STAFF REPORT

TO: Clark County Planning Commission

FROM: Oliver Orjiako, Director

PREPARED BY: Laurie Lebowsky, Planner III

DATE: September 26, 2014

SUBJECT: CPZ 2014-00005 Fifth Plain Creek Arterial Atlas Amendments

BACKGROUND:

This docket item involves amending the Arterial Plan Map to change the functional classification on the following roads:

- NE 88th St., from NE Ward Rd to NE 182nd Ave., from a two-lane Rural Major Collector (R-2) to a two-lane Urban Collector with center turn-lane and bike lane (C-2cb).
- The portion of NE 83rd St, from NE 78th Street to the edge of the Urban Growth Boundary on the East, from Rural Minor Collector (Rm-2) to a two-lane Urban Collector (C-2).
- NE 182nd Ave., from NE 88th Street to NE Fourth Plain Road, from a Rural Major Collector (R-2) to two-lane Urban Collector with center turn-lane and bike lane (C-2cb).
- A map of the affected roads and the proposed cross-sections are attached to this staff report and is found in Exhibit 1.

The Board lifted urban holding in the Fifth Plain Creek area, as part of last year's docket process. The case file number for last year's land use action was CPZ 2013-00007 Fifth Plain Creek. This current docket item is a follow-up to last year's action to lift urban holding to ensure roads are built to urban development, when it occurs. The re-designation of the above roads to urban standards facilitates development in this area, per the comprehensive plan. The three streets listed above currently have rural designations and this proposal simply involves changing the road designations to urban road designations. No new roads are proposed and no construction is proposed with this docket item.

One primary issue that has arisen for this area is the extension of NE 83rd Street, which would extend from the existing NE 83rd Street eastward through the Monet's Garden Subdivision, and connect to the existing NE 78th Street, adjacent to Frontier Middle School and Pioneer Elementary. And NE 78th Street, the short section in front of Frontier Middle School, is located within the City of Vancouver. NE 78th Street in Vancouver is designated as a minor arterial,

which is the street design that most closely approximates the county's designation of a two-lane collector (C-2). This road extension has been on the Clark County Arterial Atlas since 1998.

When the Monet's Garden rural cluster went through the land development process, the developer was required to dedicate right-of-way for the future extension of NE 83rd Street and the future road location was required to be included on the recorded plat. The plan is for NE 83rd Street to be extended and connect west to the existing NE 78th Street. A copy of the Monet's Garden plat is attached to this staff report in Exhibit 2. No construction is proposed with this arterial atlas application. The proposed changes will only ensure that when NE 83rd Street is constructed, that it will be built to urban standards.

The extension of NE 83rd Street provides circulation in the Fifth Plain Creek area; it will help carry traffic from the increased traffic volumes due to land development, and it will improve safety because it will allow an alternative route to the existing roads. NE 83rd Street is classified as a collector and will facilitate circulation of local traffic.

Since concerns have been raised, the county had DKS study the proposed extension of NE 83rd Street and a copy of this report is attached to this staff report in Exhibit 3. The DKS traffic study, in summary, shows that the proposed NE 83rd Street extension serves local traffic as was envisioned in the arterial atlas. The traffic study indicates that the proposed road extension also assists in moving local traffic to the arterial streets and helps minimize cut-through traffic on the local street system.

GENERAL INFORMATION

Location: Fifth Plain Creek area: The general vicinity includes NE Ward Road to the west, NE Fourth Plain Boulevard on the south side, and the urban growth boundary borders the east side.

Existing land use designations: Properties south and west of the proposed arterial atlas amendments are zoned for low-density residential (R1-10 and R1-20) and properties to the east of the proposed arterial atlas amendments are located outside the urban growth boundary and zoned for agriculture (Ag-20).

PUBLIC INVOLVEMENT

Staff held an open house regarding the proposed arterial atlas amendments on Tuesday, April 1st at the Sifton Fire Station from 6:30-8:30 PM. Approximately 20 people attended the open house and fifteen people signed the sign-in sheets.

This docket item is the second part of last year's lifting of urban holding in the Fifth Plain Creek area. This arterial atlas involves only changing roads from rural to urban designations because urban holding in the Fifth Plain Creek area was lifted last year. That docket item number was CPZ 2013-00007 and a SEPA was issued for that docket item.
Since a SEPA issue was done for last year's docket item for Fifth Plain Creek urban holding lifting, it was determined that last year's SEPA review covered this docket item; therefore, no SEPA was issued this year's docket because it was not needed.

Summary of Comments Received

Staff did receive a letter from WSDOT that is supportive of the docket item because the local roads will improve safety and reduce congestion on the state highway system. That letter is found in Exhibit 4 of this staff report.

The public did raise questions at the April 1st open house and copies of those comments are included in the documentation for Planning Commission. Questions were raised primarily about the proposed extension of NE 83rd Street: the design of the proposed road extension, how the proposed road extension would be financed, and construction of sidewalks.

Nine comment cards from the open house were filled out. Scanned copies of all of the comments are attached to this staff report in Exhibits 5 and 6.

The majority of commenters (five out of nine comment cards) registered their opposition to the extension of NE 83rd Street through Monet's Garden. One commenter said it will be dangerous to allow the road through Monet's Garden because of the homes' backyards will be located adjacent to the road.

Yong Harris of 17810 NE 81st Circle said that the proposed extension should have sound barriers placed on either side of the NE 83rd Street. Since NE 83rd Street will be classified as a 2-lane collector road, the County typically does not place sound barriers on collectors. She also said that she opposes the road extension because it will expose their yards to the public. As previously stated in this staff report, this proposed road extension has been on the County's Arterial Atlas since 1998 and that the road right-of-way dedication was a condition of approval for the Monet's Garden rural cluster development application.

One commenter suggested the right-of-way be marked to show the right-of-way location for NE 83rd Street. This suggestion was referred to Public Works staff.

Regarding the intersection of NE 182nd Avenue and NE 83rd Street, one commenter asked why the stop sign was placed on NE 182nd Avenue and not on NE 83rd Street. Staff referred this question to the Public Works engineer, Ejaz Khan, who addresses signing and striping issues. The response from the Public Works engineer is provided below:

> "The alignment of 182nd Avenue is a northbound to eastbound sweeping curve. The primary movement at the intersection is northbound to east bound and vice-versa. The conventional traffic control protocol is to allow free movement to the major movement and require the movement for the minor approach to Yield/Stop for the major movement.
>
> Prior to 2009, the practice of controlling conflicting major street and major street to minor street movement was via a Yield control sign. Based on agency use survey, MUTCD (Manual on Uniform Traffic Control Devices) in 2009, allowed a different traffic control for the traffic movement stated above. The revised traffic control "STOP- Except right turn" is stated to have better acceptance and understanding from the driver's perspective. The County has been replacing the Yield control at intersections (where applicable) with a "STOP- Expect right turn" sign.
>
> This is the change that has occurred with this intersection. The primary movement is still the free flow movement as before and the traffic to and from the minor approach is still required to Yield/STOP to the major movement."

Per a request from some neighbors in Monet's Garden, staff met with some neighbors regarding the extension of NE 83rd Street. This meeting occurred on April 9, 2014 at the county office building. Staff explained that the proposed road extension has been on the County's arterial atlas since 1998. In addition, the proposed road extension was placed on the original plat for

Monet's Garden. Staff explained the public hearing process and their opportunities for providing public comment.

APPLICABLE CRITERIA, EVALUATION OF REQUEST AND FINDINGS

In order to comply with the Plan Amendment Procedures in the Clark County Unified Development Code (UDC 40.560.010), requests to amend the Arterial Atlas must meet all of the criteria in Section N.

The Unified Development Code (UDC 40.560.010 N) delineates specific criteria that apply to Arterial Atlas amendments.

a. There a need for the proposed change.
b. The proposed change is compliant with the Growth Management Act
c. The proposed change is consistent with the adopted comprehensive plan, including the land use plan and the rest of the Arterial Atlas.
d. The proposed change is consistent with applicable interlocal agreements; and
e. The proposed change does not conflict with the adopted Metropolitan Transportation Plan

CRITERIA FOR ARTERIAL ATLAS AMENDMENTS

a. There a need for the proposed change.
Finding: With last year's lifting of urban holding in the Fifth Plain Creek Area, property will now be developed to urban standards and therefore increase potential trip generation. A change is needed to ensure that the roads are properly classified to urban standards so the roads are constructed to support traffic for future development.

b. The proposed change is compliant with the Growth Management Act.
The GMA goals set the general direction for the county in adopting its framework plan and comprehensive plan policies. The most pertinent GMA goals that apply to this proposal are Goals 3 and 12

(3) Transportation. Encourage efficient multimodal transportation systems that are based on regional priorities and coordinated with county and city comprehensive plans.

(12) Public Facilities and Services. Ensure that those public facilities and services necessary to support development shall be adequate to serve development at the time the development is available for occupancy and use without decreasing current service levels below locally established minimum standards.

Finding: Changing the three subject roads, including the future extension of NE 83rd Street, to compatible urban road designations will implement the County's Comprehensive Plan and also the changed road classifications will ensure that future development have adequate transportation facilities that support future development in this area.

c. The proposed change is consistent with the adopted comprehensive plan, including the land use plan and the rest of the Arterial Atlas.

The Clark County Comprehensive Plan contains many policies that guide urban form and efficient land use patterns. The most relevant goals and policies applicable to this application are as follows:

Chapter 5 Transportation Element

GOAL: Develop a regionally-coordinated transportation system that supports and is consistent with the adopted land use plan.
GOAL: Ensure mobility throughout the transportation system.

Finding: This proposal contributes to the development and improvement of an interconnected transportation system. The proposed functional classification of urban street designations supports both access and mobility, and is integrated with the land use plan as well as the Arterial Atlas.

d. The proposed change is consistent with applicable interlocal agreements; and

Finding: There are no interlocal agreements which directly apply to this proposal.

e. The proposed change does not conflict with the adopted Metropolitan Transportation Plan.

Finding: The urban street designations will help preserve an acceptable traffic circulation for the land where urban holding was lifted last year in the Fifth Plain Creek area.

Conclusion

All of the criteria for approval of an Arterial Atlas amendment have been met.

RECOMMENDATION:

Recommendation Summary

The following table lists the applicable criteria and summarizes the findings of the staff report. The Planning Commission findings will be added to the table after public deliberation at the Planning Commission hearing scheduled for this application.

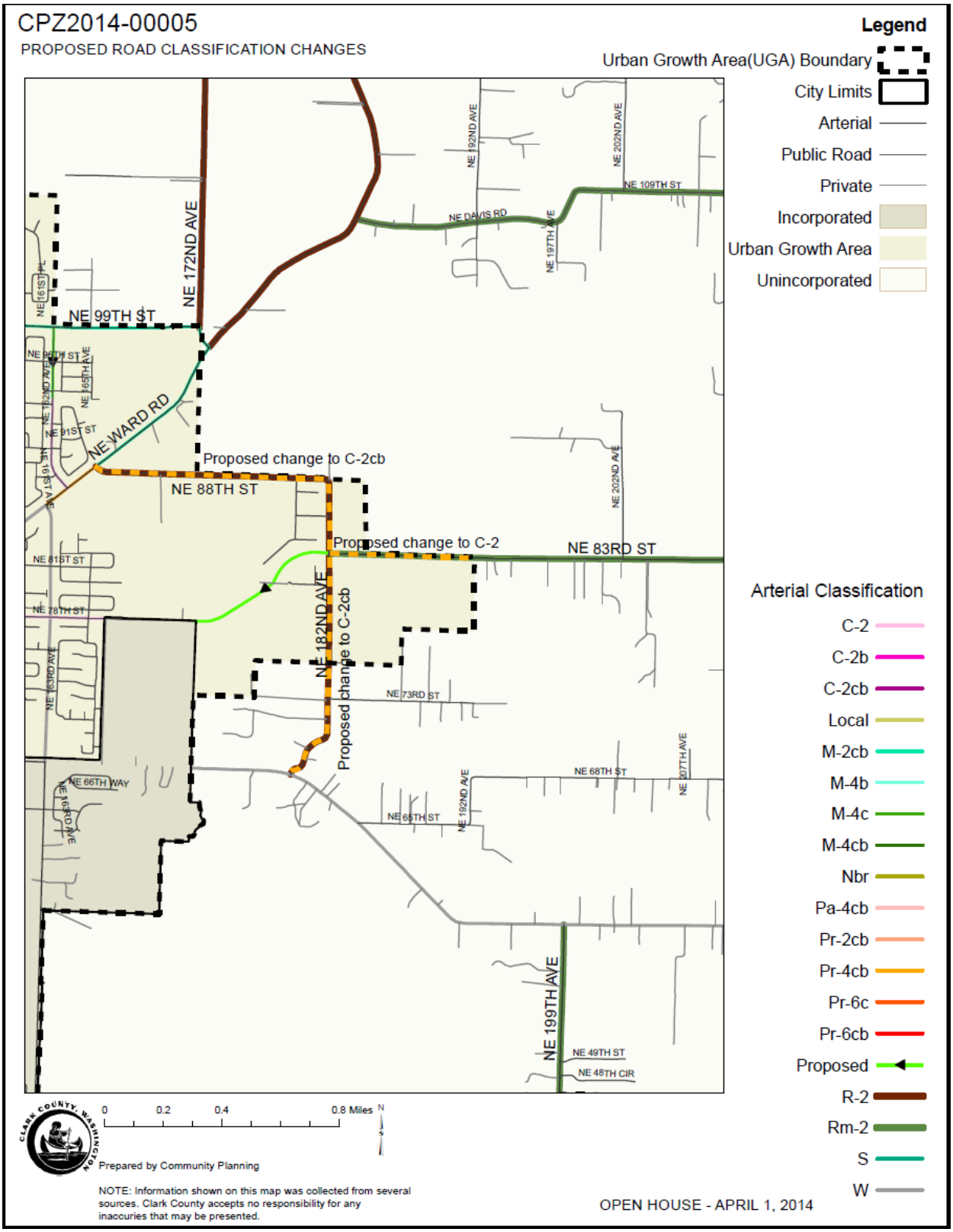
COMPLIANCE WITH APPLICABLE CRITERIA	Criteria Met?	
	Staff Report	Planning Commission Findings
Criteria for Arterial Atlas Changes		
1. Need for Change	Yes	
2. Compliance with GMA	Yes	
3. Consistency with the adopted Comprehensive Plan	Yes	
4. Consistency with applicable interlocal agreements	Yes	
5. Consistency with adopted MTP	Yes	
Recommendation:	**Approve**	

Based upon the information and the findings presented in this report and in the supporting documents, staff recommends that the Planning Commission forward to the Board of Clark County Commissioners a recommendation of **APPROVAL** of the recommended.

