Land Use Application for Harvest Gardens Agrihood

Date: June 2020 *revised*

Submitted to: City of Donald
Planning Department
10710 Main Street NE
Donald, OR 97020

Applicant: GRC Land Holding
PO Box 427
Donald, OR 97020

AKS Job Number: 6732

AKS ENGINEERING & FORESTRY
12965 SW Herman Road, Suite 100
Tualatin, OR 97062
(503) 563-6151

Table of Contents

Exhibits

Exhibit A: Preliminary Plans
Exhibit B: City Application Forms and Checklist
Exhibit C: Written Consent Form for Annexation to City of Donald
Exhibit D: Marion County Assessor's Maps
Exhibit E: Property Ownership Information
Exhibit F: Noticing Labels
Exhibit G: Certification of Legal Description and Map
Exhibit H: Preliminary Stormwater Report
Exhibit I: Preliminary Traffic Impact Study
Exhibit J: Preliminary Geotechnical Analysis
Exhibit K: Transportation Supplement
Exhibit L: Project Overview
Exhibit M: DSL Wetland Determination
Exhibit N: Septic Tank Detail

Annexation, Zone Change, Planned Unit Development & Tentative Subdivision Plat Application for Harvest Gardens Agrihood

Submitted to:

City of Donald
Planning Department
10710 Main Street NE
Donald, OR 97020

Applicant/Property Owner:

GRC Land Holdings, LLC
PO Box 427
Donald, OR 97020

Applicant's Consultant:

AKS Engineering & Forestry, LLC
12965 SW Herman Road, Suite 100
Tualatin, OR 97062

Contact: Mimi Doukas, AICP, RLA
Email: mimid@aks-eng.com
Phone: (503) 563-6151

Applicant's Transportation Engineer:

Lancaster Mobley
321 SW 4th Avenue, Suite 400
Portland, OR 97204

Contact: Todd Mobley
Email: todd@lancastermobley.com
Phone: (503) 248-0313

Site Location:

Southeast corner of Donald, OR

Marion County Assessor's Map:

Map 041W17 Tax Lot 2600
Map 041W20 Tax Lots 300

Site Size:

± 52 acres (Tax Lot 2600)
± 9.11 acres (Tax Lot 300)

County Plan Designation:

Urban Transition (UT-20)

City Zoning Upon Annexation:

Residential Single-Family (R-7) and Residential Multi-Family (RM)

I. Executive Summary

The Harvest Gardens Planned Unit Development (PUD) application represents an "Agrihood" community planned on approximately ±61.81 acres of land zoned Urban Transition in Marion County. Harvest Gardens is a consolidated application for an Annexation, Zone Change, PUD, and Tentative Subdivision Plat to the City of Donald (City) on behalf of GRC Land Holdings, LLC (Applicant). The Applicant is seeking approval to annex the ±61.81-acre 2 parcel subject site located at the southeast corner of the City for future residential use. A variety of lot sizes and housing types are provided that are intended to accommodate a mix of home sizes and plans, appealing to a broad range of future residents and the local workforce.

The design of Harvest Gardens begins with the future commercial building complex for an agricultural center that will include flexible space to accommodate a variety of retail, classroom, event rental, and restaurant space. This center is the northern terminus to an hourglass shaped open space corridor that extends north-south for the length of the property. The southern end is planned for a farm themed playground. Homes align both side of this central open space corridor, served by local public streets with parallel parking on both sides. On the outside of these streets, homes are arranged around community courtyards. These courtyard homes obtain access from a rural style street that is 28-foot wide without sidewalks because pedestrians are able to move through the central courtyards as well as a regional looped trail system that connects all of the courtyards together. Parking is permitted on one side of the 28-foot courtyard streets, as well as in shared head-in parking bays. In total, the design allows for multiple loops of pedestrian routes for resident use that allow access to neighbors, open space, and the agricultural center. A future phase of attached housing and/or multi-family housing is planned in the northwest corner of the property, adjacent to the agricultural center and to the town core via Donald Road.

The defining feature of an Agrihood is the communal proximity and access to active, functioning farmland. Harvest Gardens promotes a unique configuration of a residential community clustered around agricultural practices and farmland. The community is planned with open space and agricultural land as the centerpiece with the intent to promote educational opportunities, foster community social ties, provide residents with access to fresh and local goods, and advocate for healthy lifestyles. Clustering development around farmland creates a desirable place to live while supporting local farmers and Donald's rural character. The PUD contains a commercial component to serve as an activity center and farm service corridor for the community. This element allows planned space for food production, events, farm stand/market areas, a farm-to-table restaurant, and permits the sale of farm products. A future agricultural center building will include flexible space to accommodate a variety of retail, classroom, event rental, and restaurant space.

Harvest Gardens preserves and protects open space by incorporating flexible development standards and varying lot sizes (through a PUD) into the project design. The layout adapts to the site's existing topography, natural features, and proximity to existing farmland to arrive at a desirable community that includes abundant amenities for residents. From shared community gardens, demonstration areas, art installations featuring farm equipment, antiques on display, formal lawn and event spaces, and a farm-themed playground area – to private residential courtyards, firepits, landscaped pathways, shade structures and rest areas, bench seating, and looped cohesive walking trails – Harvest Gardens demonstrates an intentional, desirable community bound to attract residents and visitors alike. With the above amenities and design features, the development will not only provide an example of a successful

public/private workforce housing project, it will serve as a model for creating more complete and sustainable communities in Oregon. In summary, the PUD is intended to incorporate the following innovative community design principals:

- **Mixed Use Community:** Harvest Gardens incorporates residential, commercial, and agricultural amenities that leverage the advantages of farm-adjacent locations, implement an activity center for commercial farm services, and promote community interaction.
- **Open Space:** The PUD includes approximately 9 acres of open space (15 percent of the overall site) featuring natural areas, off-street trails, passive and active recreational opportunities, interpretive signage, benches, and other amenities.
- **Interconnected Pedestrian Circulation System:** The site is planned to include an extensive system of pedestrian trails, connections, and pathways which create a walkable community and encourage active lives. These accessways span throughout the site and bisect the main thoroughfare streets, which emphasize the central courtyard and accentuate open space.
- **Variety of Housing Lots:** This project includes an array of lot sizes for single-family detached homes, and future single-family attached and/or multi-family housing units, to be completed in appropriately scaled phases.
- **Interconnected Transportation Network:** The site will be served by a comprehensive transportation network that includes northerly access from Donald Road NE and a centralized thoroughfare street pattern with looped, local street connections.
- **Infrastructure:**
    - **On-site Stormwater Facilities:** Harvest Gardens includes a stormwater collection and conveyance system that will capture stormwater runoff and route it to the existing City of Donald regional stormwater facility off site. Stormwater runoff is planned to be captured from Donald Road NE and Matthieu Street NE, routed through a system of underground pipes, and conveyed to the existing regional stormwater facility west of the project site. The stormwater facility has been designed to over-detain post to pre-developed flows in order to offset the flows from the southern portion of the project that can't be routed to the facility due to topographic constraints. From there, stormwater will be rerouted through public right-of-way to the east consistent with the historic direction of flow from the property.
    - **Sanitary Sewer:** Donald's wastewater treatment facility must be upgraded to accommodate the needed residential development dictated by the 2018 UGB expansion. Through a variety of finance means—including project investment funds, grants from the Pilot Project Fund, Business Oregon, etc., and SDC credits—the sanitary sewer infrastructure is planned to be updated to provide for needed housing. At the time of this application submittal, the City is in the process of amending the Wastewater Facilities Plan and is investigating options for increasing the wastewater treatment plant facility. The Applicant will work with the City in the future to develop a new sanitary lagoon and/or provide a potential irrigation site to supplement planned capacity.
    - **Water Supply:** Water mains are planned to be extended from Donald Road NE and provided to the PUD concurrently per the scheduled phasing plan, which is intended to be flexible in configuration. Offsite water improvements are planned to occur in Matthieu

Street NE to extend and connect to existing water mains. Water mains in Donald Road NE and Matthieu Street NE will be constructed by the Applicant. Water lines with valves and fire hydrants serving the subdivision will be installed per City standards and in adequate locations to provide future extension beyond the subject site.

