKGROUND

1. Name of proposed project, if applicable: **Windhaven First Addition, P.U.D. Comprehensive Plan Amendment**

2. Name of applicant: **Morningside Investments, LLC – J.R. Bonnett Engineering, PLLC (agent)**

3. Address and phone number of applicant and contact person:

   815 E. Rosewood Avenue

   Spokane, WA 99208

   (509) 489-4260

   Contact: Jay Bonnett

   (509) 534-3929

4. Date checklist prepared: **October 14, 2015. (Amended May 4, 2016)**

5. Agency requesting checklist: **City of Spokane**

6. Proposed timing or schedule (including phasing, if applicable):

   To be determined

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

No planning or construction documents have been prepared relating to this proposal as of this date. The property will likely be developed into a multi-family living community upon securing all applicable permits.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

Infrastucture, including roadways, water, sewer, storm drainage, electrical, gas, and phone has already been installed throughout the site. Geotechnical reports relating to stormwater disposal and street pavement design may have been prepared in support of the construction work. No buildings were constructed on the site. No critical areas exist on the site. No wetlands or other environmentally sensitive areas exist on the site. Stormwater drainage reports (WCE No. 2009-678) dated November 2009 and July 2011, were prepared by Whipple Consulting Engineers. These reports were prepared in support of a supplemental parking lot addition along the northeast boundary of the property for the existing Lusitano Apartments directly east of the subject property. The parking lot was never constructed. The WCE drainage reports referenced a geotechnical study dated April 19, 2005, prepared by Allwest in 2005 that supported the use of drywells for stormwater disposal purposes in the Windhaven PUD.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

We anticipate submitting applications to the City of Spokane for the purpose of acquiring development permits. We are not aware of any applications that are or may be pending government approvals for this property.

10. List any government approvals or permits that will be needed for your proposal, if known.

This proposal requests approval of changing the land use designation in the City's Comprehensive Plan from R4-10 ~~and R10-20~~ to R10-20 and R15-30. It also requests approval of changing the City's zone designation from RSF ~~and~~ to RTF ~~to~~ and RMD. Standard development and construction permits will be secured for building multi-family dwellings.

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

This project is intended to place multiple multi-family dwellings on approximately 49.5 acres of land. The site infrastructure, including paved private streets, water piping networks, sewer systems, stormwater control facilities and all dry utilities have been constructed throughout the site to accommodate 286 single family dwellings. The intent is to construct wood-framed, multi-family buildings in lieu of the single family dwellings within the confinements of the existing private street system with as little disruption to the existing facilities as possible. The requested land use designation would provide for a housing density of approximately 15 ~~15-30~~ units per acre, yielding up to 750 ~~742 – 1485~~ units. ~~It is likely the actual unit count will be closer to the lower end of this range~~.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of

area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The subject property is located on the north side of Barnes Avenue, approximately 320 yard west of Indian Trail Road within the city limits of Spokane, WA. It is directly west of the existing Lusitano Apartment community.

13. Does the proposed action lie within the aquifer sensitive area (ASA)? The General Sewer Service area? The Priority Sewer Service Area? The City of Spokane?

Yes

14. The following questions supplement Part A.

a. Critical Aquifer Recharge Area (CARA) / Aquifer Sensitive Area (ASA)

(1) Describe any systems, other than those designed for the disposal of sanitary waste, installed for the purpose of discharging fluids below the ground surface (includes systems such as those for the disposal of stormwater or drainage from floor drains). Describe the type of system, the amount of material to be disposed of through the system and the types of material likely to be disposed of (including materials which may enter the system inadvertently through spills or as a result of firefighting activities).

Development of this property related to this proposal would consist of multi-family dwellings that will be served by public water and sewer. No fluids are anticipated to be discharged below the ground surface.

(2) Will any chemicals (especially organic solvents or petroleum fuels) be stored in aboveground or underground storage tanks?

No.

(3) What protective measures will be taken to insure that leaks or spills of any chemicals stored or used on site will not be allowed to percolate to groundwater? This includes measures to keep chemicals out of disposal systems.

It is not expected that significant quantities of chemicals will be used on the site. Household detergents, cleaning solutions, soaps, etc. consistent with normal residential products are anticipated. No leaks or spills of any chemicals are anticipated.

(4) Will any chemicals be stored, handled or used on the site in a location where a spill or leak will drain to surface or groundwater or to a stormwater disposal system discharging to surface or groundwater?

Chemicals beyond those contained in normal household products purchased by the occupants will not be stored, handled or used on the site.

b. Stormwater

(1) What are the depths on the site to groundwater and bedrock (if known)?

Unknown.

TO BE COMPLETED BY APPLICANT | EVALUATION FOR AGENCY USE ONLY

B. ENVIRONMENTAL ELEMENTS

1. **Earth**

a. General description of the site (circle one): **Gently Sloped, Relatively Flat** ~~, rolling, hilly, steep slopes, mountainous,~~
other . . . . . .

b. What is the steepest slope on the site (approximate percent slope)?

The site generally slopes uniformly down from the east end to the west end. The average grade across the site is approximately 3%. The steepest grades are approximately 6%.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

According to the Windhaven PUD geotechnical report the site soils consist of Marble loamy coarse sand (MbC). No farmlands exists on this site.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

We did not encounter any surface conditions or history of unstable soils in the immediate vicinity.

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

Minimal filling and grading is anticipated. Minor excavation work is anticipated for placement of new building foundations. Minor grading is anticipated at the new driveways and approaches to the buildings from the street. Approximate quantities of soil for filling and grading will be determined during the site design phase. The site excavations will likely be balanced, so no import or export of soil is anticipated.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Erosion could possibly occur as a result of construction activity or use. Temporary erosion and sediment control best management practices will be used to mitigate potential erosion impacts to the offsite areas. Permanent landscaping that includes ground covering vegetation will be placed at the completion of the project and therefore no erosion is anticipated upon project completion.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

We estimate that approximately 60% of the site will be covered with impervious surfaces upon project completion.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

Since the site is relatively flat, it is unlikely that erosion will occur as a result of any clearing. Mass excavation activities are not anticipated, since the streets and underground utilities have already been constructed. Temporary erosion and sediment control best management practices during construction will be used to mitigate potential erosion impacts to the offsite areas. Permanent landscaping that includes ground covering vegetation will be placed at the completion of the project and therefore no erosion is anticipated upon project completion.

a. **Air**

a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

Emissions generated on-site would occur during the following: Short term dust and emissions construction equipment; automobile emissions and dust (on and off site). Upon project completion, dust from construction activities will not exist and automobile emissions will likely return to expected levels contributory to multi-family housing.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

Methods to reduce or control dust and vehicle emissions include the following: Keep construction access routes adequately moistened with water. Cover loads; etc. The subject property is in close proximity to an existing Neighborhood Center where pedestrian and bicycle travel would likely reduce automobile trips. The subject site is in close proximity to a public transit system and would likely be used by residents of this community, which would reduce automobile trips.

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3. **Water**

a. Surface:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

No

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

The project will not require any work over, in, or adjacent to such waters.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

None

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

The proposal does not require surface water withdrawals or diversions.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

The proposal does not lie within a 100-year floodplain.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No, the proposal does not involve any discharge of waste materials to surface waters.

b. Ground:

1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.

No ground water will be withdrawn. The existing stormwater system utilizes underground injection wells (drywells) to dispose of runoff. The system was approved by the City of Spokane and is presumed to be in compliance with all local and state regulations. While not anticipated, additional drywells may be installed in accordance with Spokane Regional Stormwater Manual and Washington State Department of Ecology regulations if determined to be necessary to adequately dispose of surface runoff.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

No waste material will be discharged into the ground from septic tanks or other sources.
The subject property is located in the City of Spokane, which provides solid waste disposal service.

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EVALUATION FOR AGENCY USE ONLY

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

Runoff (including stormwater) from new asphalt-paved areas will be conveyed to adequately designed biofiltration swales for treatment and disposed of through infiltration facilities such as drywells or underground gravel galleries.

2) Could waste materials enter ground or surface waters? If so, generally describe.

No waste materials are anticipated on this site. Contaminants from vehicles will be conveyed to biofiltration swales for treatment prior to disposal through the infiltration facilities.

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

As noted previously, runoff (including stormwater) from new concrete or asphalt-paved areas will be conveyed to adequately designed biofiltration swales for treatment and disposed of through infiltration facilities such as drywells or underground gravel galleries.

4. **Plants**

a. Check or circle types of vegetation found on the site:

- ☐ deciduous tree: alder, maple, aspen, other
- ☐ evergreen tree: fir, cedar, pine, other
- ☐ shrubs
- ☐ grass

——— pasture

——— crop or grain

——— wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other

——— water plants: water lily, eelgrass, milfoil, other
——— other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

The vegetation that exists on the site consists of natural dryland sparse pine young pine trees, grass, weeds, etc., will likely be removed from all areas. The entire site was previously stripped of vegetation during construction of the streets and in preparation of single family dwelling construction. The vegetation that currently exists has naturally emerged since that time.

c. List threatened or endangered species known to be on or near the site.

We have reviewed the Threatened and Endangered Species list as determined by the Washington Department of Fish and Wildlife. None of the species are located within the area proposed for development.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:
Proposed landscaping will be consistent with the adjacent existing landscaping at the Lusitano Apartments in accordance with City of Spokane regulations.

5. **Animals**

a. Circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

birds: hawk, heron, eagle, **songbirds**, other:
mammals: deer, bear, elk, beaver, **other**:
fish: bass, salmon, trout, herring, shellfish, other:

b. List any threatened or endangered species known to be on or near the site.

Based on our review of the Department of Fish & Wildlife's determination, we were not able to identify any threatened or endangered species within this area.

c. Is the site part of a migration route? If so, explain.

The subject site is surrounded by developed land and was recently developed with streets and sidewalks. No evidence of migration routes have been detected.

d. Proposed measures to preserve or enhance wildlife, if any:

Not Applicable

6. **Energy and natural resources**

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Electricity and natural gas will likely be used for energy needs of the community.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

Unknown

c. What kinds of energy conservation features are included in the plans of this proposal?
List other proposed measures to reduce or control energy impacts, if any:

None at this time. All construction and development will be in accordance with local, state and federal regulations, including energy codes.

7. **Environmental health**

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste that could occur as a result of this proposal? If so, describe.

We do not expect to encounter any environmental health hazards.

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EVALUATION FOR AGENCY USE ONLY

1) Describe special emergency services that might be required.

None

2) Proposed measures to reduce or control environmental health hazards, if any:

No environmental health hazards are anticipated.

b. **Noise**

3) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

Existing traffic noise will continue from area residents and those visiting the Neighborhood Center. Temporary construction-related noise will occur during working hours.

4) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)?
Indicate what hours noise would come from the site.

Noise will be created by operation of construction equipment, etc. during normal working hours and on a short-term basis through project completion. Noises associated with a residential community is anticipated in the long-term.

5) Proposed measures to reduce or control noise impacts, if any:

Construction-related noise impacts will generally occur during normal working hours, which will minimize impacts to the surrounding neighborhoods.

8. **Land and shoreline use**

a) What is the current use of the site and adjacent properties?

The site is currently vacant - no structures exist. Streets, sidewalks and street lighting along with all standard residential utility services, including water, sewer, gas, phone and cable have been constructed. The adjacent properties have been developed into single family residential dwellings to the north, west and portions of the south. Multi-family housing exists along the east boundary and portions of the south boundary. A Neighborhood Center exists at the southeast corner of the site.

b. Has the site been used for agriculture? If so, describe.

Unknown

c. Describe any structures on the site.

No structures exist on the site.

d. Will any structures be demolished? If so, what?

No.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

e. What is the current zoning classification of the site?

RSF and RTF

f. What is the current comprehensive plan designation of the site?

R4-10 and R10-20

g. If applicable, what is the current shoreline master program designation of the site?

Not applicable.

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

No

i. Approximately how many people would reside or work in the completed project?

Unknown. The completed project could support ~~between 740 and 1200~~ up to 750 housing units.

j. Approximately how many people would the completed project displace?

None.

k. Proposed measures to avoid or reduce displacement impacts, if any:

No displacement impacts are expected.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

Since most of the land within and surrounding the Neighborhood Center has already been developed in to relatively low-density housing, this proposal would contribute to the quality of life in this area by supplementing the existing underutilized multi-family housing developments in the area and providing increased population within walking distance of the existing Neighborhood Center. The increased population would help support the Neighborhood Center and would have a positive influence on increasing investment and tax revenues as deemed necessary by the Comprehensive Plan to attract higher incomes to the neighborhood. The goal is to amend the land use code as it relates to the subject site to the R15-30 designation to make up for deficient multi-family housing stock in this area.

Multiple properties with multi-family residential land use designations within and around the Neighborhood Center fail to meet density goals of the Comprehensive Plan.

9. **Housing**

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

The completed project could consist of ~~740 – 1485~~ up to 750 units. Middle to high income housing is anticipated.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

No housing units will be eliminated.

c. Proposed measures to reduce or control housing impacts, if any:

None

10. **Aesthetics**

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

To be determined. Building heights will be limited to applicable building and development codes.

b. What views in the immediate vicinity would be altered or obstructed?

Unknown

c. Proposed measures to reduce or control aesthetic impacts, if any:

None

11. **Light and glare**

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Lighting will be used to provide indoor and outdoor lighting needs, which will include parking areas. Minimal glare will likely occur during evening hours, when people are entering or leaving the site.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

The site will be designed to utilize its location. Light and glare will be minimal and should not be a safety hazard or significantly interfere with views.

c. What existing off-site sources of light or glare may affect your proposal?

Existing off-site sources of light and glare generally continue to occur in the surrounding areas. Most of the off-site sources are generated by the surrounding houses and street lights.

d. Proposed measures to reduce or control light and glare impacts, if any:

No measures are proposed.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

12. **Recreation**

a. What designated and informal recreational opportunities are in the immediate vicinity?

The subject property is in close proximity to a Neighborhood Center where shopping, restaurants and other social activities are available. The property is also close to the City's Pacific Park. The property is located along and accessible to a designated pedestrian and bicycle route. The property is also in close proximity to the City's public library and elementary school with a playground.

b. Would the proposed project displace any existing recreational uses? If so, describe.

The proposed project will not displace any existing recreational uses.

c Proposed measures to reduce or control impacts on recreation, including recreational opportunities to be provided by the project or applicant, if any:

Not Applicable

13. **Historic and cultural preservation**

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

We are not aware of any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site.

b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

We are not aware of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

c. Proposed measures to reduce or control impacts, if any:

Not applicable

14. **Transportation**

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

The existing main entrances to the site access Barnes Road. Additionally, access may be provided at the northeast corner of the site at the existing Moore Street.

b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

The nearest public transit stop is approximately ¼-mile from the site on Indian Trail Road.

c. How many parking spaces would the completed project have? How many would the project eliminate?

The number of completed parking spaces will be determined during the design phase of the development. It is anticipated that 2 parking spaces per living unit will be provided. No parking spaces will be eliminated.

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

No new roads or streets are anticipated.

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No, the project will not use water, rail, or air transportation.

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

A traffic impact analysis ~~trip generation analysis~~ estimating the Average Daily Trips and peak volumes will be prepared for the project based on the final living unit count. The number of vehicular average daily trips could be as many as 4,950 ~~range between 4,900 and 7,980~~ according to the ITE Trip Generation Manual.

g. Proposed measures to reduce or control transportation impacts, if any:

Proposed measures to reduce or control transportation impacts include: ride sharing, alternating days & time, utilize the Spokane Transit Authority, etc.

15. **Public services**

a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

It is difficult to determine how the project may, or may not, result in an increased need for public services. The following services should be considered when determining the need of the community:

Fire Protection: Fire Protection is provided through Government funding.
Police Protection: Police Protection is also provided through Government funding.
Health Care: This is based on need and is paid for through the recipient.
Schools: This provides an opportunity for Children to go to School.

Due to the increase in population there may be an increased need for public services. Concurrency must be met. According to the GMA and Comprehensive Plan, the City's capital improvement program must provide adequate public facilities and ensure that the facilities will be in place when development occurs.

b. Proposed measures to reduce or control direct impacts on public services, if any.

Impact fees and GFC's will be assessed to the developer of this project to pay proportionate impacts to public services.

16. **Utilities**

a. Circle utilities currently available at the site:

electricity, natural gas, water, refuse service, telephone, sanitary sewer, cable, ~~septic system~~, other.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

Utilities proposed for the development would consist of standard residential-type utilities described below.

Electricity: Avista
Natural Gas: Avista
Refuse Service: City of Spokane
Water: City of Spokane
Telephone: Centurylink
Sanitary Sewer: City of Spokane

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: .....

Date Submitted: 5/4/2016 .....

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

D. SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (do not use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

The intention of this proposal is to provide the means for increasing the residential density on the property by changing the land use designation. The site is adjacent to an existing CC-Core land use designation and CC2-NC zoning designation that is occupied by various types of businesses. If approved, there would be increased air emissions from vehicles upon completed development compared to the emissions coming from vacant land. There will be no production, storage, or release of toxic or hazardous substances nor will there be any production of noise after construction activities have stopped other than normal residential-type noises.

Proposed measures to avoid or reduce such increases are:

Best management practices relating to erosion and sediment control, dust abatement, etc. will be exercised during construction activities. Construction activity will be limited to normal working hours. All driving surfaces will be paved and undeveloped areas surrounding the buildings and paved areas will be landscaped in a manner to reduce dust.

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

Not Applicable. The site does not contain any endangered plants, animals, fish or marine life.

Proposed measures to protect or conserve plants, animals, fish, or marine life are:

Not Applicable.

3. How would the proposal be likely to deplete energy or natural resources?

No energy or natural resources will be depleted by development of this property.

Proposed measures to protect or conserve energy and natural resources are:

All buildings will be constructed in accordance with all local, state and federal regulations including energy codes.

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

   No adverse effects to environmentally sensitive areas or areas designated for governmental protection is anticipated.

Proposed measures to protect such resources or to avoid or reduce impacts are:

No environmentally sensitive areas exist on or around the site. Therefore, no protection measures are warranted.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

The subject property is not within or near a shoreline area and therefore not subject to shoreline regulations.

Proposed measures to avoid or reduce shoreline and land use impacts are:

No shoreline areas exist on or around the site. Therefore, no protection measures are warranted.

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

Due to the increase in population there may be an increased need for public services. Concurrency must be met. According to the GMA and Comprehensive Plan, the City's capital improvement program must provide adequate public facilities and ensure that the facilities will be in place when development occurs. Traffic on Barnes Road and Indian Trail Road would likely increase. Public water and sewer demands will be evaluated and compared to existing capacities during the design phase. If determined to be warranted, system upgrades will be made as necessary.

Proposed measures to reduce or respond to such demand(s) are:

The intersection of Barnes Road and Indian Trail Road is signalized with designated left and right turn lanes. Public water and sewer demands will be evaluated and compared to existing capacities during the design phase. If determined to be warranted, system upgrades will be made as necessary. Pedestrian and bicycle paths will be provided to the public right-of-way to promote those modes of transportation to the Neighborhood Center, nearby school, library and park. The use of nearby public transportation will be encouraged to all residents.

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

No conflicts with local, state or federal laws or requirements for the protection of the environment are known to exist.

CITY OF SPOKANE

STREET DEPARTMENT
TRAFFIC PLANNING

DATE: August 11th, 2016

TO: Tirrell Black, Lisa Key, Planning Department

FROM: Inga Note, P.E., Street Department

CC: Developer Services, WSDOT

SUBJECT: Morningside (Windhaven) Comprehensive Plan Amendment

The purpose of this memorandum is to provide a traffic engineering and transportation planning review of the proposed 2016 Morningside Comprehensive Plan amendment. This review specifically focuses on compliance with Spokane Municipal Code section 17G.020.030(H) SEPA and 17G.020.030(I) Adequate Public Facilities. Since a comprehensive plan amendment is a non-project action, concurrency is not assessed at this time.

Traffic Study Review

City staff and WSDOT provided guidance to the developer's traffic engineering consultant to ensure we were in agreement on the background trips, trip distribution and traffic count methodologies used in the study. The applicant submitted two drafts of the traffic study and one final version dated 7/11/16. Areas of concern identified in the report are discussed below.

Indian Trail Capacity

City staff heard repeatedly from neighborhood residents during the early part of the public comment period about concerns regarding the number of lanes on Indian Trail and the congestion during peak travel hours. The City has plans to widen Indian Trail to a five lane road long term, but currently there is no funding for this project. The applicant's traffic consultant prepared a lane capacity analysis of the Indian Trail corridor that confirmed the need to provide additional lanes between Kathleen and Barnes in the near future.

Mitigation: The developer's traffic consultant, in working with the city, has proposed a partial widening of Indian Trail Road that could be completed at the same time as the city's asphalt overlay scheduled for 2018. This widening project would provide two continuous southbound lanes from Barnes to Francis, and two continuous northbound lanes from Francis to Pacific Park. A two-way left turn lane would be provided in the vicinity of Kathleen. The cost for the partial widening is estimated to be at least $820,000. The developer has proposed to pre-pay the impact fees that are estimated to be owed on the apartments which the City could apply towards the cost of the partial widening project. The city may be able to utilize recently

Senior Engineer Initials _____

collected Northwest District impact fees towards the project as well. Page 44 of the Traffic Impact Analysis states that the project proponent has offered to pre-pay the capital cost of the project not covered by the City to assure the timely completion of the proposed mitigation. The report goes on to indicate that the City has assured reimbursement for these capital funds through a latecomer's contribution and/or impact fee credits provided on future development proposals located within the Northwest service area. But while these ideas can be explored as the application moves forward through the Plan Commission and City Council, at this time the City has not made any commitments regarding a latecomer agreement or any other reimbursement plan.

It should be noted that the proposed partial widening project will not include the northbound lanes between Pacific Park and Barnes. This section of roadway fronts the McCarrol's plat and right-of-way will be needed to add the lane. It is anticipated that widening the northbound lanes in this segment would be done as a later project either using impact fees or in connection with development of the adjacent property.

Intersection Operations

The city's level of service standards are outlined in administrative policy and procedure ADMIN 0370-08-01. The required signalized level of service is LOS E at intersections along principal or minor arterials. This represents an average LOS for all movements at the intersection. Individual movements can be at LOS F as long as the intersection average is LOS E or better. The LOS E standard applies to all signals along the Indian Trail and Francis corridors that are included in the study. The most current version of HCS (Highway Capacity Software) is required to be used for the analysis. However, the city may request the use of a different modeling software depending on the project proposal.

The traffic analysis shows that several intersections will be nearing the threshold between LOS E and F with the addition of the background trips and the Windhaven development traffic. Intersections of particular concern are Francis/Alberta during the AM and PM peaks and Francis/Maple during the PM peak. During the review of the draft traffic study both city staff and WSDOT staff expressed concern that HCS may not be adequately modeling the level of service due to uneven lane utilization and queue spillback between signalized intersections. The applicant's engineer provided additional analysis using the Simtraffic software which showed that some intersections have issues with blocking and long queues. The intersection analysis shows that Indian Trail/Pacific Park-Strong will be operating at LOS E but capacity for this intersection can be expanded with developer frontage improvements. The intersections of Francis/Maple and Francis/Alberta are operating at LOS E and have some movements operating at LOS F and/or with long queues. Drivers on Francis often require multiple cycles to get through the signals. The intersections on Francis are essentially built-out, to the point where further expansions would be very costly and offer little in the way of additional capacity. The little remaining capacity will be needed to support other development already included in the comprehensive plan.

Mitigation: The impact of the rezone and subsequent development can be offset by implementing Travel Demand Management (TDM) strategies, which will shift existing or proposed trips from single occupant vehicles to transit or other HOV options. This method would preserve the remaining intersection capacity for other development. TDM strategies are recognized in the city LOS policy (ADMIN 0370-01-01 Section 4.12), state law (WAC 365-196-840 (6)(a)(i)), and the SRTC Congestion Management Plan (Appendix D) as ways to mitigate

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for poor level of service. Commonly used TDM strategies include a bus pass program, vanpooling, providing bus stop amenities, establishing a park and ride, walking improvements and biking improvements. Any TDM strategies proposed for the development would need to be agreed to by the Spokane Transit Authority, WSDOT and the City. The strategies would need to specifically mitigate the 89 new PM peak trips that are added to Francis Avenue (from Alberta eastward) as a result of the additional density from the rezone.

Conclusions regarding SEPA

SMC 17G.020.030(H) states that a "*SEPA review must be completed on all comprehensive plan amendment proposals*". As this is a non-project review the analysis focuses more on a big picture look at the proposed zoning change.

- The impacts of an amendment to the city's comprehensive plan and a subsequent development on Indian Trail Road will be mitigated if the developer completes the partial widening as described in this memorandum. This project will address the most significant neighborhood concern regarding roadway capacity and will provide additional capacity for further growth in the area.
- As an overall percentage of PM peak traffic, the amount of new trips added to Francis Avenue as a result of proposed comprehensive plan amendment would be relatively small (2-3%). However, the fact that two of the Francis Avenue intersections are at or near capacity means that the new trips would have a more significant impact than they would at an intersection with substantial excess capacity. The TDM strategies identified above are appropriate to mitigate the impact of these 89 new PM peak trips on Francis.
- The mitigation projects will need to be defined in greater detail and incorporated into a development agreement that would place limitations and conditions on development of the site.

Conclusions regarding Adequate Public Facilities

SMC 17G.020.030(I) states that "*The amendment must not adversely affect the City's ability to provide the full range of urban public facilities and services citywide at the planned level of service, or consume public resources otherwise needed to support comprehensive plan implementation strategies*."

- The proposed widening of Indian Trail Road by the developer will expand the available roadway capacity allowing the city to better implement the comprehensive plan.
- The Travel Demand Management strategies identified above will mitigate the impact on the Francis Avenue intersections thereby preserving the remaining capacity for other projects already in the comprehensive plan.
- The mitigation projects will need to be defined in greater detail and incorporated into a development agreement that would place limitations and conditions on development of the site.

Senior Engineer Initials _____

Black, Tirrell

From: Figg, Greg <FiggG@wsdot.wa.gov>
Sent: Monday, July 11, 2016 4:06 PM
To: Black, Tirrell
Subject: FW: Request for Additional Information Needed for SEPA Threshold Determination
Attachments: Windhaven AM Synchro-SimTraffic Results Comparison.pdf

Tirrell,

These are the comments that WSDOT submitted Friday on the Windhaven proposal. Please let me know if you have any questions.
Thanks,

Greg Figg
WSDOT Eastern Region
Development Services Manager
figgg@wsdot.wa.gov
Phone (509) 324-6199

From: Figg, Greg
Sent: Friday, July 08, 2016 11:52 AM
To: Bill White (bwhite@m-m.net); Note, Inga (inote@spokanecity.org)
Cc: Kay, Charlene; Frostad, Larry; Bjordahl, Mike
Subject: RE: Request for Additional Information Needed for SEPA Threshold Determination

Bill and Inga,

The following response is offered in regard to the email below:

1. It is a recognized practice to use simulation software results instead of HCM results under certain circumstances ("The Secrets to HCM Consistency Using Simulation Models," TMIP Connection, Summer 2007). The HCM 2010 identifies situations when alternative tools should be considered:
    - HCM 2010 quotes that are applicable to the Alberta, Ash, and Maple intersections:
        i. HCM 2010 p. 6-9: "*Using **alternative tools to supplement HCM capacity and quality-of-service procedures should be considered when** one or more of these conditions apply: . . . The HCM procedures predict oversaturated conditions that last throughout a substantial part of a peak period or **queues that overflow the available storage space** or both.*"
        ii. HCM 2010 p. 18-28: "*Scope of the Methodology - . . . This subsection identifies the conditions for which each methodology applies. . . Steady flow conditions. The three methodologies are based on the analysis of steady traffic condition and, as such, are **not well suited to the evaluation of unsteady conditions (e.g., congestion, queue spillback, signal preemption**).*"
        iii. HCM 2010 p. 18-29: "***Limitations of the Methodology**. . . Automobile Mode - The automobile methodology does not explicitly account for the effect of the following conditions on intersection operation: **Turn bay overflow;. . . Demand starvation due to a closely spaced upstream intersection; Queue spillback into the subject intersection from a downstream intersection; Queue spillback from the subject intersection into an upstream intersection;***"

2. To see the difference between Synchro HCM 2010 and SimTraffic signalized intersection results, the AM and PM Synchro models were run (models as received from Bill White on 4/28/2016) and the results are attached. The only intersections reported were the relatively uncongested ones since the congested ones, i.e., Alberta, Maple, and Ash, produce unreliable results due to signal timing coding errors and O/D weighting that needs corrected at Maple/Ash/Francis.