EXHIBITS:

Exhibit 1: Map of affected roads and Arterial Atlas cross-sections
Exhibit 2: Monet's Garden recorded plat map
Exhibit 3: DKS Traffic Study
Exhibit 4: WSDOT letter
Exhibit 5: Typed comments from April 1, 2014 open house
Exhibit 6: Scanned comment cards from the April 1, 2014 open house

EXH 1

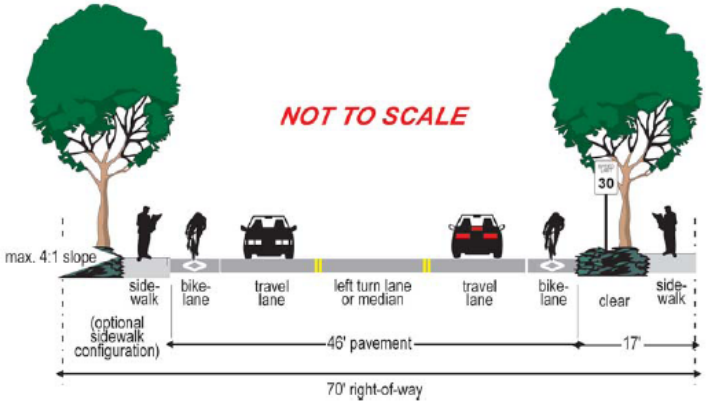

CPZ2014-00005
PROPOSED ROAD CLASSIFICATION CHANGES
Legend
Urban Growth Area(UGA) Boundary
City Limits
Arterial
Public Road
Private
Incorporated
Urban Growth Area
Unincorporated
Arterial Classification
C-2
C-2b
C-2cb
Local
M-2cb
M-4b
M-4c
M-4cb
Nbr
Pa-4cb
Pr-2cb
Pr-4cb
Pr-6c
Pr-6cb
Proposed
R-2
Rm-2
S
W
NE 172ND AVE
NE 99TH ST
NE WARD RD
NE 88TH ST
NE 83RD ST
NE 182ND AVE
NE 199TH AVE
NE 109TH ST
NE DAVIS RD
NE 192ND AVE
NE 202ND AVE
NE 197TH AVE
NE 161ST PL
NE 96TH ST
NE 165TH AVE
NE 91ST ST
NE 81ST ST
NE 78TH ST
NE 73RD ST
NE 68TH ST
NE 65TH ST
NE 66TH WAY
NE 207TH AVE
NE 49TH ST
NE 48TH CIR
Proposed change to C-2cb
Proposed change to C-2
Proposed change to C-2cb
0
0.2
0.4
0.8 Miles
N
Prepared by Community Planning
NOTE: Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuries that may be presented.
OPEN HOUSE - APRIL 1, 2014

C-2cb — 2-lane Collector with CLT & bike lanes

Collector streets connect local traffic to arterial roads. Access to abutting properties and parking is controlled through the use of raised channelization, driveway spacing, and pavement markings. Typically, collectors are not continuous for any great length, nor do they form a network by themselves.Fixed route transit service is low while bicycling and pedestrian activity ranges from moderate to high.

Left: NE 88th Street

For technical specifications, refer to Chapter 40.350.030, Clark County Code



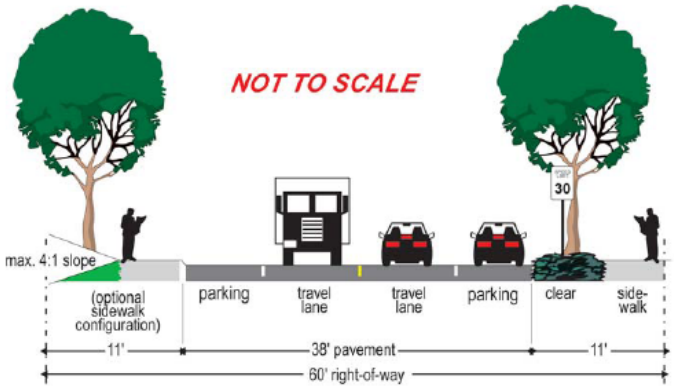
Street Width:	46 ft.
Right-of-way:	70 ft.
Design Volume:	<16,000 vehicles per day
Design Speed:	35 MPH
Typical Posted Speed:	30 MPH
Maximum Grade:	7 to 10 percent
Cross Streets:	Min. 275 ft. separation

C-2 2-lane Collector

Collector streets connect local traffic to arterial roads. Access to abutting properties and parking is controlled through the use of raised channelization, driveway spacing, and pavement markings. Typically, collectors are not continuous for any great length, nor do they form a network by themselves. Fixed route transit service is low while bicyling and pedestrian activity ranges from moderate to high.

Left: NW 9th Avenue looking south from NW 92nd Street. On-street parking is allowed on this particular street. Sidewalks have been constructed immediately adjacent to the curbs.

For technical specifications, refer to Chapter 40.350.030, Clark County Code



Street Width:	38 ft.
Right-of-way:	60 ft.
Design Volume:	2,000-12,000 vehicles per day
Design Speed:	35 MPH
Typical Posted Speed:	30 MPH
Maximum Grade:	7 to 10 percent
Cross Streets:	Min. 275 ft. separation

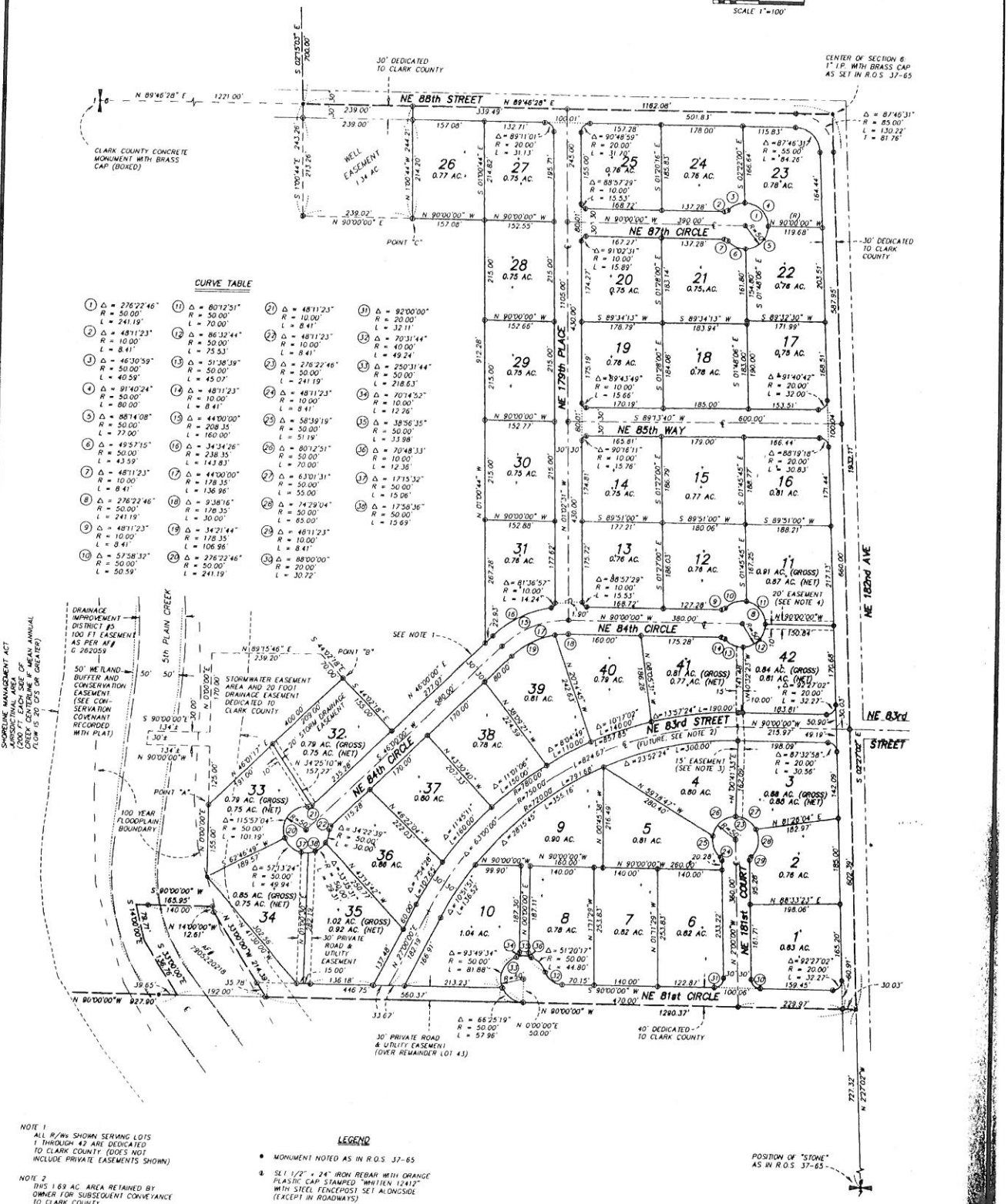
EXH 2

MONET'S GARDEN

FORMERLY KNOWN AS SI ELLEN ESTATES
IN THE SW 1/4 AND THE W 1/2 NW 1/4
SECTION 6, T2N, R3E, W.M.
CLARK COUNTY, WA

NARRATIVE

THE PERIMETER OF THIS PLAT WAS ESTABLISHED AND MONUMENTED IN R.O.S. 37-65. CORNERS WILL BE SET RADIALLY FROM THE RANDOM CONTROL TRAVERSE POINTS REMAINING FROM THAT WORK.



CURVE TABLE

(1) Δ = 276°22'46" R = 50.00' L = 241.19'	(11) Δ = 80°12'51" R = 50.00' L = 70.00'	(21) Δ = 48°11'23" R = 10.00' L = 8.41'	(31) Δ = 92°00'00" R = 20.00' L = 32.11'
(2) Δ = 48°11'23" R = 10.00' L = 8.41'	(12) Δ = 86°32'44" R = 50.00' L = 75.53'	(22) Δ = 48°11'23" R = 10.00' L = 8.41'	(32) Δ = 70°31'44" R = 40.00' L = 49.24'
(3) Δ = 46°30'59" R = 50.00' L = 40.59'	(13) Δ = 51°38'39" R = 50.00' L = 45.07'	(23) Δ = 276°22'46" R = 50.00' L = 241.19'	(33) Δ = 250°31'44" R = 50.00' L = 218.63'
(4) Δ = 91°40'24" R = 50.00' L = 80.00'	(14) Δ = 48°11'23" R = 10.00' L = 8.41'	(24) Δ = 48°11'23" R = 10.00' L = 8.41'	(34) Δ = 70°14'52" R = 10.00' L = 12.26'
(5) Δ = 88°14'08" R = 50.00' L = 77.00'	(15) Δ = 44°00'00" R = 208.35' L = 160.00'	(25) Δ = 58°39'19" R = 50.00' L = 51.19'	(35) Δ = 38°56'35" R = 50.00' L = 33.98'
(6) Δ = 49°57'15" R = 50.00' L = 43.59'	(16) Δ = 34°34'26" R = 238.35' L = 143.83'	(26) Δ = 80°12'51" R = 50.00' L = 70.00'	(36) Δ = 20°48'33" R = 10.00' L = 12.36'
(7) Δ = 48°11'23" R = 10.00' L = 8.41'	(17) Δ = 44°00'00" R = 178.35' L = 136.96'	(27) Δ = 63°01'31" R = 50.00' L = 55.00'	(37) Δ = 17°15'32" R = 50.00' L = 15.06'
(8) Δ = 276°22'46" R = 50.00' L = 241.19'	(18) Δ = 9°38'16" R = 178.35' L = 30.00'	(28) Δ = 74°29'04" R = 50.00' L = 65.00'	(38) Δ = 17°58'36" R = 50.00' L = 15.69'
(9) Δ = 48°11'23" R = 10.00' L = 8.41'	(19) Δ = 34°21'44" R = 178.35' L = 106.96'	(29) Δ = 48°11'23" R = 10.00' L = 8.41'	
(10) Δ = 57°58'32" R = 50.00' L = 50.59'	(20) Δ = 276°22'46" R = 50.00' L = 241.19'	(30) Δ = 88°00'00" R = 20.00' L = 30.72'	

NOTE 1
ALL R/Ws SHOWN SERVING LOTS 1 THROUGH 42 ARE DEDICATED TO CLARK COUNTY (DOES NOT INCLUDE PRIVATE EASEMENTS SHOWN)

NOTE 2
THIS 1.69 AC. AREA RETAINED BY OWNER FOR SUBSEQUENT CONVEYANCE TO CLARK COUNTY

NOTE 3
15 FOOT WATERLINE EASEMENT TO BE DEDICATED TO CLARK PUBLIC UTILITIES

NOTE 4
20 FOOT PEDESTRIAN ACCESS EASEMENT TO BE DEDICATED TO CLARK COUNTY

LEGEND

- ● MONUMENT NOTED AS IN R.O.S. 37-65
- ② SET 1/2" x 24" IRON REBAR WITH ORANGE PLASTIC CAP STAMPED "WHITLEN 12412" WITH STEEL FENCEPOST SET ALONGSIDE (EXCEPT IN ROADWAYS)

R.O.S. = RECORD OF SURVEY

[SM] = METHOD OF ON-SITE SEWAGE DISPOSAL ("SM"=SAND MOUND, "PD"=PRESSURE DISTRIBUTION, CAP="CAP")

• = TEST HOLE LOCATIONS FOR "PERCS"