Harvest Gardens will work with the City on expansion of public infrastructure to accommodate the additional residential homes. Donald's water and wastewater treatment facilities and resources are currently close to capacity and must be upgraded to accommodate the proposed workforce housing project. As a result, the City of Donald has secured public grant funds from the Pilot Project Fund and Business Oregon to upgrade needed public facilities to serve the recent UGB expansion. System development charge (SDC) credits from the City of Donald will also provide a funding mechanism for regional infrastructure investments. Infrastructure improvement details, capacity, and constraints are discussed in greater detail throughout this written narrative.

During recent years, the available housing supply in Donald has not been able to keep pace with the needs of local employees and their families. Since Donald and local businesses have extremely limited access to available housing, they are disadvantaged when attracting and retaining employees. As a result, much of the workforce is commuting long distances into the community each day, straining the regional transportation system. This project will allow more employees to live in the same town where they work, reducing the time and resources required by long commutes.

On August 11, 2015 the Donald City Council passed Ordinance No. 161-2015 amending the Donald Comprehensive Plan to adopt the 2015 Buildable Land Inventory, Housing Needs Assessment, Economic Opportunities Analysis and the 20-Year Population Projection coordinated with Marion County – which revealed a ±76.7 acre residential land deficit in the City's 20-year buildable land supply. This Harvest Gardens application for annexation will provide ±60 acres of residential land and is the next step in the planned land use progression for the area.

The Harvest Gardens PUD is a "needed housing" application under Oregon Revised Statute (ORS) 197.303(1)(a) as it provides housing within an urban growth boundary. ORS 197.307(4) states that a local government may apply only clear and objective standards, conditions, and procedures regulating the development of needed housing, and such standards, conditions, and procedures cannot have the effect, either in themselves or cumulatively, of discouraging needed housing through unreasonable cost or delay.

Oregon Courts and the Land Use Board of Appeals (LUBA), have generally held that an approval standard is not clear and objective if it imposes on an applicant "subjective, value-laden analyses that are designed to balance or mitigate impacts of the development." *Rogue Valley Association of Realtors v. City of Ashland*, 35 Or LUBA 139, 158 (1998) *aff'd*, 158 Or App 1 (1999). ORS 197.831 places the burden on local governments to demonstrate that the standards and conditions placed on needed housing applications can be imposed only in a clear and objective manner. While this application addresses all standards and conditions, the Applicant reserves the right to object to the enforcement of standards or conditions that are not clear and objective and does not waive its right to assert that the needed housing statutes apply to this application. The exceptions in ORS 197.307(4)(a) and 197.307(5) do not apply to this application. ORS 197.307(7)(a) is controlled by ORS 197.307(4). The City has not taken an exception under 197.303(3).

II. Site Description

This property is located west of Interstate 5, southeast of the Donald City Limits. More specifically, the subject site is north of Feller Road NE, south of Donald Road NE, and east of Matthieu Street NE. The property is currently within Marion County jurisdiction and has an Urban Transition-20 acre (UT-20) interim County zone designation. The site is designated as Residential on the Donald Comprehensive Plan and is planned for both R-7 – Single-Family (R-7) and RM – Multi-Family (RM) zoning.

This property is located within the area that was added to the Urban Growth Boundary (UGB) by Marion County in 2018. In conjunction with jurisdictions adding this area to the UGB, the City of Donald undertook extensive transportation and infrastructure planning of the area and requested workforce housing initiative funding to plan consistent growth in the area. Annexation of this parcel into the City of Donald is the next step in progression and helps facilitate the City's vision of this area.

Description of the Surrounding Area

Area	Jurisdiction	Zoning	Land Uses
North	City of Donald, within the City Limits	R-7, Single-Family Residential	Residential
South	Marion County, outside the UGB	EFU, Exclusive Farm Use	Agricultural
East	Marion County, outside the UGB	EFU, Exclusive Farm Use	Agricultural
West	Marion County, within the UGB	UT-20, Urban Transition; P, Public	Agricultural/Forested

III. Applicable Review Criteria

The following responses and findings addressing the applicable Oregon Revised Statutes (ORS), Oregon Transportation Planning Rule, and Donald Comprehensive Plan are intended for consideration for the Annexation and Zone Change application only. If any findings for these items are needed for responses to other applications in this consolidated submittal (e.g. the PUD or Preliminary Plat) they will be referenced specifically. This limitation applies to this complete application narrative.

OREGON REVISED STATUTES

2017 ORS 222.111

Authority and Procedure for Annexation

(1) When a proposal containing the terms of annexation is approved in the manner provided by the charter of the annexing city or by ORS 222.111 (Authority and procedure for annexation) to 222.180 (Effective date of annexation) or 222.840 (Short title) to 222.915 (Application of ORS 222.840 to 222.915), the boundaries of any city may be extended by the annexation of territory that is not within a city and that is contiguous to the city or separated from it only by a public right of way or a stream, bay, lake or other body of water. Such territory may lie either wholly or partially within or without the same county in which the city lies.

Response: This application is initiated by the property owner of the subject site planned for annexation. The property is currently within unincorporated Marion County and is contiguous to the Donald City Limits. The criterion is met.

(2) A proposal for annexation of territory to a city may be initiated by the legislative body of the city, on its own motion, or by a petition to the legislative body of the city by owners of real property in the territory to be annexed.

Response: This application is initiated by the property owner of the subject site planned for annexation. The Written Consent Form for annexation to City of Donald is included in Exhibit C. The criterion is met.

(3) The proposal for annexation may provide that, during each of not more than 10 full fiscal years beginning with the first fiscal year after the annexation takes effect, the rate of taxation for city purposes on property in the annexed territory shall be at a specified ratio of the highest rate of taxation applicable that year for city purposes to other property in the city. The proposal may provide for the ratio to increase from fiscal year to fiscal year according to a schedule of increase specified in the proposal; but in no case shall the proposal provide for a rate of taxation for city purposes in the annexed territory which will exceed the highest rate of taxation applicable that year for city purposes to other property in the city. If the annexation takes place on the basis of a proposal providing for taxation at a ratio, the city may not tax property in the annexed territory at a rate other than the ratio which the proposal authorizes for that fiscal year.

Response: The above standard is understood. The criterion can be met.

(4) When the territory to be annexed includes a part less than the entire area of a district named in ORS 222.510 (Annexation of entire district), the proposal for annexation may provide that if annexation of the territory occurs the part of the district annexed into the city is withdrawn from the district as of the effective date of the annexation. However, if the affected district is a district named in ORS 222.465 (Effective date of withdrawal from domestic water supply district, water control district or sanitary district), the effective date of the withdrawal of territory shall be determined as provided in ORS 222.465 (Effective date of withdrawal from domestic water supply district, water control district or sanitary district).

Response: The subject property to be annexed is not included in a district named in ORS 222.510. The criterion is not applicable.

(5) The legislative body of the city shall submit, except when not required under ORS 222.120 (Procedure for annexation without election), 222.170 (Annexation by consent before public hearing or order for election) and 222.840 (Short title) to 222.915 (Application of ORS 222.840 to 222.915) to do so, the proposal for annexation to the electors of the territory proposed for annexation and, except when permitted under ORS 222.120 (Procedure for annexation without election) or 222.840 (Short title) to 222.915 (Application of ORS 222.840 to 222.915) to dispense with submitting the proposal for annexation to the electors of the city, the legislative body of the city shall submit such proposal to the electors of the city. The proposal for annexation may be voted upon at a general election or at a special election to be held for that purpose.

(6) The proposal for annexation may be voted upon by the electors of the city and of the territory simultaneously or at different times not more than 12 months apart.

(7) Two or more proposals for annexation of territory may be voted upon simultaneously; however, in the city each proposal shall be stated separately on the ballot and voted on separately, and in the territory proposed for annexation no proposal for annexing other territory shall appear on the ballot.

Response: Pursuant to ORS 222.120(1), the legislative body of the City of Donald is not required to submit a proposal for annexation of territory to the electors of the city for their approval or rejection. The above criteria are not applicable.

2017 ORS 222.120

Procedure for Annexation Without Election

(1) Except when expressly required to do so by the city charter, the legislative body of a city is not required to submit a proposal for annexation of territory to the electors of the city for their approval or rejection.

Response: Pursuant to ORS 222.120(1), the legislative body of the City of Donald is not required by charter to submit a proposal for annexation of territory to the electors of the city for their approval or rejection. The property owners of the subject site consent in writing to the annexation and upon submittal of this application a public hearing will be scheduled. The above criterion is met.