3. Another option for verifying delay is by doing a field measurement at the congested intersections to measure what the delay is.

Additionally, it is our understanding that mitigation is being proposed for the Francis Ave. corridor. We would welcome the opportunity to discuss these comments and mitigations in greater detail with the City in the next couple of weeks. Thank you,

Greg Figg
WSDOT Eastern Region
Development Services Manager
figgg@wsdot.wa.gov
Phone (509) 324-6199

From: Bill White [mailto:bwhite@m-m.net]
Sent: Tuesday, June 21, 2016 11:03 AM
To: Key, Lisa; jbonnett1@jrbonnett.com
Cc: del@harleycdouglass.com; Figg, Greg; Note, Inga; Black, Tirrell; Richman, James; Mallahan, Jonathan; Greg FIGG (greg.f@msn.com)
Subject: RE: Request for Additional Information Needed for SEPA Threshold Determination

Lisa,

Thank you for your 6/20/2016 letter regarding "outstanding information" as it regards the TIA for Windhaven. A section of your letter highlights comments from WSDOT officials, submitted to the City on 6/8/16, as it regards the "*Windhaven Apartments, Summary Micro-simulation/SimTraffic Analysis*". The WSDOT email seems to infer correlations between Highway Capacity Manual control delay thresholds and methodologies, and total delay calculations and methodologies derived through SimTraffic (a software program with methodologies created by Trafficware). The comments that infer the correlation as follows:

1. *This analysis reports on page 2 the intersection delay in terms of seconds of delay for the existing conditions, future without project, and future with project. The delay reported in the future conditions is commiserate with LOS "F" at the intersections of Francis/Alberta and Francis/Maple. The analysis does not address this issue.*
2. *The SimTraffic results need to replace the previous Synchro delay results as they project a more accurate depiction of traffic conditions. We had asked for LOS to be defined using SimTraffic results.*
3. *A discussion on mitigation is needed for the Francis/Alberta and Francis/Maple intersections. As these two intersections currently are or will be operating below the adopted LOS standards.*

We are uncomfortable with the WSDOT request and comparison because the two delay methodologies are not analogous and comparable. The use of SimTraffic could yield misleading results.

Methodology Comparisons. As you may be aware, the Highway Capacity Manual 2010 (HCM 2010) measures levels-of-service (LOS) based on intersection control delay thresholds. The HCM 2010 indicates *"Control delay includes delay associated with vehicles slowing in advance of an intersection, the time spent stopped on an intersection approach, the time spent as vehicles move up in the queue, and the time needed for vehicles to accelerate to their desired speed."* (HCM 2010, Page 4-15)

In comparison, SimTraffic intersection total delay calculations reflect control delay plus queue delay and speed delay.(User Manual, Pages 10-18 & 26-5) As you can see, SimTraffic addresses steps beyond and in addition to HCM 2010 control delay. Calculations reflect impediment factors such as turn bay overflow, demand starvation (due to closely spaced intersections), queue spillbacks, and the impact of additional or reduced through lanes upstream/downstream of an intersection.

At the very least, the two methodologies are incompatible and therefore it is not accurate to deduce LOS equivalencies for SimTraffic based on HCM 2010 methodologies. However, because of the additional impediments, SimTraffic total delay nearly always exceeds HCM 2010 control delay. Thus, using HCM 2010 LOS control thresholds for SimTraffic total delay calculations, as WSDOT staff suggests, results in an approach which is much more restrictive and is therefore inconsistent with current City Concurrency/LOS policy.

Concurrency/SEPA Impact. Section 5.2.1.3 of City Concurrency Level of Service Standards indicates LOS E as the threshold for "signalized arterial intersections along Principal or Minor arterials identified on Comprehensive Plan Map TR3." LOS E equates to a maximum 80 seconds of average control delay per vehicle in accordance with HCM 2010 methodologies. Thus, intersections operating with greater than 80 seconds of average control delay represent "unacceptable conditions" within the City, not meeting Concurrency, and are potentially subject to system improvement and/or demand management strategy. This LOS threshold makes SEPA consideration more restrictive as well, per City LOS policy.

Using the HCM 2010 threshold of 80 seconds of control delay for SimTraffic total delay, in effect, brings about revised Concurrency policy and LOS (and transportation SEPA) policy that significantly impacts the City:

1) This policy becomes more restrictive to private development approval.
2) This policy would dictate private and public roadway infrastructure improvement projects that provide capacity in excess of current standard.
3) This policy would highlight a number of existing City intersections operating below the current standard, which therefore would require capacity improvement in order to meet new SimTraffic standard.

SimTraffic Analysis. We recognize SimTraffic as an appropriate tool for reviewing the cumulative impacts of traffic within the context of a corridor or network. To this end, we provided the *Windhaven Apartments, Summary Micro-simulation/SimTraffic Analysis* to help WSDOT officials understand the implications of project development on Francis Avenue. The analysis concluded on page 4 that:

> *"marginal changes between the future without and with project conditions. Drivers are forecast to potentially experience an average delay increase of between 2 and 5 additional seconds per intersection by year 2021, along Francis Avenue, which is a moderate change. The difference in block time and queue penalties was not summarized as the differences were negligible (although they are attached for review, as needed). Thus, the SimTraffic analysis also confirms the project proposal will have a minimal impact upon cumulative traffic operations for intersections located along Francis Avenue."*

Definite conclusions were provided within the context of what is appropriate for SimTraffic, as used as a supplemental tool, outside of City Concurrency and LOS Policy. This should be sufficient; especially

given the implications described above. *Understanding this new information, would you and your technical staff please confirm the use of SimTraffic for Concurrency and SEPA determination, as WSDOT requested?*

Alternative. Your letter suggests a meeting to discuss potential mitigation options for the development, in-lieu of what the TIA currently recommends. This seems a reasonable approach and we would like to expand the scope of this meeting to discuss alternative analyses that would satisfy WSDOT officials without having to impact current City Concurrency and LOS policy. We respectfully suggest SimTraffic is not the correct tool to use for intersection delay analyses, given the difference in delay methodologies, and hope City officials would agree with this assessment. *Can we expand the scope of this meeting to discuss this issue?*

Request. However, if SimTraffic is ultimately required, we would request that staff please provide SimTraffic total delay thresholds to differentiate "acceptable" versus "unacceptable" traffic conditions within the City.

Because there is discontinuity between methodologies and because SimTraffic total delay is more conservative than HCM 2010 control delay, the question then becomes "what is the threshold for acceptable traffic conditions within the City to verify transportation concurrency using SimTraffic?" As indicated, the current 80 seconds of HCM 2010 control delay becomes an extremely restrictive standard methodologically if paired with SimTraffic delay results. Do City officials wish to enact such restrictive standards? Thus, would staff please provide alternative Concurrency delay standard based upon SimTraffic total delay. This would allow consultants and City engineers to make relevancy transportation concurrency determinations in the future. This would allow us to derive appropriate conclusions for Windhaven.

Please note consultants cannot be the ones to make an interpretation of what is "acceptable" versus "unacceptable" within the City of Spokane, as it regards delay-based concurrency standards. State policy instructs GMA jurisdictions to "balance the desired community character, funding capacity, and traveler expectation" (WAC 365-196-840.02.e) when developing Concurrency mechanisms for facilities. Concurrency policy should therefore be set by the local agency as they are best tooled to make such determinations, based on the factors described above, with threshold less subject to challenge by outside organizations.

Thank you for hanging in there on this lengthy email. I appreciate your consideration of this topic and look forward to your feedback and willingness to meet and discuss options! Have a good day.

Bill White
Morrison Maierle
Direct | 509.315.8366

From: Key, Lisa [mailto:lkey@spokanecity.org]
Sent: Monday, June 20, 2016 12:35 PM
To: jbonnett1@jrbonnett.com
Cc: del@harleycdouglass.com; Bill White; figgg@wsdot.wa.gov; Note, Inga; Black, Tirrell; Richman, James; Mallahan, Jonathan
Subject: Request for Additional Information Needed for SEPA Threshold Determination

Hi Jay-

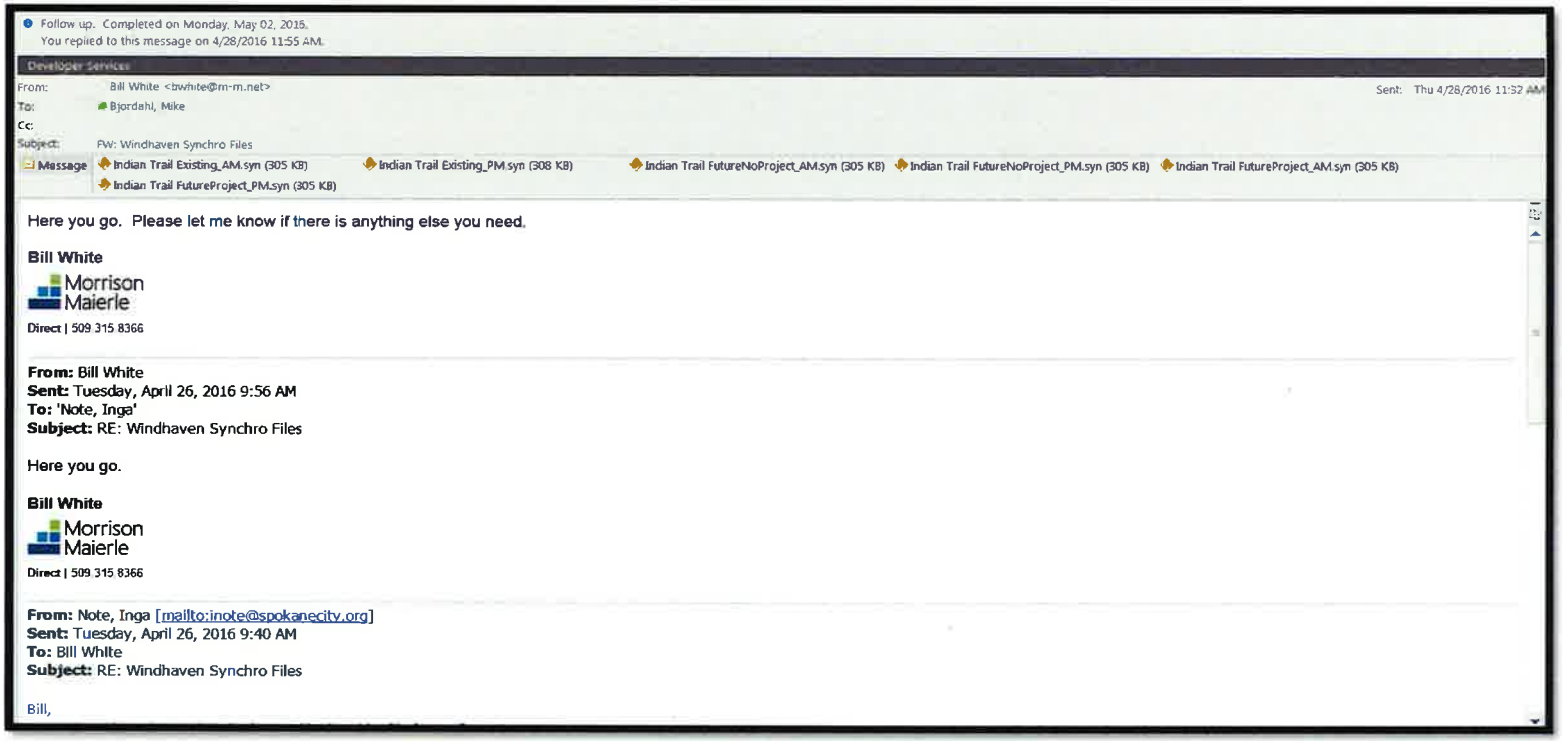
Attached, please find the letter detailing the additional information that is needed in order for the City to make a threshold determination under SEPA. A hard copy is in the mail to you.

We would be happy to schedule a meeting with you, the applicant, and your traffic engineer. Looking at City staff's combined calendars, our team appears to be available to meet on Thursday 8 am-9am, or from 10:30 to noon. Due to multiple vacations, the next available date would be the afternoon of July 5th.

Please let me know if you have any questions, or if you would like to schedule one of these times to meet.

Lisa D. Key | Planning Services Director | Planning & Development
509.625.6187 | lkey@spokanecity.org | www.spokanecity.org

	Synchro File: Indian Trail Existing AM.syn from Bill White			Synchro File: *Indian Trail Existing PM.syn* from Bill White		
	Synchro Results		SimTraffic Results*	Synchro Results		SimTraffic Results*
	Intersection Report Signal Delay	HCM 2010 Report Control Delay	SimTraffic Delay	Intersection Report Signal Delay	HCM 2010 Report Control Delay	SimTraffic Delay
Shawnee/Indian Trail	13.6	13.2	15.5	12.3	12.3	13.8
Barnes/Indian Trail	21.4	18.3	18.5	18.7	14.6	15.5
Strong/Indian Trail	10.3	9.5	8.5	12.0	15.9	23.2
Indian Trail/Francis	15.0	12.3	14.8	10.7	7.9	14.8
*Average of five 60-minute runs.						



Follow up. Completed on Monday, May 02, 2016.
You replied to this message on 4/28/2016 11:55 AM.

Developer Services

From: Bill White <bwhite@m-m.net>
To: Bjordahl, Mike
Cc:
Subject: FW: Windhaven Synchro Files
Sent: Thu 4/28/2016 11:32 AM

Message | Indian Trail Existing_AM.syn (305 KB) | Indian Trail Existing_PM.syn (308 KB) | Indian Trail FutureNoProject_AM.syn (305 KB) | Indian Trail FutureNoProject_PM.syn (305 KB) | Indian Trail FutureProject_AM.syn (305 KB) | Indian Trail FutureProject_PM.syn (305 KB)

Here you go. Please let me know if there is anything else you need.

Bill White
Morrison Maierle
Direct | 509.315.8366

From: Bill White
Sent: Tuesday, April 26, 2016 9:56 AM
To: 'Note, Inga'
Subject: RE: Windhaven Synchro Files

Here you go.

Bill White
Morrison Maierle
Direct | 509.315.8366

From: Note, Inga [mailto:inote@spokanecity.org]
Sent: Tuesday, April 26, 2016 9:40 AM
To: Bill White
Subject: RE: Windhaven Synchro Files

Bill,

Capital Projects Office
2815 East Garland Avenue
Spokane, WA 99207-5889

phone (509) 354-5775
fax (509) 489-1036
www.spokaneschools.org

Spokane Public Schools
excellence for everyone

May 31, 2016

Dear Ms. Black:

This letter is to address elementary school capacity questions on the Northwest side of the Spokane Public Schools district. The schools that we assessed are Balboa, Indian Trail, Woodridge and Westview. Assessing capacity of a school is not an exact science. There is a lot of assumptions. One of the main assumption is that students come in a neat package, but we all know that they don't. I can give you a range at each school. The other concern is that this is a snap shot in time. Listed below is a current range of capacities:

School	Current Enrollment	Comfortable Growth Capacity
Balboa	324	81
Indian Trail	309	73
Woodridge	457	99
Westview	448	81

Sincerely,

Gregory Forsyth
Capital Projects and Planning
Spokane Public Schools
509-354-5775
gregoryf@spokanepublicschools.org

PLANNING & DEVELOPMENT
808 W. SPOKANE FALLS BLVD.
SPOKANE, WASHINGTON 99201-3329
509.625.6300
FAX 509.625.6013
my.spokanecity.org

February 16, 2016

Jay Bonnett
J.R. Bonnett Engineering
803 E 3rd Avenue
Spokane, WA 99202

RE: Z1500084 Morningside Investment
Request to amend the Comprehensive Plan Land Use Plan Map

Dear Mr. Bonnett,

Agency comments received by Planning & Development as of February 10, 2016 are enclosed as **Attachment A** for your review. As you know, the City of Spokane's Streets Department has requested additional information in the form of a traffic impact study. It is our understanding that you are currently working on the scope of this study with your consultant, who you have indicated is Bill White of Morrison Maierle. In consultation with you and Mr. White, we have agreed upon March 15, 2016, as a target date for delivery of a draft of the traffic impact study. When a draft traffic impact study is forwarded to the city, the City's Streets Department will review it for completeness. Please remember that, per SMC 17G.020.060(E), "If required studies are not completed sufficiently in advance....to allow adequate staff and public review, consideration of those applications will be postponed until the next applicable amendment cycle."

Regarding the traffic impact study, the applicant was notified on December 11, 2015, via email that the City of Spokane Streets Department requests a traffic impact study. Additional preliminary information was emailed to you on December 23, 2015, from Inga Note, Senior Traffic Planning Engineer, which gave a preliminary indication of what the city anticipated the traffic impact study should contain, with the caveat that additional scoping information would be gathered from neighborhood comment and agency review. An additional agency request (email dated January 22, 2016) received from WSDOT has increased the scope to include selected intersections along Francis Avenue (aka SR 291). The City's Planning Department has been researching pipeline projects in the North Indian Trail area to identify the vehicle trips associated with those projects. A copy of the preliminary research is included in **Attachment B** with this letter.

In addition to agency comments, the City Planning & Development Department has received extensive public comment regarding traffic and other issues surrounding your proposal as well as Application Z1500087COMP, which also seeks to amend the land use plan map within the boundaries of the North Indian Trail neighborhood. We have provided you with copies of these emails and letters as they have been input into our log via email.

As we have discussed with you, the Growth Management Act (RCW 36.70A) and Chapter 17G.020 of the Spokane Municipal Code require the City to consider comprehensive plan amendments concurrently in order to evaluate their cumulative effect on the City's capital facilities program, neighborhood planning documents, adopted environmental policies, and other relevant implementation measures. Along those lines, Application Z1500087COMP also seeks to amend the land use plan map within the same North Indian Trail Neighborhood Council boundaries, and with reference to SMC 17G.020.030(G), both applications must be reviewed concurrently in order to evaluate their cumulative effects.

Comments from agencies and the public have highlighted the existing transportation infrastructure in this area. As we have discussed with you, the process of amending the City's comprehensive plan is legislative, and SMC 17G.020.030 establishes a list of review criteria/considerations that "shall be used, as appropriate, by the applicant in developing an amendment proposal, by planning staff in analyzing a proposal, and by the plan commission and city council in determining whether a criterion for approval has been met."

In preliminary review of your application materials, questions remain as to how your application will meet the decision criteria in SMC 17G.020.030, particularly, in relation to the issues of:

- ***Internal Consistency*** (SMC 17G.020.030(E)), which states: "The requirement for internal consistency pertains to the comprehensive plan as it relates to all of its supporting documents, such as development regulations, capital facilities program...and any neighborhood planning documents adopted after 2001";
- ***Cumulative Effect*** (SMC 17G.020.030(G)), which states: "All amendments must be considered concurrently in order to evaluate their cumulative effect on the comprehensive plan text and map, development regulations, capital facilities program, neighborhood planning documents, adopted environmental policies and other relevant implementation measures";
- ***Adequate Public Facilities*** (SMC 17G.020.030(I)), which states: "The amendment must not adversely affect the ability to provide the full range of urban public facilities and services (as described in CFU 2.1 and CFU 2.2) citywide at the planned level of service, or consume public resources otherwise needed to support comprehensive plan implementation strategies"; and,
- ***Financing*** (SMC 17G.020.030(C)), which states: "Infrastructure implications of approved comprehensive plan amendments must be reflected in relevant six-year capital improvement plan(s) approved in the same budget cycle".

Please be aware that these are essential questions that will need to be addressed as part of your traffic impact analyses and supplemental application materials. Failure to adequately or completely address these essential questions has the potential to lead to a determination of significance (DS) under SEPA. Please also be aware that a DS would result in the deferral of your application until the next applicable review cycle to allow adequate time for generating and processing the required environmental impact statement (EIS), as provided for in SMC 17G.020.030(H)(1).

It may be beneficial for you to schedule a meeting with City staff to further discuss the above questions, the implications to process and timeline, and the potential options moving forward. If you are interested in doing so, please contact Tirrell Black at (509) 625-6185, and she will coordinate a meeting with me and involved City staff.

Sincerely,

Lisa D. Key
Planning Director

Cc: Morningside Investments, LLC
Tirrell Black, Planning
Inga Note, Streets
James Richman, Legal
File

Attachments: Attachment A
Attachment B

PLANNING & DEVELOPMENT
808 W. SPOKANE FALLS BLVD.
SPOKANE, WASHINGTON 99201-3343
509.625.6300
FAX 509.625.6822
spokaneplanning.org

Attachment A

Comments from Agency Review Z1500084COMP (as of Feb 10 2016)

AGENCY	DATE	COMMENTER
City of Spokane, Engineering Services	Email received on 1.22.16	Inga Note
City of Spokane, Integrated Capital Programs	Email received on 2.8.16	Katherine Miller
City of Spokane, Fire Dept.	Email received on 2.5.16	Dave Kokot
City of Spokane, Business & Development Services, Current Planning	Email received on 2.5.16	Tami Palmquist
City of Spokane, Business & Development Services, Engineering	Email received on 2.8.16	Eldon Brown
Spokane County Public Works	Letter received on 2.1.16	Scott Engelhard
Washington State Department of Transportation	Email received on 1.22.16	Greg Figg
Spokane School District 81	Email received on 1.27.16	Gregory Forsyth
Spokane Transit Authority	Email received in 2.8.16	Karl Otterstrom
Spokane Regional Transportation Council	Email received on 2.9.16	Kevin Wallace

Black, Tirrell

From: Amanda Mansfield <amansfield@srtc.org>
Sent: Tuesday, February 09, 2016 11:55 AM
To: Black, Tirrell
Subject: City of Spokane 2015 Comprehensive Plan Amendments - SRTC Review Letters
Attachments: SRTC - City of Spokane 2015 Amendment Letter_ Z1500084.pdf; SRTC - City of Spokane 2015 Amendment Letter_ Z1500087.pdf; SRTC - City of Spokane 2015 Amendment Letter_ Z1500078 & Z1500085.pdf

Hello Tirrell,

See SRTC's review letters attached for the following amendments:

- Z1500078COMP
- Z1500084COMP
- Z1500085COMP
- Z1500087COMP

Please feel free to contact me with questions or comments.

Amanda Mansfield
Associate Transportation Planner
Spokane Regional Transportation Council (SRTC)
221 W. First Ave., Suite 310
Spokane, WA 99201
509-343-6384
amansfield@srtc.org

SRTC SPOKANE REGIONAL TRANSPORTATION COUNCIL
221 W. FIRST AVE., SUITE 310 • SPOKANE, WA 99201 • 509-343-6370 • WWW.SRTC.ORG

February 8, 2016

Tirrell Black, Assistant Planner
City of Spokane Planning and Development Services
808 W. Spokane Falls Blvd.
Spokane, WA 99201-3329

RE: City of Spokane 2015 Proposed Comprehensive Plan Amendment - Z1500084COMP

Dear Ms. Black:

Thank you for the opportunity to comment on this application for the City of Spokane's 2015 comprehensive plan amendment. SRTC serves as the Regional Transportation Planning Organization (RTPO) for Spokane County. As an RTPO, SRTC is mandated by the Revised Code of Washington (RCW)[i], including the Growth Management Act (GMA)[ii] to certify that the transportation elements of local comprehensive plans are consistent with SRTC's Regional Transportation Plan (RTP): Horizon 2040[iii]. SRTC staff has reviewed the application materials you provided for the following amendment:

1. Morningside Investments; Application/Permit Number: Z1500084COMP

Based on the information you provided for the location and scale of the proposed comprehensive plan changes, SRTC has determined that the proposed amendment is generally consistent with the relevant Guiding Principles and Policies of Horizon 2040 as well as with the relevant transportation planning requirements of the Revised Code of Washington (RCW), including the Growth Management Act (GMA).

Because of the scale of this proposal, SRTC finds that the City's requirement for the applicant to conduct a traffic study to determine the cumulative traffic impacts of this proposal is consistent with the 2008 Countywide Planning Policies (CWPP) for Spokane County.

The CWPP states the following: "The Growth Management Act (GMA) establishes a goal of encouraging development in urban areas where adequate public facilities and services exist or can efficiently be provided. Growth planning must ensure that needed facilities and services are adequate to serve new development without decreasing current service levels below locally established minimum standards."

SRTC recommends consideration of the following Policies from Guiding Principle 5: Safety and Security and Guiding Principle 6: Choice and Mobility from SRTC' Horizon 2040 as the proposed project moves forward:

Guiding Principle 5: Safety and Security

- Support transportation infrastructure and operational strategies for emergency response.

Guiding Principle 6: Choice and Mobility

- 6a. Strengthen connections by filling gaps within and between modes.
- 6b. Improve access to transit for all persons.
- 6c. Promote high performance transit service where regional activity centers with transit supportive development exist.
- 6d. Expand the pedestrian and bicycle networks while focusing on moving people between centers and linking with transit.
- 6f. Support transportation demand management strategies.

SRTC's level of service (LOS) analysis did not show a forecasted LOS failure for the regional mobility corridors.

For more information on SRTC's required comprehensive plan amendment review and certification process, please see: http://www.srtc.org/other_documents.html.

Please contact me if you need additional information about our review of this amendment proposal.

Sincerely,

Kevin Wallace
Executive Director

---

[i] http://apps.leg.wa.gov/rcw/default.aspx?cite=47.80.026
[ii] http://apps.leg.wa.gov/rcw/default.aspx?cite=36.70a.070
[iii] http://www.srtc.org/mtp_2040.html

Black, Tirrell

From: Johnson, Erik D.
Sent: Monday, February 08, 2016 4:18 PM
To: Black, Tirrell
Cc: Becker, Kris; Brown, Eldon; Saywers, John; Nilsson, Mike; Kells, Patty
Subject: Z1500084COMP Comments
Attachments: Z1500084COMP.pdf; Z1500084COMP.docx

Follow Up Flag: Follow up
Flag Status: Flagged

Tirrell,

Attached you will find comments for Comp Plan Amendment Z1500084COMP

Thanks,

Erik Johnson | City of Spokane | Engineering Technician III | Planning & Development
509.625.6445 | *fax* 509.625.6124 | edjohnson@spokanecity.org | spokanecity.org

MEMORANDUM

CITY OF SPOKANE
PLANNING & DEVELOPMENT

DATE: **February 08, 2016**

TO: **Tirrell Black, Assistant Planner**

FROM: **Eldon Brown, P.E., Principal Engineer – Planning & Development**

File No: **Z1500084COMP**

SUBJECT: **Comprehensive Plan Amendment – Request a change in the land designation from R4-10 to partially R15-30 and R10-20 as well as changing the current RSF to RMP and RTF for 260 single family parcels.**

APPLICANT: **Morningside Investments, LLC**

Comp Plan Amendment Comments

1. The majority of these parcels have previously been connected individually to a private sewer system. This private system appears to have capacity to serve additional units however the individual lot connections have been sized to serve single family homes. These service connections will need to be further evaluated for capacity at the time of future development applications. It is likely that these service connections will need to be upsized to handle additional units.

   This private sewer system eventually ties into the City of Spokane's public sewer system in Barnes Road and Concord Lane. The City's public sewer system appears to have adequate capacity to serve this increased density but may also need to be evaluated with future development applications.