(NET) INDICATES AREA LESS EASEMENTS SHOWN

CHARLES E. WHITLEN — 12412 — REGISTERED PROFESSIONAL LAND SURVEYOR

8-22-96

HAGEDORN, INC.
1924 Broadway Vancouver, WA
Ph: (206) 696-4428 (503) 2[illegible]

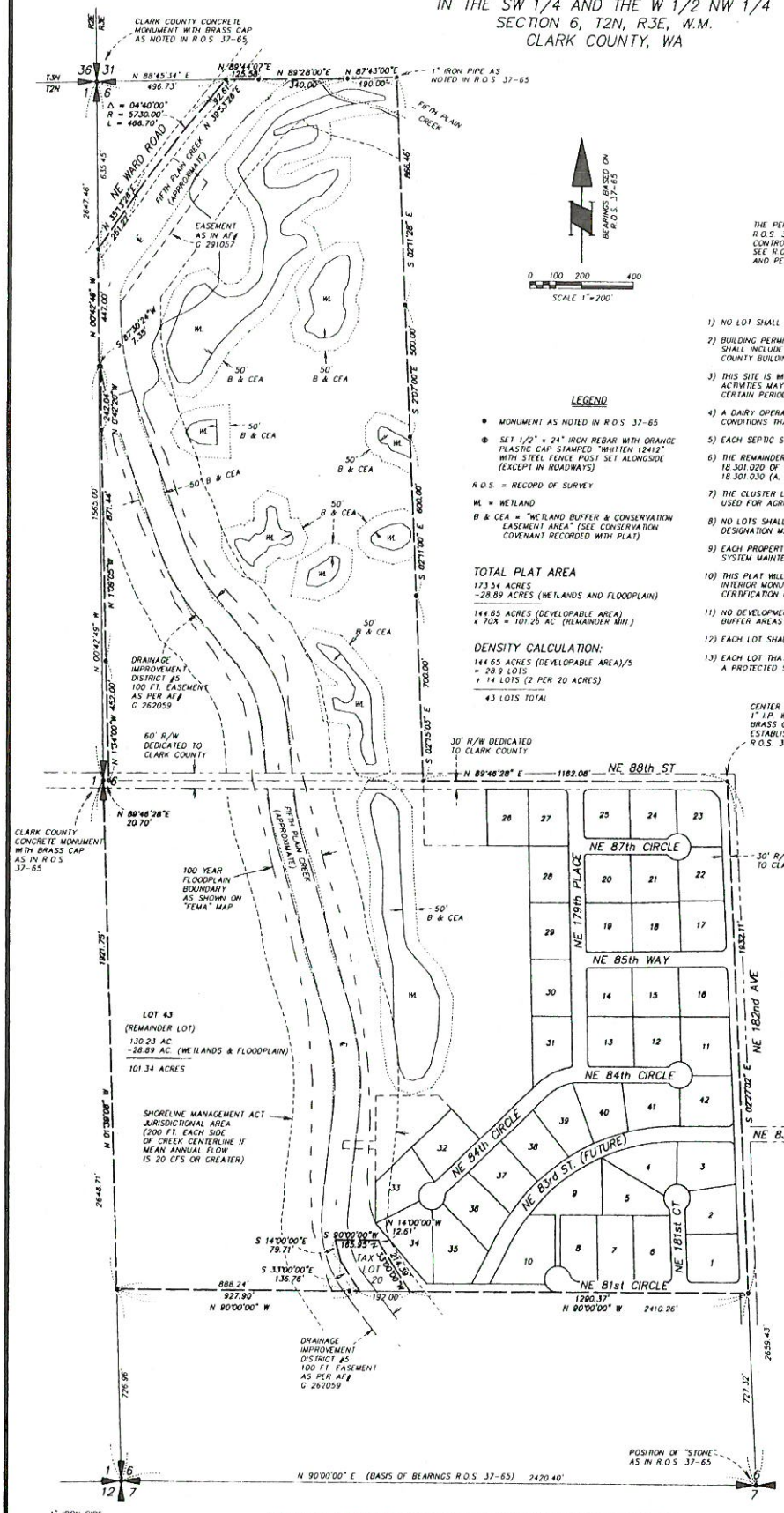
SCALE: 1"=100'	CALC BY: CEW
DATE: 8/21/96	DRAWN BY: CC
JOB No: 94-124	CHECKED BY: PBT

J-322 1972 J-322 1972

PAGE 1 OF 2

MONET'S GARDEN

FORMERLY KNOWN AS SI ELLEN ESTATES
IN THE SW 1/4 AND THE W 1/2 NW 1/4
SECTION 6, T2N, R3E, W.M.
CLARK COUNTY, WA



LEGEND

- ● MONUMENT AS NOTED IN R.O.S. 37-65
- ⊕ SET 1/2" x 24" IRON REBAR WITH ORANGE PLASTIC CAP STAMPED "WHITTEN 12412" WITH STEEL FENCE POST SET ALONGSIDE (EXCEPT IN ROADWAYS)

R.O.S. = RECORD OF SURVEY

WL = WETLAND

B & CEA = "WETLAND BUFFER & CONSERVATION EASEMENT AREA" (SEE CONSERVATION COVENANT RECORDED WITH PLAT)

TOTAL PLAT AREA

173.34 ACRES
-28.89 ACRES (WETLANDS AND FLOODPLAIN)

144.65 ACRES (DEVELOPABLE AREA)
x 70% = 101.26 AC. (REMAINDER MIN.)

DENSITY CALCULATION:

144.65 ACRES (DEVELOPABLE AREA)/5
= 28.9 LOTS
+ 14 LOTS (2 PER 20 ACRES)

43 LOTS TOTAL

NARRATIVE

THE PERIMETER OF THIS PLAT WAS ESTABLISHED AND MONUMENTED IN R.O.S. 37-65. CORNERS WILL BE SET RADIALLY FROM THE RANDOM CONTROL TRAVERSE POINTS REMAINING FROM THAT WORK. SEE R.O.S. 37-65 FOR ROAD ESTABLISHMENT DATA, SECTION SUBDIVISION AND PERIMETER DETAIL.

NOTES

1) NO LOT SHALL ACCESS DIRECTLY ONTO PROPOSED NE 83rd STREET.

2) BUILDING PERMITS WHICH ARE ISSUED FOR CONSTRUCTION ON THE LOTS SHOWN ON THIS PLAT SHALL INCLUDE AN APPROVED EROSION CONTROL PLAN WHICH IS ON FILE WITH THE CLARK COUNTY BUILDING DEPARTMENT.

3) THIS SITE IS WITHIN DESIGNATED AGRICULTURAL LAND ON WHICH A VARIETY OF COMMERCIAL ACTIVITIES MAY OCCUR THAT ARE NOT COMPATIBLE WITH RESIDENTIAL DEVELOPMENT FOR CERTAIN PERIODS OF LIMITED DURATION.

4) A DAIRY OPERATION ON THE REMAINDER PARCEL MAY RESULT IN ADVERSE ODORS OR OTHER CONDITIONS THAT MAY BE INCOMPATIBLE WITH RESIDENTIAL USE.

5) EACH SEPTIC SYSTEM SHALL BE ON THE SAME LOT THAT IT SERVES.

6) THE REMAINDER LOT SHALL BE USED ONLY FOR THE USES PERMITTED OUTRIGHT IN SECTION 18.301.020 OF THE CLARK COUNTY CODE AND THOSE CONDITIONAL USED LISTED IN SECTION 18.301.030 (A, C, AND E) OF THE CLARK COUNTY CODE.

7) THE CLUSTER LOTS SHALL HAVE A MINIMUM FRONT YARD SETBACK OF 25 FEET AND BUILDINGS USED FOR AGRICULTURAL PURPOSES SHALL HAVE A MINIMUM SIDE YARD SETBACK OF 50 FEET.

8) NO LOTS SHALL BE FURTHER DIVIDED OR REDUCED IN SIZE UNTIL SUCH TIME AS THE ZONING DESIGNATION MAY BE CHANGED TO ALLOW A MORE INTENSIVE USE OR DENSITY.

9) EACH PROPERTY OWNER IS REQUIRED TO PARTICIPATE IN A MANDATORY ON-SITE SEWAGE SYSTEM MAINTENANCE PROGRAM.

10) THIS PLAT WILL BE POST MONUMENTED IN COMPLIANCE WITH CLARK COUNTY CODE 17.501.030. INTERIOR MONUMENTS TO BE SET AFTER RECORDING ARE GUARANTEED BY A "DEVELOPER'S CERTIFICATION OF POSTMONUMENTATION".

11) NO DEVELOPMENT SHALL OCCUR WITHIN THE WETLANDS OR WETLAND BUFFERS. THE WETLAND BUFFER AREAS SHALL BE MAINTAINED IN A NATURAL STATE.

12) EACH LOT SHALL BE SERVED BY PUBLIC WATER, CLARK PUBLIC UTILITIES, PURVEYOR.

13) EACH LOT THAT DOES NOT COMPLY WITH THE BASIC SOLAR DESIGN STANDARD SHALL HAVE A PROTECTED SOLAR BUILDING LINE.

DEPARTMENT OF COMMUNITY DEVELOPMENT

APPROVED BY [signature] 8/29/96
FOR CLARK COUNTY PLANNING DIRECTOR

COUNTY DEPARTMENT OF PUBLIC WORKS

APPROVED BY [signature] 9-9-96
CLARK COUNTY ENGINEER

COUNTY ASSESSOR

THIS PLAT MEETS THE REQUIREMENTS OF R.C.W. No. 58.17.170, LAWS OF WASHINGTON, 1981, TO BE KNOWN AS SI ELLEN ESTATES PLAT No. J-322 IN THE COUNTY OF CLARK, STATE OF WASHINGTON.

[signature] by DL
COUNTY ASSESSOR

COUNTY AUDITOR

9609120902
ATTESTED BY Elizabeth Luce by M Sprecher
COUNTY AUDITOR

COUNTY COMMISSIONER

APPROVED AND ACCEPTED BY THE BOARD OF COUNTY COMMISSIONERS, COUNTY OF CLARK, STATE OF WASHINGTON, THIS 10 DAY OF Sept 1996.

[signature] ATTEST: [signature]
CHAIR OF THE BOARD CLERK TO THE BOARD

SOUTHWEST WASHINGTON HEALTH DISTRICT

THIS SUBDIVISION IS APPROVED IN GENERAL ONLY, ALL LAND-USES MUST COMPLY WITH THE RULES & REGULATIONS IN EFFECT AT THE TIME OF IMPLEMENTATION AND/OR PERMIT APPLICATION.

- ✓ AN APPROVED MUNICIPAL PUBLIC WATER SUPPLY SYSTEM IS REQUIRED.
- ___ AN APPROVED SMALL PUBLIC WATER SUPPLY SYSTEM IS REQUIRED.
- ___ LOTS IN THIS PLAT MAY BE SERVED BY INDIVIDUAL WATER SYSTEMS, SUBJECT TO HEALTH DISTRICT APPROVAL.
- ___ AN APPROVED PUBLIC SEWER SYSTEM IS REQUIRED.
- ✓ LOTS IN THIS PLAT MAY BE SERVED BY INDIVIDUAL ON-SITE SEWAGE SYSTEMS, SUBJECT TO HEALTH DISTRICT APPROVAL.

Carla C. Landon, R.S. 8/26/96
DISTRICT HEALTH OFFICER DATE

UTILITY EASEMENT

AN EASEMENT IS HEREBY RESERVED UNDER AND UPON THE EXTERIOR SIX (6) FEET OF FRONT AND REAR BOUNDARY LINES AND THE EXTERIOR THREE (3) FEET OF SIDE BOUNDARY LINES OF ALL LOTS FOR THE PURPOSE OF LAYING, CONSTRUCTING, RENEWING, OPERATING AND MAINTAINING ELECTRICAL, CABLE T.V., TELEPHONE AND SANITARY SEWER SERVICE.

LAND SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THIS PLAT, AS SHOWN, IS A TRUE RETURN FROM THE FIELD AND THAT THE DELINEATION IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

CHARLES E. WHITTEN 12412 REGISTERED PROFESSIONAL LAND SURVEYOR
8-22-96

PURSUANT TO CHAPTER 18.65 OF THE CLARK COUNTY CODE, THE IMPACT FEES FOR SAID PROJECT SHALL BE FIXED FOR A PERIOD OF THREE YEARS BEGINNING FROM THE DATE OF PRELIMINARY PLAT APPROVAL, DATED APRIL 14, 1992 AND EXPIRING ON APRIL 14, 1995. IMPACT FEES FOR PERMITS APPLIED FOR FOLLOWING SAID EXPIRATION DATE SHALL BE RECALCULATED USING THE THEN-CURRENT REGULATIONS AND FEE SCHEDULE. FEES SHALL BE IMPOSED ON A PER LOT/UNIT BASIS AT THE TIME OF BUILDING PERMIT APPLICATION. THESE FEES DO NOT CONSTITUTE A LIEN AGAINST THE LOTS, BUT ARE COLLECTED AS A CONDITION OF INITIAL BUILDING PERMIT ISSUANCE.
IMPACT FEES APPLICABLE TO THIS PROJECT ARE AS FOLLOWS:
SCHOOLS:
SCHOOL DISTRICT: EVERGREEN, WITH A CURRENT FEE OF $931 AND HOCKINSON, WITH A CURRENT FEE OF $1200, PER SINGLE FAMILY UNIT.

HAGEDORN, INC.
1924 Broadway Vancouver, WA 98663
Ph: (206) 696-4428 (503) 285-4743

SCALE: 1"=200' CALC BY: CEW
DATE: 8/21/96 DRAWN BY: CC

EXH 3

DKS

720 SW Washington St.
Suite 500
Portland, OR 97205
503.243.3500
www.dksassociates.com

MEMORANDUM

DATE: September 4, 2014

TO: Laurie Lebowsky, Clark County

FROM: Reah Flisakowski, P.E., DKS Associates
Julie Sosnovske, P.E., DKS Associates
Courtney Furman, E.I.T., DKS Associates

SUBJECT: NE 83rd Street Extension Transportation Analysis P#14085-001

This memorandum summarizes the existing and future transportation analysis for the planned NE 83rd Street Extension Project in Clark County, Washington. The project would extend NE 83rd Street west as a two-lane facility, connecting with NE 78th Street. The analysis provides an inventory of the existing transportation facilities, including safety and operational analysis, evaluates future conditions with and without the planned roadway extension, identifies improvements to reduce congestion and highlights benefits of the planned extension. The analysis is presented in the following sections.