(…)

2017 ORS 222.170

Annexation by Consent Before Public Hearing or Order for Election

(…)

(2) The legislative body of the city need not call or hold an election in any contiguous territory proposed to be annexed if a majority of the electors registered in the territory proposed to be annexed consent in writing to annexation and the owners of more than half of the land in that territory consent in writing to the annexation of their land and those owners and electors file a statement of their consent with the legislative body on or before the day:

(a) The public hearing is held under ORS 222.120 (Procedure for annexation without election), if the city legislative body dispenses with submitting the question to the electors of the city; or

Response: Pursuant to ORS 222.120(1), the legislative body of the City of Donald is not required by charter to submit a proposal for annexation of territory to the electors of the city for their approval or rejection. The property owners of the subject site consent in writing to the annexation and upon submittal of this application a public hearing will be scheduled. The above criterion is applicable.

(…)

(2) If the city legislative body has not dispensed with submitting the question to the electors of the city and a majority of the votes cast on the proposition within the city favor annexation, or if the city legislative body has previously dispensed with submitting the question to the electors of the city as provided in ORS 222.120 (Procedure for annexation without election), the legislative body, by resolution or ordinance, shall set the final boundaries of the area to be annexed by a legal description and proclaim the annexation.

Response: The draft legal description and exhibit map for annexation are included within Exhibit G. The criterion above is understood.

(4) Real property that is publicly owned, is the right of way for a public utility, telecommunications carrier as defined in ORS 133.721 (Definitions for ORS 41.910 and 133.721 to 133.739) or railroad or is exempt from ad valorem taxation shall not be considered when determining the number of owners, the area of land or the assessed valuation required to grant consent to annexation under this section unless the owner of such property files a statement consenting to or opposing annexation with the legislative body of the city on or before a day described in subsection (1) of this section.

Response: The above standard is understood.

CITY OF DONALD COMPREHENSIVE PLAN

DONALD COMMUNITY GOALS

Physical Development

1. The creation of a pleasing, safe, efficient rural community environment.
2. Encourage the proper use and management of lands within the Urban Growth Boundary.
3. Encourage the orderly and efficient growth of the community based on social, physical and economic needs and factors
4. Develop a land use pattern consistent with local and state goals.

Response: Harvest Gardens is a PUD intended to provide needed residential land, incorporate natural features, and arrange agricultural practices in close proximity to provide a pleasing, safe, and efficient rural community. The zone changes from Urban Transition (UT-20) to R-7 and RM will allow residential uses and establish needed housing as described in this narrative. Site improvements in conformance with an approved comprehensive plan, as is the case here, results in an orderly land use pattern and efficient growth. Donald's community goals related to physical development are met.

Residential Development

1. Encourage the development and maintenance of an adequate quantity, quality and variety of housing facilities to satisfy the desired lifestyles and financial capabilities of the community.
2. Provide the necessary public facilities and services to maintain a safe, healthful, and pleasing living area.

Response: This application involves an increase in the supply of housing, specifically addresses workforce housing needs for the citizens of Donald and provides necessary public facilities to support the site. A variety of lot sizes and housing types are provided that are intended to accommodate a mix of home sizes and plans, appealing to a broad range of future residents to support the local workforce. The Donald Development Ordinance (DDO) provides the basis for decisions related to the use of land within Donald, including the PUD provisions which allow flexibility in design standards to arrive at the unique project design.

Transportation

1. Encourage a balanced system of transportation including such alternatives as public transit, bicycle, rail, and pedestrian facilities in addition to the private automobile.
2. Develop and maintain an efficient and reliable transportation system that encourages proper land development.

Response: As illustrated on the Preliminary Plans (Exhibit A), the intended local street pattern within the subdivision includes pedestrian and bicycle facilities and is connected throughout the site. Access from Donald Road NE provides a continuous network through and to the boundaries of the subdivision. The planned future road extension and connection to Tax Lot 300 will provide a secondary access and continuous network through the south portion of the subdivision by means of Matthieu Street NE. In the interim, secondary

emergency access will be provided through gated connections to a farm road over Tax Lot 1100.

A Traffic Impact Study prepared by Lancaster Mobley Engineering is included as Exhibit I and demonstrates compliance with applicable State, County, and City transportation-related requirements. Please refer to the TIS for further information. The street and connectivity improvements encourage a safe and convenient transportation system for pedestrians and motorists.

Public Facilities

1. Provide adequate park and recreation facilities for the resident and visitor.

Response: Harvest Gardens is intended to provide an open space network of trails, pedestrian facilities, and include passive and active recreation spaces for the community. As illustrated on the Preliminary Plans (Exhibit A), the open space configuration spans throughout the site to include ±9 acres of open space (over 15 percent of the overall site) to showcase natural features and encourage physical fitness and recreation.

Harvest Gardens is designed with open space and agricultural land as the centerpiece of the community to foster social ties, provide residents with access to fresh and local goods, and promote educational opportunities. The Agrihood provides a clustered residential design which allows the community to conserve productive farmland and natural areas. This concept mitigates increases in impervious surfaces and lowers infrastructure expenditures and maintenance costs. The interconnected transportation network and inclusion of multi-use trail system is intended to encourage physical fitness and recreation uses for healthy living. The open courtyard areas provide opportunities for passive recreation and relaxation. This PUD application uses innovative planning that will provide a variety of needed workforce housing and ultimately benefit the City of Donald by bringing a live/work concept to fruition and allow controlled, logical growth in an area characterized by high employment and low housing.

2. Encourage urban development in an orderly and economic manner.

Response: This application complies with the applicable requirements found in the DDO. Site improvement in conformance with an approved comprehensive plan and with relevant DDO standards, as is the case here, results in orderly and efficient arrangement of public facilities and services and ensures orderly growth. Therefore, the application is consistent with this Comprehensive Plan Policy.

…

6. Keep current and achievable water, wastewater system and storm water master plans.

Response: The City of Donald Public Works Design & Construction Standards are the current wastewater system and stormwater standards which guide the DDO. The Preliminary Plans (Exhibit A) conform to the water, wastewater, and stormwater plans. The policy is met.

Energy Conservation

1. Encourage the economical use of energy supplies through zoning and land use regulations, building codes and public awareness.

Response: The City's Comprehensive Plan and its standards governing energy conservation are not affected by this decision. Upon annexation of this property into City limits, the DDO and regulations for energy conservation will apply.

…

URBAN GROWTH PROGRAM POLICIES

1. Annexations of the City should be discouraged until a major portion of the City's buildable vacant land is developed.

Response: The City has encouraged this annexation proposal as the existing City Limits do not encompass available land for residential development. The policy is met.

…

5. Lands within the Urban Growth Boundary shall be available for urban development concurrent with the provision of key urban facilities.

Response: There are a variety of factors which affect public services to the project site. Donald's wastewater treatment facility must be upgraded to accommodate the needed residential development dictated by the 2018 UGB expansion. Through a variety of finance means—including project investment funds, grants from the Pilot Project Fund, Business Oregon, etc., and SDC credits—the sanitary sewer infrastructure is planned to be updated to provide for needed housing. At the time of this application submittal, the City is in the process of amending the Wastewater Facilities Plan and is investigating options for increasing the wastewater treatment plant facility. In addition, the Applicant will work with the City in the future to develop a new sanitary lagoon and/or provide a potential irrigation site to supplement planned capacity.

A sanitary sewer force main is planned to be extended from Donald Road NE and provided to the PUD concurrently, per the scheduled phasing plan. Offsite sanitary improvements are planned to occur in Matthieu Street NE to extend and connect to existing sanitary sewer mains. The sanitary force mains in Donald Road NE and Matthieu Street NE will be constructed by the Applicant. The City currently operates on a Septic Tank Effluent Pump (STEP) design, providing individual septic tank service on separate lots. Sanitary sewage is planned to be conveyed to a public sanitary sewer with adequate capacity. System development charge (SDC) credits from the City of Donald will be the financial catalyst for the City to expand the needed facilities. The required improvement criteria can be provided.

6. The city shall review methods to increase residential development densities allowed in the R-7 and RM zoning districts to partially accommodate housing needs that are projected through 2034.