2. The majority of these parcels have previously been connected individually to a private water system. This private water system appears to have capacity to serve additional units however the individual lot connections are likely undersized to serve anything larger than single family homes. Water sizing requirements will be evaluated with future development applications and any unused individual lot connections will need to be abandoned and capped at the private main.

   The public water system that serves this area appears to have adequate capacity to serve this upsize in density but may also need to be evaluated with future development applications.

3. Compliance to SMC 17.060D Stormwater Facilities is required and will be reviewed at the time of development application(s).

4. After an evaluation of the existing streets it appears that on-street parking may be prohibited. (Maintain a 20-foot unobstructed traveled way for emergency access). Therefore an increase in density may require on-site parking.

cc: Developer Services File
Kris Becker, P.E., Manager, Planning & Development
John Saywers, P.E., Senior Engineer, Planning & Development
Mike Nilsson, P.E., Associate Engineer, Planning & Development
Patty Kells, Traffic Engineering Assistant, Planning & Development

Black, Tirrell

From: Weinand, Kathleen <KWeinand@spokanetransit.com>
Sent: Monday, February 08, 2016 3:59 PM
To: Freibott, Kevin; Black, Tirrell
Subject: RE: City of Spokane Z1500084COMP #2 of 4 Comprehensive Plan Amendment
Attachments: STAComments_COS_Z1500084COmpMornignside.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Please find the attached comments.

From: Freibott, Kevin [mailto:kfreibott@spokanecity.org]
Sent: Monday, January 25, 2016 2:01 PM
To: Black, Tirrell <tblack@spokanecity.org>; kmkearney@q.com; jatrent1@gmail.com; Allenton, Steven <sallenton@spokanecity.org>; Arnold, Dale <XXXdarnold@spokanecity.org>; Basinger, Mike <mbasinger@spokanevalley.org>; Becker, Kris <kbecker@spokanecity.org>; Brown, Eldon <ebrown@spokanecity.org>; Brown, Ken <kbrown@spokanecity.org>; Buller, Dan <dbuller@spokanecity.org>; Byrne, Ray <rbyrne@srhd.org>; Caputo, Dee <dee.caputo@commerce.wa.gov>; Casci, Erin <erincasci@hotmail.com>; Corley, Jacki <jacqueline.corley@spokanetribe.com>; Coster, Michael <mcoster@spokanecity.org>; Dalrymple, Dana <ddalrymple@spokanelibrary.org>; Divens, Karin <Karin.divens@dfw.wa.gov>; Duvall, Megan <mduvall@spokanecity.org>; Engelhard, Scott <SEngelhard@spokanecounty.org>; Environmental Review <SEPAUNIT@ECY.WA.GOV>; Erkel, Tim <tim.r.erkel@usace.army.mil>; Figg, Greg <FiggG@wsdot.wa.gov>; Gately, John <jgately@spokanepolice.org>; Halsey, John <jhalsey@spokanecity.org>; Hanson, Tonilee <sajbinfo@gmail.com>; Howell, Gordon <GHowell@spokanetransit.com>; Hughes, Rick <rhughes@spokanecity.org>; Hynes, Mike <MHynes@spokanetransit.com>; Johnson, Candy <CandyJ@spokaneschools.org>; Kaehler, Gretchen <gretchen.kaehler@DAHP.wa.gov>; Kay, Char <kayc@wsdot.wa.gov>; Kegley, Daniel <dkegley@spokanecity.org>; Kells, Patty <pkells@spokanecity.org>; Koch, Lori <lori.koch@amr.net>; Kokot, Dave <dkokot@spokanecity.org>; Madunich, Tony <tmadunich@spokanecity.org>; Mallahan, Jonathan <jmallahan@spokanecity.org>; McCann, Jacob <Jacob.mccann@dnr.wa.gov>; McClure, Jeff <Jmcclure@cheneysd.org>; Meyer, Eric <EMeyer@srhd.org>; Miller, Katherine E <kemiller@spokanecity.org>; Moore, David <david.moore@ecy.wa.gov>; Moore, Michael <michael.s.moore@williams.com>; Morris, Mike <mmorris@spokanecity.org>; Neff, Julie <jneff@spokanecity.org>; Neighborhood Services <Neigh.Svcs@SpokaneCity.org>; Nilsson, Mike <mnilsson@spokanecity.org>; Note, Inga <inote@spokanecity.org>; Nyberg, Gary <GNYBERG@spokanecounty.org>; Palmquist, Tami <tpalmquist@spokanecity.org>; Peacock, William <wpeacock@spokanecity.org>; Pederson, John <JPederson@spokanecounty.org>; Qureshi, Megan <mqureshi@spokanecity.org>; Ragaza-Bourassa, Anna <annarb@srtc.org>; Richman, James <jrichman@spokanecity.org>; Sakamoto, James <jsakamoto@spokanecity.org>; Sanders, Theresa <tsanders@spokanecity.org>; SEPA Center <sepacenter@dnr.wa.gov>; Sikes, Jeremy <jsik461@ecy.wa.gov>; Steele, David <dsteele@spokanecity.org>; Trautman, Heather <htrautman@spokanecity.org>; Wallace, Kevin <kwallace@srtc.org>; Weinand, Kathleen <KWeinand@spokanetransit.com>; Weingart, LuAnn <luann.weingart@avistacorp.com>; Wendle, Ned <ned.wendle@mead354.org>; Westby, April <awestby@spokanecleanair.org>; Windsor, Scott <swindsor@spokanecity.org>
Subject: RE: City of Spokane Z1500084COMP #2 of 4 Comprehensive Plan Amendment

Good afternoon. As you may remember from our emails in December, this year's round of proposed Comprehensive Plan Amendments are subject to a 60-day agency comment period. We felt this longer Agency Comment period would be useful given the complexity of some aspects of the proposals. As this has been an extra long Agency comment period, we wanted to remind all of you that the time to submit comments will end at **5:00 PM on February 8th**. If you

Spokane Transit

February 8, 2016

Tirrell Black
Assistant Planner
City of Spokane
808 W Spokane Falls Boulevard
Spokane WA, 99201

RE: REQUEST FOR COMMENTS FILE NO. Z1500084COMP, Morningside Investments LLC

Dear Ms. Black,

Thank you for the notice of the above referenced request for comment.

The proposed amendment of the land use plan map designation for the subject site from "R 4-10" to "R 10-20" and "R 15-30" will likely result in an increased demand for transit at this location. The closest stops to the subject site are located at Indian Trail Road and Shawnee Avenue and Indian Trail Road and Barnes Road. These stops are served with 30 minute service during the weekday but are not currently served on evenings and weekends. Residents that live in higher density development patterns that the proposed designation would allow are more likely to use transit and as such are more impacted than residents in single-family detached housing by the absence of fixed-route service during evening and weekends.

The STA Board of Directors has adopted the *STA Moving Forward Plan*, which proposes to provide service on nights and weekends at this location however the necessary funding has not been secured to implement the plan. An April 2015 ballot measure to fund the plan, including extending service hours in the Indian Trail area, was not approved by voters. The STA Board of Directors is currently in discussion regarding proposing another ballot measure to voters to fund the *STA Moving Forward Plan.* Some funding packages the Board is discussing would not include the addition of night and weekend service for the Indian Trail area.

The quantity of transit service that will be provided to the Indian Trail community within the horizon of the City's Comprehensive Plan will be dependent on demand and available resources. However, because of this area's location at the edge of the City and the topographic barriers that isolate the area it should be noted that areas more connected by a grid street network and more central in the City are easier and more affordable to serve with transit and as result will likely be better served by transit in the future.

Should this proposed land use plan designation change be adopted, STA requests that following mitigations be enforced at the time of building permit for subsequent development:

1. ADA compliant pedestrian connections for the most direct route possible between residential units and the closet bus stop be required.

328-RIDE
spokanetransit.com
TTY 456-4327

1230 W Boone Avenue
Spokane, Washington 99201-2686

509.325.6000
509.325.6036

2. The bus stops at Indian Trail and Shawnee Avenue and Indian Trail and Barnes Road be upgraded with ADA accessible "shelter-ready" concreate pads. This will allow STA to install a bus shelter as demand from new residential areas warrants.

Please let me know if you have any questions about these comments or requests. It is important to STA to continue to coordinate on changes to our respective plans. We value your efforts to include us in this process.

Sincerely,

Karl Otterstrom, AICP
Planning Director

Black, Tirrell

From: Miller, Katherine E
Sent: Monday, February 08, 2016 6:45 PM
To: Black, Tirrell
Subject: RE: City of Spokane Z1500084COMP #2 of 4 Comprehensive Plan Amendment

Tirrell,

Regarding this land use change to increase density. There is currently nothing in the 6-yr Program to alleviate the increase in traffic that this proposed change would result in. Due to the topography in the area, solutions to traffic congestion are limited. Typically challenging topography results in higher costs to address both transportation and utility issues. These costs should be clearly understood before approvals to increase density are moved forward to allow City Council to understand the financial impacts and any resulting impacts to currently planned transportation and utility projects.

Thank you,
Katherine

Katherine Miller, P.E.| City of Spokane | Director- Integrated Capital Management
509.625-6338 | *fax* 509.625.6822 | kemiller@spokanecity.org | spokanecity.org

---

From: Black, Tirrell
Sent: Monday, February 08, 2016 12:04 PM
To: Miller, Katherine E
Subject: FW: City of Spokane Z1500084COMP #2 of 4 Comprehensive Plan Amendment

Tirrell Black
Planning & Development Services
509-625-6185

From: Freibott, Kevin
Sent: Monday, January 25, 2016 2:01 PM
To: Black, Tirrell <tblack@spokanecity.org>; kmkearney@q.com; jatrent1@gmail.com; Allenton, Steven <sallenton@spokanecity.org>; Arnold, Dale <XXXdarnold@spokanecity.org>; Basinger, Mike <mbasinger@spokanevalley.org>; Becker, Kris <kbecker@spokanecity.org>; Brown, Eldon <ebrown@spokanecity.org>; Brown, Ken <kbrown@spokanecity.org>; Buller, Dan <dbuller@spokanecity.org>; Byrne, Ray <rbyrne@srhd.org>; Caputo, Dee <dee.caputo@commerce.wa.gov>; Casci, Erin <erincasci@hotmail.com>; Corley, Jacki <jacqueline.corley@spokanetribe.com>; Coster, Michael <mcoster@spokanecity.org>; Dalrymple, Dana <ddalrymple@spokanelibrary.org>; Divens, Karin <Karin.divens@dfw.wa.gov>; Duvall, Megan <mduvall@spokanecity.org>; Engelhard, Scott <SEngelhard@spokanecounty.org>; Environmental Review <SEPAUNIT@ECY.WA.GOV>; Erkel, Tim <tim.r.erkel@usace.army.mil>; Figg, Greg <FiggG@wsdot.wa.gov>; Gately, John <jgately@spokanepolice.org>; Halsey, John <jhalsey@spokanecity.org>; Hanson, Tonilee <sajbinfo@gmail.com>; Howell, Gordon <ghowell@spokanetransit.com>; Hughes, Rick <rhughes@spokanecity.org>; Hynes, Mike

SPOKANE COUNTY
PUBLIC WORKS DEPARTMENT
Division of Engineering and Roads
Transportation Engineering
1026 West Broadway Avenue
Spokane, WA 99260-0170

(509) 477-3600 Fax (509)477-7655
sengelhard@spokanecounty.org
gbaldwin@spokanecounty.org

Memo

Planner: Tirrell Black, Assistant Planner

From: Scott Engelhard, Spokane County Engineering Scott

File #: Z1500084COMP, Morningside Investments LLC

Date: February 1, 2016

RE: Proposed amendment of Land Use Plan Map from "R 4-10" (Residential 4 to 10 units per acre) to a portion to "R 10-20" and a portion to "R 15-30"; If approved with concurrent change to zoning map from RSF (Residential Single Family) zoning to RTF (Residential Two Family) and RMF (Residential Multi Family).

Please include these comments from Spokane County Engineering in the file for the above referenced application.

It is noted that in Section 14 of the SEPA Checklist submitted with this application that a Trip Distribution Letter will be prepared for a development proposal. Spokane County Engineering is requesting to be included in any additional traffic information that is submitted for agency review to determine if any County facilities will be affected.

end

Black, Tirrell

From: Palmquist, Tami
Sent: Friday, February 05, 2016 3:35 PM
To: Black, Tirrell
Subject: Comments for Morningside Comp Plan

Tirrell,
It is my opinion that the proposal that is included in the application for Morningside Comp Plan change would not meet the development standards outlined in 17C. 110 Residential Zones, specifically lot coverage and front yards. Also, per Section 17C.230.145 Development Standards for Residential Uses, in the RTF, RMF, RHD, FBC CA4 zones, no more than twenty percent of the land area between the front lot line and the front building line may be paved or used for vehicle areas. As shown the proposal would require a substantial modification from the original PUD which would be reviewed by the Hearing Examiner.

Tami Palmquist, AICP, CFM | Associate Planner | City of Spokane
509.625.6157 | *fax* 509.625.6013 | tpalmquist@spokanecity.org | spokanecity.org

Black, Tirrell

From: Freibott, Kevin
Sent: Friday, February 05, 2016 2:00 PM
To: Black, Tirrell
Subject: FW: City of Spokane Z1500084COMP #2 of 4 Comprehensive Plan Amendment

Please see below for fire comments on Morningside.

Kevin

Kevin Freibott | Assistant Planner | City of Spokane - Planning and Development Services
509.625-6184 | mailto:kfreibott@spokanecity.org | spokanecity.org | spokaneplanning.org

From: Kokot, Dave
Sent: Friday, February 05, 2016 1:59 PM
To: Freibott, Kevin <kfreibott@spokanecity.org>
Subject: RE: City of Spokane Z1500084COMP #2 of 4 Comprehensive Plan Amendment

The Fire Department has the following concerns about this proposal:

1. There are three access points into this development, so it appears that access would be compliant.
2. Traffic considerations need to be taken into account for response times and the ability to respond.
3. With the increased number of dwelling units, there needs to be consideration for providing that fire access can be met. This may involve "No Parking" signs or some other method to confirm that the minimum requirements for fire lanes are met.

David F. Kokot, P.E. | City of Spokane | Fire Protection Engineer
509.625-7056 | *fax* 509.625.7006 | dkokot@spokanefire.org | spokanefire.org

From: Freibott, Kevin
Sent: Monday, January 25, 2016 2:01 PM
To: Black, Tirrell; kmkearney@q.com; jatrent1@gmail.com; Allenton, Steven; Arnold, Dale; Basinger, Mike; Becker, Kris; Brown, Eldon; Brown, Ken; Buller, Dan; Byrne, Ray; Caputo, Dee; Casci, Erin; Corley, Jacki; Coster, Michael; Dalrymple, Dana; Divens, Karin; Duvall, Megan; Engelhard, Scott; Environmental Review; Erkel, Tim; Figg, Greg; Gately, John; Halsey, John; Hanson, Tonilee; Howell, Gordon; Hughes, Rick; Hynes, Mike; Johnson, Candy; Kaehler, Gretchen; Kay, Char; Kegley, Daniel; Kells, Patty; Koch, Lori; Kokot, Dave; Madunich, Tony; Mallahan, Jonathan; McCann, Jacob; McClure, Jeff; Meyer, Eric; Miller, Katherine E; Moore, David; Moore, Michael; Morris, Mike; Neff, Julie; Neighborhood Services; Nilsson, Mike; Note, Inga; Nyberg, Gary; Palmquist, Tami; Peacock, William; Pederson, John; Qureshi, Megan; Ragaza-Bourassa, Anna; Richman, James; Sakamoto, James; Sanders, Theresa; SEPA Center; Sikes, Jeremy; Steele, David; Trautman, Heather; Wallace, Kevin; Weinand, Kathleen; Weingart, LuAnn; Wendle, Ned; Westby, April; Windsor,

Black, Tirrell

From: Gregory Forsyth <GregoryF@SpokaneSchools.org>
Sent: Wednesday, January 27, 2016 10:35 AM
To: Black, Tirrell
Subject: RE: FW: City of Spokane Z1500084COMP #2 of 4 Comprehensive Plan Amendment
Attachments: Northwest Capacity Elementary Information.docx

Follow Up Flag: Follow up
Flag Status: Flagged

Hello -

Here are some rough numbers around the capacity of our Northwest elementary school sites, Woodridge, Indian Trail, and Balboa. It is difficult to predict the capacity of schools as programs change along with state guidelines. If you have any further questions please feel free to contact me. -greg-

Gregory J. Forsyth
Spokane Public Schools
Director, Capital Projects
509-354-5771 office
509-370-1665 cell
gregoryf@spokaneschools.org

>>> "Black, Tirrell" <tblack@spokanecity.org> 1/22/2016 1:52 PM >>>

Tirrell Black
Planning & Development Services
509-625-6185

-----Original Message-----
From: Gregory Forsyth [mailto:GregoryF@SpokaneSchools.org]
Sent: Wednesday, January 20, 2016 3:14 PM
To: Black, Tirrell <tblack@spokanecity.org>
Subject: Re: FW: City of Spokane Z1500084COMP #2 of 4 Comprehensive Plan Amendment

Hello -

I will work on getting those facts back to you by the end of the week. Will that work for you? -greg-

>>> "Black, Tirrell" <tblack@spokanecity.org> 1/20/2016 11:36 AM >>>
Mr. Forsyth,
We spoke on the phone (last month?) about the large North Indian Trail Comprehensive Plan Land Use Amendments that we are processing and the potential impacts to the elementary school in the N. Indian Trail neighborhood. We have two requests for amendments to the land use plan map within N. Indian Trail.

The documents that you received in December are attached again for your convenience and the webpage link: https://my.spokanecity.org/projects/comprehensive-plan-amendment-cycle-2015-2016/

Due to the complexity of these applications, we provided a lengthy agency comment period. The agency comment period runs to February 8, 2016.

In our phone conversation last month, you indicated that you were unlikely to submit comments. Since then, we have received a substantial number of public comments - even though we are not yet to the public comment phase. Much of the comment has indicated that Woodridge Elementary school is over capacity but after our phone conversation, it was my impression that this is not the case.

Factual information about the number of students in the area, and what the school district's growth projections are for the school would be very useful to have into the record at this point. Whatever adopted plan excerpt that you have would be great.

If you'd like more information, please feel free to contact me. If the public comment to date would be useful, please let me know and I can provide that as well.

Sincerely,

[cid:image002.jpg@01D0A82A.5C931420]

Tirrell Black, AICP

City of Spokane | Assistant Planner

509.625.6185 | fax 509.625.6013 | tblack@spokanecity.org<mailto:tblack@spokanecity.org> | spokanecity.org<http://www.spokanecity.org/>
[cid:image002.png@01CE560D.102DE590]<http://www.spokanecity.org/>
[cid:image003.png@01CE560D.102DE590] <http://facebook.com/cityspokane>
[cid:image004.png@01CE560D.102DE590] <http://twitter.com/spokanecity>

From: Bishop, Stephanie
Sent: Wednesday, December 09, 2015 5:00 PM
To: tldeno@peoplepc.com; jandmhernandez@comcast.net; melody.d.huston@gmail.com
Cc: Black, Tirrell <tblack@spokanecity.org>
Subject: City of Spokane Z1500084COMP #2 of 4 Comprehensive Plan Amendment

Dear Agency or Interested City Department Reviewer,

This is the second of four emails with "Request for Comment" and SEPA consultation on four Proposed Annual Amendment's to the City's Comprehensive Plan Land Use Plan Map.

For each, you will receive a copy of the Request for Comments and SEPA checklist attached. For more information including maps and application documents go to:
https://my.spokanecity.org/projects/comprehensive-plan-amendment-cycle-2015-2016/

Please feel free to contact me if you have any questions, Sincerely,

[cid:image002.jpg@01D0A82A.5C931420]

Tirrell Black

City of Spokane | Assistant Planner

509.625.6185 | fax 509.625.6013 | tblack@spokanecity.org<mailto:tblack@spokanecity.org> | spokanecity.org<http://www.spokanecity.org/>

Northwest Capacity Elementary Information

1-27-16

Woodridge Elementary School

- Current enrollment as of Nov 2015: 461
- Capacity of building as designed: 575 - 625
- Potential student growth: 114
- Demographers 2014 study projections for 2024: 429

Indian Trail Elementary School

- Current enrollment as of Nov 2015: 332
- Capacity of building as designed: 415 - 465
- Potential student growth: 83
- Demographers 2014 study projections for 2024: 299

Balboa Elementary School

- Current enrollment as of Nov 2015: 348
- Capacity of building as designed: 525 - 575
- Potential student growth: 177
- Demographers 2014 study projections for 2024: 347

Black, Tirrell

From: Figg, Greg <FiggG@wsdot.wa.gov>
Sent: Friday, January 22, 2016 1:03 PM
To: Note, Inga
Cc: Kay, Charlene; Black, Tirrell; Bjordahl, Mike
Subject: Indian Trail Traffic Study Scope

Follow Up Flag: Follow up
Flag Status: Flagged

Inga,

Thank you for the opportunity to comment on the scope of the traffic studies for the McCarroll East and Windhaven comprehensive plan amendments. Due to the sizable nature of these two projects and the anticipated trip distribution, SR-291 (Francis Ave) will bear a significant impact from much of this traffic. Consequently, WSDOT requests that the following intersections along SR 291 be added to the scope of this study:

- Francis and Indian Trails Road
- Francis and Alberta
- Francis and Ash
- Francis and Maple

Additionally, due to the queue lengths that many of these intersections experience in the peak hours the traffic counts performed need to track the arrivals in the queue rather than the discharge from these signalized intersections.
Please let me know if you should have any questions.
Best Regards,

Greg Figg
WSDOT Eastern Region
Development Services Manager
figgg@wsdot.wa.gov
Phone (509) 324-6199

Black, Tirrell

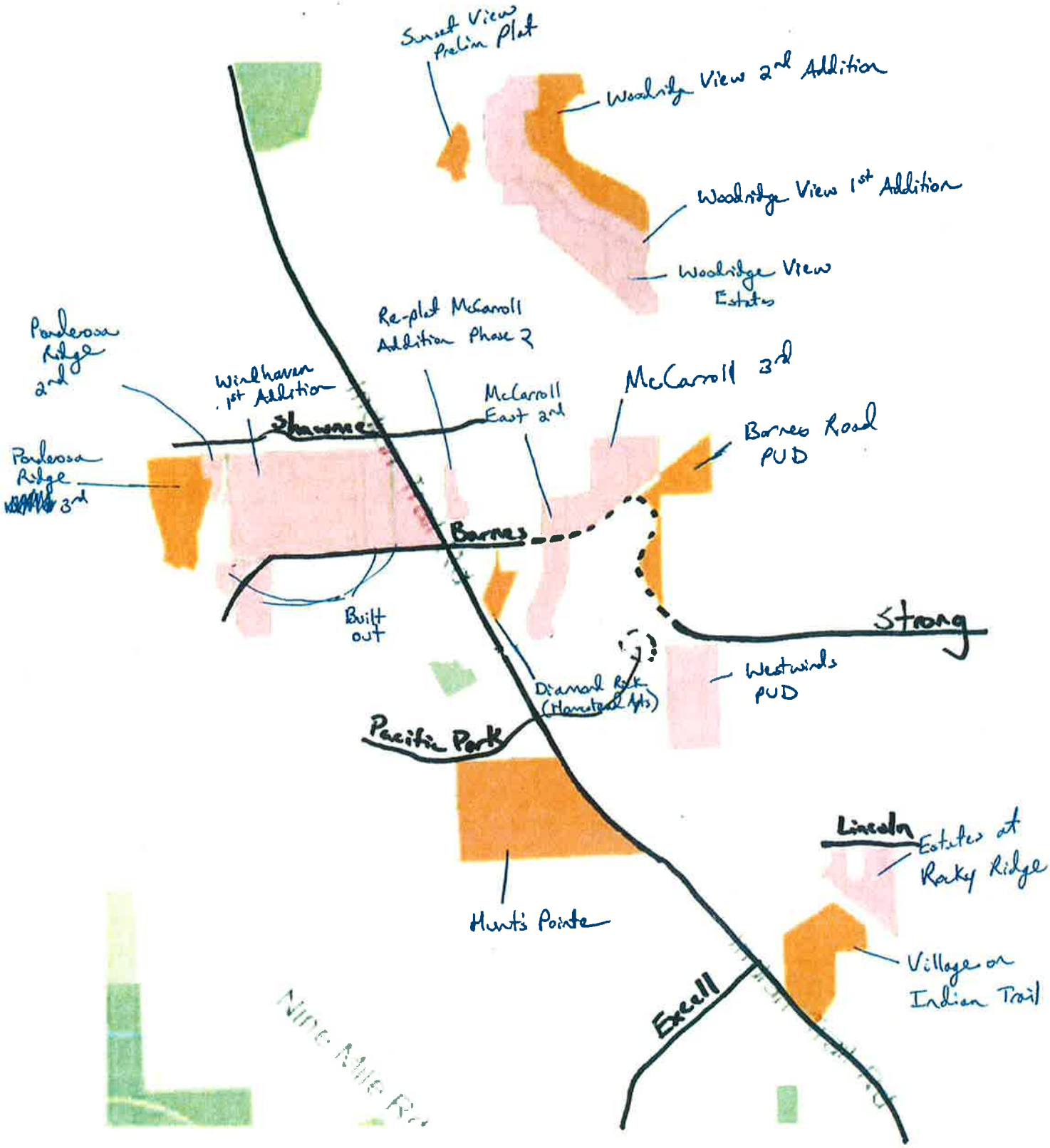
From: Note, Inga
Sent: Wednesday, December 23, 2015 1:55 PM
To: 'Jay Bonnett'
Cc: Black, Tirrell; Kells, Patty
Subject: Morningside - Indian Trail traffic study scope
Attachments: 1117_001.pdf; Indian Trail Development Summary for Comp PLan TIAs.xlsx

Jay,
This should get you going on the traffic impact study for the comprehensive plan amendment. We will want a public traffic meeting once the results are completed to have the engineer present the results to the neighborhood. Sometimes we do a traffic scoping meeting at the beginning, but I'm going to skip that because I want to allow your traffic engineer to get moving on the analysis. Instead I'm going to send a copy of this scope to the neighborhood council for distribution. If there are additional items they want to have studied, they can send me the request via email and I'll see if we should include it. So when you are discussing price, just be aware that there's the possibility of adding a little more to the scope.

- See the attached excel file and PDF for information on background projects. You'll notice that the Morningside single family plat is included since it's already approved. The analysis should only look at the difference between the current and proposed zoning.
- The Barnes Road extension should be built by 2017. So transfer all traffic counted on Strong Road over to Barnes and assume Strong becomes a cul-de-sac at the water tower. Barnes will likely see an increase in traffic as well due to the improved conditions. Apply a 3% per year growth factor to the new Barnes Road connection to Five-Mile. No other background growth rate is needed.
- Intersections to analyze. I don't have any recent turning counts for these. But I did include some historic tube counts in the attached excel file.
    - Indian Trail / Barnes (AM and PM) – the phasing may have changed recently to protective-permissive lefts
    - Indian Trail / Strong-Pacific Park Drive (AM and PM)
    - Indian Trail / Francis (AM and PM)
- Scenarios
    - Existing
    - Future No-Build (built-out background projects)
    - Future Build with Morningside rezone traffic
    - Future Build + Morningside + Crapo/McCarroll rezone traffic
    - Assume 6 years out for the build out year?
- Indian Trail Road needs to be analyzed with a recommendation for when the first phase of widening from Kathleen to Pacific Park should occur. We probably need an estimate of the number of new trips that can be added to the area before the widening is needed.

Let me know if you have any questions. I will be out of the office Dec 24th through Jan 3rd.