STUDY AREA

The study area (shown in Figure 1) is generally bounded by NE 88th Street on the north, NE 182nd Avenue on the east, NE Fourth Plain Road on the south, and NE Ward Road on the west. Eight study intersections were selected based on proximity to the planned NE 83rd Street extension and regional significance. Of the eight study intersections, five are signalized, including the four located on NE 162nd Avenue and the NE Ward Road/NE 78th Street intersection. The remaining three intersections are unsignalized, and operate under stop control for the minor street approach. The study area intersections are listed below and shown in Figure 1.

1. NE Ward Road/NE 88th Street
2. NE Ward Road/ NE 162nd Avenue/Retail Signal
3. NE Ward Road/NE 162nd Avenue
4. NE 162nd Avenue/NE 78th Street
5. NE 162nd Avenue/NE Fourth Plain Road
6. NE Ward Road/NE 78th Street
7. NE 182nd Avenue/NE 83rd Street
8. NE 182nd Avenue/NE Fourth Plain Road

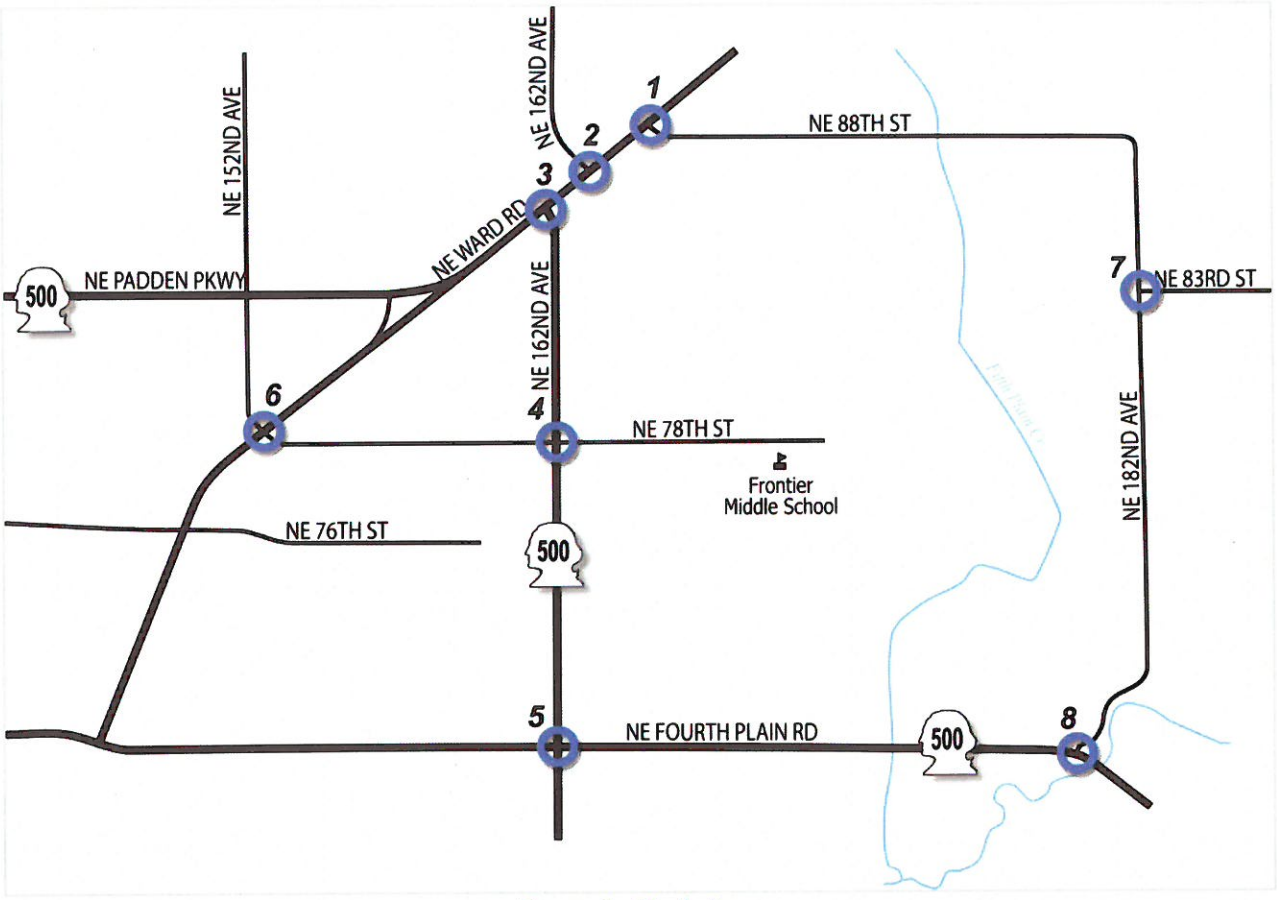


Figure 1 - Study Area

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ROADWAY CHARACTERISTICS

The key roadways within the study area are summarized in Table 1, including their jurisdiction, functional classification, cross section, posted speed, and presence of sidewalks or bicycle lanes.

Table 1 - Roadway Characteristics

Roadway	*Jurisdiction*	*Functional Classification*	*Cross Section*	*Posted Speed (mph)*	*Sidewalks*	*Bicycle Lanes*
NE Fourth Plain Rd (east of NE 162nd Ave)	WSDOT	State Route	4 lanes	50	No	No
NE Fourth Plain Rd (west of NE 162nd Ave)	Clark County	Primary Arterial	4 lanes	50	Yes	No
NE Ward Rd	Clark County	Urban Principal Arterial	4 lanes/ 2 lanes	40/45	Yes	Yes
NE 162nd Ave	WSDOT	State Route	4 lanes	40	Yes	Yes
NE 78th St	Clark County	Urban Collector	2 lanes	35/25	Partial (varies by block)	No
NE 88th St	Clark County	Rural Major Collector	2 lanes	50*	No	No
NE 182nd Ave	Clark County	Rural Major Collector	2 lanes	50*	No	No
NE 83rd St	Clark County	Rural Minor Collector	2 lanes	50*	No	No

*Speed follows Basic Speed Rule, speed shown is based on the design speed for the functional classification [1]

Pedestrian Facilities

Pedestrian facilities were inventoried for the study area. Sidewalks are provided on the majority of the urban streets within the study area. The most significant gap is on NE 78th Street, between NE 154th Avenue and NE 159th Avenue. Additionally, there is a signalized pedestrian crossing on NE Ward Road where the merge occurs with NE Padden Parkway. The crossing leads to a trail on the south side of NE Padden Parkway that connects to the NE Padden Parkway/NE Ward Road intersection just west of the pedestrian crossing. The pedestrian network generally has good connectivity within the study area in the urban area, and provides access between the residential areas, commercial centers and neighborhood schools.

Bicycle Facilities

Bicycle facilities were inventoried for the study area. Bicycle lanes are provided on NE Ward Road (between NE Fourth Plain Road and NE 88th Street) and on NE 162nd Avenue (between NE Fourth Plain Road and NE Ward

[1] Clark County Unified Development Code, Table 40.350.030-3.

Road), within the study area. NE Fourth Plain Road has a few short sections where bicycle lanes have been constructed adjacent to new developments; however, this corridor lacks bicycle connectivity. Although there are no bicycle lanes on the other roadways within the study area, bicyclists have the option to share the roadway with motor vehicles.

Transit Facilities

Transit service is provided within the study area by two fixed C-TRAN bus routes. Both routes travel into the study area only as far as NE Ward Road.

Route 44, the Fourth Plain Limited route, runs along Fourth Plain Boulevard between the Delta Park/Vanport MAX Station and the Kaiser Clinic (at NE 137th Avenue), including a loop that travels along NE Ward Road between Fourth Plain Boulevard and NE 76th Street. Route 44 provides service approximately every half-hour during both morning and evening peak periods.

Route 72, the Orchards route, runs along Fourth Plain Boulevard from the Vancouver Mall Transit Center on Ward Road to NE 99th Street, providing service to a business park, a school, and shopping centers. Route 72 travels along NE Ward Road between NE Fourth Plain Boulevard and NE 152nd Avenue. Route 72 provides service approximately every hour throughout the day between 5 AM and 9 PM.

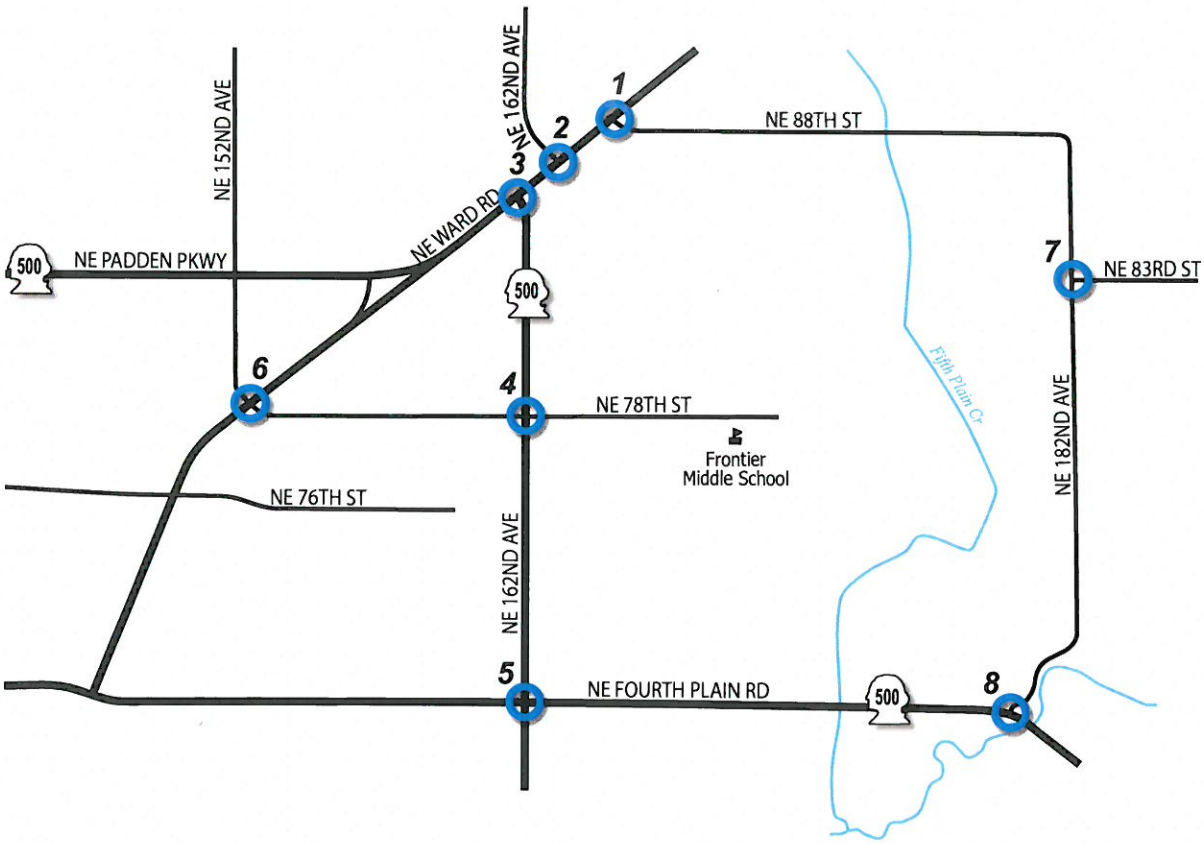
ROADWAY VOLUMES

The study area roadways are used by motor vehicles, pedestrians, and bicyclists, and their activity was recorded at each study intersection during the morning and evening peak periods[2].

Motor Vehicle Volumes

To determine intersection traffic operations, vehicle turn movement counts were conducted at study area intersections during the weekday morning peak period (7 to 9 AM), and evening peak period (4 to 6 PM). The raw traffic count data is included in the Appendix. Raw traffic count data were adjusted to reflect balanced volumes between nearby intersections. The adjusted peak period traffic volumes developed for the study intersections are shown in Figure 2.

[2] Traffic counts conducted Thursday, June 5, 2014.