Response: This application for Harvest Gardens is associated with a State of Oregon Workforce Housing Initiative. To provide workforce housing and address an overall lack of housing availability, the City and the Applicant have demonstrated a public/private partnership to expand the UGB in 2018 and provide additional residential land to meet the existing and

future needs. The subject site is currently within the UGB and is planned for annexation into the City limits. Pursuant to the PUD provisions of the DDO, Harvest Gardens is planned to exercise flexibility in design to provide residential densities allowed in the underlying zoning districts and accommodate housing needs. The above policy is met.

CITY OF DONALD DEVELOPMENT CODE

SUBCHAPTER 2.1: LAND USE ZONING

§ 2.103 SINGLE-FAMILY RESIDENTIAL 7,000 SQUARE FOOT (R-7).

2.103.01 Purpose. The purpose of the R-7 Zone is to allow development of single-family dwellings on individual lots provided with urban services at low urban densities. Other uses compatible with residential development are also appropriate. These areas are designated as Residential in the Comprehensive Plan.

Response: The application package includes a PUD where residential zone densities may be blended per §3.113.07 and development standards can be varied to achieve an innovative design. Harvest Gardens is planned to include a variety of housing types, including single-family detached homes, to meet the needs of local workforce housing, and to provide an agricultural themed commercial center. The purpose of the R-7 Zone is met.

2.103.02 Permitted uses. The following uses, when developed under the applicable development standards in the Development Ordinance, are permitted in the R-7 Zone:

A. One detached single-family dwelling on a separate lot or parcel.

B. One two-family dwelling (duplex) on a separate lot or parcel.

C. Residential homes and facilities.

D. Child day care service, including family day care provider, for 12 or fewer children.

Response: The application involves a PUD where residential zone boundaries may be blended per §3.113.07. The Preliminary Plans (Exhibit A) illustrate a variety of housing types, including detached single-family dwellings on separate lots and a future multi-family and/or attached housing site. Two-family dwellings, residential care homes/facilities, and childcare service facilities are not included in this application. The use standards are met.

2.103.03 Special permitted uses. The following uses, when developed under the applicable standards in the Development Ordinance and special development requirements, are permitted in the R-7 Zone:

A. Accessory structure(s) and use(s) prescribed in § 2.203 and subject to the provisions in § 2.309.

B. Accessory dwelling unit subject to the provisions in § 2.309.02.

C. The following uses, subject to the applicable standards in § 2.4: 1. Manufactured homes on individual lots (§ 2.402) 2. Manufactured home parks (§ 2.403). 3. Home occupations (§ 2.404).

Response: This application does not involve approval of special uses. Harvest Gardens is a PUD and complies with the use standards in §3.113. The criteria above are not relevant.

2.103.04 Conditional uses. The following uses require approval of a conditional use permit:

A. Elementary schools.

B. **Public parks, playgrounds, community clubs including swimming, tennis and similar recreational facilities, and other public and semi-public uses.**

C. **Child day-care services for 13 or more children.**

D. **Churches.**

E. **Bed and breakfast, limited to two units per property, with one on-site parking space provided per unit, and occupied by the owner of the property (§ 2.406).**

Response: This application does not involve approval of conditional uses. Harvest Gardens is a PUD and complies with the use standards in §3.113. The criteria above are not relevant.

2.103.05 Dimensional standards.

A. **Minimum lot dimension and height requirements.**

Dimension	Residential Uses	Non-Residential Uses
Lot Size	7,000 sq. ft. - Single-family 7,000 sq. ft. - Duplex 6,500 sq. ft. - Single-family in the Donald South Expansion Area per Map 2.103.A.	Adequate to comply with all applicable development standards
Maximum Height	35 feet	45 feet

Response: Harvest Gardens is a PUD that permits flexibility to the development standards to achieve an innovative design; see §3.113 for responses addressing compliance with the applicable lot dimension and height standards. The criteria above are not applicable.

B. **Minimum yard setback requirements.**

	Single-Family Dwelling	Duplex	Accessory Dwelling Unit	Non-Residential
Front	10 feet	10 feet	20 feet	20 feet
Side	8 feet	8 feet	10 feet	10 feet
Rear	15 feet - 1-story 20 feet - 2-story	15 feet - 1-story 20 feet - 2-story	15 feet - 1-story 20 feet - 2-story	20 feet
Street-side	10 feet	10 feet	20 feet	20 feet
Garage (1)	20 feet	20 feet	20 feet	20 feet
(1) The garage setback shall be measured from the property line or edge of private access easement to the entrance of the garage. The centerline of the driveway shall be measured if the driveway to the garage entrance is not perpendicular to the property line or private access easement.				

Response: Harvest Gardens is a PUD that permits flexibility to the development standards to achieve an innovative design; see §3.113 for responses addressing compliance with the applicable yard setback standards. The criteria above are not applicable.

2.103.06 Development standards. All development in the R-7 Zone shall comply with the applicable provisions of this Development Ordinance. The following references additional development requirements:

Response: Harvest Gardens is a PUD that permits flexibility to the development standards to achieve an innovative design; see §3.113 for a response addressing compliance with the

applicable PUD standards which override the underlying zone standards. The criteria below are addressed as appropriate.

A. Off-street parking. Parking shall be as specified in § 2.303.

Response: Off-street parking standards are addressed in §2.303.

B. Yards and lots. Yards and lots shall conform to the standards of § 2.308.

Response: Yard and lot standards are addressed in §2.308.

C. Site Development Review. Manufactured home parks and non-residential uses shall require a Site Development Review, pursuant to § 3.1.

Response: Site Development Review will occur in the future for commercial uses within the 2-acre commercial area allowed within the PUD, pursuant to §3.113.

D. Landscaping. A minimum of 35% of the property shall be landscaped, including all required yards. Landscaped areas shall be landscaped as provided in § 2.306.

Response: Harvest Gardens is a PUD that permits flexibility to the development standards to achieve an innovative design; see §3.113 for responses addressing compliance with the required open space and landscaped areas, which override the underlying zone standards.

E. Lot coverage. The maximum coverage allowed for buildings, accessory structures and paved parking shall be 65%.

Response: Harvest Gardens is a PUD that permits flexibility to the development standards to achieve an innovative design; see §3.113 for responses addressing compliance with the applicable PUD standards which override the underlying zone standards.

F. Density.

1. When R-7 Zoned property is divided subject to §§ 3.105 or 3.109, the minimum density shall be four units per gross acre; the maximum density shall be six units per gross acre.

2. R-7 land divisions subject to §§ 3.105 or 3.109 within the Donald South Expansion Area, as depicted on Map 2.103.A, shall achieve a minimum overall density of five units per gross acre. The maximum density shall be six units per gross acre.

Response: As shown on the density calculations on Sheet P08 of the Preliminary Plans (Exhibit A) and described in narrative section §3.113.07, the property is within the Donald South Expansion Area and complies with the minimum and maximum densities of the R-7 zone (and is blended with the RM density requirements to achieve total density throughout the PUD). The criteria are met.

G. Exterior finish. The use of "T-111" siding on single-family dwellings and duplexes located on lots or parcels 7,000 square feet or larger shall be prohibited.

Response: Harvest Gardens generally contains residential lots smaller than 7,000 square feet, with the exception of two lots (lots 7 and 169). There are also two lots for future development (Lots 120 and 246) that exceed 7,000 square feet. The above standard is understood and can be met.

H. Garage or carport construction. All single-family dwellings, including manufactured homes on individual lots, shall contain an attached or detached garage that contains a minimum of 240 square feet of area. Garages and/or carports shall be constructed to include a roof pitch similar to the primary dwelling(s), and shall be constructed to include exterior siding and paint to match the primary dwelling(s).

Response: Harvest Gardens is a PUD that permits flexibility to the development standards to achieve an innovative design; see §3.113 for responses addressing compliance with the applicable PUD standards. The above architectural design standards for garages and carports will be reviewed during future review of building permits. All homes will be provided with a an enclosed two-car garage. The criteria above are not applicable.

§ 2.104 MULTIPLE FAMILY RESIDENTIAL (RM).

2.104.01 Purpose. The RM Zone is primarily intended for multiple family development on a parcel at medium residential densities. Other uses compatible with residential development are also appropriate. RM Zones are located in areas designated Residential in the Comprehensive Plan. They are suited to locations near commercial areas and along collector and arterial streets so that traffic is not required to travel on local streets through lower density residential areas.