Inga Note, P.E. PTOE | City of Spokane | Senior Traffic Planning Engineer
509.232.8813 | *fax* 509.232.8831 | inote@spokanecity.org | spokanecity.org


Sunset View Prelim Plat
Woodridge View 2nd Addition
Woodridge View 1st Addition
Woodridge View Estates
Re-plat McCarroll Addition Phase 2
Ponderosa Ridge 2nd
Windhaven 1st Addition
Shawnee
McCarroll East 2nd
McCarroll 3rd
Barnes Road PUD
Ponderosa Ridge 3rd
Barnes
Built out
Strang
Westwinds PUD
Diamond Rock (Hamstead Mtls)
Pacific Park
Lincoln
Estates at Rocky Ridge
Hunt's Pointe
Village on Indian Trail
Excell

Developable Land in Indian Trail Neighborhood

Project Name	Parcel #	Owner/Developer	Plat Status	Build Out Status (per 2014 photo)	Size (acre)	Zoning	# Lots	# Apts
Village on Indian Trail	multiple	Excelsior Youth Center	Prelim Plat	Not started	22	R4-10	81	
Hunt's Point	multiple	Douglass	Prelim Plat	Not started		R4-10, R10-20	214	
Windhaven First Addition	multiple	MorningSide Investme	Final Plat	Not started		R4-10	288	
Diamond Rock (Homestead) Apartments	26221.0902	Indian Trail LLC	BSP approved	Under construction	4.5	O-35		96
Barnes Road PUD	multiple	Barnes Road, LLC	Prelim Plat	Not started	14	R4-10	25	
Sunset View Prelim Short Plat	26151.0712	Dimov	Prelim Plat	Not started	4.2	R4-10	8	
Woodridge View 2nd Addition	26155.001	MSK, LLC	Prelim Plat	Not started	88	R4-10	21	
Estates at Rocky Ridge - off Lincoln Rd	26262.3301	D&J Rocky Ridge LLC	Final	Not built out		RSF	44	
Westwinds PUD - off Strong Rd - to Lowell	26262.3028	R&C Brown	Final	Not built out		RSF	37	
McCarroll's East 2nd Addition			Final	Almost built out		RSF	37	
Replat McCarroll's Addition Phase 2			Final	Not started	2.69	RSF	18	
McCarroll's East 3rd Add			Final	Not built out		RSF	48	
Ponderosa Ridge 2nd & 3rd Add			Prelim Plat	Not built out		RSF	155	

Black, Tirrell

From: Note, Inga
Sent: Monday, December 14, 2015 9:31 AM
To: 'Jay Bonnett'
Cc: Black, Tirrell
Subject: RE: Z1500084COMP Morningside Investment Comprehensive Plan Amendment

Jay,
We do not give credits for the cost of preparing the TIA.
Thanks,
Inga

From: Black, Tirrell
Sent: Monday, December 14, 2015 9:21 AM
To: Note, Inga
Subject: FW: Z1500084COMP Morningside Investment Comprehensive Plan Amendment

Tirrell Black
Planning & Development Services
509-625-6185

From: Jay Bonnett [mailto:jbonnett@jrbonnett.com]
Sent: Monday, December 14, 2015 9:20 AM
To: Black, Tirrell <tblack@spokanecity.org>
Cc: Meuler, Louis <lmeuler@spokanecity.org>; Richman, James <jrichman@spokanecity.org>
Subject: RE: Z1500084COMP Morningside Investment Comprehensive Plan Amendment

Thanks Tirrell,

Can you confirm that the costs associated with preparing the TIA will be credited back to the owner when the traffic impact fees are assessed?

Thanks.

Jay Bonnett, P.E., Principal
J.R. Bonnett Engineering, PLLC
803 E. 3rd Avenue
Spokane, WA 99202
509-534-3929

From: Black, Tirrell [mailto:tblack@spokanecity.org]
Sent: Friday, December 11, 2015 12:20 PM
To: Jay Bonnett <jbonnett@jrbonnett.com>
Cc: Meuler, Louis <lmeuler@spokanecity.org>; Richman, James <jrichman@spokanecity.org>
Subject: FW: Z1500084COMP Morningside Investment Comprehensive Plan Amendment

Mr. Bonnett,

This request was received by Planning Department yesterday regarding the Morningside Comprehensive Plan Amendment. Additional agency comments are anticipated, but you will be forwarded agency comments as they are received.

Please include me (by cc) when you discuss the Traffic Impact Analysis with Inga Note.
Sincerely,

Tirrell Black
Planning & Development Services
509-625-6185

From: Note, Inga
Sent: Thursday, December 10, 2015 11:32 AM
To: Black, Tirrell <tblack@spokanecity.org>
Subject: RE: City of Spokane Z1500084COMP #2 of 4 Comprehensive Plan Amendment

Tirrell,
The Streets Department requests a traffic impact analysis of the proposed zoning change. It should include a public meeting with the neighborhood. The applicant should work with the Streets Department to determine the scope of the analysis.

Thanks,

Inga Note, P.E. PTOE | City of Spokane | Senior Traffic Planning Engineer
509.232.8813 | *fax* 509.232.8831 | inote@spokanecity.org | spokanecity.org

From: Bishop, Stephanie
Sent: Wednesday, December 09, 2015 4:50 PM
To: kmkearney@q.com; jatrent1@gmail.com; Allenton, Steven; Arnold, Dale; Basinger, Mike; Becker, Kris; Brown, Eldon; Brown, Ken; Buller, Dan; Byrne, Ray; Caputo, Dee; Casci, Erin; Corley, Jacki; Coster, Michael; Dalrymple, Dana; Divens, Karin; Duvall, Megan; Engelhard, Scott; Environmental Review; Erkel, Tim; Figg, Greg; Gately, John; Halsey, John; Hanson, Tonilee; Howell, Gordon; Hughes, Rick; Hynes, Mike; Johnson, Candy; Kaehler, Gretchen; Kay, Char; Kegley, Daniel; Kells, Patty; Koch, Lori; Kokot, Dave; Madunich, Tony; Mallahan, Jonathan; McCann, Jacob; McClure, Jeff; Meyer, Eric; Miller, Katherine E; Moore, David; Moore, Michael; Morris, Mike; Neff, Julie; Neighborhood Services; Nilsson, Mike; Note, Inga; Nyberg, Gary; Palmquist, Tami; Peacock, William; Pederson, John; Qureshi, Megan; Ragaza-Bourassa, Anna; Richman, James; Sakamoto, James; Sanders, Theresa; SEPA Center; Sikes, Jeremy; Steele, David; Trautman, Heather; Wallace, Kevin; Weinand, Kathleen; Weingart, LuAnn; Wendle, Ned; Westby, April; Windsor, Scott
Cc: Black, Tirrell; Freibott, Kevin
Subject: City of Spokane Z1500084COMP #2 of 4 Comprehensive Plan Amendment

Dear Agency or Interested City Department Reviewer,

This is the second of four emails with "Request for Comment" and SEPA consultation on four Proposed Annual Amendment's to the City's Comprehensive Plan Land Use Plan Map.

For each, you will receive a copy of the Request for Comments and SEPA checklist attached. For more information including maps and application documents go to:
https://my.spokanecity.org/projects/comprehensive-plan-amendment-cycle-2015-2016/

Please feel free to contact me if you have any questions,
Sincerely,

Tirrell Black

City of Spokane | Assistant Planner

509.625.6185 | *fax* 509.625.6013 | tblack@spokanecity.org | spokanecity.org

Black, Tirrell

From: Bishop, Stephanie
Sent: Wednesday, December 09, 2015 5:00 PM
To: tldeno@peoplepc.com; jandmhernandez@comcast.net; melody.d.huston@gmail.com
Cc: Black, Tirrell
Subject: City of Spokane Z1500084COMP #2 of 4 Comprehensive Plan Amendment
Attachments: City_Spokane_Z1500084COMP_Morningside_Investments_Request_Agency_Comments(2).pdf; Z1500084COMP_SEPA_Checklist_Morningside_Invest.pdf

Dear Agency or Interested City Department Reviewer,

This is the second of four emails with "Request for Comment" and SEPA consultation on four Proposed Annual Amendment's to the City's Comprehensive Plan Land Use Plan Map.

For each, you will receive a copy of the Request for Comments and SEPA checklist attached. For more information including maps and application documents go to:
https://my.spokanecity.org/projects/comprehensive-plan-amendment-cycle-2015-2016/

Please feel free to contact me if you have any questions,
Sincerely,

Tirrell Black
City of Spokane | Assistant Planner
509.625.6185 | *fax* 509.625.6013 | tblack@spokanecity.org | spokanecity.org

CITY OF SPOKANE
PLANNING & DEVELOPMENT
808 W. SPOKANE FALLS BLVD.
SPOKANE, WASHINGTON 99201-3329
509.625.6300
FAX 509.625.6013
WWW.SPOKANEPLANNING.ORG
WWW.BUILDINGSPOKANE.ORG

REQUEST FOR COMMENTS
Agency and Interested City Department Review
FILE NO. Z1500084COMP, Morningside Investments LLC
Comprehensive Plan Land Use Map Amendment Proposal

DATE: December 9, 2015

TO: Interested Parties, City Departments
And Agencies with Jurisdiction.
(Distribution list on last page)

FROM: Tirrell Black, Assistant Planner
808 West Spokane Falls Boulevard
Spokane, WA 99201 or call (509) 625-6300 or 625-6815; email: tblack@spokanecity.org

SUBJECT: **Proposed amendment of Land Use Plan Map from "R 4-10" (Residential 4 to 10 units per acre) to a portion to "R 10-20" and a portion to "R 15-30"; If approved with concurrent change to zoning map from RSF (Residential Single Family) zoning to RTF (Residential Two Family) and RMF (Residential Multi Family).**

APPLICANT/ OWNER: **Morningside Investments LLC**

AGENT: **Mr. Jay Bonnett**
J.R. Bonnett Engineering
803 E. 3rd Avenue, Spokane WA 99202
509-534-3929; jbonnett1@jrbonnett.com

LOCATION: **This proposal is located north of W. Barnes Road and is generally bounded by W. Youngstown Lane, N. Concord Lane, W Jamestown Lane, and N Camden Lane.**

The location may also be described as: All parcels and tracts within the Windhaven First Addition PUD, except lots 1-8 Block 4, lots 1-13 Block 5, lots 1-5 Block 6. The area is comprised of 260 platted lots on approximately 45.5 acres. Map is attached.

Located within SW ¼ 15-26-42; SE ¼ 16-26-42; NE ¼ 21-26-42: NW ¼ 22-26-42

REPORT NEEDED BY: 5 P.M. February 8, 2016. If additional information is required in order for your department or agency to comment on this proposal, please notify the Planning Services Department as soon as possible so that the application processing can be suspended while the necessary information is being prepared. Under the procedures of SMC 17G.060, this referral to affected departments and agencies is for the following:

1) The determination of a complete application. If there are materials that the reviewing departments and agencies need to comment on this proposal, notice of such must be provided to the applicant;
2) Provides notice of application;
3) Concurrency Testing, **please note one of the following:**
   a) ( ) This application is subject to concurrency and agency is required to notify this department that applicant meets/fails currency; OR
   b) (X) This application is exempt from concurrency testing, but will use capacity of existing facilities.

The lack of comment including concurrency by any referral agency will be considered acceptance of this application as technically complete and meeting concurrency requirements.

Under the revised procedures of SMC 17G.060, this referral to affected Departments and Agencies is to provide notice of a pending application. **THIS WILL BE THE LAST NOTICE PROVIDED TO REFERRAL DEPARTMENTS AND**

* - The lack of comment including concurrency/capacity by any referral agency will be considered acceptance of this application as technically complete and meeting concurrency/capacity requirements.

** - Forward your comments to Patty Kells, Developer Services at **least 2 working days before the "Report needed by" date shown on** the front page.

DISTRIBUTION LIST FOR COMMENTS
FILE No.: Z1500084COMP (Comprehensive Plan Land Use Amendment Proposal)

Hard Copies

City Departments

- Engineering Services, Attn: Gary Nelson* **
- Engineering Services, Attn: Patty Kells *
- Construction Management, Attn: Ken Brown* **
- Capital Programs, Attn: Mike Taylor* **
- Solid Waste, Attn: Scott Windsor*
- Building Department, Attn: John Halsey

County Departments

- SRCAA, Attn: Chuck Studer
- Spokane Regional Health District, Attn: Eric Meyer

Washington State Agencies

- Department of Fish & Wildlife, Attn: Karin Divens - Habitat Program

Other Agencies

- U.S. Postal Service, Attn: Postmaster
- Avista Utilities, Attn: Lu Ann Weingart
- District 81, Attn: Facilities Planning*
- Spokane Tribe of Indians, Attn: Randy Abrahamson

  (SW ¼ 15-26-42; SE ¼ 16-26-42; NE ¼ 21-26-42: NW ¼ 22-26-42, see map follows)

E-mail Copies

City Departments

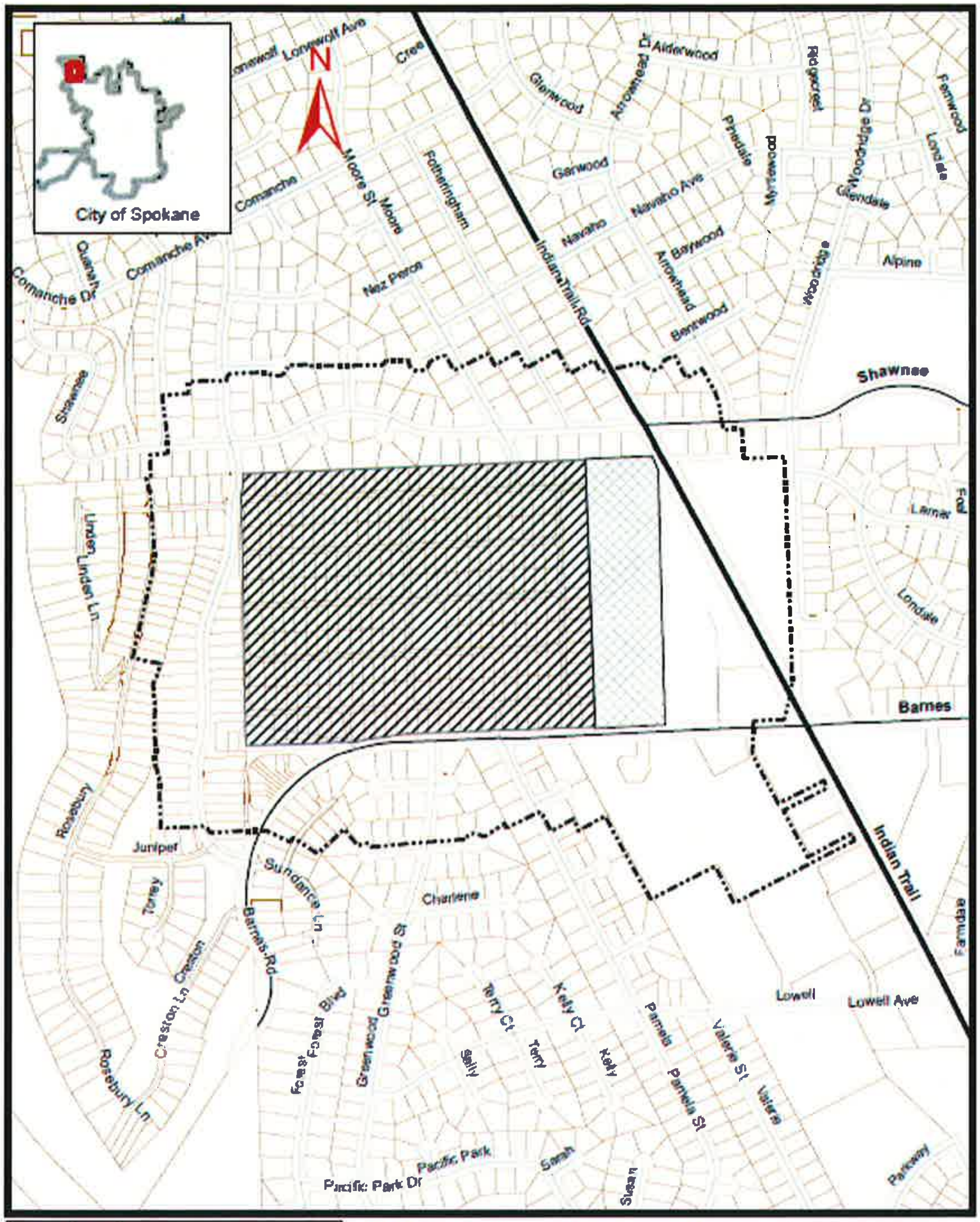
- Fire Dept., Attn: Dave Kokot, P.E.*
- Park Dept, Attn: Tony Madunich*
- City Attorney, Attn: James Richman
- Asset Management, Attn: Dave Steele
- Police Department, Attn: Lt. Rex Olson*
- Library Services, Attn: Dana Dalrympie*
- Neighborhood Services, Attn: Jonathan Mallahan & ONS Team
- Capital Programs, Attn:Steven Allenton
- Planning & Development Services, Attn: Julie Neff
- Historic Preservation, Attn: Jennifer Haegele

County Departments

- Spokane County Public Works, Attn: Scott Engelhard
- Spokane County Planning Department, Attn: John Pederson

Washington State Agencies

- Department of Natural Resources, Attn: Jacob McCann
- Department of Commerce, Attn: Dee Caputo
- Department of Archaeology & Historic Preservation, Attn: Gretchen Kaehler
- Department of Ecology, Attn: Environmental Review Section
- Department of Ecology, Eastern Region, Terri Costello
- Department of Ecology, Eastern Region, Attn: Michael Maher, Shoreline Permit Reviewer


City of Spokane
N
Longwolf Ave
Cree
Alderwood
Arrowhead Dr
Ridgecrest
Fernwood
Glenwood
Prestige
Myrtlewood
Woodridge Dr
Lonsdale
Garwood
Glendale
Moore St
Moore
Fotheringham
Comanche
Comanche Ave
Comanche Dr
Navaho Ave
Navaho
Baywood
Arrowhead
Bentwood
Woodridge
Alpine
Nez Perce
Indian Trail Rd
Quanah
Shawnee
Lamar
Ford
Linden
Linden Ln
Lonsdale
Barnes
Rosebury
Juniper
Sundance Ln
Charlene
Indian Trail
Torrey
Creston
Creston Ln
Barnes Rd
Greenwood St
Forest Blvd
Forest
Greenwood
Terry Ct
Kelly Ct
Pamela
Valerie St
Lowell
Lowell Ave
Farmdale
Sally
Terry
Kelly
Pamela St
Valerie
Rosebury Ln
Pacific Park
Pacific Park Dr
Sarah
Susan
Parkway

Legend
Parcels
Notification district
Project Site
Adjacent Ownership

APPLICANT: Morningside Investments, LLC
PROPOSAL: Proposed Comprehensive Land designation from R4-10 to partially R15-30 and R10-20; and change zoning from RSF to RMF and RTF

Prepared by: WTC
Date prepared: 11/05/15
QC'd by:
Date QC'd:

SW 1/4 15-26-42, SE 1/4 16-26-42, NE 1/4 21-26-42, NW 1/4 22-26-42

Black, Tirrell

From: Freibott, Kevin
Sent: Monday, January 25, 2016 2:01 PM
To: Black, Tirrell; kmkearney@q.com; jatrent1@gmail.com; Allenton, Steven; Arnold, Dale; Basinger, Mike; Becker, Kris; Brown, Eldon; Brown, Ken; Buller, Dan; Byrne, Ray; Caputo, Dee; Casci, Erin; Corley, Jacki; Coster, Michael; Dalrymple, Dana; Divens, Karin; Duvall, Megan; Engelhard, Scott; Environmental Review; Erkel, Tim; Figg, Greg; Gately, John; Halsey, John; Hanson, Tonilee; Howell, Gordon; Hughes, Rick; Hynes, Mike; Johnson, Candy; Kaehler, Gretchen; Kay, Char; Kegley, Daniel; Kells, Patty; Koch, Lori; Kokot, Dave; Madunich, Tony; Mallahan, Jonathan; McCann, Jacob; McClure, Jeff; Meyer, Eric; Miller, Katherine E; Moore, David; Moore, Michael; Morris, Mike; Neff, Julie; Neighborhood Services; Nilsson, Mike; Note, Inga; Nyberg, Gary; Palmquist, Tami; Peacock, William; Pederson, John; Qureshi, Megan; Ragaza-Bourassa, Anna; Richman, James; Sakamoto, James; Sanders, Theresa; SEPA Center; Sikes, Jeremy; Steele, David; Trautman, Heather; Wallace, Kevin; Weinand, Kathleen; Weingart, LuAnn; Wendle, Ned; Westby, April; Windsor, Scott
Subject: RE: City of Spokane Z1500084COMP #2 of 4 Comprehensive Plan Amendment
Attachments: City_Spokane_Z1500084COMP_Morningside_Investments_Request_Agency_Comment.... pdf; Z1500084COMP_SEPA_Checklist_Morningside_Invest.pdf

Good afternoon. As you may remember from our emails in December, this year's round of proposed Comprehensive Plan Amendments are subject to a 60-day agency comment period. We felt this longer Agency Comment period would be useful given the complexity of some aspects of the proposals. As this has been an extra long Agency comment period, we wanted to remind all of you that the time to submit comments will end at **5:00 PM on February 8th**. If you plan to submit comments but have not yet done so, please submit your comments before that time to either Tirrell or me.

This will be one of four emails you will be receiving, one for each of the four proposals. As always, if you have any questions please feel free to contact Tirrell or me. Thank you and have a good day.

Kevin Freibott

Kevin Freibott | Assistant Planner | City of Spokane - Planning and Development Services
509.625-6184 | mailto:kfreibott@spokanecity.org | spokanecity.org | spokaneplanning.org

From: Bishop, Stephanie
Sent: Wednesday, December 09, 2015 4:50 PM
To: kmkearney@q.com; jatrent1@gmail.com; Allenton, Steven <sallenton@spokanecity.org>; Arnold, Dale <darnold@spokanecity.org>; Basinger, Mike <mbasinger@spokanevalley.org>; Becker, Kris <kbecker@spokanecity.org>; Brown, Eldon <ebrown@spokanecity.org>; Brown, Ken <kbrown@spokanecity.org>; Buller, Dan <dbuller@spokanecity.org>; Byrne, Ray <rbyrne@srhd.org>; Caputo, Dee <dee.caputo@commerce.wa.gov>; Casci, Erin <erincasci@hotmail.com>; Corley, Jacki <jacqueline.corley@spokanetribe.com>; Coster, Michael <mcoster@spokanecity.org>; Dalrymple, Dana <ddalrymple@spokanelibrary.org>; Divens, Karin

<Karin.divens@dfw.wa.gov>; Duvall, Megan <mduvall@spokanecity.org>; Engelhard, Scott <SEngelhard@spokanecounty.org>; Environmental Review <SEPAUNIT@ECY.WA.GOV>; Erkel, Tim <tim.r.erkel@usace.army.mil>; Figg, Greg <FiggG@wsdot.wa.gov>; Gately, John <jgately@spokanepolice.org>; Halsey, John <jhalsey@spokanecity.org>; Hanson, Tonilee <sajbinfo@gmail.com>; Howell, Gordon <ghowell@spokanetransit.com>; Hughes, Rick <rhughes@spokanecity.org>; Hynes, Mike <mhynes@spokanetransit.com>; Johnson, Candy <CandyJ@spokaneschools.org>; Kaehler, Gretchen <gretchen.kaehler@DAHP.wa.gov>; Kay, Char <kayc@wsdot.wa.gov>; Kegley, Daniel <dkegley@spokanecity.org>; Kells, Patty <pkells@spokanecity.org>; Koch, Lori <lori.koch@amr.net>; Kokot, Dave <dkokot@spokanecity.org>; Madunich, Tony <tmadunich@spokanecity.org>; Mallahan, Jonathan <jmallahan@spokanecity.org>; McCann, Jacob <Jacob.mccann@dnr.wa.gov>; McClure, Jeff <Jmcclure@cheneysd.org>; Meyer, Eric <EMeyer@srhd.org>; Miller, Katherine E <kemiller@spokanecity.org>; Moore, David <david.moore@ecy.wa.gov>; Moore, Michael <michael.s.moore@williams.com>; Morris, Mike <mmorris@spokanecity.org>; Neff, Julie <jneff@spokanecity.org>; Neighborhood Services <Neigh.Svcs@SpokaneCity.org>; Nilsson, Mike <mnilsson@spokanecity.org>; Note, Inga <inote@spokanecity.org>; Nyberg, Gary <GNYBERG@spokanecounty.org>; Palmquist, Tami <tpalmquist@spokanecity.org>; Peacock, William <wpeacock@spokanecity.org>; Pederson, John <JPederson@spokanecounty.org>; Qureshi, Megan <mqureshi@spokanecity.org>; Ragaza-Bourassa, Anna <annarb@srtc.org>; Richman, James <jrichman@spokanecity.org>; Sakamoto, James <jsakamoto@spokanecity.org>; Sanders, Theresa <tsanders@spokanecity.org>; SEPA Center <sepacenter@dnr.wa.gov>; Sikes, Jeremy <jsik461@ecy.wa.gov>; Steele, David <dsteele@spokanecity.org>; Trautman, Heather <htrautman@spokanecity.org>; Wallace, Kevin <kwallace@srtc.org>; Weinand, Kathleen <kweinand@spokanetransit.com>; Weingart, LuAnn <luann.weingart@avistacorp.com>; Wendle, Ned <ned.wendle@mead354.org>; Westby, April <awestby@spokanecleanair.org>; Windsor, Scott <swindsor@spokanecity.org>
Cc: Black, Tirrell <tblack@spokanecity.org>; Freibott, Kevin <kfreibott@spokanecity.org>
Subject: City of Spokane Z1500084COMP #2 of 4 Comprehensive Plan Amendment

Dear Agency or Interested City Department Reviewer,

This is the second of four emails with "Request for Comment" and SEPA consultation on four Proposed Annual Amendment's to the City's Comprehensive Plan Land Use Plan Map.

For each, you will receive a copy of the Request for Comments and SEPA checklist attached. For more information including maps and application documents go to:
https://my.spokanecity.org/projects/comprehensive-plan-amendment-cycle-2015-2016/

Please feel free to contact me if you have any questions,
Sincerely,

Tirrell Black
City of Spokane | Assistant Planner
509.625.6185 | *fax* 509.625.6013 | tblack@spokanecity.org | spokanecity.org

ATTACHMENT B - Preliminary and Final Plats - Indian Trail Vicinity

DATE: 2/15/2016

Prepared for the North Indian Trail 2015/2016 Comp Plan Amendment Applications - Includes development that would be expected to contribute to traffic and transportation capacity on Indian Trail and Francis.

Please note that this table represents a summary of available information and is neither exhaustive nor representative of all approvals, applications, or requirements concerning the listed projects. Refer to project documentation for more information.