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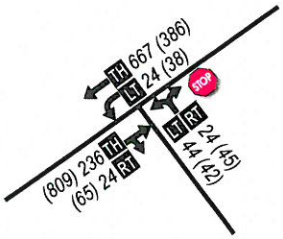

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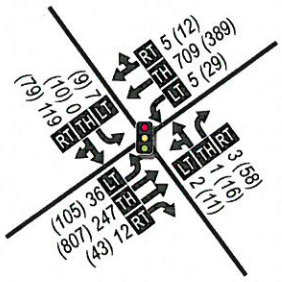

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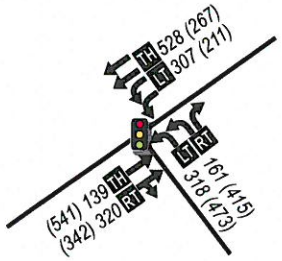

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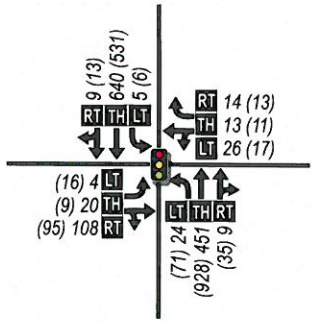

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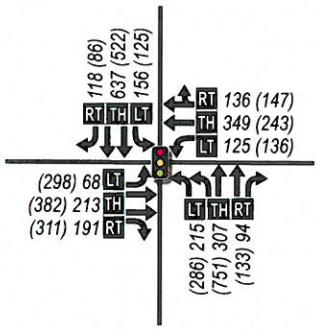

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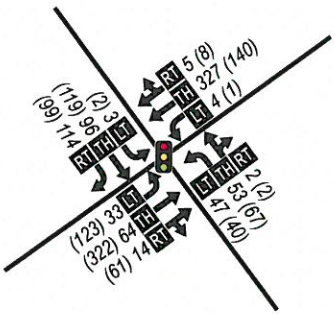
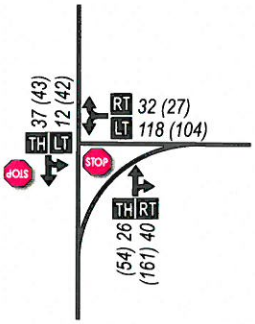


7. NE 83rd Ave./NE 182nd Ave.



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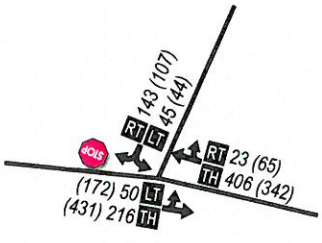

LEGEND

- # - Study Intersection
- Traffic Signal
- STOP - Stop Sign
- ← - Lane Configuration
- (PM) AM - Peak Hour Traffic Volumes
- LT TH RT (Left•Thru•Right) - Volume Turn Movement

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No Scale

Figure 2

2014 EXISTING AM/PM PEAK HOUR TRAFFIC VOLUMES

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Pedestrian & Bicycle Volumes

Pedestrian and bicycle count data indicates that the majority of the pedestrian activity is occurring within the urban portion of the study area and that the bicycle activity is relatively low during the AM and PM peak hours. Intersection count data is provided in the Appendix. In the morning peak hour, approximately ten pedestrians traveled on NE 78th Street, crossing at the intersections with NE 162nd Avenue and NE Ward Road. This pedestrian activity is most likely related to the nearby Pioneer Elementary School and Frontier Middle School, located on NE 166th Avenue. In the afternoon peak hour, the pedestrian activity appears to be primarily related to the shopping centers located the NE Ward Road/NE 162nd Avenue and NE 162nd Avenue/NE Fourth Plain Road intersections.

MOTOR VEHICLE OPERATIONS

The existing traffic operating conditions at the study intersections were determined for the AM, and PM peak hours based on the 2010 Highway Capacity Manual methodology[3] for signalized and unsignalized intersections. The conditions include the estimated average delay, level of service (LOS), and volume-to-capacity (V/C) ratio of the study intersections.

Intersection Performance Measures

Level of service (LOS) and volume-to-capacity (V/C) ratios are two commonly used performance measures that provide a gauge of intersection operations. In addition, they are often incorporated into agency mobility standards. Descriptions are given below:

- Level of service (LOS): A "report card" rating (A through F) based on the average delay experienced by vehicles at the intersection. LOS A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. LOS D and E are progressively worse operating conditions. LOS F represents conditions where average vehicle delay has become excessive and demand has exceeded capacity. This condition is typically evident in long queues and delays.
- Volume-to-capacity (V/C) ratio: A decimal representation (between 0.00 and 1.00) of the proportion of capacity that is being used (i.e., the saturation) at a turn movement, approach leg, or intersection. It is determined by dividing the peak hour traffic volume by the hourly capacity of a given intersection or movement. A lower ratio indicates smooth operations and minimal delays. As the ratio approaches 1.00, congestion increases and performance is reduced. If the ratio is greater than 1.00, the turn movement, approach leg, or intersection is oversaturated and usually results in excessive queues and long delays.

Jurisdictional Operating Standards

All study intersections have been compared against the applicable jurisdictional operating standards. The study intersections on SR 500 must comply with a level of service target of E for urban areas, since SR 500 is not a

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[3] *2010 Highway Capacity Manual*, Transportation Research Board, Washington DC, 2010.

Highway of State Significance (non-HSS) under WSDOT jurisdiction within Clark County[4]. All other intersections must comply with the Clark County mobility targets[5], where signalized intersections must comply with a level of service target of D and unsignalized with a level of service of E.

Existing Motor Vehicle Traffic Operations

Existing motor vehicle operations at the study intersections are shown in Table 2. During the AM and PM peak hours, all study area intersections operate within the corresponding jurisdictional standard.

Table 2 - Existing Intersection Operations

Intersection		*Jurisdictional Standard*	*AM Peak Hour*			*PM Peak Hour*		
			LOS	Delay	v/c	LOS	Delay	v/c
Signalized Intersections								
2	NE Ward Road/NE 162nd Avenue/Retail	D	B	12.9	0.33	B	18.2	0.37
3	NE Ward Road/NE 162nd Avenue	E	C	32.2	0.44	D	37.6	0.60
4	NE 162nd Avenue/NE 78th Street	E	B	16.8	0.34	B	15.4	0.45
5	NE 162nd Avenue/NE Fourth Plain Road	E	C	33.1	0.72	D	44.9	0.74
6	NE Ward Road/NE 78th Street	D	C	28.3	0.22	C	33.6	0.31
Unsignalized Intersections								
1	NE Ward Road/NE 88th Street	E	A/C	22.8	0.28	B/E	37.6	0.47
7	NE 182nd Avenue/NE 83rd Street	E	A/A	9.5	0.06	A/A	9.5	0.11
8	NE 182nd Avenue/NE Fourth Plain Road	E	A/C	18.4	0.45	A/D	28.9	0.53

Two-Way Stop: LOS = Level of Service of Major Street/Minor Street, V/C = Volume-to-Capacity Ratio of Worst Movement
NE 182nd Avenue/NE 83rd Street intersection control was modified to report traffic operations due to software limitations.

Queuing Analysis

An estimate of the 95th percentile vehicle queues for each of the signalized intersection approach movements was made using SimTraffic modeling software and supplemented with field observations for existing conditions. Queuing results are summarized in the Appendix. The 95th percentile queue lengths at all study intersections would be accommodated by the existing available storage lengths.

Safety Analysis

The most recent five years (January 2009 – December 2013) of available crash data for the study area was obtained from the Washington Department of Transportation (WSDOT)[6] and used to evaluate the crash history. To identify potential deficiencies, crash types were analyzed to identify patterns or trends.

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[4] WSDOT, Level-of-service Standards for Washington State Highways, January 1, 2010.
[5] Clark County Code, Level of Service Standards, http://www.codepublishing.com/wa/clarkcounty.html, Accessed June 16, 2014.
[6] Washington Department of Transportation, Collision Data & Analysis Branch, received on June 18, 2014.

Study Area Collisions

The individual crash types within the study area were examined to see if any patterns would emerge. Figure 3 breaks down the crash types and severities experienced, with percentages of each shown. There were a total of 73 collisions (January 2009 – December 2013). The majority of the collisions resulted in property damage only (about three quarters), and only one percent resulted in serious injury. There was a mix of angle, rear end, turning, and fixed object collision types.

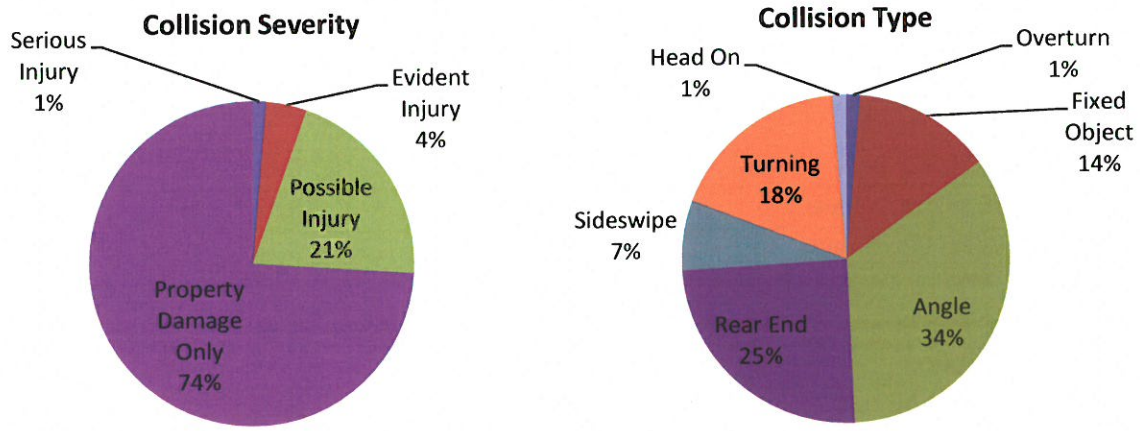

Figure 3 - Collisions by Type & Severity

Intersection Safety Analysis

Crash rates at study intersections were calculated to identify problem areas using the crash frequency and traffic volumes (MEV - million entering vehicles). Using this technique, a crash rate of 1.0 MEV or greater is commonly used to identify when further investigation is warranted. As shown in Table 3, no intersections were flagged by this criterion, as their observed crash rates are all below 1.0. It is worth noting that the NE 182nd Avenue/NE Fourth Plain Road intersection had the highest crash rate of 0.80.

Table 3 - Study Intersection Collision Data

Intersection		*Number of Crashes*	*MEV*	*Crash Rate*
1	NE Ward Road/NE 88th Street	1	25.28	0.04
2	NE Ward Road/ NE 162nd Avenue/Retail Signal	6	28.62	0.21
3	NE Ward Road/NE 162nd Avenue	12	41.04	0.29
4	NE 162nd Avenue/NE 78th Street	6	31.85	0.19
5	NE 162nd Avenue/NE Fourth Plain Road	24	62.42	0.38
6	NE Ward Road/NE 78th Street	3	17.96	0.17
7	NE 182nd Avenue/NE 83rd Street	4	7.87	0.51
8	NE 182nd Avenue/NE Fourth Plain Road	17	21.19	0.80

Intersection Sight Distance

All study intersections should meet Clark County sight distance requirements[7] as measured from 15 feet back from the edge of the traveled way. Based on the posted speed, each of the unsignalized study intersections require between 400 and 500 feet of clear sight distance.

NE 88th Street looking east to NE Ward Road

The two study intersections along NE 182nd Avenue, including NE 182nd Avenue/NE 83rd Street and NE 182nd Avenue/NE Fourth Plain Road, have adequate sight distance of at least 500 feet. However, the NE Ward Road/NE 88th Street study intersection does not meet the four hundred feet of required sight distance in the northeast direction, due to landscaping on the street corner. The landscaping would need to be trimmed back to provide adequate sight distance at this location.

FUTURE CONDITIONS

The transportation network was evaluated for the future year 2035 to assess the impact of the NE 83rd Street Extension Project on the study intersections. The two scenarios that were evaluated include the Future Baseline and the Future Baseline with Project. The NE 83rd Street Extension Project would connect NE 83rd Street between NE 78th Street and NE 182nd Avenue, as shown in Figure 5.

Traffic Forecasting

The Southwest Washington Regional Transportation Council (SWRTC) travel demand models were used for developing future traffic volumes. The models, as provided by SWRTC, generally contain regionally significant facilities, typically arterials and above, with some collector roadways. DKS reviewed network elements of the travel demand models in the study area (speeds, number of travel lanes, capacities) for consistency between facility types and with the existing roadway network. DKS also refined the models in the study area by adjusting and adding centroid connectors to better reflect access to the street network. No land use or trip generation adjustments were made to the travel demand models.

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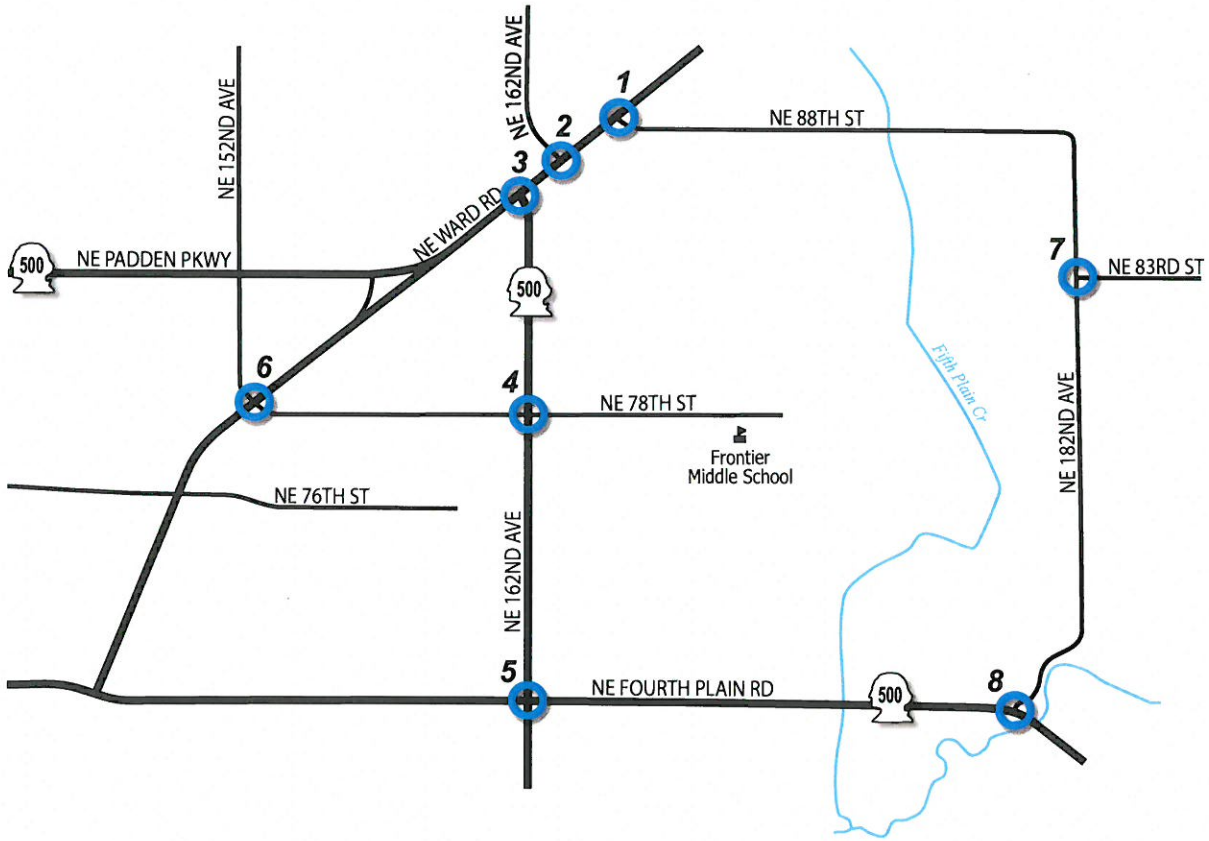
[7] Intersection sight distance (ISD) is defined by AASHTO as the distance provided at an intersection to allow the driver in the stopped vehicle a sufficient view of the intersecting road to decide when to enter the road. The AASHTO and Clark County standards are based on vehicle speeds. Clark County sight distance standards are based on 10 times the vehicle speed.