Response: The application involves a PUD where residential zone boundaries may be blended per §3.113.07. Harvest Gardens is planned to include a variety of housing types, including future multi-family units and/or attached townhouses to meet the needs of the local workforce. Multi-family housing is planned in a suitable location near the community's farm service corridor, an allowed commercial area. The purpose of the RM Zone is met.

2.104.02 Permitted uses. The following uses, when developed under the applicable development standards in the Development Ordinance, are permitted in the RM Zone:

A. Residential buildings containing two or more dwelling units.

B. Residential homes and facilities.

C. Child day care service, including family day care provider, for 12 or fewer children.

D. Single-family attached dwellings.

Response: The application involves a PUD where residential zone boundaries may be blended per §3.113.07. The Preliminary Plans (Exhibit A) illustrate a variety of lot and housing types, including future residential buildings containing multiple dwelling units and/or single-family attached dwellings. Residential care homes/facilities and childcare service facilities are not included in this application. The use standards are met.

2.104.03 Special permitted uses. The following uses, when developed under the applicable standards in the Development Ordinance and special development requirements, are permitted in the RM Zone:

A. Accessory structures and uses prescribed in § 2.203 and subject to the provisions in § 2.309.

B. The following uses subject to the applicable standards in § 2.4:

1. Manufactured home parks (§ 2.403).

2. Home occupations (§ 2.404).

Response: This application does not involve approval of special uses, above. The criteria above are not relevant.

2.104.04 Conditional uses. The following uses require a conditional use permit:

A. Schools.

B. Public parks, playgrounds, community clubs including swimming, tennis and similar recreational facilities, and other public and semi-public uses.

C. Child day care service for 13 or more children.

D. Churches.

Response: This application does not involve approval of conditional uses, above. Harvest Gardens is a PUD and complies with the use standards in §3.113. The criteria above are not relevant.

2.104.05 Dimensional standards.

A. Minimum lot dimension and height requirements.

Dimension	Multi-Family	Single-Family Attached	Non-Residential
Lot Size	3,000 square feet per unit	3,000 square feet	Adequate to comply with all applicable development standards
Maximum Height	45 feet	35 feet	45 feet

Response: Harvest Gardens is a PUD that permits flexibility to the development standards to achieve an innovative design; see §3.113 for a response addressing compliance with the applicable lot dimension and height standards. The criteria above are not applicable.

B. Minimum yard setback requirements.

Setbacks	Multi-Family	Single-Family Attached	Non-Residential
Front	20 feet	10 feet	20 feet
Side	10 feet	Interior side: 0 feet Exterior side: 5 feet	10 feet
Rear	15 feet - 1 story 20 feet - 2 story	15 feet	15 feet
Street-side	10 feet	10 feet	20 feet
Garage (1)	20 feet	15 feet	20 feet
(1) The garage setback shall be measured from the property line or edge of private access easement to the entrance of the garage. The centerline of the driveway shall be measured if the driveway to the garage entrance is not perpendicular to the property line or private access easement			

Response: Harvest Gardens is a PUD that permits flexibility to the development standards to achieve an innovative design; see §3.113 for responses addressing compliance with the applicable yard setback standards. The criteria above are not applicable.

§ 2.104.06 Development standards. All development in the RM Zone shall comply with the applicable provisions of this Development Ordinance. The following references additional development requirements:

Response: Harvest Gardens is a PUD that permits flexibility to the development standards to achieve an innovative design; see §3.113 for responses addressing compliance with the applicable PUD standards which override the underlying zone standards. The criteria below are addressed as applicable.

A. Off-street parking. Parking shall be as specified in § 2.303.

Response: Off-street parking standards are addressed in §2.303.

B. Yards and lots. Yards and lots shall conform to the standards of § 2.308.

Response: Yard and lot standards are addressed in §2.308.

C. Site Development Review. Manufactured home parks, multi-family developments and non-residential uses shall require a Site Development Review, pursuant to § 3.1.

Response: Site Development Review will occur for future multi-family and/or attached townhouse uses within the PUD, pursuant to §3.1, as required.

D. Landscaping. A minimum of 25% of the property shall be landscaped, including all required yards. Landscaped areas shall be landscaped as provided in § 2.306.

Response: Harvest Gardens is a PUD that permits flexibility to the development standards to achieve an innovative design; see §3.113 for responses addressing compliance with the required open space and landscaped areas, which override the underlying zone standards.

E. Lot coverage. The maximum coverage allowed for buildings, accessory structures and paved parking shall be 75%.

Response: Harvest Gardens is a PUD that permits flexibility to the development standards to achieve an innovative design; see §3.113 for responses addressing compliance with the applicable PUD standards, which override the underlying zone standards.

F. Density. Subdivisions and multi-family development within the RM Zone shall comply with the following density requirements:

1. Land divisions subject to §§ 3.105 or 3.109, multiple family dwellings and manufactured home parks: the minimum density shall be eight units per gross acre; the maximum density shall be 14 units per gross acre.

2. New land divisions subject to §§ 3.105 or 3.109 and multi-family development within the Donald South Expansion Area, as depicted on Map 2.103.A, shall achieve a minimum overall density of ten units per gross acre. The maximum density shall be 14 units per gross acre.

Response: As shown on the density calculations on Sheet P08 of the Preliminary Plans (Exhibit A) and described in narrative Section §3.113.07, the property is within the Donald South Expansion Area, and complies with the minimum and maximum densities of the RM zone (and is blended with the R-7 density requirements to achieve total density throughout the PUD). The criteria are met.

G. Garage or carport construction. Garages and/or carports shall be constructed to include a roof pitch similar to the primary dwelling(s), and shall be constructed to include exterior siding and paint to match the primary dwelling(s).

Response: Harvest Gardens is a PUD that permits flexibility to the development standards to achieve an innovative design; see §3.113 for responses addressing compliance with the applicable PUD standards. The above architectural design standards for garages and carports associated with multi-family housing will be reviewed during future Site Development Review. The criteria above are not applicable.

SUBCHAPTER 2.3: GENERAL DEVELOPMENT STANDARDS

§ 2.302 STREET STANDARDS.

2.302.01 Purpose. The purpose of the street standards area to provide for safe, efficient, and convenient vehicular movement in the City; to provide adequate access to all proposed developments; and to provide adequate area in all public rights-of-way for sidewalks, sanitary sewers, storm sewers, water lines, power lines and other utilities commonly and appropriately placed in such rights-of way; and to provide improvement standards for dedicated but unimproved or partially improved rights-of-way.

2.302.02 Scope. The provisions of this section shall be applicable for the following:

A. Land divisions. The creation, dedication or construction of all new public or private streets in all subdivisions, partitions or other developments in the City.

B. Street expansion. The extension or widening of existing public or private street rights-of-way, easements, or street improvements including those which may be proposed by an individual or the City, or which may be required by the City in association with other development approvals.

C. Utility improvements. The construction or modification of any utilities or sidewalks in public rights-of-way or private street easements.

D. Exceptions. Provisions of this section do not apply in existing developed areas of the City. Improvements in these areas shall be based on standards adopted by the Department of Public Works.

Response: Harvest Gardens is a consolidated land use application for a PUD and includes a proposed tentative plat land division; therefore, these criteria are applicable.

2.302.03 General provisions. All public street and utility improvements shall comply with the Donald Public Works Design and Construction Standards. The following provisions shall apply to the dedication, construction, improvement or other development of all public streets in the City of Donald:

A. General requirement. The location, width, and grade of streets shall be considered in their relation to existing and planned streets, to topographical conditions, to public convenience and safety, and to the proposed use of the land to be served by the streets.

Response: The location, width, and grade of existing streets were considered when planning the design for Harvest Gardens. All streets shall be constructed to Construction specifications in the Donald Public Works Design and Construction Standards unless separate approval is requested. This criterion will be met.

B. Continuation of street. Development proposals shall provide for the continuation of, and connection to, existing principal streets where necessary to promote appropriate traffic circulation in the vicinity of the development.

Response: No principal streets extend to the Harvest Gardens site; therefore, this criterion is not applicable.