FINAL PLAT?	Project Name	Plat Status	Prelim Plat	Prelim Plat Date	Final Plat	Final Plat Date	Buildout Status	Size (GIS)	Zoning	Single-Family		Two-Family[1]		Multi-Family	
										SF Units In Plat	SF Units Unbuilt	TF Units in Plat	TF Units Unbuilt	MF Units in Plat	MF Units Unbuilt
N	Hunt's Pointe	Prelim Plat	Z0800063-PP	10/14/2009	n/a	-	No Final Plat	52.56	RSF, RTF	183	183	48	48		
Y	Windhaven First Addition	Final Plat	Z9700051-PP/PUD	12/8/2003	Z0500112-FP/PUD	9/27/2006	Not started	49.48	RSF, RTF	286	286				
Y	Diamond Rock (Homestead) Apartments (AKA Indian Trail BSP)	BSP approved	Z0800004-BSP (Binding Site Plan, Not Plat)	4/23/2009	Building Permits: B1501541 B1501543 B1501544	-	Under Construction (No Further Permits)	4.32	O-35	0	0			96	96
Y	Estates at Rocky Ridge - off Lincoln Rd	Final Plat	Z0500089-PP/PUD	5/2/2006	Z0700037-FP/PUD	12/3/2007	Under Construction	13.17	RSF	42	15				
Y	Westwinds PUD - off Strong Rd - to Lowell	Final Plat	Z0500010-PP/PUD	6/8/2005	Z0600046-FP/PUD	2/22/2008	Under construction	19.96	RSF	36	19				
Y	Replat McCarroll's Addition Phase 2	Final Plat	Z1300061-PPLT	1/21/2014	Z1500038-FPLT	7/15/2015	Not Started	2.69	RSF	13	13				
Y	McCarroll's East 3rd Add	Final Plat	Z9400073-PP/ZC	11/19/1994	Z0500081-FP	8/24/2006	Under Construction	19.18	RSF	44	10				
Y	McCarroll's East 4th Add	Final Plat (Proposed)	Z9400073-PP/ZC	11/19/1994	Z1500028-FPLT	In Process	FPLT Application in Process	8.58	RSF	15	15				
N	McCarroll East[3]	Prelim Plat	Z9400073-PP/ZC	11/19/1994	Various (See Items Above)	-	Various Final Plats Listed Separately	118.2	RSF, RTF	133	7	28	28		
Y	Ponderosa Ridge 3rd Addition	Final Plat	Z0000045-PP/PUD Z1000065-PPLT	7/20/2000 4/20/2011	Z1200004-FPLT	7/11/2012	Under Construction	9.94	RSF	43	12				
Y	Ponderosa Ridge 4th Addition	Final Plat (Proposed)	Z0000045-PP/PUD Z1000065-PPLT	7/20/2000 4/20/2011	Z1600082-FPLT	In Process	FPLT Application in Process	18.95	RSF	25	25				
Y	Woodridge View 1st Addition	Long Plat	Z0100033-PP	7/20/2001	Z0600060-FP	11/16/2006	Under Construction	24.72	RSF	40	7				

Notes:

[1] For every two-family lot approved there are assumed to be two units; each duplex = two dwelling units.

[2] A Binding Site Plan was approved for this parcel. However, the BSP expired and the current project under construction is not being constructed as part of the BSP, rather as a new project outside the BSP. As no change in use or division of land was necessary, only building permits were required prior to construction.

[3] The original McCarroll East preliminary plat approval included 257 single-family lots, 30 duplex lots, and 11 larger undivided parcels. Only those lots allowed prior to additional traffic analysis, AKA "Phase I" (per HE decision Z9400073PP/ZC/R) are listed herein. The "Unbuilt" category in this row only includes lots that were not already included in final plats in other rows on this table.

	Single-Family		Two-Family		Multi-Family	
	SF Units In Plat	SF Units Unbuilt	TF Units in Plat	TF Units Unbuilt	MF Units in Plat	MF Units Unbuilt
Total Units in Final Plats	**544**	**402**	**0**	**0**	**96**	**96**
Total Units in Preliminary Plats, Not Yet Finalized	**316**	**190**	**76**	**76**	**0**	**0**
Total Units in Final Plats not including the current applications for Comprehensive Plan Amendments	258	116	0	0	96	96
Total Units in Preliminary Pats not including the current applications for Comprehensive Plan Amendments	183	183	48	48	0	0

Exhibit S-3

City of Spokane Comprehensive Plan - selected Goals/Policies
For Discussion Purposes, these have been excerpted from the Comp Plan.
For full copy of City of Spokane Comprehensive Plan go to: my.spokanecity.org/services/

From Chapter 3, Land Use:

LU 1 CITYWIDE LAND USE

Goal: Offer a harmonious blend of opportunities for living, working, recreation, education, shopping, and cultural activities by protecting natural amenities, providing coordinated, efficient, and cost effective public facilities and utility services, carefully managing both residential and nonresidential development and design, and proactively reinforcing downtown Spokane's role as the urban center.

Policy:
LU 1.3 Single-Family Residential Areas
Protect the character of single-family residential neighborhoods by focusing higher intensity land uses in designated centers and corridors.

Discussion: The city's residential neighborhoods are one of its most valuable assets. They are worthy of protection from the intrusion of incompatible land uses. Centers and corridors provide opportunities for complementary types of development and a greater diversity of residential densities.
Complementary types of development may include places for neighborhood residents to work, shop, eat, and recreate. Development of these uses in a manner that avoids negative impacts to surroundings is essential. Creative mechanisms, including design standards, must be implemented to address these impacts so that potential conflicts are avoided.

Policy: LU 1.4 Higher Density Residential Uses
Direct new higher density residential uses to centers and corridors designated on the land use plan map.

Discussion: Higher density housing of various types is the critical component of a center.
Without substantially increasing population in a center's immediate vicinity, there is insufficient market demand for goods and services at a level to sustain neighborhood-scale businesses.
Higher density residential uses in centers range from multi-story condominiums and apartments in the middle to small-lot homes at the edge. Other possible housing types include townhouses, garden apartments, and housing over retail space.

To ensure that the market for higher density residential use is directed to centers, future higher density housing generally is limited in other areas. The infill of Residential 15+ and Residential
15-30 residential designations located outside centers are confined to the boundaries of existing multi-family residential designations where the existing use of land is predominantly higher density residential.

From Chapter 3, Land Use:

LU 3 EFFICIENT LAND USE

Goal: Promote the efficient use of land by the use of incentives, density and mixed-use development in proximity to retail businesses, public services, places of work, and transportation systems.

Policy:

LU 3.1 Coordinated and Efficient Land Use

Encourage coordinated and efficient growth and development through infrastructure financing and construction programs, tax and regulatory incentives, and focused growth in areas where adequate services and facilities exist or can be economically extended.

Discussion: Future growth should be directed to locations where adequate services and facilities are available. Otherwise, services and facilities should be extended or upgraded only when it is economically feasible to do so.

The centers and corridors designated on the land use plan map are the areas of the city where incentives and other tools should be used to encourage infill development, redevelopment and new development. Examples of incentives the city could use include assuring public participation, using public facilities and lower development fees to attract investment, assisting with project financing, zoning for mixed-use and higher density development, encouraging rehabilitation, providing in-kind assistance, streamlining the permit process, providing public services, and addressing toxic contamination, among other things.

LU 3.2 Centers and Corridors

Designate centers and corridors (neighborhood scale, community or district scale, and regional scale) on the land use plan map that encourage a mix of uses and activities around which growth is focused.

Discussion: Suggested centers are designated where the potential for center development exists. Final determination is subject to the neighborhood planning process.

Neighborhood Center

Neighborhood centers designated on the Land Use Plan map have a greater intensity of development than the surrounding residential areas. Businesses primarily cater to neighborhood residents, such as convenience businesses and services. Drive-through facilities, including gas stations and similar auto-oriented uses tend to provide services to people living outside the surrounding neighborhood and should be allowed only along principal arterials and be subject to size limitations and design guidelines. Uses such as a day care center, a church, or a school may also be found in the neighborhood center.

Businesses in the neighborhood center are provided support by including housing over ground floor retail and office uses. The most dense housing should be focused in and around the neighborhood center. Density is high enough to enable frequent transit service to a neighborhood center and to sustain neighborhood businesses. Housing density should decrease as the distance from the neighborhood center increases. Urban design guidelines of the Comprehensive Plan or a neighborhood plan are used to guide architectural and site design to promote compatible, mixed land uses, and to promote land use compatibility with adjoining neighborhoods.

Buildings in the neighborhood center are oriented to the street. This encourages walking by providing easy pedestrian connections, by bringing activities and visually interesting features closer to the street, and by providing safety through watchful eyes and activity day and night. Parking lots should not dominate the frontage of these pedestrian-oriented streets, interrupt pedestrian routes, or negatively impact surrounding neighborhoods. Parking lots should be located behind or on the side of buildings as a rule.

To promote social interaction and provide a focal point for the center, a central gathering place, such as a civic green, square, or park, should be provided. To identify the center as the major activity area of the neighborhood, it is important to encourage buildings in the core area of the neighborhood center to be taller. Buildings up to three stories are encouraged in this area. Attention is given to the design of the circulation system so pedestrian access

between residential areas and the neighborhood center is provided. To be successful, centers need to be integrated with transit. Transit stops should be conveniently located near commercial and higher density residential uses, where transit service is most viable.

The size and composition of neighborhood centers, including recreation areas, vary by neighborhood, depending upon location, access, neighborhood character, local desires, and market opportunities. Neighborhood centers should be separated by at least one mile (street distance) or as necessary to provide economic viability. As a general rule, the amount of commercial space and percent devoted to office and retail should be proportional to the number of housing units in the neighborhood. The size of individual commercial business buildings should be limited to assure that the business is truly neighborhood serving. The size of the neighborhood center, including the higher density housing surrounding the center, should be approximately 15 to 25 square blocks. The density of housing should be about 32 units per acre in the core of the neighborhood center and may be up to 22 units per acre at the perimeter.

District Center
District centers are designated on the land use plan map. They are similar to neighborhood centers, but the density of housing is greater (up to 44 dwelling units per acre in the core area of the center) and the size and scale of schools, parks, and shopping facilities are larger because they serve a larger portion of the city. As a general rule, the size of the district center, including the higher density housing surrounding the center, should be approximately 30 to 50 square blocks.

As with a neighborhood center, buildings are oriented to the street and parking lots are located behind or on the side of buildings whenever possible. A central gathering place, such as a civic green, square, or park is provided. To identify the district center as a major activity area, it is important to encourage buildings in the core area of the district center to be taller. Buildings up to five stories are encouraged in this area

The circulation system is designed so pedestrian access between residential areas and the district center is provided. Frequent transit service, walkways, and bicycle paths link district centers and the downtown area.

Employment Center
Employment centers have the same mix of uses and general character features as neighborhood and district centers but also have a strong employment component. The employment component is expected to be largely non-service related jobs incorporated into the center or on land immediately adjacent to the center.

Employment centers vary in size from 30 to 50 square blocks plus associated employment areas.
The residential density in the core area of the employment center may be up to 44 dwelling units per acre.
Surrounding the center are medium density transition areas at up to 22 dwelling units per acre.

Corridors
Corridors are areas of mixed land use that extend no more than two blocks in either direction from the center of a transportation corridor.

Within a corridor, there is a greater intensity of development in comparison to the surrounding residential areas. Housing at a density up to 44 units per acre and employment densities are adequate to support frequent transit service. The density of housing transitions to a lower level (up to 22 units per acre) at the outer edge of the corridor. A variety of housing styles, apartments, condominiums, rowhouses, and houses on smaller lots are allowed.
A full range of retail services, including grocery stores serving several neighborhoods, theaters, restaurants, dry-cleaners, hardware stores, and specialty shops are also allowed.
Low intensity, auto-dependent uses (e.g., lumber yards, automobile dealers, and nurseries) are prohibited.

Corridors provide enhanced connections to other centers, corridors, and downtown Spokane. To accomplish this, it is important to make available safe, attractive transit stops and pedestrian and bicycle ways. The street environment for pedestrians is much improved by placing buildings with multiple stories close to the street with wide sidewalks and street trees, attractive landscaping, benches, and frequent transit stops. Parking lots should not dominate the

frontage of these pedestrian-oriented streets, interrupt pedestrian routes, or negatively impact surrounding neighborhoods. Parking lots should be located behind or on the side of buildings whenever possible.

Regional Center
Downtown Spokane is the regional center, containing the highest density and intensity of land use. It is the primary economic and cultural center of the region. Emphasis is on providing more housing opportunities and neighborhood services for downtown residents, in addition to enhancing economic, cultural, and social opportunities for the city and region.

LU 3.3 Planned Neighborhood Centers

Designate new centers or corridors in appropriate locations on the land use plan map through a neighborhood planning process.

Discussion: The comprehensive plan recognizes that centers and corridors are the most appropriate venue for the location of commercial and higher density residential uses. In some areas of the city, there may be a need to establish a center or corridor. The exact location, boundaries, size, and mix of land uses in a potential neighborhood center should be determined through the neighborhood planning process. This process may be initiated by the city at the request of a neighborhood or private interest. Objective criteria should include:

- ♦ existing and planned density;
- ♦ amount of commercial land needed to serve the neighborhood;
- ♦ transportation investments and access including public transit; and
- ♦ other characteristics of a neighborhood center as provided in this plan, or as further refined.

LU 3.4 Planning for Centers and Corridors

Utilize basic criteria for growth planning estimates and, subsequently, growth targets for centers, and corridors.

Discussion: Growth planning estimates and growth targets for centers and corridors should be based on:

- ♦ availability of infrastructure;
- ♦ public amenities and related facilities and services capacity for residential and commercial development;
- ♦ existing and proposed residential densities and development conditions;
- ♦ accessibility of transit; and,
- ♦ density goals for centers and corridors.

LU 3.5 Mix of Uses in Centers

Achieve a proportion of uses in centers that will stimulate pedestrian activity and create mutually reinforcing land uses.

Discussion: Neighborhood, District, and Employment Centers are designated on the land use plan maps in areas that are substantially developed. New uses in centers should complement existing on-site and surrounding uses, yet seek to achieve a proportion of uses that will stimulate pedestrian activity and create mutually reinforcing land use patterns. Uses that will accomplish this include public, core commercial/office and residential uses.

All centers are mixed-use areas. Some existing uses in designated centers may fit with the center concept; others may not. Planning for centers should first identify the uses that do not fit and identify sites for new uses that are missing from the existing land use pattern. Ultimately, the mix of uses in a center should seek to achieve the following minimum requirements:

TABLE LU 1 MIX OF USES IN CENTERS		
Use	**Neighborhood Center**	**District and Employment Center**
Public	10 percent	10 percent
Commercial/Office	20 percent	30 percent
Higher Density Housing	40 percent	20 percent
Note: All percentage ranges are based on site area, rather than square footage of building area.		

This recommended proportion of uses is based on site area and does not preclude additional upper floors with different uses.

The ultimate mix of land uses and appropriate densities should be clarified in a site-specific planning process in order to address site-related issues such as community context, topography, infrastructure capacities, transit service frequency, and arterial street accessibility. Special care should be taken to respect the context of the site and the character of surrounding existing neighborhoods. The 10 percent public use component is considered a goal and should include land devoted to parks, plazas, open space, and public facilities.

LU 3.6 Neighborhood Centers

Designate the following seven locations as neighborhood centers on the land use plan map.

- Indian Trail and Barnes;
- South Perry;
- Grand Boulevard/12th to 14th;
- Garland;
- West Broadway;
- Lincoln and Nevada;
- Fort George Wright Drive and Government Way.

From Chapter 3, Land Use:

LU 4 TRANSPORTATION

Goal: Promote a network of safe and cost effective transportation alternatives, including transit, carpooling, bicycling, pedestrian-oriented environments, and more efficient use of the automobile, to recognize the relationship between land use and transportation.

Policy:

LU 4.1 Land Use and Transportation

Coordinate land use and transportation planning to result in an efficient pattern of development that supports alternative transportation modes consistent with the transportation chapter and makes significant progress toward reducing sprawl, traffic congestion, and air pollution.

Discussion: The GMA recognizes the relationship between land use and transportation. It requires a transportation element that implements, and is consistent with, the land use element.

The transportation element must forecast future traffic and provide information on the location, timing, and capacity needs of future growth. It must also identify funding to meet the identified needs. If probable funding falls short of needs, the GMA requires the land use element to be reassessed to ensure that needs are met.

From Chapter 3, Land Use:

LU 5 DEVELOPMENT CHARACTER

Goal: Promote development in a manner that is attractive, complementary, and compatible with other land uses.

Policy:

LU 5.1 Built and Natural Environment

Ensure that developments are sensitive to and provide adequate impact mitigation so that they maintain and enhance the quality of the built and natural environment (e.g., air and water quality, noise, traffic congestion, and public utilities and services).

LU 5.5 Compatible Development

Ensure that infill and redevelopment projects are well-designed and compatible with surrounding uses and building types.

From Chapter 4, Transportation:

TR 2 TRANSPORTATION OPTIONS

Goal: Provide a variety of transportation options, including walking, bicycling, taking the bus, carpooling, and driving private automobiles, to ensure that all citizens have viable travel options and reduce dependency on automobiles.

Policy:

TR 2.2 TDM Strategies

Use Transportation Demand Management strategies to reduce the demand for automobile travel.

Discussion: Transportation Demand Management (TDM) is an approach to solving transportation problems that focuses on reducing the demand for automobile travel rather than increasing the system capacity (supply) for automobile travel. TDM strategies should be particularly aimed at reducing the volume of single occupancy vehicles. TDM is a valuable tool with which to address transportation problems because it generally avoids the high environmental, financial, and human costs associated with capacity-oriented solutions, such as road construction. The Commute Trip Reduction Program provides TDM techniques locally.

TDM involves two types of strategies. One strategy reduces the demand for single-occupant automobiles. This is accomplished through programs, such as:

- Employer-subsidized bus passes and other financial incentives for transit use.
- Infrastructure changes, such as providing safe and convenient bicycle parking and safe and convenient bikeways from residential to work, school, and shopping locations, to increase the use of non-motorized modes of transportation.
- Parking management that reduces the amount of easy and cheap parking for employees provided this does not lead to an unacceptable reduction in available parking for residents in adjacent areas.
- Preferential parking for car pools and vanpools.
- The building of lockers, change rooms, and shower facilities for bicyclists.
- Ride match services.

The other TDM strategy reduces the overall need for travel by any means. This is accomplished through programs, such as:

- Flexible work schedules, including four-day work week.

♦ Teleworking (using telecommunications and computer technology to work from home to another location).

TDM techniques should be used to reduce the demand for both work-related travel and non-work related travel, such as shopping and errands.

TR 2.3 Pedestrian/Bicycle Coordination

Provide adequate City of Spokane staff dedicated to pedestrian/bicycle planning and coordination to ensure that projects are developed that meets the safety, access, and transportation needs of pedestrians, bicyclists, and other non-motorized transportation users.

Discussion: One of the main themes of this plan is that citizens should have viable transportation options. Accomplishing this requires the attention of City of Spokane staff from a variety of departments and disciplines. Some staff time, however, should be entirely devoted to the needs of pedestrians, bicyclists, and other non-motorized transportation users. This staff will work to accomplish the goals and carry out the policies of the City of Spokane's plans as they relate to non-motorized transportation users. Projects for the coordinator could include:

♦ Coordinating with City of Spokane departments and other agencies to efficiently provide for transportation alternatives and facilitate the accomplishment of the city's transportation priorities.

♦ Incorporating bicycle/pedestrian facilities as early as possible into plans to reduce costs and take advantage of cooperative opportunities.

♦ Serving as a resource for city departments for facility standards (such as Americans with Disabilities Act (ADA) requirements) so issues can be efficiently addressed.

♦ Seeking funding sources for transportation alternatives.

♦ Developing and implementing design guidelines to ensure that public and private developments meet a variety of transportation needs.

♦ Developing transportation-related educational programs for both non-motorized and motorized transportation users.

♦ Encouraging promotional events for transportation alternatives.

♦ Supporting efforts to increase the number of combined bicycle/transit trips.

♦ Developing and implementing specific plans for non-motorized transportation users.

♦ Incorporating bicycle facilities into design standards for4 new development.

♦ Assisting Spokane to achieve higher bicycle friendly city ratings.

♦ Promoting Spokane as a bicycle friendly city.

Providing adequate City of Spokane staff dedicated to pedestrian and bicycle planning and coordination is the best way to ensure that the interests of the pedestrian and bicycling community will be incorporated in the formation of public transportation policy, the development of transportation facilities, and in the fair disbursement of public funds for this important and currently under-served community.

TR 2.14 Bikeways

Provide safe, convenient, continuous bikeways between activity centers and through the city.

Discussion: Some city streets are more bicycle friendly than others due to hills, traffic flow, speed, and the access they provide for bicyclists. Providing bicycle facilities that link city centers and the downtown core through identified corridors will encourage utilitarian cycling. This will serve to decrease traffic and its intrinsic problems (e.g. air and noise pollution). Bikeways should be designed and maintained that are clearly marked, safe, and that serve the needs of bicyclists for both thru-routes and destinations.

TR 2.15 Bicycles on Streets

Provide safe accommodations for bicyclists on the street system, which will continue to be the primary route system for bicyclists.

Discussion: The street system serves to connect citizens throughout the city. City of Spokane staff should coordinate with designers, engineers, law enforcement, "citizen advisory boards" such as the Bicycle Advisory Board, Department of Licensing, and educators to ensure that the street environment is safe and practical for bicyclists. All street users should be taught to understand and respect the rights of other street users to ensure safe and pleasant travel. Bicycles are legal on all public roadways unless specifically prohibited. Drivers Education classes could include detailed information about bicycling and the need for cooperation among road users while laws pertaining to bicyclists should be strictly enforced.

TR 3 TRANSPORTATION AND LAND USE

Goal: Recognize the key relationship between the places where people live, work, and shop and their need to have access to these places; use this relationship to promote land use patterns, transportation facilities, and other urban features that advance Spokane' s quality of life.

Policy:

TR 3.1 Transportation and Development Patterns

Use the city's transportation system and infrastructure to support desired land uses and development patterns, especially to reduce sprawl and encourage development in urban areas.

Discussion: Transportation and land use planning must be coordinated for the city to function smoothly, efficiently, and healthily. Investments in new transportation infrastructure can have both positive and negative impacts on the city. For example, while it may be relatively easy to build new streets or expand existing streets at the edge of the city to add transportation capacity, that can lead to sprawling development that, in the long run, is costly to the city.

This policy is particularly important given two goals of the GMA, which state:

- "Encourage development in urban areas where adequate public facilities and services exist or can be provided in an efficient manner."
- "Reduce the inappropriate conversion of undeveloped land into sprawling, low density development."

TR 3.2 Reduced Distances to Neighborhood Services

Provide a variety of services within neighborhoods that are convenient to and meet the needs of neighborhood residents, decreasing the need for driving.

Discussion: Providing a variety of services within neighborhoods decreases the distances needed to travel to meet daily needs, making opportunities for walking and bicycling more feasible. The services are intended to serve the daily needs of neighborhood residents, not to draw people from outside the neighborhood. Furthermore, the design of the buildings housing these services must be compatible with the neighborhood.

TR 3.3 Walking and Bicycling-Oriented Neighborhood Centers

Incorporate physical features in neighborhood centers to promote walking, bicycling, and other non-motorized modes of transportation to and within the centers, reducing the need for driving.

Discussion: This policy, though similar to TR 2.1, "Physical Features," is included to ensure that the neighborhood services desired in TR 3.2, "Reduced Distances to Neighborhood Services," are walking and

bicycling oriented. Development that requires driving to the development and from place to place within the development should be avoided.

TR 3.4 Increased Residential Densities

Increase residential densities, as indicated in the land use element of the City of Spokane's Comprehensive Plan, to support the efficient functioning of transit and mass transit.

Discussion: Residential densities relate strongly to transportation options. Lower densities decrease the ability to provide efficient alternative transportation modes while higher densities increase the ability. Furthermore, sprawling growth increases the stress on the transportation system in that the more spread out the city becomes, the farther people have to travel and the less likely they will be to walk, bicycle, or take the bus. This policy does not mean that there will be no single-family residential areas in the city. This policy has an essential link to policy TR 3.6, "Use of Design."

From Chapter 5, Capital Facilities & Utilities:

CFU 2 CONCURRENCY

Goal: Ensure that those public facilities and services necessary to support development are adequate to serve the development and available when the service demands of development occur without decreasing current service levels below locally established minimum standards.

Policy CFU 2.1 Available Public Facilities

Consider that the requirement for concurrent availability of public facilities and utility services is met when adequate services and facilities are in existence at the time the development is ready for occupancy and use, in the case of water, wastewater and solid waste, and at least a financial commitment is in place at the time of development approval to provide all other public services within six years.

Discussion: Public facilities are those public lands, improvements, and equipment necessary to provide public services and allow for the delivery of services. They include, but are not limited to, streets, roads, highways, sidewalks, street and road lighting systems, traffic signals, domestic water systems, storm and sanitary sewer systems, solid waste disposal and recycling, fire and police facilities, parks and recreational facilities, schools and libraries.

It must be shown that adequate facilities and services are available before new development can be approved. While occupancy and use imply an immediate need for water, wastewater and solid waste services, other public services may make more sense to provide as the demand arises. For example, a certain threshold of critical mass is often needed before construction of a new fire station, school, library, or park is justified. If these facilities and services do not currently exist, commitments for services may be made either from the public or the private sector. Public commitments are documented through the Capital Facilities Program and the relevant Six-Year Capital Improvement Plans.

If there is no public commitment to provide needed resources, the development could still proceed if the developer assumes responsibility for provision of all needed facilities and services, either through actual provision of the facility or service, or appropriate financial assurances that facilities and services will be provided in a timely manner. In this case, the City of Spokane may enter into an agreement with the developer for repayment through latecomer fees, special connection fees, or other payments earmarked for or pro-ratable to the particular system improvement.

Policy
CFU 2.2 Concurrency Management System
Maintain a concurrency management system for all capital facilities.

Discussion: A concurrency management system is defined as an adopted procedure or method designed to ensure that adequate public facilities and services needed to support development and protect the environment are available when the service demands of development occur.

The following facilities must meet adopted level of service standards and be consistent with the concurrency management system: fire protection, police protection, parks and recreation, libraries, public wastewater (sewer and stormwater), public water, solid waste disposal and recycling, transportation, and schools.
The procedure for concurrency management includes annual evaluation of service levels and land use trends in order to anticipate demand for service and determine needed improvements.

Findings from this review will then be addressed in the Six-Year Capital Improvement Plans,
Annual Capital Budget, and all associated capital facilities documents to ensure that financial planning remains sufficiently ahead of the present for concurrency to be evaluated.

The City of Spokane must either ensure that adequate facilities are available to support development or else prohibit development approval when such development would cause service levels to decline below standards currently established in the Capital Facilities Program.

In the event that reduced funding threatens to halt development, it is much more appropriate to scale back land use objectives than to merely reduce level of service standards as a way of allowing development to continue. This approach is necessary in order to perpetuate a high quality of life. All adjustments to land use objectives and service level standards will fall within the public review process for annual amendment of the Comprehensive Plan and Capital Facilities Program.

CFU 2.6 Funding Shortfalls
Reassess the land use element whenever probable funding falls short of meeting existing needs in order to ensure that development patterns and level of service standards remain consistent with financing capabilities related to capital facilities plans.

Discussion: The GMA requires consistency and conformity between plans and budgets so that development does not occur before there are adequate services to support it. In this regard, the land use element, capital facilities plan element, and financing plan within the capital facilities plan element should be coordinated and consistent.

In the event that reduced funding threatens to halt development, it is much more appropriate to scale back land use objectives than to reduce level of service standards as a way of allowing development to continue. This approach is necessary in order to perpetuate a high quality of life.

All adjustments to land use objectives and service level standards will fall within the public review process for annual amendment of the comprehensive plan and Capital Facilities Program.

From Chapter 5, Capital Facilities & Utilities:

CFU 4 SERVICE PROVISION
Goal: Provide public services in a manner that facilitates efficient and effective delivery of services and meets current and future demand.

Policy
CFU 4.1 Compact Development
Promote compact areas of concentrated development in designated centers to facilitate economical and efficient provision of utilities, public facilities, and services.

Discussion: Infill and dense development should be encouraged where excess capacity is available since compact systems are generally less expensive to build and maintain. However, it may also be necessary to periodically include upgrades in the Six-Year Capital Improvement Plans if sufficient capacity is not currently available to support intensification of development in target areas.

From Chapter 5, Capital Facilities & Utilities:

CFU 6 MULTIPLE OBJECTIVES
Goal: Use capital facilities and utilities to support multiple interests and purposes.

Policy
CFU 6.1 Community Revitalization
Provide capital facilities and utility services strategically in order to encourage and support the development of Centers and Corridors, especially in older parts of the city.