The base (2010) and future (2035) travel demand models were used to develop future year 2035 traffic volumes. The future (2035) model includes regional improvements that can reasonably be expected to be funded by 2035). The future model did not include improvements in the study area, although improvements in other parts of the region affect travel behavior and route choice. The growth increment between the base (2010) and future (2035) years was calculated for volumes at each study intersection and factored to reflect 21 years of linear growth (2014 to 2035), since existing traffic counts were collected in 2014. This growth was added to the existing traffic volumes and post-processed to create a volume forecast.

The future (2035) model was modified to include the planned NE 83rd Street extension in order to develop the Future Baseline with Project volumes. The NE 83rd Street extension was modeled as a two lane collector roadway with a 35 mph speed. The improved NE 182nd Avenue/NE 83rd Street intersection was modeled to be reconfigured as a four-leg intersection with stop control on the NE 83rd Street approaches.

Future Year 2035 Volumes

Future year 2035 traffic volumes were developed for the two scenarios, Future Baseline and Future Baseline with Project, as shown in Figures 4 and 5. Based on the model output and review of forecasted land use in the vicinity of the planned project, the NE 83rd Street extension is not expected to significantly shift travel patterns in the area. The planned roadway is an important east-west connection, but it is expected to accommodate mostly local traffic. There is limited land use growth expected to the east of NE 83rd Street and traffic destined for either NE Ward Road or NE 4th Plain Road is expected to stay on those routes. There is no direct route between the east end of the planned NE 83rd Street extension and NE Ward Road and speeds on NE Fourth Plain Boulevard are higher than those planned for the NE 83rd Street extension, so there is little incentive for existing travel patterns to change in the area.



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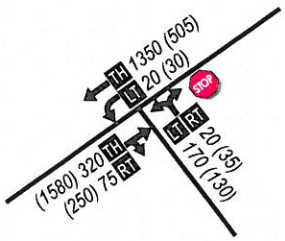
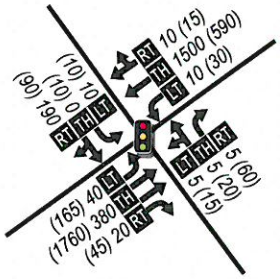


2. NE Ward Rd./NE 162nd Ave./ Retail Signal



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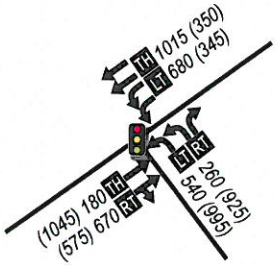

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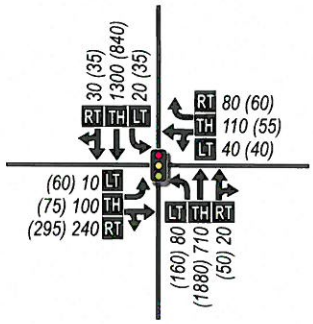

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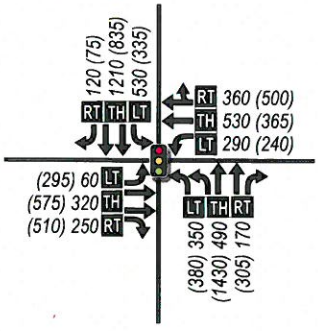

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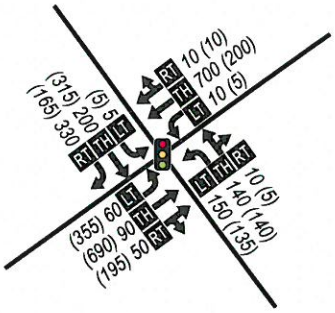

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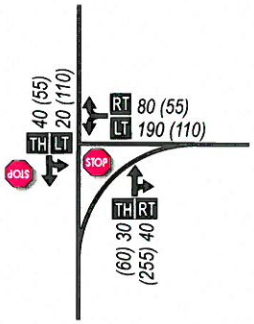

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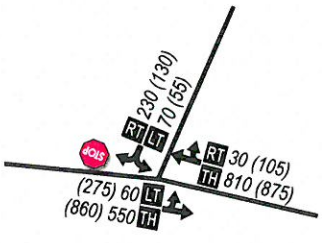

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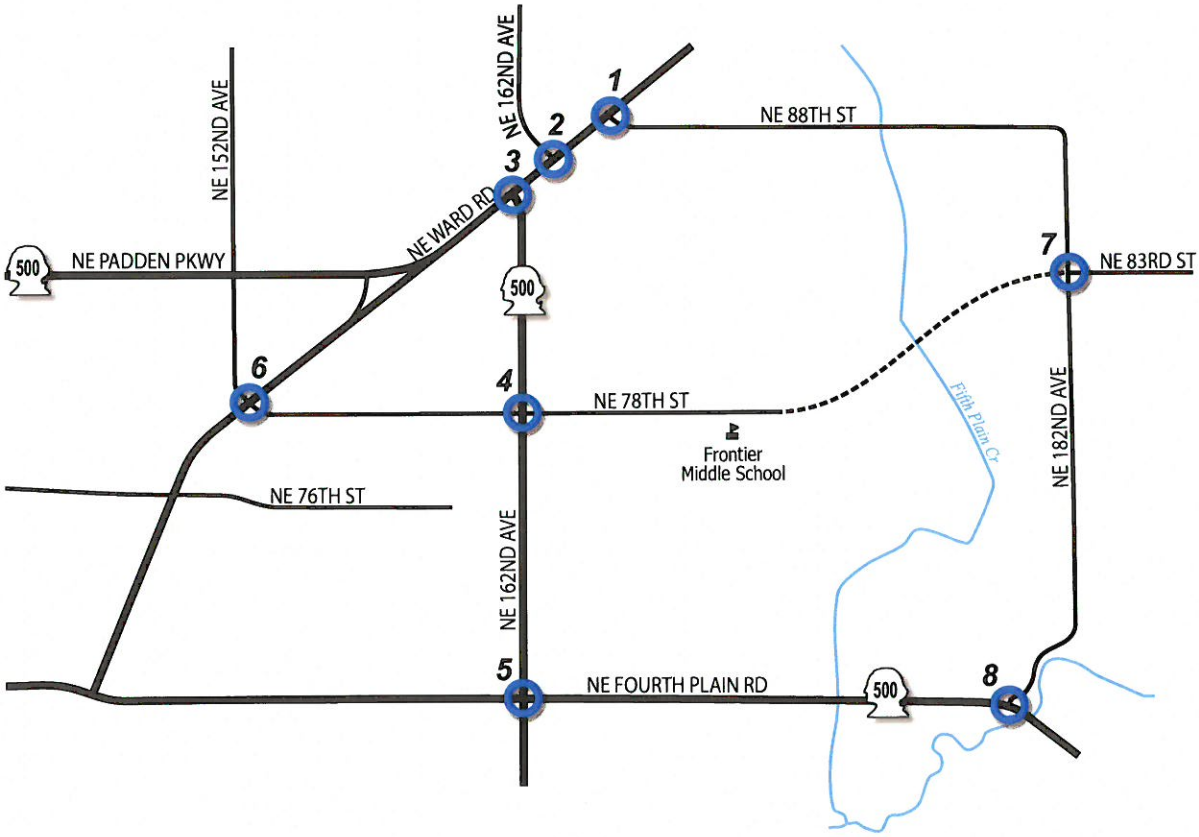
- Traffic Signal
- STOP - Stop Sign
- ← - Lane Configuration
- (PM) AM - Peak Hour Traffic Volumes
- LT TH RT - Volume Turn Movement (Left•Thru•Right)

DKS

No Scale

Figure 4

2035 FUTURE BASELINE AM/PM PEAK HOUR TRAFFIC VOLUMES



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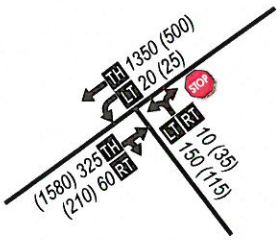

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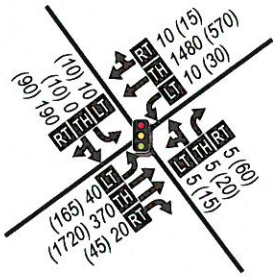

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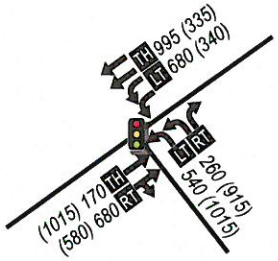

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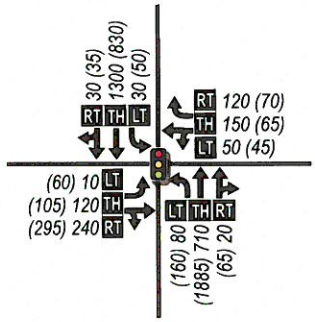

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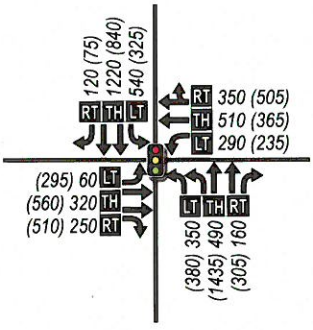

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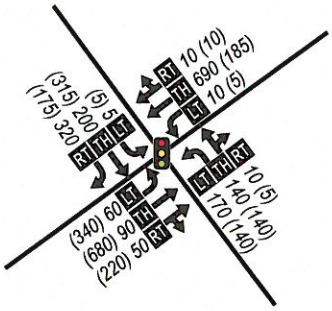
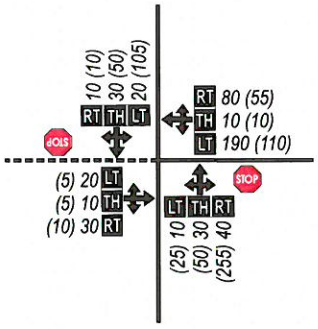
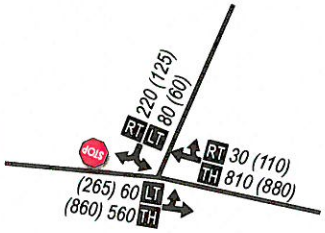


7. NE 83rd Ave./NE 182nd Ave.



8. NE Fourth Plain Rd./ NE 182nd Ave.



LEGEND

- # - Study Intersection
- ------ - Roadway Extension
- STOP - Stop Sign
- Traffic Signal
- ← - Lane Configuration
- (PM) AM - Peak Hour Traffic Volumes
- LT TH RT - Volume Turn Movement (Left-Thru-Right)

DKS

No Scale

Figure 5

2035 FUTURE BASELINE WITH PROJECT AM/PM PEAK HOUR TRAFFIC VOLUMES

Proposed NE 83rd Extension Roadway Use

The proposed NE 83rd Extension is expected to provide access to the arterial system for local development. It is an important connection in the regional street network, but due to the planned land use in the area, the west end of the proposed extension is expected to attract significantly more traffic than the east end. Figure 5 shows expected daily traffic volumes on either end of the proposed extension, with about 5,000 vehicles daily on the west end while less than 1,000 vehicles daily are expected on the east end. As shown in Figure 6, traffic volumes on the proposed roadway extension are comparable to other collectors in the area, such as NE 182nd Avenue and NE 88th Street.

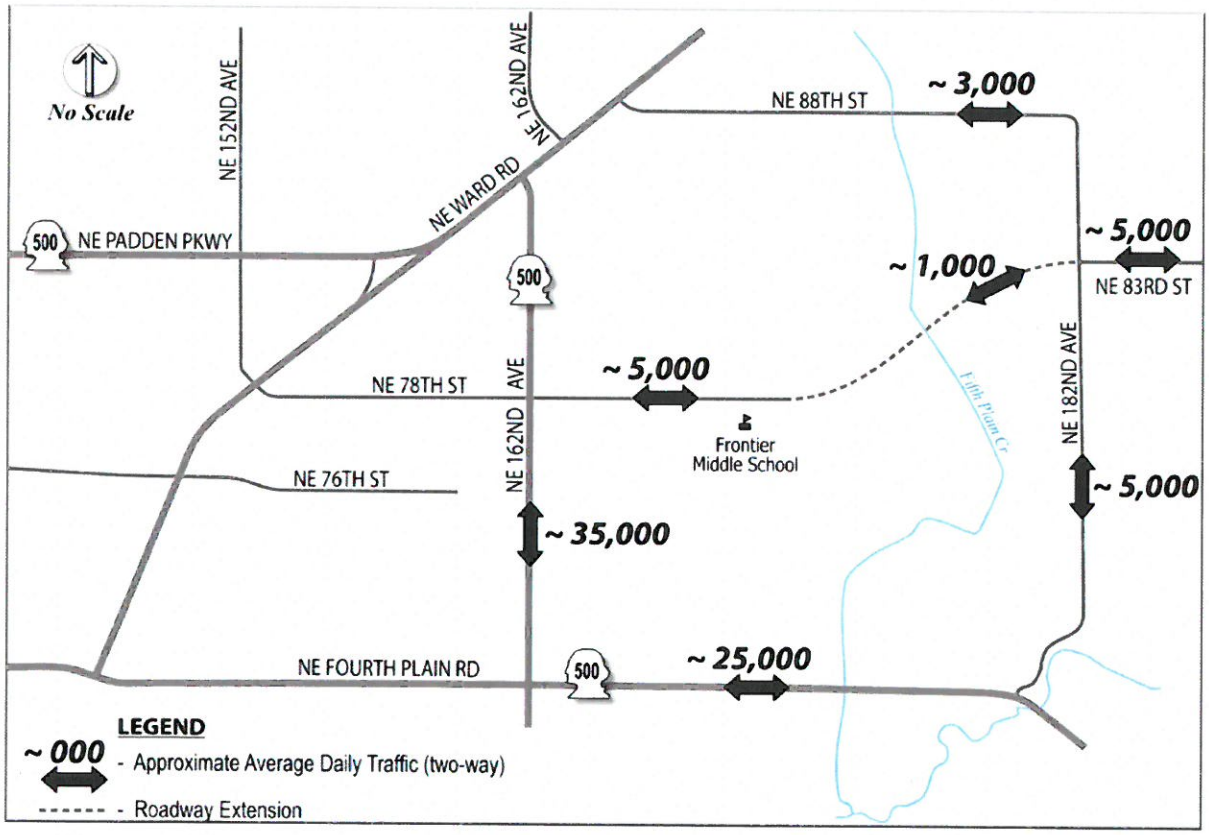


Figure 6: Approximate Average Daily Traffic (ADT) on Study Area Roadways

DKS

Future Year 2035 Motor Vehicle Traffic Operations

The future traffic operating conditions at the study intersections were determined for the PM peak hour based on the 2010 Highway Capacity Manual methodology[8] for signalized and unsignalized intersections. The conditions include the estimated average delay, level of service (LOS), and volume-to-capacity (V/C) ratio at the study intersections.