> **C. Alignment. All streets other than minor streets or cul-de-sacs, as far as practical, shall be in alignment with existing streets by continuation of the existing centerlines. The staggering of street alignments resulting in "T" intersections shall, wherever practical, meet with the approval of the City Engineer and minimally acceptable traffic safety standards or Transportation System Plan of the City, where applicable.**

Response: An existing high value irrigation well is located directly south of the intersection of Huckleberry Lane and Donald Road NE, which requires the off-site Street 2. The off-set does not create conflicts for left-turn movements on Donald Road as shown in the supplemental Traffic Impact Analysis. This criterion is satisfied.

> **D. Future extension of streets. When it appears possible to continue a street, bicycle path and/or pedestrian accessway into a future subdivision, adjacent acreage or area attractors such as schools and shopping centers, streets, bicycle paths and/or pedestrian accessways shall be platted to a boundary of the subdivision. The street may be platted without a turnaround unless the Public Works Department or local Fire District finds a turnaround is necessary for reasons of traffic safety.**

Response: Right-of-way has been extended to the project boundary is multiple locations allowing for connectivity for future development. This criterion is met.

> **E. Intersection angles. Streets shall be laid out to intersect at angles as near to right angles as practical, except where topography requires lesser angles. Intersections of less than 60 degrees shall require special intersection designs and approval of Public Works Department.**

Response: The organic geometry of Harvest Gardens results in some intersections that are less than right angles. Deviations have been minimized where possible and are not less than 60 degrees; therefore, this criterion is met.

> **F. Existing streets. Whenever existing public streets adjacent to or within a tract are of inadequate width, additional right-of-way shall be provided at the time of subdivision, partitioning, or development.**

Response: Donald Road NE and Matthieu Street NE are the only existing streets adjacent to the Harvest Gardens project. These roads will be improved to Marion County or City standards; therefore, this criterion is met.

> **G. Cul-de-sacs. The City discourages the use of cul-de-sacs. When cul-de-sacs are necessary, the maximum length shall be 800 feet. Cul-de-sacs over 400 feet in length shall provide accessways to provide connectivity to adjacent streets and uses, unless physical constraints preclude a pedestrian/bicycle accessway.**

Response: No cul-de-sacs are proposed; therefore, this criterion is not applicable.

> **H. Street names. Street names and numbers shall conform to the established standards and procedures in the City.**

Response: Once street names are chosen, they will be reviewed by City staff to confirm conformance with City standards. This criterion will be satisfied.

I. Alleys. Alleys are encouraged in Residential Zones and shall be provided in all commercial and Industrial Zones unless other permanent provisions for access to off-street parking and loading facilities are provided.

Response: No alleys are proposed; therefore, this criterion is not applicable.

J. Clear vision areas. Clear vision areas shall be maintained on corner lots at the intersection of public streets and at the intersections of a public street with a private street, alley or private access easement, in compliance with § 2.308.08.

Response: Clear vision triangles are shown on the Preliminary Plans (Exhibit A); therefore, this criterion is satisfied.

K. Lots abutting a partial street. Development of property abutting an existing public street which does not meet the minimum right-of-way standards in § 2.302 shall provide sufficient yard setback equal to the minimum yard requirements of the applicable Zone, plus, the additional land required to meet the minimum right-of-way width, also known as a "special setback" or the required right-of-way required shall be dedicated at the time of development.

Response: Donald Road NE and Matthieu Street NE are the only existing streets adjacent to the Harvest Gardens project. Full right-of-way for these roads will be dedicated with the final plat; therefore, this criterion is met.

2.302.04 General right-of-way and improvement widths. Street widths and design shall be as designated in the Public Works Design and Construction Standards, except where modifications are permitted under § 2.302.05.

2.302.05 Modification of right-of-way and improvement width. The City may allow modification to the public street standards defined in the Public Works Design and Construction Standards, when the following criteria are satisfied:

A. Modification permitted. The modification is necessary to provide design flexibility where:

1. Unusual topographic conditions require a reduced width or grade separation of improved surfaces; or

2. Parcel shape or configuration precludes accessing a proposed development with a street which meets the full standards; or

3. A modification is necessary to preserve trees or other natural features determined by the Planning Commission to be significant to the aesthetic character of the area.

B. Vehicular access maintained. Modification of the standards shall only be approved if the City Engineer finds that the specific design proposed provides adequate vehicular access based on anticipated traffic volumes.

Response: Street standards can also be modified by the PUD provisions to allow for innovative design. Donald Road NE and Matthieu Street NE have been designed to follow City or County standards.

Streets 1 and 2 have been designed to reflect a modified local street standard and are detailed on Sheet P18 of the Preliminary Development Plans (Exhibit A). These streets accommodate two travel lanes and parking on both sides of the street. Planter strips and detached sidewalks are also proposed, all within 60-foot wide right-of-way.

Streets 3, 11, 12, 13, and 14 have also been designed to reflect a modified local street standard and are detailed on Sheet P18 of the Preliminary Development Plans (Exhibit A). These streets accommodate two travel lanes and parking on one sides of the street. Planter strips and detached sidewalks are also proposed, all within 50-foot wide right-of-way.

The 'courtyard' streets are one of the key innovative design features of Harvest Gardens. The courtyard homes obtain access from a rural style street that is 28-foot wide with no sidewalks because pedestrians are able to move through the central courtyards as well as a reginal looped trail system that connects all of the courtyards together. Parking is permitted on one side of the 28-foot courtyard streets, as well as in shared head-in parking bays. In total, the design allows for multiple loops of pedestrian routes for residents that allow access to neighbors, open space, and the agricultural center.

All proposed streets allow for two travel lanes that are appropriate for the traffic volumes projected for this development. This criterion is be met.

2.302.06 Construction specifications. Construction specifications for all public streets shall comply with the standards of the most recently adopted City of Donald Public Works Design and Construction Standards.

Response: All streets shall be constructed to Construction specifications in the Donald Public Works Design and Construction Standards. This criterion will be met.

2.302.07 Private streets. Streets and other right-of-ways that are not dedicated for public use shall comply with the following:…

Response: No private streets are proposed; therefore, this criterion is not applicable.

2.302.08 Private access easements. A private access easement created as the result of an approved partitioning shall conform to the following….

Response: No private access easements are proposed; therefore, this criterion is not applicable.

2.302.09 Fee in lieu of street improvements.

A. Street frontage improvements are required at the time of development unless applicant requests, and the City approves in its sole discretion, the applicant's payment of a fee in lieu of constructing (FILOC).

B. Criteria. The city may accept a fee in lieu of construction of required street improvements if one or more of the following conditions exist:

1. Required improvements are not feasible due to the inability to achieve proper design standards.

2. Required improvements would create a safety hazard.

3. Required improvements are part of a larger approved capital improvement project in the City's Capital Improvement Program (CIP).

4. Required improvements would not result in a roadway wholly compliant with current street standards.

C. Findings. The City of Donald shall determine and make written findings as to whether an applicant is eligible to deposit a fee in lieu of construction, which decision is final.

D. **Fees. If determined by the City of Donald that required street improvements are eligible for FILOC, the applicant shall pay a fee to the City as established on the City of Donald Fee Schedule. The amount of the fee shall be determined by resolution of the City Council. All fees shall be paid to the City prior to the issuance of any development or building permits, or prior to final plat recording for partitions and subdivisions.**

1. **If previous development(s) on the subject property have resulted in the full construction of street improvements or payment of FILOC fees and the proposed development has additional impacts, the city may only assess additional FILOC fees when there has been a change to the city's design standards.**

2. **If previous development(s) on the subject property have resulted in the partial construction of a facility improvements or payment of FILOC fees and the proposed development has additional impacts, the City may assess additional FILOC fees for the balance of the improvements to bring the facilities into compliance with the City's current design standards.**

E. **Administration. Fees collected by the City may be used to construct street improvements or to leverage additional grant money for larger street improvement projects. An accounting of fees collected and expended will be made available by the City to the public on an annual basis at the end of the fiscal year. Fees shall be used for construction of street improvement projects that benefit the development site, or are within 1,000 feet of the development site, as determined by City staff.**

F. **Refunds. Fees collected by the City may be paid or refunded to the original payee or a third party upon written request to the City of Donald, provided that FILOC funds are available. Fees refunded in this manner may only be used for the construction of the specified improvements for which they were received, including, but not limited to, surveying, engineering, design, and construction. In no event shall the refund exceed the original amount paid. Requests for FILOC refunds shall be approved by the City of Donald and will be issued in accordance with an "Improvement Agreement" approved by the City of Donald and executed by the original FILOC payee and/or third party requesting the refund.**

Response: Fee in lieu of constructing (FILOC) is not requested for any internal streets or frontage streets. The Applicant has been working with Marion County to use a FILOC system to address the off-site regional transportation mitigation requirements. The Traffic Impact Study (TIS) has identified some County intersections that are currently projected to fail to meet performance standards without the addition of Harvest Gardens. Construction of these regional transportation facilities cannot be borne by this project alone; they need to be constructed by the County or ODOT. Therefore, a FILOC program is proposed with Marion County to establish a fair/proportionate transportation contribution for each residential building permit. This criterion is met.