Discussion: Public investment often needs to be the first step toward revitalization of a community. Once the public sector takes steps to rehabilitate and improve dilapidated and deteriorated areas of the city, this inspires the confidence that encourages private investment to follow.

While Six-Year Capital Improvement Plans must cover maintenance and repair of existing facilities, projects that expand facilities and services must be done with land use objectives in mind in recognition of the key link between service levels and development. In the past, of capital infrastructure facilities (roads, sewers, water lines, and parks) at the edge of the city limits and beyond has facilitated sprawl and accommodated its impacts. This practice in turn drained away resources needed to meet the service requirements of the inner city neighborhoods. A good rule of thumb for the future is to spend a higher than proportionate share of all capital dollars in central city neighborhoods in order to bring infrastructure back into the older parts of the city where the need for revitalization is greatest. In this way, the economic viability and desirability of the city center can be restored, creating a cycle of enhancement that sustainable.

From Chapter 6, Housing:

H 1 AFFORDABLE HOUSING
Goal: Provide sufficient housing for the current and future population that is appropriate, safe, and affordable for all income levels.

H 1.4 Use of Existing Infrastructure

Direct new residential development into areas where community and human public services and facilities are available and in a manner that is compatible with other Comprehensive Plan elements.

Discussion: Using existing services and infrastructure often reduces the cost of creating new housing. New construction that takes advantage of existing services and infrastructure conserves public resources that can then be redirected to other needs such as adding amenities to these projects.

H 2 HOUSING CHOICE AND DIVERSITY

Goal: Increase the number of housing alternatives within all areas of the city to help meet the changing needs and preferences of a diver se population.

Policy
H 2.1 Distribution of Housing Options

Promote a wide range of housing types and housing diversity to meet the needs of the diverse population and ensure that this housing is available throughout the community for people of all income levels and special needs.

Discussion: A variety of housing types should be available in each neighborhood. The variety of housing types should not concentrate or isolate lower-income and special needs households.
Diversity includes styles, types, and cost of housing.

Many different housing forms can exist in an area and still exhibit an aesthetic continuity. In many cases, -based design guidelines will be available to guide the design of the housing forms. Allowing a wide range of housing types throughout the city provides the opportunity for increased socioeconomic integration.

Housing standards that will be allowed throughout the city include small single-family lot sizes, manufactured housing on single-family lots, townhouses, condominiums, clustering, and other options that increase the supply of affordable home ownership opportunities.

From Chapter 8, Urban Design & Historic Preservation:

DP 1 PRIDE AND IDENTITY

Goal: Enhance and improve Spokane's visual identity and community pride while striving to maintain its visual diversity.

Policy
DP 1.4 New Development in Established Neighborhoods

Ensure that new development is of a type, scale, orientation, and design that maintains or improves the character, aesthetic quality, and livability of the neighborhood.

Discussion: While compatibility is more of an issue in established neighborhoods, new development needs to take into account the context of the area and should result in an improvement to the surrounding neighborhood.

DP 3 FUNCTION AND APPEARANCE

Goal: Use design to improve how development relates to and functions within its surrounding environment.

Policy
DP 3.8 Infill Development

Ensure that infill construction and area redevelopment are done in a manner that reinforces the established neighborhood character and is architecturally compatible with the surrounding existing commercial and residential areas.

Discussion: Infill construction can represent a benefit to the community that does not necessitate an expansion of the infrastructure when done in a manner that does not detract from the area.
Flexible design standards enable infill development that is architecturally compatible with the context of the proposed area by permitting higher intensity activities without detracting from the existing character of the area.

DP 6 NEIGHBORHOOD QUALITIES

Goal: Preserve, improve, and support the qualities of individual neighborhood areas.

Policy

DP 6.2 Access to Housing Choices

Encourage building and site design that that allows a variety of housing forms while being compatible with the character of the immediate surrounding area, thereby generating community support for development at planned densities.

Discussion: Increasing housing densities and innovative development protects special sites, and enables the efficient use of remaining buildable land, the efficient and cost effective provision of city facilities and services, the provision of affordable housing, and the promotion of increased ridership on mass transit. A variety of housing types, such as townhouses, courtyard buildings, and housing clusters, contributes to housing diversity and interest, and provides more opportunities for prospective residents. Design that is compatible with the surroundings helps make increased densities acceptable to the current residents. Higher residential density in commercial areas can provide additional economic stability for businesses while lessening automobile dependence.

N 8 NEIGHBORHOOD PLANNING PROCESS

Goal: Ensure a sense of identity and belonging for neighborhoods throughout the city and the city' s Urban Growth Area by developing a neighborhood planning process that is all-inclusive, maintains the integrity of neighborhoods, implements the comprehensive plan, and empowers neighborhoods in their decision-making.

Policy

N 8.4 Consistency of Plans

Maintain consistency between neighborhood planning documents and the comprehensive plan.

Discussion: The "framework" comprehensive plan guides all aspects of the city's growth and development for the next twenty years. The plan provides the overall scheme of city development: the major land uses, transportation systems, parks, recreation, and open spaces, and centers of shopping and employment. The comprehensive plan establishes the framework for all other planning activities and documents.

It is recognized that in some cases neighborhood planning may result in recommended changes to the comprehensive plan. Comprehensive Plan changes will be reviewed and decided upon once each year.

(end)

12/4/07

RECEIVED
NOV 15 2007
CITY CLERK'S OFFICE
SPOKANE, WA

AgSht03.30.2007

AGENDA SHEET FOR COUNCIL MEETING OF: November 26, 2007

Submitting Dept.	Contact Person/Phone No.	Council Sponsor
Planning Services Department	Marla French 625-6638	Alexander Joe Shogan, Jr.

ADMINISTRATIVE SESSION
- o Contract
- o Report
- o Claims

LEGISLATIVE SESSION
- o Emergency Ord
- o Resolution
- o Final Reading Ord
- X First Reading Ord
- o Special Consideration
- X Hearing

CITY PRIORITY
- o Communications
- o Economic Development
- X Growth Management
- o Human Services
- o Neighborhoods
- o Public Safety
- o Quality Service Delivery
- o Racial Equity/Cultural Diversity
- o Rebuild/Maintain Infrastructure

CLERK'S FILE _____
RENEWS _____
CROSS REF _____
ENG _____
BID _____
REQUISITION _____

STANDING COMMITTEES (Date of Notification)
- o Finance _____
- X Neighborhoods
- X Planning/Community & Econ Dev 6-4, 8-6, 9-3, 10-1-07
- o Public Safety _____
- o Public Works _____

Neighborhood/Commission/Committee Notified:
Plan Commission workshops: 6-13, 8-23 and 9-12-07
Plan Commission Public Hearing: 10-10-07
Action Taken: Recommend approval

AGENDA WORDING: (If contract, include the term.)

Adoption of proposed changes to the Comprehensive Plan Land Use Plan Map and Official Zoning Map for the North Indian Trail Neighborhood Center as recommended by the City Plan Commission following an abbreviated center planning public participation process.

BACKGROUND: (Attach additional sheet if necessary)

This Center Planning Process is the result of the position created in the 2007 budget to accomplish Center/Corridor and Sub-Area planning. An abbreviated process was implemented to propose changes to the Land Use Plan Map and Zoning Map for the North Indian Trail Neighborhood Center by the North Indian Trail Stakeholder Team. Planning Services Staff facilitated a public participation process amend the Comprehensive Plan Land Use Plan Map and Zoning Map to implement the Center & Corridor concepts I the Comprehensive Plan and to ensure development in the neighborhood center is driven by the desires of those directly affected.

RECOMMENDATION:

Fiscal Impact: o N/A	**Budget Account:** o N/A
o Expenditure: $	#
o Revenue: $	#
X Budget Neutral	

ATTACHMENTS: Include in Packets: Cover letter, Plan Commission Findings & Conclusions, Ordinance, Land Use Plan Map & Official Zoning Map change proposals, SEPA Checklist, Public Comments

On file for Review in Office of City Clerk:

SIGNATURES:

Department Head

Division Director

Finance

Legal

Chief Operating Officer for Mayor

Council President

DISTRIBUTION: Mike Ekins, Plan Commission Chair; James Richman, Legal Dept.; Pat Hall, Planning Services; Louis Meuler, Planning Services; Marla French, Planning Services; Leroy Eadie, Planning Services

COUNCIL ACTION:

FIRST READING OF THE ABOVE ORDINANCE WAS HELD ON November 26, 2007
AND FURTHER ACTION WAS DEFERRED
CITY CLERK

PASSED BY SPOKANE CITY COUNCIL:
DEC 03 2007
CITY CLERK

ORDINANCE NO C 34154

SPOKANE COMPREHENSIVE PLAN LAND USE PLAN MAP and ZONING MAP CHANGES FOR THE NORTH INDIAN TRAIL NEIGHBORHOOD CENTER

An ordinance amending the Spokane Comprehensive Plan Land Use Plan Map and the City of Spokane Official Zoning Map to include the proposed land use plan and official zoning map changes for the North Indian Trail Neighborhood Center;

WHEREAS, the Washington State Legislature passed the Growth Management Act (GMA) in 1990 requiring, among other things, the development of new comprehensive plans for cities such as Spokane; and

WHEREAS, the City of Spokane adopted a Comprehensive Plan on May 21, 2001 that complies with the requirements of the Growth Management Act; and

WHEREAS, the City of Spokane Comprehensive Plan designates 19 mixed-use Centers and Corridors and directs resources towards planning the growth and development of these areas. One of those designated Centers and Corridors is the Garland Neighborhood Center; and

WHEREAS, the City of Spokane Planning Services Department 2007 Work Program designates the North Indian Trail Neighborhood Center as one of four Centers & Corridors with which to conduct an abbreviated planning process; the others are Garland Neighborhood Center, Lincoln Heights District Center, and the North Monroe Corridor; and

WHEREAS, the Planning Services Department, Long Range Planning Section, has worked with the North Indian Trail Stakeholder Team including members from: North Indian Trail Neighborhood Council, Land Development Companies, and general neighborhood/business representatives; and

WHEREAS, the Planning Services staff and the North Indian Trail Stakeholder Team conducted several neighborhood meetings including the following dates: April 16, June 19, June 20, July 18, August 8, and an open house on September 11. In addition, 550 post card notices were sent out to affected properties on July 23, 2007 inviting members of the community to attend the last Stakeholder Team meeting on August 8 and to attend the Open House on September 11, 2007; and

WHEREAS, Planning Community and Economic Development (PCED) sub-committee of the City Council heard presentations about the amendments on June 4, 2007, August 6, 2007, September 2, 2007, and October 1, 2007; and

WHEREAS, in accordance with RCW 36.70A.130(2)(a), amendments to an adopted Comprehensive Plan may be allowed more frequently than once per year if the initial adoption of the sub-area plan did not modify the comprehensive plan policies and designations applicable to the sub-area; and

WHEREAS, the proposal is consistent with RCW 36.70A.020, GMA Planning Goal for Urban Growth which states: Encourage development in urban areas where adequate public facilities and services exist or can be provided in an efficient manner; and

WHEREAS, the proposal is consistent with RCW 36.70A.020, GMA Planning Goal for Housing which states: Encourage the availability of affordable housing to all economic segments of the population of this state, promote a variety of residential densities and housing types, and encourage the preservation of existing housing stock; and

WHEREAS, the proposal is consistent with the Comprehensive Plan Chapter 3 Land Use Goal LU1 Citywide Land Use, "Offer a harmonious blend of opportunities for living, working, recreation, education, shopping, and cultural activities by... carefully managing both residential and non-residential development and design...."; and

WHEREAS, the proposal is consistent with the Comprehensive Plan Chapter 4 Transportation, Section 3 Transportation and Land Use, policy TR 3.2 Reduced Distances to Neighborhood Services, "Provide a variety of services within neighborhoods that are convenient to and meet the needs of neighborhood residents, decreasing the need for driving."; and

WHEREAS, the proposal is consistent with RCW 36.70A.020, Goal 11 Citizen Participation and Coordination of the GMA, was achieved through neighborhood meetings on June 20, 2007, July 18, 2007, and August 8, 2007, and an open house on September 11, 2007. In addition, 550 post card notices were sent out on July 23, 2007; and

WHEREAS, public notice was published in the Spokesman-Review on Wednesday, September 26, 2007 and Wednesday, October 3, 2007 giving notice of the Plan Commission public hearing and giving notice of the released SEPA Checklist and DNS, and encouraging public participation; and

WHEREAS, the City of Spokane also encouraged public participation and provided information on the Sub-Area land use and zoning amendments on its website (http://www.spokaneplanning.org/nit_center.htm); and

WHEREAS, as a result of the City's efforts, the public has had extensive opportunities to participate throughout the Sub-Area amendment process and all persons desiring to comment on the proposal were given a full and complete opportunity to be heard; and

WHEREAS, the Spokane Plan Commission conducted a public hearing on October 10, 2007, for the purposed Comprehensive Plan Land Use Plan Map changes and the proposed Official Zoning Map changes. The Plan Commission deliberated, and voted to recommend to the City Council the proposed Spokane Comprehensive Plan Land Use Plan Map change and the proposed Zoning Map change for the Garland Neighborhood Center on November 6, 2007; and

WHEREAS, the City Council finds that the amendments set forth herein are consistent with the Growth Management Act, and will protect and promote the health, safety and welfare of the general public; and,

NOW, THEREFORE, THE CITY OF SPOKANE DOES ORDAIN: That the Spokane Comprehensive Plan Land Use Plan Map and Official Zoning Map be amended as presented in the attached land use plan map and official zoning map for the North Indian Trail Neighborhood Center.

Passed by the City Council December 03, 2007

Joe Shogan, Council President

Attest: _____
City Clerk

Dated: _____

Mary B. Verner (12-07-07)
Mary B. Verner, Mayor

RECEIVED
12-10-07
CITY CLERK'S OFFICE
SPOKANE, WA

Approved as to form:

_____
Assistant City Attorney

EFFECTIVE DATE: 01-08-08

C 34154

CITY PLAN COMMISSION
808 W. SPOKANE FALLS BLVD.
SPOKANE, WASHINGTON 99201-3329
(509) 625-6060
FAX (509) 625-6013

November 6, 2007

City Council President Joe Shogan and City Council Members
808 W. Spokane Falls Blvd.
Spokane, WA 99201-3329

Re: Proposed map amendments for the North Indian Trail Neighborhood Center

Dear City Council President Joe Shogan and City Council Members:

This process was set in motion by your approval of a Center/Corridor and Sub-Area planning position and support of the Neighborhood/Center & Corridor planning. The North Indian Trail Neighborhood Center was chosen as a participant in this abbreviated planning process for the following reasons:

1. North Indian Trail is designated in the Comprehensive Plan as a Neighborhood Center
2. North Indian Trail has an active Neighborhood Council
3. North Indian Trail has a strong interest in planning issues
4. The North Indian Trail Neighborhood Council agreed to be participants in this process
5. North Indian Trail continues to be heavily impacted by growth and development
6. North Indian Trail is located in Council District 3, the district with the most centers/corridors yet to be planned

The attached proposal requests that amendments be made to the Comprehensive Plan Land Use Plan Map and the Official Zoning Map.

Under the Growth Management Act, RCW 36.70A.130(2)(a)(i), "...Amendments may be considered more frequently than once per year under the following circumstances:

> (i) The initial adoption of a sub-area plan that does not modify the comprehensive plan policies and designations applicable to the sub-area.

The Plan Commission held a public hearing on October 10, 2007 and continued deliberations on November 6, 2007 and after hearing public testimony and reviewing written comments the Plan Commission voted 7 to 0 on November 6, 2007 to recommend approval of the map changes proposed to the Land Use Plan Map and Official Zoning Map.

Sincerely,

Michael J. Ekins
President, City Plan Commission

SPOKANE PLAN COMMISSION FINDINGS AND CONCLUSIONS

LAND USE PLAN MAP AND ZONING MAP AMENDMENTS PROPPOSED AS PART OF THE NORTH INDIAN TRAIL SUB-AREA NEIGHBORHOOD CENTER PROPOSAL
November 6, 2007

RECOMMENDATION: The Spokane City Plan Commission recommends approval of the proposal to changes to the Comprehensive Plan Land Use Plan Map and Official Zoning Map for the North Indian Trail Neighborhood Center as recommended by the North Indian Trail Stakeholder Team following a planning services staff facilitated public participation process. In making this recommendation, the Commission makes the following findings and conclusions:

FINDINGS:

1. The Washington State Legislature passed the Growth Management Act (GMA) in 1990, requiring among other things, the development of a Comprehensive Plan (RCW 36.70A).

2. The City of Spokane adopted a Comprehensive Plan in May of 2001 that complies with the requirements of the Growth Management Act.

3. The City of Spokane Comprehensive Plan designates 19 mixed-use Centers and Corridors and directs resources towards planning the growth and development of these areas. One of those designated Centers and Corridors is the Garland Neighborhood Center.

4. The City of Spokane Planning Services Department 2007 Work Program designates the Garland Neighborhood Center as one of four Centers & Corridors with which to conduct an abbreviated planning process; the others are North Indian Trail Neighborhood Center, Lincoln Heights District Center, and the North Monroe Corridor.

5. The North Indian Trail Neighborhood Center was designated for an abbreviated planning process due to the following: North Indian Trail is designated in the Comprehensive Plan as a Neighborhood Center, North Indian Trail has an active Neighborhood Council, North Indian Trail has a strong interest in planning issues, The North Indian Trail Neighborhood Council agreed to be participants in this process, North Indian Trail continues to be heavily impacted by growth and development, North Indian Trail is located in Council District 3, the district with the most centers/corridors yet to be planned.

6. The Planning Services Department, Long Range Planning Section, has worked with the North Indian Trail Stakeholder Team including members from: North Indian Trail Neighborhood Council, Land Development Companies, and general neighborhood/business representatives.

7. Planning Services Staff and the North Indian Trail Stakeholder Team conducted several neighborhood meetings including the following dates: April 16, June 19, June 20, July 18, August 8, and an open house on September 11. In addition, 550 post card notices were sent out to affected properties on July 23, 2007 inviting members of the community to attend the last Stakeholder Team meeting on August 8 and to attend the Open House on September 11, 2007.

8. PCED heard presentations about the amendments on June 4, 2007, August 6, 2007, September 2, 2007, and October 1, 2007

9. The Spokane City Plan Commission held a workshop to study the amendments on June 13, 2007 and September 12, 2007.

10. A State Environmental Policy Act (SEPA) Checklist and Determination of Non-Significance was issued on September 26, 2007 for the Comprehensive Land Use Plan Map and Zoning Map changes for the North Indian Trail Neighborhood Center. The public comment period for the SEPA determination ended on October 10, 2007.

11. Notice of the SEPA Checklist and Determination, the Land Use Plan Map changes, and the Zoning Map changes for the North Indian Trail Neighborhood Center, and announcement of the October 10, 2007 Plan Commission Public Hearing were published in the Spokesman-Review on Wednesday, September

26, 2007 and Wednesday, October 3, 2007 and posted on the City of Spokane website on September 27, 2007.

12. Notices (184) were mailed to the North Indian Trail Neighborhood Center property owners, tax payers, or occupants who were directly affected (or within 300 feet of areas affected) by the Land Use Plan Map changes and Zoning Map changes on September 26, 2007.

13. The Washington State Department of Community Trade and Economic Development (CTED) and appropriate state agencies were given the required 60-day notice on September 20, 2007. CTED acknowledged the notice via email on September 20, 2007.

14. The Spokane Plan Commission conducted a public hearing on October 10, 2007, and continued deliberations on November 6, 2007, for the proposed Comprehensive Plan Land Use Plan Map changes and the proposed Zoning Map changes for the North Indian Trail Neighborhood Center.

15. The Plan Commission, by a vote of 7 to 0, recommended forwarding the proposed amendments to City Council for consideration and adoption.

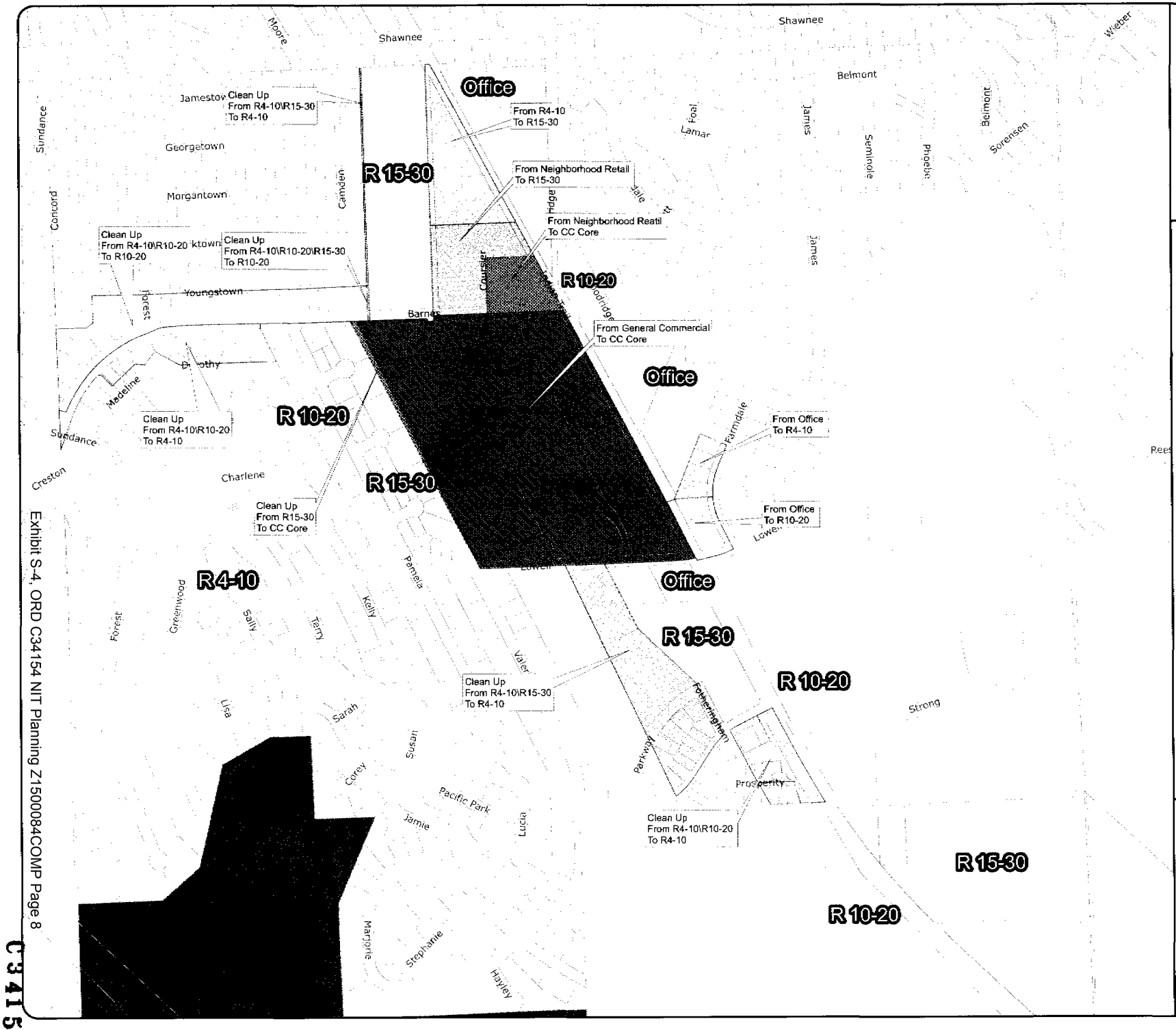
CONCLUSIONS:

The City Plan Commission concludes that the proposed amendments to the Land-Use Plan Map and Official Zoning Map for the North Indian Trail Neighborhood Center were developed through an open and public process, that the proposed amendments are consistent with the Growth Management Act and will protect and promote the health, safety and welfare of the general public.

The City Plan Commission recommends approval of the amendments, which proposes changes to the Comprehensive Plan Land Use Plan Map and Official Zoning Map for the North Indian Trail Neighborhood Center.

These findings and conclusions were approved on November 6, 2007.

Michael J. Ekins, President
Spokane Plan Commission



City of Spokane

SECOND DRAFT

North Indian Trail Neighborhood Center Land Use Plan Map Proposal

August 7, 2007

Legend

Existing Land Use

- Open Space
- Residential 4-10
- Residential 10-20
- Residential 15-30
- Residential 15+
- Office
- Neighborhood Retail
- General Commercial

Proposed Land Use Plan

NIT Proposed Land Use

- Residential 4-10
- Residential 10-20
- Residential 15-30
- CC Core

0 125 250 500 750 1,000
Feet

N

THIS IS NOT A LEGAL DOCUMENT

The information shown on this map is compiled from various sources and is subject to constant revision. Information shown on this map should not be used to determine the location of facilities in relationship to property lines, section lines, roads, etc.

SPOKANE

Exhibit S-4, ORD C34154 NIT Planning Z1500084COMP Page 8

C34154

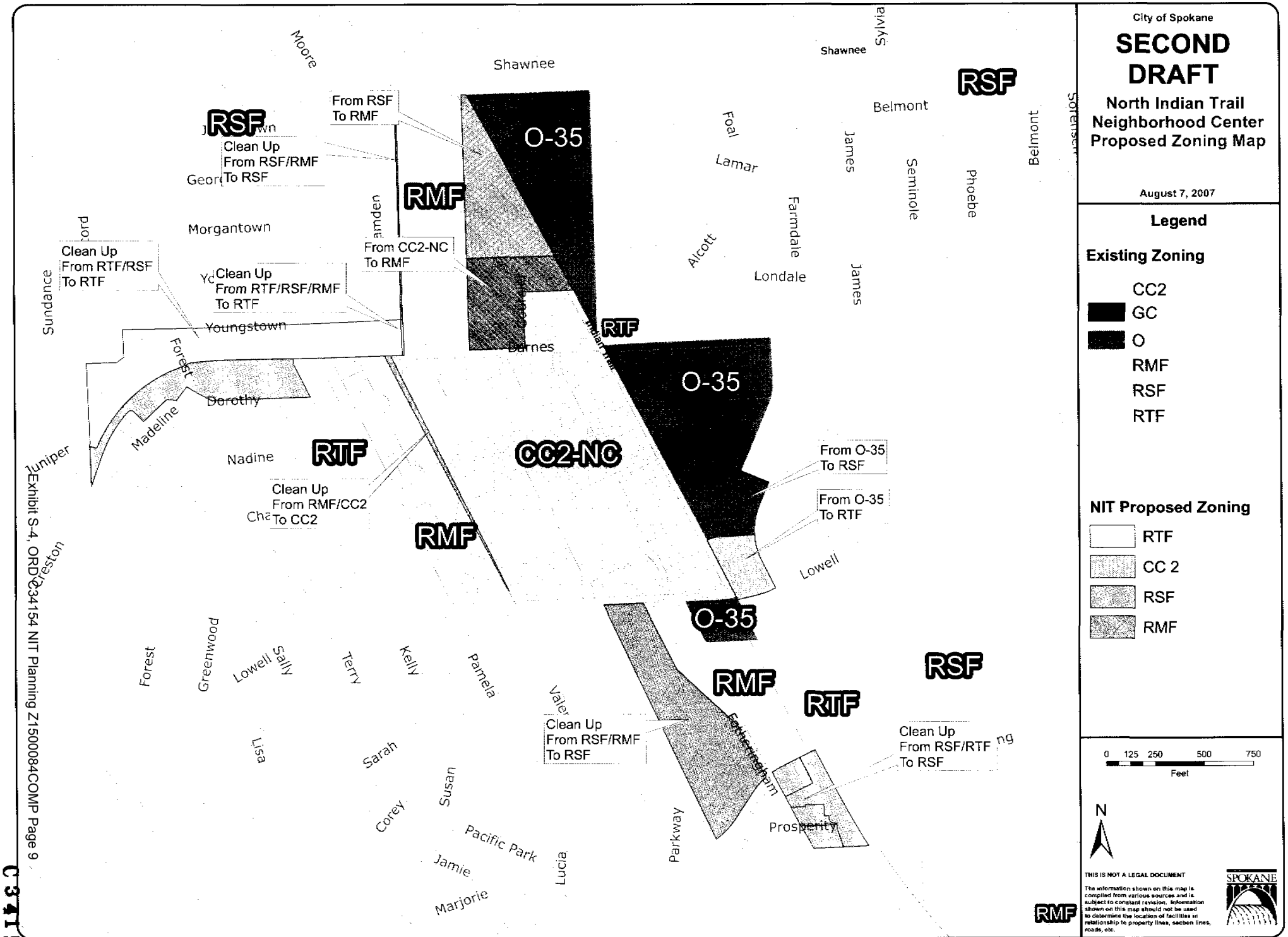


Exhibit S-4, ORD C34154 NIT Planning Z1500084COMP Page 9

C 34154

Comprehensive Plan Land Use Amendment
Morningside Investments LLC File Z150084COMP
PUBLIC COMMENTS SUMMARY
City of Spokane
Planning Department
August 1, 2016

Subject

Morningside Investments LLC has requested a change of land use and zoning as part of the city's annual comprehensive plan amendment review; the area is located in the vicinity North of Indian Trail Shopping Center and Barnes Road aka Windhaven 1st Addition PUD & Plat. If approved, the request would change the Land Use Plan Map from Residential 4-10 units per acre to Residential 10-20 units per acre and Residential 15-30 units per acre. The request would change the zoning from RSF (Residential Single Family) to RTF (Residential Two Family) and RMF (Residential Multifamily).