The following section summarizes the operational results for the two scenarios: (1) Future Baseline and (2) Future Baseline with Project, relative to their corresponding jurisdictional standard. The results are shown in Table 4 and in Table 5. The study intersection traffic operations are similar with and without the project, with the same four intersections failing in both scenarios. The future traffic volume forecasts show that, while the NE 83rd Street extension attracts traffic from local development, it does not eliminate or postpone the need for improvements along either the NE Ward Road or NE Fourth Plain Road corridors. Therefore the future 2035 traffic operations on those corridors are similar with and without the extension project.

Table 4 - Future 2035 Baseline Intersection Operations

Intersection		*Jurisdictional Standard*	*AM Peak Hour*			*PM Peak Hour*		
			LOS	Delay	v/c	LOS	Delay	v/c
Signalized Intersections								
2	NE Ward Road/ NE 162nd Avenue/Retail Signal	D	C	20.4	0.77	B	17.0	0.75
3	NE Ward Road/NE 162nd Avenue	E	D	38.9	0.73	**F**	**158.4**	**1.29**
4	NE 162nd Avenue/NE 78th Street	E	C	21.0	0.73	C	28.5	0.91
5	NE 162nd Avenue/NE Fourth Plain Road	E	**F**	**112.4**	**1.24**	**F**	**116.1**	**1.24**
6	NE Ward Road/NE 78th Street	D	C	25.0	0.56	C	34.9	0.85
Unsignalized Intersections								
1	NE Ward Road/NE 88th Street	E	**A/F**	**>300**	**>1.5**	**C/F**	**>300**	**>1.5**
7	NE 182nd Avenue/NE 83rd Street	E	A/B	10.4	0.09	A/B	10.3	0.21
8	NE 182nd Avenue/NE Fourth Plain Road	E	**B/F**	**>300**	**>1.5**	**C/F**	**>300**	**>1.5**

Two-Way Stop: LOS = Level of Service of Major Street/Minor Street, V/C = Volume-to-Capacity Ratio of Worst Movement

*Bolded Red and Shaded indicates intersection is approaching or exceeding the mobility target
NE 182nd Avenue/NE 83rd Street intersection control was modified to report traffic operations due to software limitations.

[8] *2010 Highway Capacity Manual*, Transportation Research Board, Washington DC, 2010.

Table 5 - Future 2035 Baseline with Project Intersection Operations

	Intersection	*Jurisdictional Standard*	*AM Peak Hour*			*PM Peak Hour*		
			LOS	Delay	v/c	LOS	Delay	v/c
Signalized Intersections								
2	NE Ward Road/ NE 162nd Avenue/Retail Signal	D	C	20.2	0.76	B	16.9	0.73
3	NE Ward Road/NE 162nd Avenue	E	D	39.0	0.73	**F**	**152.0**	**1.27**
4	NE 162nd Avenue/NE 78th Street	E	C	23.1	0.77	C	34.1	0.95
5	NE 162nd Avenue/NE Fourth Plain Road	E	**F**	**109.1**	**1.23**	**F**	**115.4**	**1.23**
6	NE Ward Road/NE 78th Street	D	C	25.1	0.58	C	34.1	0.85
Unsignalized Intersections								
1	NE Ward Road/NE 88th Street	E	**A/F**	**>300**	**>1.5**	**C/F**	**>300**	**>1.5**
7	NE 182nd Avenue/NE 83rd Street	E	A/C	16.6	0.17	A/C	21.5	0.45
8	NE 182nd Avenue/NE Fourth Plain Road	E	**B/F**	**>300**	**>1.5**	**C/F**	**>300**	**>1.5**

Two-Way Stop: LOS = Level of Service of Major Street/Minor Street, V/C = Volume-to-Capacity Ratio of Worst Movement

*Bolded Red and Shaded indicates intersection is approaching or exceeding the mobility target

ROADWAY CONNECTIVITY

The planned project would extend NE 83rd Street west as a two-lane facility, connecting with NE 78th Street. While the NE 83rd Street extension does not attract a significant amount of traffic from either the NE Ward Road or NE Fourth Plain Road corridors, an east-west collector facility in this location does serve an important function in the study area roadway network.

One mile spacing for arterials and one-half mile spacing for collectors is recommended in transportation system planning to provide a balance between mobility and land accessibility. The NE 83rd Street extension is planned in a desirable location about one-half mile north of NE Fourth Plain Road and about one-half mile south of NE Ward Road. The planned extension would provide a direct connection between NE 162nd Avenue (State Route) and NE 182nd (Rural Major Collector) and access to Frontier Middle School and future neighborhoods in the area.

If an east-west collector roadway is not provided at this location, drivers will travel long distances (up to a half mile) along local streets within the neighborhoods to access the outlying State Route and Rural Major Collector facilities. This is undesirable for drivers within the neighborhoods, and unpleasant for fronting residents on local streets where traffic volumes and speeds may exceed livability thresholds. The NE 83rd Street extension would help alleviate these potential traffic issues with future development in the study area.

In addition, this route would improve bicycle and pedestrian connectivity in the area. The NE 83rd Street extension should be constructed with continuous sidewalks and bicycle lanes to provide an important east-west route in the area. This is especially needed since the parallel routes on NE Fourth Plain Road and NE 88th Street provide very narrow (NE Fourth Plain Road) or non-existent (NE 88th Street) paved shoulders for pedestrians and cyclists.

Applying the same system planning guidelines, north-south roadway connectivity is also lacking in the area. There is an approximately one-mile gap between NE 162nd Avenue and NE 182nd Avenue, with only local streets. An additional north-south collector located midway between these two routes would be desirable for motor vehicles, cyclists and pedestrians.

INTERSECTION IMPROVEMENTS

Intersection improvements were considered for the future scenarios to reduce congestion at study intersections. Improvements considered additional capacity based on turn lane warrants and traffic signal warrants at unsignalized intersections, and turn lane capacity analysis at signalized intersections. The 2035 Baseline with Project traffic volumes were used for the turn lane and traffic signal warrant analysis presented in this memorandum (following two sections). The 2035 Baseline traffic volumes were also analyzed, however the findings were the same due to the similar future volumes.

TURN LANE WARRANTS

Turn lane warrants were used to assess the need for left and right turn lanes at the three unsignalized study intersections, which include the following locations: NE Ward Road/NE 88th Street, NE 182nd Avenue/NE 83rd Street, and NE 182nd Avenue/NE Fourth Plain Road. The left turn lane warrants were based on the HRB criteria[9] and the right turn lane warrants use the NCHRP criteria[10]. The results of the left and right turn lane warrant analyses are summarized in Table 6.

Table 6 - Future 2035 Turn Lane Warrants

Intersection		*Approach*	*Left Turn Lane*		*Right Turn Lane*	
			AM Peak	**PM Peak**	**AM Peak**	**PM Peak**
1	NE Ward Road/ NE 88th Street	NB	No	No	No	No
		EB	N/A	N/A	No	**Yes**
7	NE 182nd Avenue/ NE 83rd Street	EB	No	No	No	No
		WB	No	No	No	No
		SB	No	No	No	No
		NB	No	No	No	**Yes**
8	NE 182nd Avenue/NE Fourth Plain Road	SB	No	No	**Yes**	**Yes**
		EB	**Yes**	**Yes**	N/A	N/A
		WB	N/A	N/A	No	**Yes**

*Bolded Red and Shaded indicates turn lane is warranted

[9] Volume Warrant for Left-Turn Storage Lanes at Unsignalized Grade Intersections, Highway Research Record 211, Highway Research Board, National Research Council, Washington D.C., 1967.

[10] NCHRP 279, Intersection Channelization Design Guide, National Cooperative Highway Research Program, November, 1985.

Five turn lanes are warranted in the future, including:

- NE Ward Road/NE 88th Street intersection - eastbound right turn lane
- NE 182nd Avenue/NE 83rd Street - northbound right turn lane
- NE 182nd Avenue/NE Fourth Plain Road - southbound right turn lane, eastbound left turn lane, and westbound right turn lane

TRAFFIC SIGNAL WARRANTS

The need for a traffic signal at the three unsignalized intersections was tested by the use of the nine warrants provided by the Manual on Uniform Traffic Control Devices (MUTCD)[11]. The warrants are summarized below:

1. Eight-Hour Vehicular Volume: large volume of intersecting traffic (condition A) or large major street traffic volumes causing excessive delay on the intersecting minor street (condition B)
2. Four-Hour Vehicular Volume: large volume on intersecting street
3. Peak Hour: a facility attracts or discharges large numbers of vehicles over a short time
4. Pedestrian Volume: large major street traffic volumes causing pedestrians to experience excessive delay when crossing the major street
5. School Crossing: excessive delay at school crossings from large major street volumes
6. Coordinated Signal System: when needed to maintain vehicle platoons
7. Crash Experience: history of severe and frequent collisions (greater than five per year)
8. Roadway Network: part of a major route or roadway system
9. Intersection Near a Grade Crossing: close proximity to an at grade railroad crossing

Of the nine warrants, the first three are the only applicable warrants at the study intersections. The results for the first three warrants[12] under estimated future conditions are summarized in Table 7, which resulted in traffic signals being warranted at two unsignalized locations; NE 182nd Avenue/NE Fourth Plain Road and NE Ward Road/NE 88th Street.

[11] Manual on Uniform Traffic Control Devices (MUTCD), 2009 Edition, Federal Highway Administration.

[12] Future volumes were estimated based on existing 16-hour counts. Warrants at NE 182nd Ave/NE Fourth Plain Rd were based on two major street lanes and two minor street lane and warrants at NE Ward Rd/NE 88th St were based on two major street lanes and one minor street lane. No right turn reductions were applied at either intersection.

Table 7 - Future 2035 Traffic Signal Warrants

Warrant	*Warrant Name*	*Number of Hours Required*	*Meets Signal Warrant? (Number of Hours that meet criteria)*		
			182nd Ave/ Fourth Plain Rd	Ward Rd/ 88th St	182nd Ave/83rd St
1	Eight-hour vehicular volume – Condition A	8	Yes (10)	No (4)	NA
	Eight-hour vehicular volume – Condition B	8	Yes (14)	Yes (13)	NA
2	Four-hour vehicular volume	4	Yes (14)	Yes (12)	NA
3	Peak hour	1	Yes (8)	Yes (7)	No (0)

*Bolded Red and Shaded indicates traffic signal is warranted

NA – Eight and Four-hour vehicular volumes not available

The intersection of NE 182nd Avenue/NE 83rd Avenue was not tested against the four hour and eight hour warrants since only peak hour counts were available. The peak hour warrant was analyzed at NE 182nd Avenue/NE 83rd Street and it was found that a signal is not warranted at this location.