§ 2.303 OFF-STREET PARKING AND LOADING.

2.303.01 Purpose. The purpose of this section is to provide adequate areas for the parking, maneuvering, loading and unloading of vehicles for all land uses in the City.

…

2.303.04 Location and use provisions. Off-street parking and loading areas shall be provided on the same lot with the main building or structure or use.

A. **Accessory parking use, non-residential. Parking of vehicles in a structure, or outdoors, is a permitted accessory or secondary use in non-residential Zones provided all of the vehicles are owned by the owner or lessee of the lot.**

B. **Accessory parking use, residential. Parking of vehicles in a structure or outdoors is a permitted accessory use in conjunction with a dwelling in any Zone provided:**

1. **All of the vehicles are owned by the owner or lessee of the lot.**

2. **Vehicles parked on a lot in a Residential Zone shall be for the personal use of the occupants of the dwelling.**

3. **One vehicle used in conjunction with a home occupation or other employment may be parked on the lot.**

Response: This application does not involve parking lots or structures as an accessory or secondary use. The standard is not applicable.

2.303.05 Joint use. Parking area may be used for a loading area during those times when the parking area is not needed or used. Parking areas may be shared subject to Manager, or designee, approval for public, commercial and industrial uses where hours of operation or use are staggered such that peak demand periods do not occur simultaneously. Such joint use shall not be approved unless satisfactory legal evidence is presented which demonstrates the access and parking rights of parties.

Response: This application does not involve joint uses described above. The standard is not applicable.

2.303.06 Off-street vehicle parking requirements.

A. **Number of spaces. Off-street parking shall be provided in the amount not less than listed on the following chart.**

B. **Maximum number of spaces. The number of minimum required parking spaces shall not be increased by more than 50%.**

Land Use Activity	Spaces	How measured
All Dwelling Types	2	Per dwelling unit

Response: The Preliminary Parking Plans (sheets P23-26) illustrate compliance with the above residential parking standards. Harvest Gardens provides 297 single-family detached lots and includes 1,188 private, off-street parking spaces. A range of multi-family dwelling units (49-133 units) are provided as well as a commercial use area (±2 acres); associated parking requirements will be reviewed at time of Site Design Review.

411 public parking spaces are provided along streets internal to the PUD. 91 private off-street parking spaces are provided (Tracts C, E, G, I, J, M, S, W, Y) and will be maintained by a future HOA. This parking configuration allows ease of access to parks and recreational areas for visitors and residents alike. The parking requirements are satisfied.

2.303.07 Standards for disabled person parking spaces. The number of spaces shall comply with the Oregon Structural Specialty Code. Striping and signing of the handicap space(s) shall conform with the Oregon Transportation Commission's standards.

Response: Required parking spaces will comply with the above standard.

…

2.303.11 Parking and loading area development requirements. All parking and loading areas shall be developed and maintained as follows:

A. Surfacing. All driveways, parking and loading areas shall have a durable, hard, dustless surface or other permeable paving such as cobblestone, masonry or grasscrete. These areas shall be improved prior to occupancy of the primary building.

Response: Driveways, parking, and loading areas are planned to be surfaced in compliance with the above standard. At the time of this application submittal, the commercial event site (lot 120) is intended to contain a temporary gravel parking lot. A community center building is planned for a future phase where permanent parking requirements will be determined based on building square footage. The criterion, as applicable, are met.

B. Parking spaces. Parking spaces shall be a minimum nine feet wide and 18 feet in length.

C. Driveways. The following driveway dimensions shall apply:

1. Without adjacent parking:

a. Single-family residence: 12 feet.

b. One-way: 12 feet.

c. Two-way: 22 feet.

Response: Parking spaces meet the minimum standards listed above, 9 feet wide by 18 feet long. Driveways associated with individual single-family dwellings are 12-foot wide. The standard is met.

2. With adjacent parking:

Parking Angle	Driveway Width
0 to 40	12 feet
41 to 45	13 feet
46 to 55	15 feet
56 to 70	18 feet
71 to 90	24 feet

E. Lighting. All lighting shall be directed entirely onto the loading or parking area and away from any residential use. The lighting shall not cast a glare or reflection onto the public rights-of-way.

Response: Lighting plans are not included with this application submittal and will be reviewed at future Site Design Review and construction plan submittal.

F. Traffic flow. Off-street parking access shall be designed to allow flow of traffic, provide maximum safety of traffic access and egress, and the maximum safety of pedestrians and vehicular traffic.

Response: Off-street parking access is designed to allow a safe and efficient flow of traffic. Pedestrian safety is maximized in this PUD design by the elimination of sidewalks from looped, local roads and the inclusion of sidewalks, accessways, and pedestrian facilities in between

street sections. The separation of vehicular and pedestrian flow will amplify safety and enhance the planned accessways and recreational areas by encouraging community use.

> **G. Entrance/exits. Service drives and driveway exits shall have a minimum vision clearance area and separation of 15 feet from the intersection of the street and driveway.**
>
> **1. General. Parking facilities containing more than four spaces shall be accessed by a driveway and prohibited from backing movement or otherwise maneuvering within a street right-of-way, unless otherwise permitted in this Development Ordinance.**
>
> **2. Residential. No more than two parking spaces may back onto a public street other than an alley.**

Response: Service drives and driveway exits have a minimum vision clearance area and separation of 15 feet from the street. Several public off-street parking areas (Tracts C, E, G, I, J, M, S, W, Y) contain more than four spaces and back onto a street right-of-way. The standard is addressed by alternative means. PUD applications are permitted to request alternative standards to code requirements. The Applicant requests allowance of backing movements for parked cars onto public right-of-way, which is currently allowed from driveways for up to two cars. Please see §3.113 for responses addressing flexible provisions allowed through a PUD.

> **H. Parking lot landscaping - commercial and multi-family. The following standards shall be met for new and redeveloped parking lots in commercial and multi-family developments. Industrial and Employment Industrial Developments are subject to § 2.303.11.H instead of these standards.**
>
> **If a portion of an existing parking lot is redeveloped, these standards apply to only the redeveloped portion and not the entire site. If a development contains multiple parking lots, then the standards shall be evaluated separately for each parking lot.**

Response: Permanent parking areas for multi-family and commercial uses are not included in this application submittal. The project does not contain industrial or employment industrial land or uses. In the future, multi-family and commercial uses requiring permanent parking spaces and the location and number of landscape islands and trees will be reviewed at time of Site Design Review. The remainder of the section has been omitted for brevity.

> **I. Parking lot landscaping - industrial. The following standards shall be met for new and redeveloped parking lots in the industrial and Employment Industrial Zones.**

Response: Harvest Gardens does not contain industrial or employment industrial land or uses. The standards are not applicable and have been omitted for brevity.

> **...**

2.303.12 Bicycle parking requirements.

> **A. Applicability. Bicycle parking requirements apply to all new commercial, industrial and multi-family development.**

Response: Permanent parking areas for multi-family and commercial uses are not included in this application submittal. The project does not contain industrial or employment industrial land or uses. In the future, multi-family and commercial uses requiring permanent parking

spaces and the location and number of landscape islands and trees will be reviewed at time of Site Design Review. The remainder of the section has been omitted for brevity.

§ 2.307 DEVELOPMENT STANDARDS FOR LAND DIVISIONS

2.307.01 Purpose. To provide for the orderly, safe, efficient and livable development of land within the City of Donald.

2.307.02 Scope; Application. The provisions of this section shall apply to all subdivisions and partitions within the City of Donald.

Response: Harvest Gardens is a PUD with concurrent land division pursuant to §3.113.03.C. Therefore, the following standards are applicable.

2.307.03 Standards for lots or parcels.

A. Minimum lot area. Minimum lot area shall conform to the requirements of the zoning district in which the parcel is located.