Pursuant to Chapter 365-196 WAC, the City of Spokane provided the public with opportunities to comment on the proposed 2015/2016 Comprehensive Plan Land Use Amendments. The public comment period was open for 75 days from May 10, 2016 through July 25, 2016. Written comments were submitted by email, letter, and through handwritten paper surveys completed during neighborhood meetings. Comment is being made available to the Plan Commission and City Council. This summary is a review of public comment through July 25, 2016. Additional public comment is anticipated.

Respondents

A total of 506 respondents sent approximately 628 written comments via write-in survey, letter, and/or email; approximately 427 households were represented. Of the 506 respondents, 110 respondents made multiple comments during the comment period, ranging from 2 communications up to 28 communications per individual.

425 respondents (84%) indicated opposition to the Morningside proposal. 15 respondents (1%) indicated opposition to the Crapo development, another application for an area located near the Morningside proposal that has since been withdrawn. Remaining respondents either did not indicate a position, or simply requested that they receive updates via email throughout the process. No respondents indicated support of the Morningside Land Use Amendment proposal.

Concerns

Emails, letters and surveys expressed a broad array of concerns, categorized as follows:

- 89% expressed concern about traffic
- 31% expressed concern about emergency services
- 31% expressed concern about school capacity
- 25% expressed concern about density
- 23% expressed concern about crime
- 18% expressed concern about water pressure
- 7% expressed concern about transit improvements
- 6% expressed concern about bicycle infrastructure

Other concerns noted but not categorized due to smaller volumes included decrease in property values, noise and pollution.

The biggest concern noted by a majority of respondents was traffic; a sample of comments:

> *"Traffic study needs to be completed in winter months. Also does not address what they would face in case of an emergency. Traffic study also needs to be done north of Albertsons where a lot of bottleneck occurs. The City is opening itself up for a lawsuit should an emergency happen and people can't get out due to bottlenecked traffic."*

> *"There are only two main egresses in the neighborhood. This will not accommodate the massive traffic. The traffic study was performed by an interested party. Serious traffic congestion concerns."*

> *"The traffic situation is already bad, not only during the rush hour, but throughout the day."*

Emergency services and school capacity were the next largest categories of concern; a sample of comments:

> *"Whether due to weather, fire or accidents, neighborhood safety may be affected during slowed traffic times and the ability for first responders to get down our road will be significantly impacted."*

> *"Fire Department is ill-equipped to handle a three story fire."*

> *"The schools are already close to or at maximum capacity. Will we have to add portables to the schools taking away playing areas on the school property?"*

> *"Grandson moving into existing house already has to be bused out of area to go to school."*

Areas of concern such as density, crime and water pressure received significant commentary as well; a sample of comments:

> *"We do not want this to set a precedent for high density development in other neighborhoods that have also been working and planning in good faith under the rules of the current comprehensive land use plan."*

> *"Police Department is already understaffed and many crimes are already not being investigated."*

> *"Water pressure is already compromised so I can only imagine what will happen with the addition of the apartments."*

Concerns over transit improvements and bicycle infrastructure were also captured:

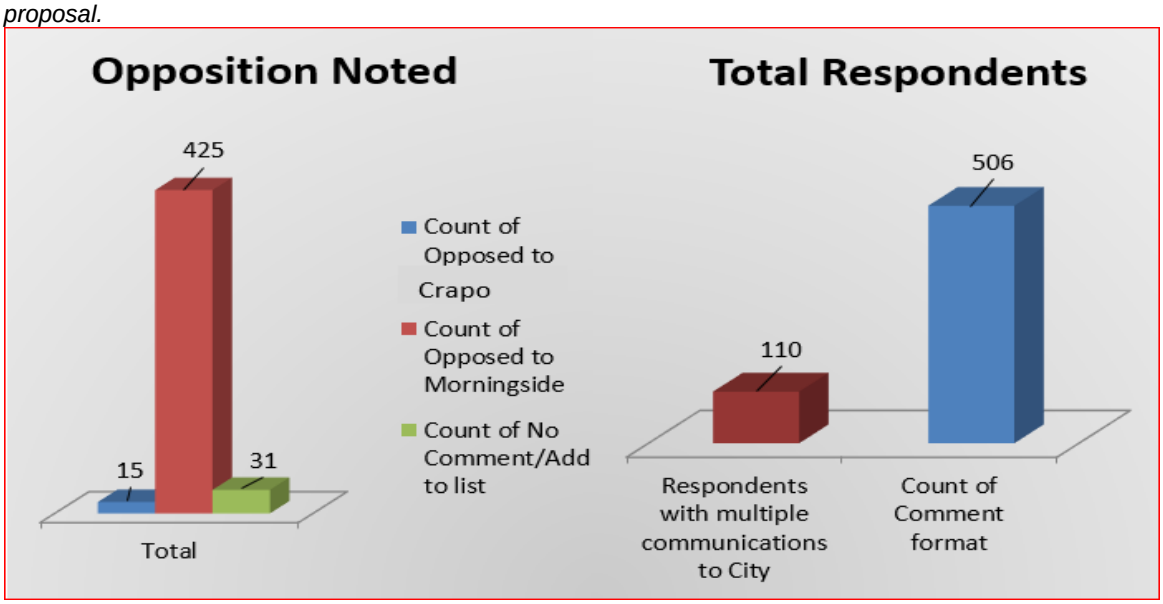
> "*My greatest concern with additional growth in the Indian Trail area besides the obvious increased amount of traffic on the road is pedestrian access and safety*

[…] There is no safe place for pedestrians to cross after passing the intersection at Francis and Alberta until you reach the light at Strong Road and Indian Trail."

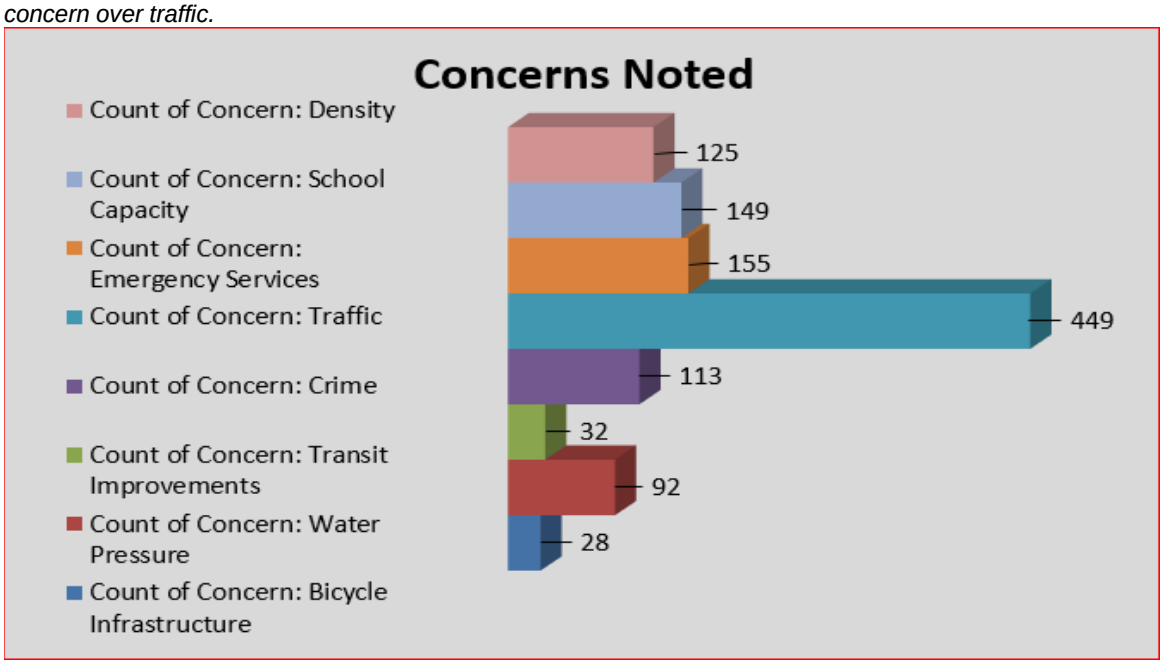
"I bicycle commute 8.5 miles each way to work and back. Over the last few years I have noticed an increase in the number of vehicles passing me on Indian Trail Road, even at 5:30 am and 7 pm. More traffic would make this commute more dangerous for me and other cyclists I see every day."

Visual Data

Of the 506 total respondents, 110 commented multiple times. 425 respondents stated their opposition to the Morningside proposal; some responses were neutral but no responses indicated full support for the proposal.



Of the eight top concerns tracked throughout the public comment process, 89% of respondents voiced concern over traffic.



Additional Data:
Names and addresses of respondents follow. Full comments are a matter of public record and are being forwarded to the Plan Commission and City Council.

Respondents by Last Name, First Name, Street Address:

Last name	First name	Number	Dir	Street name	Road class
Abel	Dennis				
Ablutz	Jon	10711	n	Klamath	Ct
Abrahamson	Tommy	9622	N	Arrowhead	Rd
Abrahamson	Doris	9622	N	Arrowhead	Rd
Adams	Terri				
Aden	Gordan				
Anderson	Marian	8411	N	Susan	Ct
Appleton	Keith				
Arnold	Bill	6305	W	Geronimo	Dr
Badger	Mary				
Bailey	Karolyn	6223	W	Shawnee	Ave
Bakke	James				
Balboa South Indian Trail Neighborhood Council					
Bandh	Noreen/Laurinda	5614	W	Charlene	Ct
Bangle	Erin				
Barton		9719	N	Navaho	Ct
Bay	Arussa	9616	N	Monroe	St
Beal	Teri				
Beck	Alan				
Beck	Peggy				
Beck	Norm	8913	N	Rosebury	Ln
Bell	Forest	10705	n	Klamath	Ct
Bell	Mark	5208	W	Ridgecrest	dr
Benton	Tim & Aurora	7406	N	Sullivan	Rd
Binkley	Christine	10115	N	Comanche	Dr
Binkley	Craig	10115	N	Comanche	Dr
Blaschke	Stephen				
Bloom	Courtney	5207	W	Russett	Dr
Bloom	Renee	5207	W	Russett	Dr
Bobbell	Gail				
Bolin-Jones	Theresa				
Bontrager	Shannon				
Booth	Margie	8906	N	Rosebury	Ln
Bowman	Bret				
Bowman	Stephanie	6109	W	Kittitas	Ct
Bowman	Jamie	6018	W	Melrose	Ln

Bowman	Janet	9721	N	Navaho	Ct
Boyer	Donna	10601	N	Skyline	dr
Brickweg	Tom	9222		Sundance	Dr
Brown	Janet				
Brown	Frederick/Linda	5224	W	Pinedale	Ct
Brunette	Linda	9219	N	Rosebury	Ln
Bryan	J.L.				
Bryan	Lyle	4402	W	Shawnee	Ave
Buff	Brad	9911	N	Arrowhead	Rd
Bullard	Larry	6102	W	Kittitas	Ct
Buller	Paul				
Burnette	Kamilah				
Campbell	Patrick				
Cannon	Patty				
Carney	Brian				
Carney	Nikki	5112	W	Ridgecrist	dr
Carruthers	Steve/Laurian	8802	N	James	Dr
Carter	Kristen				
Carter	tara				
Caruso	Kari	5709	W	Dorothy	Ct
Caruso	Pete	5709	W	Dorothy	Ct
Cathcart	Michael				
Choma	Roberta	6006	W	Chippewa	Ct
Choma	William	6006	W	Chippewa	Ct
Christopher	Barbara				
Christopher	Steven	7001	N	Weile	Ave
Christy	Kristeen				
Clement	Shelbie				
Clinesmith	Brenda	8913	n	barnes	Rd
Collins	Lucinda				
Colt	Rian	9117		Seminole	dr
Comfort	Amber	9106	n	Rosebury	Ln
Comfort	Josh	9106	n	Rosebury	Ln
Cook	Janet				
Cook	John/Janet	8201	N	Marjorie	St
Cook	John	8201	N	Marjorie	
Corkins	Troy & Miriam	10716	N	Arrowhead	Ave
Corppetts	Diane				
Craig	Walter	10115	N	Comanche	dr
Cree	Larry/Jane	9223	N	Rosebury	Ln
Crisp	Kathy				
Crisp	Larry & Kathy	8901	N	Madeline	Ln
Crum	Tim				

Cruz-Santos	Debbie	6003	W	Melrose	Ln
Czoski	Kathleen	4802	W	Shawnee	Ave
Czoski	Floyd	4802	W	Shawnee	Ave
Davies	Mark	9414	N	Farmdale	St
Davis	Robyn	5209	w	Bentwood	Ct
Davis	Mike	5209	w	Bentwood	Ct
Davis	Linda	8814	N	James	Dr
Davis	George	9331	N	Rosebury	Ln
Davis	Sam	5707	W	Shawnee	Ave
Dejanovich	Dan	10119	n	Comanche	dr
Dejanovich	Janice	10119	n	Comanche	dr
Dejanovich	Mike	10427	N	Iroquois	Dr
Dejanovich	Winnie	10427	n	Iroquois	Dr
Dejanovich	Janie	9015	n	sundance	Dr
Denman	Jason				
Dennis	Stephen	8614	N	Kelly	Ct
Deno	Terry				
Deno	Trina	8123	N	Valence	St
Dershem	Mona				
Deschaine	Vicki/Larry	6506	W	Sundance	Dr
Deschaine	Vicki	6506	W	Sundance	dr
Dieringer	Gail	9135	N	Coursier	Ln
Doyle	Denise	5901	W	Shawnee	Ave
Doyle	Terry	5901	W	Shawnee	Ave
Durfee	Pauline	9112	N	Farmdale	St
Durfee	Jason	9112	N	Farmdale	St
Edwards	Nichole				
Eggerman	Craig	9628	N	Arrowhead	Rd
Eggerman	Jean	9628	N	Arrowhead	Rd
Ehrgood	Baba				
Elias	Marilyn	9609	N	Seminole	Dr
Elias	Earl	9609	N	Seminole	Dr
Eliason	Jeremy	10706	N	Klamath	Ct
Ellis	Pamela				
Erdahl	Lisa				
Eymer	Scott	5219	W	Orangewood	Ct
Falkner	Don	10931	n	acoma	dr
Fanazick	Denise	9615	N	Ridgecrest	Dr
Fanazick	Richard	9615	N	Ridgecrest	Dr
Faught	Mike	5238	W	Navaho	Ave
Faught	Hanna	5238	W	Navaho	Ave
Ferguson	E.J.	10713	N	Cowlitz	Ct
Ferguson	Earlene	10717	N	Cowlitz	Ct

Ferguson	Audrey	6107	W	Shawnee	Ave
Fetch	Gena	10908	N	Iroquois	Dr
Fetch	Tracy	10908	N	Iroquois	Dr
Fetch	Gena	10908	N	Iroquois	Dr
Field	Lori/Dean	10503	N	Fleetwood	Ct
Flisakowski	Peter				
Flisakowski	Judi				
Floyd	Diane				
Formella	Leslie	10915	N	Iroquois	Dr
Forni	Victor	5110	W	Lamor	Dr
Fortin	Peter	9705	N	Ridgecrest	Dr
Fowler	Aaron	9105	N	James	Dr
Fox	Stuart				
Francis	Greg				
Frazier	Victor	2423	W	Liberty	Ave
Frostad	Larry				
Gamble	Cheryl	9527	N	Wieber	Dr
Gamble	Kenneth	9527	N	Wieber	Dr
Gay	Charles/Martha	6007	W	Chippewa	Ct
Gehrig	Luanne	9808	N	Fotheringham	st
Gehrig	Roger	9808	n	Fotheringham	st
Gildeman	Lula	9627	N	Arrowhead	Rd
Gilman	Mary	8607	N	Sally	Ct
Gimeno	Rick	105207	N	Prairie	Dr
Goertzen	Denece				
Goertzen	Galen	9311	N	James	Dr
Golden	Dave				
Goodman	Tisha				
Graham	Richard	10935	N	Acoma	Dr
Graham	John	9017	N	Rosebury	Ln
Grant	Robert	5125	W	Ridgecrest	dr
Grant	Josh	5125	W	Ridgecrest	
Grassi	Mary				
Greer	Reuben				
Griffin	Gary				
Griffin	Maria	8615	N	Terry	Ct
Griffith	Adam				
Griffith	Scott				
Griffith	Calli				
Grimes	Kerry	4103	W	Hiawatha	
Grimmer	Russ	9008	N	Greenwood	St
Grimmer	Jackie	9008	N	Greenwood	St
Grimmer	Annette				

Grimmer	Sharon	10816	N	Klamath	Ct
Grubb	Fred	5207	W	Alderwood	
Gyarfas	Jim				
Hagan	Michelle	9803	N	Hillsdale	Ct
Hagel	Sheena				
Hamblin	Mike				
Hanley	Jim	5607	W	Newbury	Dr
Hanley	Bonnie	5607	W	Newbury	Dr
Hansen	Georgiann	10309	N	Sundance	Dr
Hanson	Levi				
Hanson	Nancy	8907		Madeline	Ln
Harrington	Shellaree				
Hartanov	Tyler				
Hartsoch	Pamela	10211	N	Prairie	Dr
Harvey	Debbie	6103	W	Shawnee	Ave
Hauder					
Hauder	Pat				
Heath	Julie	5121	W	Ridgecrest	dr
Hedge	David	6267	W	Shawnee	Ave
Hedge	Anne	6267	W	Shawnee	Ave
Heimbigner	Jeremy	10905	N	Acoma	Dr
Hendershot	Richard and Carol	6007	W	Hopi	Ct
Henke	Chuck	8602		Creston	Ln
Herrd	Dixie	10710	N	Clallam	Ct
Heuett	Caralee				
Hibbard	Margaret	9004	N	Sundance	Dr
Higdon	Julie	9509	N	Loganberry	Ct
Holden	Judith	9717	N	Navaho	Ct
Hollenbeck	Mark	5903	W	Tepee	Ct
Hollenbeck	Jena	5903	W	Tepee	Ct
Holmes	Alana	5910	W	Tepee	Ct
Hooper	Kara	4104	W	Osage	
Hoover	Rick	3806	W	Jay	Ave
Hornyale	Stephen	8726	N	Pamela	St
Howard	Michael	8502	W	Forest	Ct
Howe	David	6504	w	Kitsap	dr
Howe	Laura	6504	w	Kitsap	dr
Howe	Michael	5416	W	Newbury	Ct
Hughes	Shannon	8226	N	Pamela	St
Hunter	Gary	5417	w	Brookfield	Ave
Hunter	John				
Hunter	Chris				

Hunter	GDPJ				
Husk	Christina				
Husted	Michael	5911	W	Tepee	Ct
Husted	Kathy	5911	W	Tepee	Ct
Imholt	Kathy	9327	N	Rosebury	Ln
Indian Trail Concerned Citizen					
Indian Trail Resident					
Inman	Mark	9002	N	Sundance	Dr
Iverson	Tim				
Janke	Brenda	6418	W	Skagit	Ave
Jaquish	Michael	4414	W	Excell	Ave
Jenkins	Alan	5715	W	Dorothy	Ct
Jenkins	Joey				
Jenkins	Barbara				
Jernigan	Oletha	9330	N	Rosebury	Ln
Jerry	Bock				
Johnson	Carrie				
Johnson	Mary				
Johnson	Aaron				
Jones	Mike	6106	W	Juniper	Ln
Jordan	Dan/Sheri	8915	N	Farmdale	St
Jordan	Todd	6118	W	Shawnee	Ave
Kauffman	Debra				
Kautzman	Yvonne	5412	W	Shawnee	Ave
Keaton	Greta	9323	N	Rosebury	Ln
Kelly	Jack	8408	N	Upper Mayes	Ln
Kelly	Peggy	8408	N	Upper Mayes	Ln
Kembel	Steven	9626	N	Seneca	Dr
Kerr	Charles	8508	N	Pamela	St
Kimball	Joe				
King	Karin	9616	N	Arrowhead	
Kirner	Dale	9103	n	Sundance	Dr
Kirner	Rebecca	9103	n	Sundance	Dr
Klain	Heather				
Klain	Ken				
Klingback	Millayna				
Knapp	Keith	5920	W	Lonewolf	st
Knepley	Pat	5603	w	Bedford	
Knodel	John	6006	W	Crowchief	Ct
Krueger	Amanda	8805	N	James	Dr
Krueger	Eric	8805	n	James	Dr
Kruger	Jan				
Kuhn	Jeremy	9628	N	Kiowa	Ct

Kyle	Randi	5706	W	Dorothy	Ct
Lane	Stephen	8226	N	Pamela	St
Lang	Graham	6119	W	Shawnee	Ave
Lang	Debra	6119	W	Shawnee	Ave
Largent	Don				
Larkin	Angela				
Larner	Richard				
Larter	Leigh	9331	N	Rosebury	Ln
Lecas	Merl	5915	W	Tepee	Ct
Lemire	Richard	10912	N	Iroquois	Dr
Lewandowski	Karen	4335	W	Arrowhead	Rd
Lilla	Jon/Jane	5907	W	Shawnee	Ave
Lines	Mary	8305	N	Valerie	St
Lobdell	Jerry	9020	N	Sundance	Dr
Lobdell	Paula	9020	N	Sundance	Dr
Lochridge	Dayna	9205	n	Sundance	Dr
Lochridge	Dustin	9205	n	Sundance	Dr
Lodato	Sally	4903	w	Howesdale	dr
Lounsbury	Dayv	9325	N	Sundance	Dr
Lowther	Randy	9335	N	Rosebury	Ln
Lucke	Mike				
Ludescher	Gary				
Lyons	Cory	8207	N	Pamela	
Mack	Trish				
Madden	Patrick	5318	W	Shawnee	Ave
Maddux	Darrel	10416	N	Iroquois	Dr
Malones	Karen & Johnny	10721	N	Iroquois	Dr
Marsh	Mary				
Marsh	Jeff	8913	N	Torrey	Ln
Martin	Jeff	10514	N	Iroguois	dr
Martin	Kori				
Martin	Chad				
Marvin	Larry				
Marvin	Lynn				
Mattison	William	9805	N	Ridgecrest	Dr
Mattison	Sandi	9805	N	Ridgecrest	Dr
Matz	Brian	10701	n	skyline	dr
Maupin	William				
McGarr	Liz	9823	N	Seminole	dr
McGarr	Michael	9823	N	Seminole	dr
Mcgovern	Dave	10702	N	Klamath	Ct
Mcgovern	Connie	10702	n	Klamath	Ct
McHugh	Kathleent				

McKinney	Jeanine				
McManamon	Thomas	8706	N	Rosebury	Ln
McManamon	Elizabeth	8706	N	Rosebury	Ln
McMurtery	Dorothy				
McNary	Samuel	10124	N	Larchwood	st
McNary	Beverly	10124	N	Larchwood	st
Mcphee					
Mehr	Geraldine	5923	W	Tepee	Ct
Mehr	Kenneth	5923	W	Tepee	Ct
Melges	David				
Melges	Shirley	9817	N	Ute	Ct
Mencke	Dan				
Meyers	Larry	10727	N	Portsmouth	Ct
Migliore	Crystal				
Miotke	Kathy				
Monger	Ben				
Moore	Amanda	9003	n	Sundance	Dr
Moore	Mike/Diane	9210	N	Sundance	Dr
Moore	Chris	9003	n	Sundance	Dr
Moore	David	6108	W	Sundance	Dr
Morasch	Dale & Judy	9220	N	Rosebury	Ln
Morasch	Dale	9220	N	Rosebury	Ln
Morel	Patricia	9322	N	Rosebury	Ln
Morellie	John	6014	W	Melrose	Ln
Morellie	JoDee				
Morford	Dennis				
Morford	Kathleen				
Moser	Clarence	8404	N	Susan	Ct
Mulder	Robert	10910	N	Huron	Ct
Mulder	Marilyn	10910	N	Huron	Ct
Myers	R.D.	10706	N	Klamath	Ct
Myers	Doug	6009	W	Pima	Ct
Myers	Beverly				
Naccarato	Kyle				
Nance	Paul	9721	n	Fotheringham	st
Neff	Ebonie				
Neidhold	Gail				
Neil	Mel				
Nelson	Doug	10120	n	fleetwood	Ct
Nelson	Edie	10120	n	fleetwood	Ct
Neuberger	Jeffrey	9106	N	Bradbury	Ct
Nicolai	Gary	8206	N	Lucia	Ct
Nicolai	Barbara				

Noble	Sharon	9403	N	Seminole	dr
North Indian Trail Neighborhood Council					
North Indian Trail Neighborhood Council					
Nussbaum	Bonnie	9828	N	Moore	
Olesen	Marie	5236	W	Navaho	Ave
Olesen	Bryan	5236	W	Navaho	Ave
Olson	Bryan	10710	n	Klamath	Ct
Oltmann	Gene	9010	N	Sundance	Dr
Oltmann	Nancy	9010	N	Sundance	Dr
Pace	Sue				
Papenleur	Fran				
Parker	Lynnette				
Pauletto	Brayden				
Pauletto	Janine				
Pauley	Thomas				
Paulin	Peggy				
Paullin	Peggy				
Pellicciotti	Beth				
Perkins	Nancy	5915	W	Tepee	Ct
Peterson	Heidi				
Phellabarn	Ben	9023	n	Sundance	Dr
Phellabarn	Jenn	9023	n	Sundance	Dr
Phillabaum	Ben				
Plese	Rod				
Poffenroth	Don				
Poirier	Carolyn	8523	N	Pamela	St
Postlewait	Herb	9019	N	James	Dr
Postlewait	Diana	9019	N	James	Dr
Powell	Sharon				
Powell	Brenda	5811	W	Shawnee	Ave
Powell	Dennis	5811	w	Shawnee	Ave
Primm	Monica				
Putzke	Wendi				
Radoslovich	Benjamin	4912	W	Lamar	
Rainey	Linda	9911	N	Comanche	Dr
Rainey	Neal	9911	N	Comanche	Dr
Rankin	Wendy	5212	W	Russett	Dr
Rebel	Jolene				
Reser	Russ	5104	S	Pittsburg	St
Reuter	William	6248	W	Shawnee	Ave
Reuter	Mrs.	6248	W	Shawnee	Ave