IDENTIFIED INTERSECTION IMPROVEMENTS

Two tiers of improvements were identified for both future traffic volume scenarios. Minimum improvements were identified to allow all intersections to meet jurisdictional mobility standards. At this level of improvement, all study intersections meet mobility standards, however two locations are expected to operate with a v/c ratio exceeding 1.0. In addition, initial simulation runs of the operation model indicated that reliable queuing estimates could not be provided due to excessive congestion and queueing. A second tier of recommended improvements was developed, in which study intersection v/c ratios are all under 1.0 and more reliable queuing data was available. The minimum and recommended tiers of improvements include the following, recommended improvements are shown in Figure 6:

Minimum Improvements:

- NE Ward Road/NE 88th Street
  - Traffic signal
- NE Ward Road/NE 162nd Avenue
  - Eastbound right turn lane
- NE 162nd Avenue/NE Fourth Plain Road
  - Eastbound dual left turn lane
  - Westbound dual left turn lane
  - Westbound right turn lane
  - Southbound dual left turn lane
- E 182nd Avenue/NE 83rd Street
  - Northbound right turn lane
- NE 182nd Avenue/NE Fourth Plain Road
  - Traffic signal

- Eastbound left turn lane
- Westbound right turn lane
- Southbound right turn lane

Recommended Improvements:

- NE Ward Road/NE 88th Street
  - Second eastbound through lane (existing two-lane section to 1,000 feet east of intersection)
  - Second westbound through lane (convert existing left turn lane from 1,000 feet east of intersection to existing two-lane section west of intersection)
- NE Ward Road/NE 162nd Avenue
  - Second northbound right-turn lane

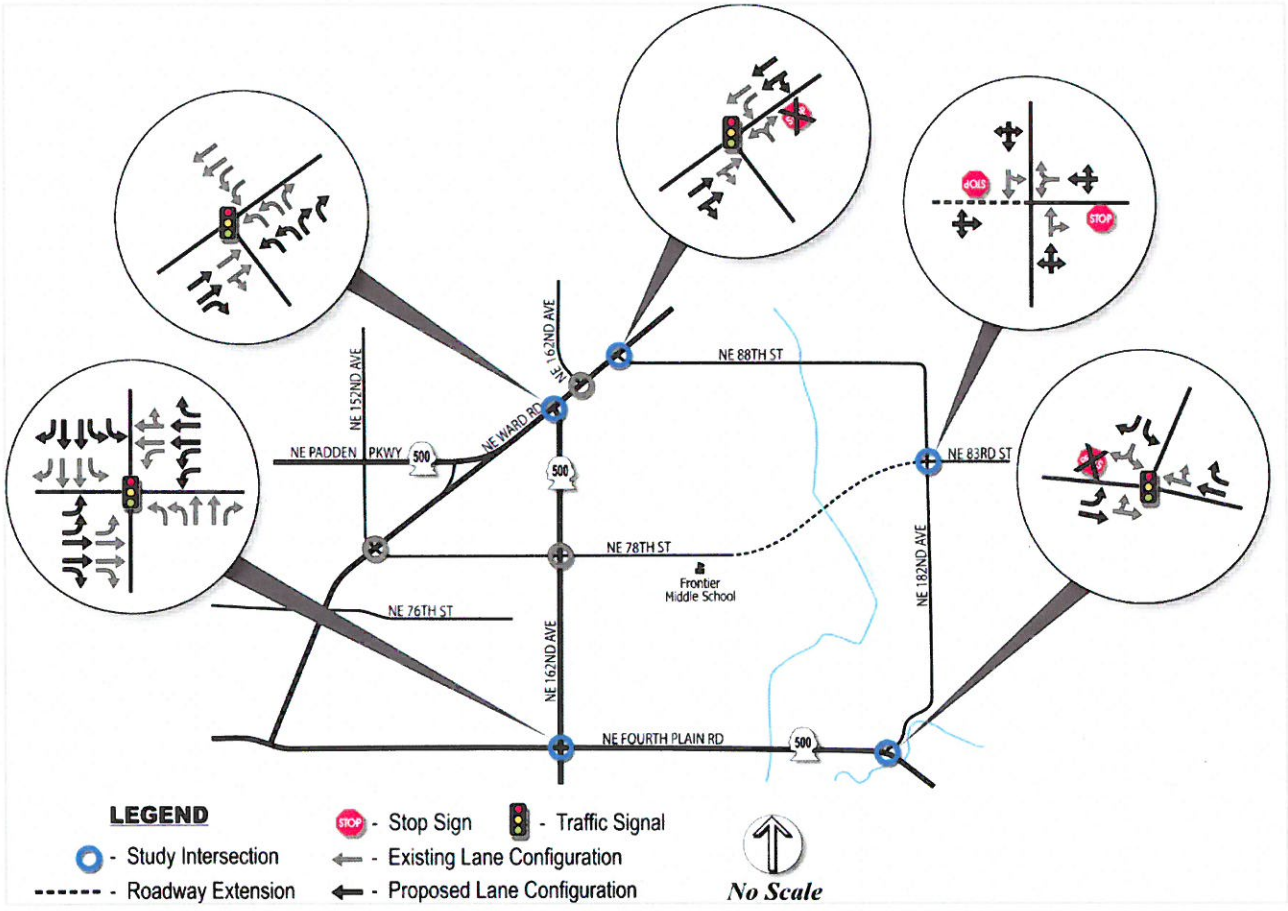


Figure 7 - Future Recommended Improvements

The future 2035 baseline with project scenario was analyzed with the identified minimum and recommended improvements. The operational results for the study intersections with these improvements added are summarized in Table 8; study intersections without improvements operate as previously shown in Table 5. With the improvements, all of the intersections are within the jurisdictional operating standards of a level of service E and have a v/c ratio less than 1.0. The intersection with the worst operating conditions is NE 162nd Avenue/NE Fourth Plain Road, with a level of service at the operating standard of E, and a volume to capacity ranging between 0.93 in the AM and 0.99 in the PM.

Table 8 - Future 2035 Baseline with Project + Recommended Improvements Intersection Operations

Intersection		*Jurisdictional Standard*	*AM Peak Hour*			*PM Peak Hour*		
			LOS	Delay	v/c	LOS	Delay	v/c
Signalized Intersections								
1	NE Ward Road/NE 88th Street	E	B	10.2	0.64	A	8.4	0.67
3	NE Ward Road/NE 162nd Avenue	E	D	40.1	0.74	D	48.1	0.84
5	NE 162nd Avenue/NE Fourth Plain Road	E	E	56.1	0.93	E	63.9	0.99
8	NE 182nd Avenue/NE Fourth Plain Road	E	B	10.7	0.72	A	8.1	0.75
Unsignalized Intersections								
7	NE 182nd Avenue/NE 83rd Street	E	A/C	16.7	0.12	A/C	17.7	0.39

Two-Way Stop: LOS = Level of Service of Major Street/Minor Street, V/C = Volume-to-Capacity Ratio of Worst Movement

The future 2035 baseline with project scenario with the identified improvements in place was analyzed further to estimate vehicle queues during the PM peak hour. The queuing analysis focused on the three closely spaced traffic signals (two existing, one future) on NE Ward Road. An estimate of the 95th percentile vehicle queues for each of the signalized intersection approach movements was made using the traffic operation model. The model simulation estimates the queue length that would not be exceeded in 95 percent of the queues formed during the peak hour. Queuing results (more detail in the Appendix) indicate that the NE 162nd Avenue/NE Ward Road intersection is expected to have significant queues in both the northbound and westbound directions, as follows:

NE 162nd Avenue/NE Ward Road 95th Percentile Queue Lengths:

- Northbound left: approximately 2,000 feet (back of queue extends to 78th Street intersection)
- Northbound right: approximately 1,500 feet (back of queue extends to midway between NE 81st Street and NE 78th Street)
- Westbound left: queue extends to the east through NE 162nd Avenue (North) and approximately 300 feet east of the NE 88th Street intersection

In general, when vehicle queues extend past available storage bays, queues in turn lanes can block through movements and through movements can, in turn, block upstream intersections. The result is an increased potential for rear-end collisions and a significant loss in system capacity.

The most critical movement that affects queuing on NE Ward Road is the westbound left turn at the NE 162nd Avenue/NE Ward Road intersection. The lack of storage blocks the westbound through movements for the two adjacent signalized intersections to the east.

KEY FINDINGS

Based on the analysis presented above, the following key findings can be made regarding the planned NE 83rd Street Extension:

- Improvements will be required at several study intersections by 2035, and the addition of the planned extension does not eliminate or postpone the need for these improvements.
- Recommended system planning for collector facilities is approximately one-half mile spacing. The planned project is ideally located approximately one-half mile north of NE Fourth Plain Boulevard and approximately one-half mile south of NE Ward Road.
- Based on the recommended collector spacing of one-half mile, a north-south roadway connecting NE Fourth Plain Boulevard and NE Ward Road would be desirable midway between NE 162nd Avenue and NE 182nd Avenue.
- The planned NE 83rd Street extension provides an important collector facility for local traffic to access adjacent neighborhoods (including future developments), reducing the potential for traffic volumes and speeds to exceed livability thresholds on local streets with residential frontage.
- The planned NE 83rd Street extension provides an important connection for bicyclists and pedestrians. Dedicated bicycle lanes and sidewalks should be provided on the planned extension.

EXH 4

Washington State Department of Transportation

Lynn Peterson
Secretary of Transportation

Southwest Region
11018 Northeast 51st Circle
Vancouver, WA 98668-1709
360-905-2000 / Fax 360-905-2222
TTY: 1-800-833-6388
www.wsdot.wa.gov

September 22, 2014

Laurie Lebowsky
Clark County
1300 Franklin Street
Vancouver, WA 98666

Re: Arterial Atlas Update

Dear Ms. Lebowsky:

The Washington State Department of Transportation (WSDOT) staff has reviewed the information you submitted regarding updating the Clark County Arterial Atlas. WSDOT would like to address our concerns and offer the following comments.

It's our understanding this proposal involves reclassifying several roads in the Fifth Plain Creek area near the SR 500/NE 182nd Avenue intersection. WSDOT encourages and supports Clark County to pursue transportation improvements that improve safety and reduce congestion on state highways.

Thank you for the opportunity to comment on this proposal. If you have any questions or need additional information, please contact Jeff Barsness, Southwest Region Development Services Engineer, at 360-905-2059.

Sincerely,

Dave Bellinger
Design Services Engineer

DB: jb

Fifth Plain Creek CPZ2014-00005 Open House April 1, 2014 Comment cards

1. We hope impact fees will not be waived on NE 182nd Ave and 83rd St. If the land is developed there, the roads will definitely need to be improved. Also, why in the world would the County put a STOP sign northbound on NE 182nd Ave instead of NE 83rd St? It simply doesn't make any sense. The STOP sign definitely needs to go at the end of the westbound end of NE 83rd St. Crazy! The recent road improvement there makes absolutely no sense.

2. Always include an index of "codes" for each road segment. "C-2" means nothing without further description. Also, where is this information on the website?

3. No development UNTIL roads improved. Today, mark all proposed right of ways with semi-permanent flags to indicate location and extent of these proposed changes.

4. It seems to be too dangerous to continue NE 83rd St into Monet's Garden. There already have had accidents with vehicles driving through the wire fence into the neighborhood over the years. Perhaps it would be safer and make better sense to lengthen 78th St to meet NE 182nd Ave.

5. If the 83rd St goes in, it should include noise barriers on both sides of it.

6. We oppose the proposed NE 83rd St westward expansion because it will make most of our yard exposed to the public that will be using the extension.

7. NE 83rd St is not needed and creates a huge hardship for the residents of Monet's Garden.

8. I oppose 83rd St extension. This goes through the backyards of 13 homes. I see it as a dangerous situation.

9. It is immoral for you to allow the developers to post maps that do not disclose this "new road". Our seller was the builder and he said it was going to be a community trail.

EXH 6

COMMENT CARD

Fifth Plain Creek CPZ2014-00005

Open House April 1, 2014

Please take a moment to provide any comments. Thank you for your valuable help!

Comments:

We hope impact fees will not be waived on N.E. 182nd Ave & 83rd ST. If the land is developed there, the roads will definitely need to be improved.

Also, Why in the world would the County put a Stop sign Northbound on NE 182nd Ave instead of W.E 83rd ST? It simply doesn't make any sense. The stop sign definitely need to go at the end of the westbound end of N.E. 83rd ST. Crazy! The recent road improvement there make absolutely no sense.

For other formats, contact the Clark County ADA Office: Voice (360) 397 2000; Relay 711 or (800) 833-6388; Fax (360) 397-6165; E-mail ADA@clark.wa.gov.

COMMENT CARD

Fifth Plain Creek CPZ2014-00005

Open House April 1, 2014

Please take a moment to provide any comments. Thank you for your valuable help!

Comments:

Always include an index of "codes" for each road segment "C-2" means nothing w/o further description -

Also where is this information on web site.

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COMMENT CARD

Fifth Plain Creek CPZ2014-00005

Open House April 1, 2014

Please take a moment to provide any comments. Thank you for your valuable help!

Comments:

(1) NO Development UNTIL roads improved

(2) Today – mark all proposed right of ways with semi permanent flags to indicate location and extent of these proposed changes.

For other formats, contact the Clark County ADA Office: Voice (360) 397-2000; Relay 711 or (800) 833-6388; Fax (360) 397-6165; E-mail ADA@clark.wa.gov.

COMMENT CARD

Fifth Plain Creek CPZ2014-00005

Open House April 1, 2014

Please take a moment to provide any comments. Thank you for your valuable help!

Comments:

~~There~~ It seems to be too dangerous to continue NE 83rd ~~St~~ Ave into Monet's Garden. There ~~have~~ already have had accidents with vehicles driving ~~through~~ the wire fence into the neighborhood over the years.

Perhaps it would be safer and make better sense to lengthen 18th St to meet NE 182nd Ave.

For other formats, contact the Clark County ADA Office: Voice (360) 397-2000; Relay 711 or (800) 833-6388; Fax (360) 397-6165; E-mail ADA@clark.wa.gov.

COMMENT CARD

Fifth Plain Creek CPZ2014-00005

Open House April 1, 2014

Please take a moment to provide any comments. Thank you for your valuable help!

Comments: If the 83rd street goes in, it should include noise barriers on both sides of it.

Yong Harris
17810 NE 81st Circle

For other formats, contact the Clark County ADA Office: Voice (360) 397-2000; Relay 711 or (800) 833-6388; Fax (360) 397 6165; E-mail ADA@clark.wa.gov.

COMMENT CARD

Fifth Plain Creek CPZ2014-00005

Open House April 1, 2014

Please take a moment to provide any comments. Thank you for your valuable help!

Comments: David & Yong Harris @ 17810 NE 81st Circle

We oppose the proposed NE 83rd Street westward expansion because it will make most of our yard exposed to the public that will be using the extension.

For other formats, contact the Clark County ADA Office: Voice (360) 397-2000; Relay 711 or (800) 833-6388; Fax (360) 397 6165; E-mail ADA@clark.wa.gov.

COMMENT CARD

Fifth Plain Creek CPZ2014-00005

Open House April 1, 2014

Please take a moment to provide any comments. Thank you for your valuable help!

Comments:

NE 83RD CT. IS NOT NEEDED AND CREATES A HUGE HARDSHIP FOR THE RESIDENTS OF MANY HOMES

For other formats, contact the Clark County ADA Office: Voice (360) 397 2000; Relay 711 or (800) 833 6388; Fax (360) 397-6165; E-mail ADA@clark.wa.gov.

COMMENT CARD

Fifth Plain Creek CPZ2014-00005

Open House April 1, 2014

Please take a moment to provide any comments. Thank you for your valuable help!

Comments:

I oppose 83rd Street extension.

THIS GOES THROUGH THE BACKYARDS OF 13 HOMES

I see it as a dangerous situation

RICH JONES

650-464-1308

For other formats, contact the Clark County ADA Office: Voice (360) 397-2000; Relay 711 or (800) 833-6388; Fax (360) 397-6165; E-mail ADA@clark.wa.gov.

COMMENT CARD

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Open House April 1, 2014

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