Riddle	Julie				
Riddle	Garrett				
Roberts	Bill	8490	N	Forest	Ct
Roberts	Jeff				
Roberts	Kathy				
Rogas	Roy	7907	W	Rutter	Ct
Rogas	Judy	7907	W	Rutter	Ct
Rogers	Lea				
Rogers	Jim				
Rogers	Annalisa	8614	N	Terry	Ct
Rogers	Jason	8614	N	Terry	Ct
Rose	Jared				
Roske	Dan/Brenda	8609	N	Pamela	St
Rountree	Jack	8909	N	Pamela	St
Ruffcorn	Sid	9807	N	Comanche	Dr
Ruffcorn	Jennifer	9807	N	Comanche	Dr
Ruffcorn	Sid				
Rush	John/Deborah	9107	N	Sundance	Dr
Ruster	Jim	6110	W	Juniper	Ln
Santos	Arnold	6003	W	Melrose	Ln
Sarver	Helen				
Savitz	Kay & Ken				
Saxe	Siri				
Schillios	Colleen	6827	w	Iroquois	Dr
Schillios	Marc	6827	w	Iroquois	Dr
Schwartz	Dave	9022	N	Rosebury	Ln
Schwartz	Joann	9022	N	Rosebury	Ln
Scott	Andrew/Jenny	10909	N	Acoma	Dr
Scott	Thomas	9301	N	Belmont	Dr
Sealock	Neal				
Sealock	Donna				
Sellers	Kelly				
Semple	Fr. Richard				
Sergott	Chris	8804	N	Pamela	St
Shadden	Patty				
Shauvin	Leanna	3427	W	Excell	Ln
Shaw	Thelma	6002	W	Crowchief	Ct
Shaw	Don	6002	W	Crowchief	Ct
Sherwood	Bekki	8909	N	Madeline	Ln
Sigel	Jerry	2916	W	Woodside	Ct
Sigel	Susan	2916	W	Woodside	Ct
Smeltzer	Lonna	8207	N	Lucia	Ct
Smith	Kathy	5207	W	Baywood	Ct

Smith	Jeff	9911	N	Fotheringham	st
Spaid	Robert	9616	N	kiowa	Ct
Spaid	Jan	9616	N	Kiowa	Ct
Stalley	Larry	8701	N	Forest	
Stamp	Marsha	5212	W	Russett	Dr
Staples	Greg				
Steinle	Basil	5605	w	Charlene	Ct
Steinle	Christy	5605	w	Charlene	Ct
Steinle	Basil	5605	W	Charlene	Ct
Stejskal	Manuella	10305	N	Sundance	Dr
Stewart	John	9122	N	Rosebury	Ln
Stewart	Susan	9122	N	Rosebury	Ln
Stewart	Theresa	9115	n	Sundance	Dr
Stewart	Jay	9115	n	Sundance	Dr
Stoicheff	Robert	8905	N	Barnes	Rd
Strawn	Donna	5115	W	Russett	Ct
Strom	Ted	9110	n	Sundance	Dr
Strom	Tammy	9110	N	Sundance	Dr
Swartz	Jake				
Taylor	James	4323	W	Hiawatha	dr
Taylor	Sheri	4323	W	Hiawatha	dr
Teel	Dan/Donna	10119	N	Ridgecrest	Dr
Thames	Susan				
Thomas	Wendy				
Thomas	Brian				
Thorpe	Eileen				
Tillotson	Joyce	5319	W	Newell	Ct
Tillotson	Ben				
Torrisi	Kay & Ken	9915	N	Arrowhead	
Towner	Ken				
Treffry	Larry	4905	w	Navaho	Ave
Treffry	Kathleen	4905	w	Navaho	Ave
Turner	Malynda	8720	N	Terry	Ct
Turner	Michael	8720	N	Terry	Ct
unknown 1	unknown				
unknown 2	unknown				
unknown 3	unknown				
unknown 4	unknown				
unknown 5	unknown		W	Shawnee	Ave
unknown 6	unknown				
unknown 7	Mary				
unknown 8	Janet				
Urlacher	Madisyn				

Vanos	Jon				
Vanos	Diane				
Vickers	Steve/Ellita	11004	N	Acoma	St
Virden	Mark	9224	N	Rosebury	Ln
Virden	Margo	9224	N	Rosebury	Ln
Voogd	Bill	10015	N	Moore	st
Voogd	Carol	10015	N	Moore	St
Wade	Tom	5416	W	Russett	Dr
Waller	Megan				
Walling	Rolf	5112	W	Russett	Ct
Walling	Vivienne	5112	W	Russett	Ct
Weaver	Stan				
Weberling	Lynnette				
Webster	Jerry	5607	W	Bedford	Ave
Webster	Bernie	5607	W	Bedford	Ave
Weddle	Jacquie	9005	N	Pamela	
Weigel	Ellen	9102	N	Rosebury	Ln
West	Ken	9906	N	Comanche	dr
West	Vicki	9906	N	Comanche	dr
West	Ron	5403	W	Woodview	Ct
West	Diana	5403	W	Woodview	Ct
Widhurst	Joy	5302	W	Woodview	Ct
Wiebers	Jim	6216	W	Skagit	Ct
Wilbert	Nancy	5911	W	Tom Tom	Ct
Wilbert	Chuck	5911	w	Tom Tom	Ct
Wilde	Pamela	9301	n	Belmont	Dr
Willemsen	Donna				
Williams	Fred	8405	N	Pamela	st
Williams	Linda	3333	w	Woodside	Ct
Wilson	David/Evelyn	9016	N	Sundance	Dr
Wilson	Bill				
Wilson	Randall	10525	N	Woodridge	Ct
Woodard	Michael	8905	N	Rosebury	Ln
Woodard	Sheree				
Woods	Joyce				
Wynecoop	Tim	9011	n	Sundance	Dr
Young	Sheri				
Zahmer	John	5323	W	Woodview	Ct
Zbaracki-Marsh	Jean	8913	N	Torrey	Ln
Zehm	Judy	9711	N	Sundance	Dr
Zehm	Sandy	9711	N	Sundance	Dr
Zehm	Dale	9711	N	Sundance	
Zisumbo	Manuel	8009	N	Farmdale	St

Community Assembly
West 808 Spokane Falls Blvd,
Spokane, WA,99201, Fifth Floor
Tel 509.755.2489

JULY 18, 2016

Plan Commission, City Council, Planning Dept.

Dear Plan Commission, City Council, Planning Dept.,

On July 7, 2016, the Community Assembly took under consideration a vote from out Land Use Committee. As the result of that vote the CA directed that a letter of support be sent to you. Below is the discussion and vote, as recorded from the CA meeting.

Here is the discussion and motion made by the CA on July 7, 2016:

Discussion:
The CA Land Use Committee voted unanimously at a special meeting on 6/23/16 to recommend that Community Assembly consider a resolution supporting the North Indian Trail, Balboa/South Indian Trail, and Five Mile neighborhoods in their opposition of the Morningside comprehensive plan amendment.

Motion:
Approve support for the North Indian Trail, Balboa/South Indian Trail, and Five Mile neighborhoods in their opposition of the Morningside comprehensive plan amendment and send that to the Plan Commission and City Council for the public record.
Approve-13
Opposed-0
Abstain-2

Sincerely,

Jay Cousins

Jay Cousins, Chair, Community Assembly

Community Assembly Minutes

July 7, 2016

1. Proposed Agenda
    a. Approved
2. Approve Amended Minutes
    a. Proposed amendment (Kathryn Alexander, Bemiss - budget committee numbers need to change from $20,000 to $25,000.
        i. Approved as amended
3. Open Forum
    a. Garry Pollard, Riverside
        i. Community assembly handbook – congratulations to the CA, very impressed. Trying for years to get something like this on the books.
    b. Kathryn Alexander, Bemiss
        i. 20 year anniversary of CA, congratulations on all the hard work over the years.
        ii. Bemiss is having concerts this summer, every other week starting July 15th at Hayes Park.
4. Comp Plan update - Opportunities for engagement
    a. Lisa Keys, Director of City Planning
        i. https://static.spokanecity.org/documents/neighborhoods/getinvolved/agendas/2016/07/community-assembly-agenda-packet-2016-07-18.pdf
        ii. Comprehensive plan background
            1. Comp Plan was first adopted in 2001
            2. Last major update was in 2006
            3. Review process for this update began in 2013
            4. Update must be adopted by June, 2017
        iii. Early Outreach Efforts – 2013
            1. Public Participation Plan – adopted by City Council (Revised in 2014 & 2016).
            2. Website
            3. Plan Commission and City Council updates.
            4. Community Assembly updates and requests for focus group volunteers.
            5. Council District Neighborhood Outreach Committee.
            6. 3 Council District Meetings.
            7. Plan Commission Open House.
        iv. Early Outreach – Policy Focus Groups
            1. Streamlined chapters and eliminated redundancies.
            2. Added new policies if group found 'gaps'.
            3. Re-arranged sections – to enable better flow.

v. Early Outreach Efforts – 2014-2015
    1. Neighborhood Profiles. Purpose, to highlight each neighborhoods assets for use by visitors, developers, business.
    2. Staff Developed instruction booklet and CD's for neighborhoods to use when writing profiles and worked with CA.
    3. Interactive website let people pin icons to places of interest in their neighborhoods.

vi. What is different in this update?
    1. Address regulatory changes – GMA.
    2. Streamlined for improved readability.
    3. Integrated capital facilities – LINK Spokane.
    4. Neighborhood Profiles.
    5. Implementation.

vii. Implementation Chapter
    1. Future strategic actions for implantation will be included in the update.
    2. Staff will gather ideas over the remainder of this year on what items should be included in the list of future work.

viii. PC First Review Workshop
    3. April 27th – Overview
    4. May 25th – Profiles and Neighborhoods
    5. June 8th – Introduction and Land Use
    6. June 22nd – Natural Environment; Leadership, Governance, and Citizenship; Urban Design/Historic Preservation.
    7. July 13th – Economic Development; Social Health; Parks, Recreation, Open Spaces.
    8. August 10th – Housing; Capital Facilities and Utilities.
    9. September 14th – Transportation (LINK Spokane). https://my.spokanecity.org/projects/link-spokane/

ix. How to Read the Revisions
    1. The 'track changes' version has new additions that have been moved – underlined in red.
    2. Items that have been removed or moved to another location are crossed out in Red.
    3. Red tent boxes contain comments for discussion – will not be part of the final document.
    4. Green text boxes contain items to be included in new chapter 2.
    5. If no comment box exists – the changes are minor.
    6. The second version is a 'clean' reformatted copy.

x. September Public Open Houses
    1. Four Public Open Houses – held in each Council District, plus downtown.

2. Virtual Open House through the month of September.

xi. Next Steps
    1. Questions and comments – send to: Shapingspokane@spokanecity.org
    2. Come back to next meeting to discuss public participation plan.

5. City council — City Update

a. Councilman Breean Beggs & Councilwomen Karen Stratton
    i. Legislative priorities – first meeting a couple weeks ago, defined list of 5 items - top priorities. Houses on maple and Boone – moving – restored and being moved back.
    ii. Next week advisory committee on Monroe – sit down w council women Mumm to discuss this further.
    iii. New Police Chief Candidates
        1. Down to 3 selected candidates
        2. July 20th – public panel at city hall going almost all day, candidates will rotate around.
        3. Contact HR if you want to be a part of this process.
    iv. Traffic calming – met last week, and reviewed all Neighborhood Council applications. Final decisions should be getting back to the Neighborhood Councils soon.
    v. Heather Trautman and Breean Beggs – discussing neighborhoods and parking to come up with a standard way to have community engagement in this process.

6. Admin committee – Updates, August Picnic and December Meeting

a. Tina Larson, Grandview/Thorpe
    i. No CACC in July, next meeting – August 31st
    ii. August Picnic – social gathering to have fun together. Need a date and location.

<u>Vote on date and location for August Picnic:</u>

- Does the group want to have picnic at mission or Manito Park?

Mission park: 9 vote yes

Manito Park: 9 vote yes

- Sunday - Aug 14th or Aug 21st

14th: 12 vote yes

21st: 3 vote yes

- Time frame: 4pm-6:30pm or 6pm-8:30pm?

4pm: 14 vote yes

6pm: 1 vote yes

Final Vote: Manito Park on the 14th at 4pm

1. Wanting to do recognition awards – if you have suggestions please contact Tina.
2. Do we want to make this event a plus one or bring family? Restrict young family members and allow spouses? If you have thoughts on this please contact Tina.

iii. December meeting: awards banquet and potluck – do we want to continue to do this?

Vote:

Traditional: hour meeting and potluck – vote yes: 11

Nontraditional: complete business meeting - vote yes: 3

7. ONS & Code Enforcement – Update

a. Heather Trautman, Director of Office of Neighborhood Services and Code Enforcement

i. https://static.spokanecity.org/documents/neighborhoods/getinvolved/agendas/2016/07/community-assembly-agenda-packet-2016-07-18.pdf

ii. Dawn Kinder, Director of CHHS – CDBG allocations

1. Estimated allocation figures have changed slightly– going to effect the NC allocations.
2. CACD Committee has been informed of this change.
3. If you have questions, please send them to Heather Trautman.
4. Bring this back in August for further discussion.

8. Land Use – 2016 Proposed Comp Plan Amendments

a. Greg Francis, Rockwood

i. https://static.spokanecity.org/documents/neighborhoods/getinvolved/agendas/2016/07/community-assembly-agenda-packet-2016-07-18.pdf

ii. Three proposed amendments

1. All three are proposed rezoning
2. Two generally non-contentious (QueenB & Avista)
3. One contentious and much larger (Morningside)
4. Land Use Committee is recommending action on Morningside in support of impacted neighborhoods.

iii. Key guiding principles to consider

1. Honor the community's long term investment in the comp plan
2. Encourage development that will enable whole community to prosper
3. Proposed changes must result in a net benefit to the general public

iv. Morningside – Traffic Factors

1. Substantial traffic issues in this area already
2. Near failure levels by 2021 if rezone and project are approved
3. Indian Trail road is only effective road into area
4. No opportunity to create a second primary arterial to mitigate traffic concerns due to geography
5. Widening of Indian Trail Road to four lanes $3-$5.8mil and is not in six year capital improvement plan.
6. Traffic study does not factor in the potential impact of developments that could occur on undeveloped land already zoned as RMF, CC2, and O-35 in the Indian Trail area.

v. Morningside – Other Factors
1. Violates the sub-area plan for the North Indian Trail Neighborhood Center (2007)
2. STA only provides weekday service to this area – does not anticipate adding weekend or evening service.
3. No substantial employment opportunities exist in the area
4. Concerns about emergency service and school
5. North Indian Trail, Balboa/South Indian Trail, and Five Mile neighborhoods have expressed opposition to rezone.
6. More than 500 public comments have been submitted to the Planning Department opposing the proposed amendment – not one comment of support.

vi. The CA Land Use Committee voted unanimously at a special meeting on 6/23/16 to recommend that Community Assembly consider a resolution supporting the North Indian Trial, Balboa South Indian Trail, and Five Mile neighborhoods in their opposition of the Morningside comprehensive plan amendment.

Motion: Approve support for the North Indian Trail, Balboa/South Indian Trail, and Five Mile neighborhoods in their opposition of the Morningside comprehensive plan amendment and send that to the Plan Commission and City Council for the public record.

Approve-13

Opposed-0

Abstain-2

9. Liaison – Design Review Board Member (DRB)

a. Paul Kropp, PeTT Committee Chair
i. CA has had the benefit of long serving - Design Review membership.

Invite members of the CA and neighborhood councils that might be interested in filling this position.

1. At least 4 DRB meetings between June/Sept of this year, these would be folks that are members in good standing on their NC or for CA reps from NC that are members of the CA in good standing.
2. 3 year long appointment
3. One can always resign
4. Substantial assignment/appointment
5. Does all public projects – have a ton of huge things happening like Riverfront Park – all these go through the DRB.
6. Bring this information back to your NC and see if people are interested or have a background in planning or an interest in this in general.
7. The DRB meets twice a month on the 2nd &4th Wed of the month from 5:30-8pm.

ii. Paul will draft an email to send to CA reps to get out to their Neighborhood Councils – also post this on Nextdoor.

10. Policy and procedures – Update

a. Valena Arguello, East Central

i. Grievance policy and possibility of having this in a committee. Having a committee in place – tossing this idea around – what does the CA want to do?

1. Possibly eliminate the Grievance Committee idea? 20 years of the CA and there has not been one grievance, arbitration or resolution.
2. Standing committee, need to have specific language on how to create the committee.
3. Would it be appropriate to have language around a grievance, keep the language and form an at Hawke committee?
4. Simple statement on how to file a grievance and refer back to creating an at hawk committee.

11. Roundtable

a. Velena Arguello, East Central

i. Report on 'Every Place Counts Design Challenge - East Central and I-90 Visioning and Design Workshop'.

1. Design workshops held at the Riverpoint Campus.
2. Great opportunity to have community input.
3. Next workshop: 3:30pm – 5pm, July 8th at the pharma building at Riverpoint Campus.

<u>In attendance:</u>

15 Representatives Present

Bemiss, Chief Garry Park, Cliff Cannon, East Central, Emerson/Garfield, Grandview Thorpe, Lincoln Heights, Logan, North Indian Trail, Peaceful Valley, Riverside, Rockwood, Southgate, West Hills, Whitman

Not in Attendance:

Audubon/Downriver, Balboa/SIT, Browne's Addition, Comstock, Five Mile Prairie, Hillyard, Latah/Hangman, Manito/Cannon Hill, Minnehaha, Nevada/Lidgerwood, North Hill, Northwest, West Central

North Indian Trail
Neighborhood Council
www.nitnc.com

June 2, 2016

To: City of Spokane Plan Commission

Cc: Tirrell Black, City of Spokane Planning Department

RE: z1500084 COMP, Morningside Investments LLC (Windhaven)

The North Indian Trail Neighborhood Council wants to on record as being adamantly opposed to the proposed amendment.

1. **The proposed rezone violates the Sub-area plan that was adopted for the Indian Trail Neighborhood Center on 12/03/07 when the City Council passed Ordinance C34154. The Stakeholder group which worked with City Planning in developing the Sub-area plan included Cliff Cameron, who represented Harlan Douglass et al.**
2. The NIT Neighborhood has historically attracted residents whose demographics are that they are more educated, are more employed in managerial and professional occupations, have higher incomes and have higher home ownership rates than the average for Spokane. The predominantly single-family owner-occupied character of the neighborhood has been a major reason for the attraction.
3. A healthy City will have a diversity of neighborhood characteristics, including those of North Indian Trail, in order to meet the needs and preferences of a diversity of residents and potential employers, not “one-kind fits all”.
4. Our residents have responded to the proposed amendment with hundreds of comments expressing overwhelming objections to the re-zone. Allowing the re-zone will substantially alter the character of the neighborhood to the detriment of existing residents and significantly reduce its attractiveness to future potential home buyers.
5. The TIA being limited to signalized intersections, ignores the already congested and dangerous intersection of IT and Woodside. The proposed development would increase the congestion and danger.
6. The TIA also did not study Woodside, which already has some 4000 trips per day, and would likely see more from further development in the NIT Neighborhood. The traffic calming Traffic Circles to be built, (June 2016) my or may not reduce trips on Woodside. Any reduction would increase traffic on Francis.

7. If the proposed barrier to left turns onto or to crossing Francis is built,(sometime this Summer), at North A, traffic will be diverted to Alberta in order to do so. A possibly worse outcome would be drivers trying to use North C to do so.
8. No "Collision Analysis" was done with this Traffic Study. The 2012 Traffic Study conducted by the City concluded that IT is a dangerous street if a major emergency or crash occurred due to the bottleneck at Kathleen and IT. The 2 fires that we had are perfect examples of the in-gress and e-gress safety issues on IT.
9. The Indian Trail and Five Mile Neighborhoods are housing growth neighborhoods and there was inadequate consideration of future development. Vacant land which will eventually be developed, but is not currently platted, is not considered in the TIA for future impacts. One example being the land on the East side of IT and Strong Rd that is owned by Douglass that is zoned for multi-family apartments. As Mr. Douglass stated at our Board meeting, " When we get done with Morningside we would be heading South.
10. The currently vested trips for the 286 units do not actually exist, but they are credited against the trips to be generated by the proposed development.(Am 65 in 145 out, PM 179 in 92 out). If the amendment is approved, those trips will become "real" and will add to the traffic impact forecast by the TIA.
11. The possibility of residential units being built within the Sundance Center in lieu of businesses is not addressed. The 96 unit Apartments being constructed in an 0-35 zone is an example of what could be done in the Sundance Center.
12. Future development on Five Mile Prairie, in both the City and the County will add traffic to that already existing, but is not included in the TIA projections. With Barnes Rd connecting to IT traffic would probably increase.
13. The Traffic Study states that 21% of project traffic will use Barnes Rd, based on traffic modeling software, which likely doesn't take topography or weather into consideration. Completing Barnes RD will not significantly reduce peak hour traffic on IT or Francis-as acknowledged by Mr. White due to limited roads off Five Mile, (3 single lanes roads), and because only people working in the far North side are likely to use it.
14. Future development to the North, (9 mile and Suncrest, for example), will add traffic to Francis and likely IT, but is not considered in the TIA.
15. If IT is eventually widened to a full 4 lanes and center turn lane, and the signal timing " tweeks" are done and a turn lane constructed at Alberta, all possible capacity improvements will be done. Any future increases in traffic will not be remediable. There is not possible route parallel to IT, no feasible even if possible, route to the West, such as extending Barnes Rd; and no possible additional lanes or road to/from 5 mile Prairie.
16. The GMA puts an emphasis on encouraging development in "urban areas where adequate public facilities and services exist or can be provided in an efficient manner". "Smart Growth" also locates high density housing near major employment, shopping and recreational centers. This proposal does not meet those criteria.
17. Many current jobs, and the projected major job growth areas, are in the Riverpoint campus, downtown and the West plains. The proposed development would mean longer commutes than the average Spokane commute, (in fact our neighborhood already has longer commutes than

average), which means they would impose a greater impact on the regional transportation system than more appropriately located high density housing.

18. The application cites job creation in the Sundance Center due to the proposed high density. The current reality of the retail economy is that retailers are cutting back on physical locations, so the prospects for well-paying jobs within" walking distance "of the project are doubtful.

19. There are no significant employment centers within the Indian Trail Neighborhood. Therefore, the great majority of current or future employed residents must commute out of the neighborhood.

20. The Agency Comment submitted by the STA cites the problems in providing service to the Indian Trail Neighborhood caused by our location and topography and suggest that service may not be improved with respect to evenings and weekends.

21. The Agency Comment submitted by Katherine Miller, Director of Integrated Capital Management, states in part, "Typically challenging topography results in higher costs to address both transportation and utility issues". The $3,000,000 cost estimate for widening IT is one example.

Finally, we as the Board of the North Indian Trail Neighborhood Council are not against development, we have not opposed any development that stays within the Comp Plan Amendment.

Best Regards,

Terry Deno
Chair
Mel Neil
Vice-Chair/Treasurer
Curt Fackler
Past-Chair
Leslie Formella
Secretary
Mark Davies
CA Rep
Jim Bakke
Past CA Rep
Mike Husted
IT/E-mail Facilitator

Five Mile Prairie Neighborhood Associaion
Five Mile Prairie Neighborhood Council

June 6, 2016

Spokane City Plan Commission
City of Spokane Planning Department, Lisa Key
City of Spokane Planner, Tirrell Black

RE: Morningside Investment LLC
Comprehensive Plan Amendment Z1500084

Five Mile Prairie Neighborhood Association has joined with North Indian Trail Neighborhood Council and South Indian Trail Balboa Neighborhood Council in opposing the referenced proposed comprehensive plan amendment for 2016.

The proposed amendment takes a final plat for single family residential zoning to medium density residential zoning. This plat (Windhaven) was included in the subarea plan that was adopted by the City in 2007 after months of planning efforts with all stakeholders involved. Five Mile Prairie Neighborhood also commented during the planning process with emphasis on the Barnes Road connection between our two neighborhoods. The question we have is "what's changed" from the 2007 adoption of the subarea plan to amend the zoning? And why would the NIT neighborhood agree to such a proposal without, first, going through the subarea planning process again before rezoning.The neighborhhood should be able to count on the process and the ordinance unless substantial changes have occurred.

To our knowledge, NIT road conditions have not changed.There is more congestion, not less. There are traffic intersections that were not looked at, such as NIT and Woodside. There are three traffic calming circles that will be placed on Woodside this year. That may increase traffic on NIT Road from Woodside to Francis. There is no funding to widen the road in the Capital Facilities Plan.

The developer has agreed to traffic impact fees, in this case,the City has deemed concurrency is met by the payment of the fees. I believe the City has an obligation to revisit the concurrency management ordinance and Impact Fee Ordinance. Concurrency demands that services be in place at the time development occurs or a financial mechanism to achieve concurrency within the 6 year plan. I don't believe the City has that in place.

So for these reasons as well as some SEPA concerns that will be addressed later, our neighborhood joins its partner NIT and SIT/Balboa in opposing this amendment, at this time.

Respectfully,

Kathy Miotke
Five Mile Prairie Neighborhood Council Chair

Balboa South Indian Trail Neighborhood Council

RECEIVED
JUN 20 2016
PLANNING & DEVELOPMENT

June 14, 2016

To: City of Spokane Plan Commission

Cc: Tirrell Black, City of Spokane Planning Departmemt

RE: Z1500084 COMP, Morningside Investments LLC

The Balboa South Indian Trail Neighborhood Council wants to go on record as being opposed to the proposed amendment.

As Chair of the Balboa South Indian Trail Neighborhood Council, I am very concerned along with the residents of this council about the negative impact this project will have In our neighborhood and the increase of traffic.on Woodside. Woodside has a traffic volume of 4,000 cars from Five Mile road onto Woodside and from Indian Trail on to Woodside. We are a neighborhood that has been fighting the volume and speed on Woodside for 20 plus years. We have no intention of becoming an arterial, as a meeting of over 300 residents declined to go that direction.

This neighborhood is a neighborhood surrounded by churches and schools, traffic is already an issue for children crossing Woodside, There has been property damage from accidents on Woodside, we wait in fear to hear that a child has been fatally injured, which we pray will never happen.

The TIA, was limited to signalized intersections, and ignored the already congested and dangerous intersection at Indian Trail and Woodside.The proposed development would most definitely increase the congestion and danger.

The TIA also did not study Woodside, which as stated has some 4,000 trips a day, and would likely see more from future development in the North Indian Trail Neighborhood. The traffic calming traffic circles to be constructed ma or may not

reduce trips on Woodside. I am very concerned and so are my neighbors regarding the traffic this project will bring to our neighborhood. My South Indian Trail neighbors are in the middle of traffic issues on Indian Trail road as I write this letter. The road was poorly planned when it was constructed, with no anticipation of what the future might bring development wise. As of now the development of the road (Indian Trail) is in the six year plan, however there is no money to do that as this time.

We value our safety, and our children's safety, more traffic will be considered an accident or fatal issue when it comes to a man, a women, or God forbid one of our children.

Officer Signature Karen M Kearney

Karen M. Kearney, Chairman of the Balboa South Indian Trail Neighborhood Council

AUDUBON
DOWNRIVER
NEIGHBORHOOD COUNCIL

July 26, 2016

City of Spokane
Planning & Development Services
808 W Spokane Falls Blvd
Spokane, WA 99201

RE: Morningside Investments, LLC

Dear Plan Commission/City Officials,

As chair of the Audubon-Downriver Neighborhood Council, I am submitting this official opposition [on behalf of my neighborhood council] to this development. Large apartment complexes are totally inappropriate for the Indian Trail neighborhoods, particularly with regards to public safety, as there one arterial is profoundly inadequate in case of fire or other evacuation situations.

The ADNC is particularly concerned about the significant increase in traffic through our neighborhood, particularly Northwest Boulevard. Thank you for your consideration.

Regards,

/s/ Fran Papenleur

Fran Papenleur
Chair, Audubon-Downriver Neighborhood Council