B. Access. All lots and parcels created after the effective date of this Development Ordinance shall provide a minimum frontage, on an existing or proposed public street, equal to the minimum lot width required by the underlying Zone. The following exceptions shall apply:

Response: Harvest Gardens is a PUD with concurrent land division. Minimum lot area and lot frontage width conform to PUD standards, rather than the underlying zoning districts. As described in the narrative Section §2.302.08 and illustrated on the Preliminary Plans (Exhibit A), the lots created through this application will provide adequate lot area and frontage on the future public streets internal to the subdivision. Please refer to the list of modifications to development standards pursuant to the PUD. The above criteria are not directly applicable.

1. Residential lots or parcels may be accessed via a private street or partition access easement developed in accordance with the provisions of §2.302 when the City finds that public street is not necessary to provide for the future development of adjoining property.

2. Commercial or Industrial uses located in a campus or park like development may be accessed via private streets when developed in accordance with §2.302.08.

3. Cul-de-sac lots shall have a minimum frontage of 25 feet.

4. Flag lots, as permitted in division 2.307.03.C.

Response: Harvest Gardens does not incorporate private streets, partition access easements, cul-de-sacs, or flag lots to access residential lots. The above exceptions criteria are not applicable.

C. Flag lots. Flag lots shall only be permitted if it is the only reasonable method by which the rear portion of a lot being unusually deep or having an unusual configuration may be accessed. If a flag-lot is permitted, the following standards shall be met:

Response: This application does not involve flag lots. The remainder of the subsection has been omitted for brevity.

D. *Through lots.* Through lots are discouraged unless essential to provide separation of residential development from major traffic arteries, adjacent non-residential activities, or to overcome specific site disadvantages.

Response: This application does not include through lots or interior lots having frontage on two streets. The criterion is not applicable.

E. *Lot lines.* The side lines of lots, as far as practicable, shall run at right angles to the right-of-way line of the street upon which the lots face. The rear lot line shall be no less than half the dimension of the front lot line.

Response: As shown on the Preliminary Plans (Exhibit A), the lot lines are arranged in right angles to the right-of-way lines of the fronting streets to the greatest extent practicable. The rear lot lines are not less than half of the dimension of the front lot lines. The criterion is met.

F. *Utility easements.* Utility easements shall be provided on lot areas where necessary to accommodate public utilities.

Response: As shown on the Preliminary Plans (Exhibit A), utility easements are provided where necessary. The criterion is met.

2.307.04 Additional design standards for subdivisions.

A. *Standards for blocks.* Blocks should not exceed 600 feet in length between street lines, except blocks adjacent to arterial streets, or unless the previous adjacent development pattern or topographical conditions justify a variation. The recommended minimum distance between intersections on arterial streets is 1,800 feet.

Response: Harvest Gardens involves a PUD with concurrent land division by tentative subdivision plat. As shown on the Preliminary Plans (Exhibit A), the site includes an interconnected transportation network provided by Street 1 and Street 2, closely comparing to Core Area Local design standards. These two main streets run directionally north to south and access on Donald Road NE, a Minor Collector within Marion County jurisdiction. The internal street pattern includes looped, local streets which connect to the two thoroughfares (Streets 1 and 2). The block length of Streets 1 and 2 exceeds 600 feet, though flexible design standards permitted through a PUD allow for innovative design which will benefit the community.

The intent of Harvest Gardens is to provide a clustered residential design, conserving open space, natural features, and farmland. Through the use of pedestrian and bicycle accessways at approximately 100-foot intervals, the Street 1 and Street 2 blocks satisfy the maximum block length standard. The pedestrian accessways bisecting these blocks at approximately 100-foot intervals throughout the site are designed to encourage safe and convenient pedestrian trips and directly promote the objectives this standard intends to achieve. The planned street configuration, including block length, is justified in this unique residential design. Please see Section §3.113.01 for responses addressing flexibility in development standards allowed through the PUD provisions. The criterion above is not relevant to the application.

B. *Traffic circulation.* The proposed subdivision shall be laid out to provide safe, convenient, and direct vehicle, bicycle and pedestrian access to nearby residential areas, neighborhood activity centers such as schools and parks, commercial areas, and industrial areas; and to provide safe convenient and

direct traffic circulation. At a minimum, "nearby" is interpreted to mean uses within a quarter mile which can be reasonably expected to be used by pedestrians, and uses within one mile of the subdivision boundary which can reasonably expected to be used by bicyclist.

Response: The site will be served by a comprehensive transportation network that includes northerly access from Donald Road NE and a centralized, hourglass-shaped street pattern with looped, local street connections. Between each street connection there is a greenway pedestrian connection including grassy areas, landscaping, and sidewalks on both sides. Said multi-use connections are provided at five intervals along Street 1 and six intervals along Street 2 to allow convenient, safe, and direct bicycle and pedestrian access. This extensive system of pedestrian trails, connections, and pathways creates a walkable community and encourages active lifestyles. Additionally, this design provides access throughout the site and stubs street and multi-use connectivity sections at the property boundaries for future connectivity, where appropriate. Generally, pedestrians and bicyclists "nearby," or within a quarter mile of the site, will be traveling west toward the City of Donald or east toward Interstate 5. The criteria above are satisfied.

C. *Connectivity*. To achieve the objective in B., above, the City may require the following: 1. Stub streets. Where the potential exists for additional residential development on adjacent property. 2. Pedestrian/bicycle accessways. Public accessways to provide a direct connection to cul-de-sac streets and to pass through oddly shaped or unusually long blocks.

Response: As shown on the Preliminary Plans (Exhibit A), the two main thoroughfares (Street 1 and 2) are stubbed at the south property boundary of Tax Lot 2600 for future connection. Street 3 is stubbed to the west property boundary of Tax Lot 2600 and north property boundary of Tax Lot 300. Streets 12, 13, and 14 within Tax Lot 300 are stubbed to the property boundaries for future connectivity. Additionally, the looped local street sections are designed to construct right-of-way up to the edge of the east and west property lines. The intent of the design considers the prospect of future residential development and allows logical infrastructure connectivity.

As described extensively throughout this document, there are ample opportunities for pedestrian and bicycle access throughout the PUD. The pedestrian accessways located between local streets include 6-foot-wide paved pathways for circulation. Additionally, these accessways bisect Street 1 and Street 2 at five intervals along the non-typical block to provide 6-foot-wide pathways and direct connectivity. Two 20-foot-wide tracts for emergency vehicle access with associated removable bollards bisect the main thoroughfares at two locations. The criteria are satisfied.

D. *Design standards for pedestrian/bicycle accessways*. Such accessways shall meet the following design standards:

1. Minimum dedicated width: 15 feet.

Response: The pedestrian and bicycle accessways are largely designed to be dedicated in 15-foot-wide tracts. There are three exceptions to the above standard. The tracts located between looped local streets (Streets 5, 6, and 7) are decreased to 10-foot widths to incorporate an access easement and stormwater facilities on the eastern portion of the PUD. The

standard is included in the PUD provisions which allow modifications to development standards, Section 3.113.04. The criterion is not directly applicable.

2. **Minimum improved width: ten feet.**

Response: The accessways for pedestrian and bicycle circulation are improved (e.g. landscaped, paved, fenced, etc.) to the ten-foot design standard above. The criterion is met.

3. **The access way shall be maintained by a homeowners association or other mechanism acceptable to the City.**

Response: The tracts are planned to be maintained by a homeowners' association, the owner/operator of the commercial site, or other mechanism, as approved by the City. The criterion is met.

4. **The accessway shall be designed and signed to prohibit motor vehicle traffic.**

Response: The accessways are designed and signed solely for pedestrian access. Bollards and signage are provided along the emergency vehicle accessways where local vehicle access could be presumed to be practical but is prohibited.

2.307.05 *Improvement requirements - partitions.* During the review of partition proposals, the City shall require, as a condition of approval, the following improvements:

Response: This application does not involve a land division by partition. The criteria are not applicable and have been omitted for brevity.

2.307.06 *Improvement requirements - subdivisions.* The following improvements shall be required for all subdivisions:

A. ***Frontage improvements.* Street improvements to full City standards shall be required for all public streets on which a proposed subdivision fronts in accordance with §2.302 of this code. Additional frontage improvements including: sidewalks, curbing, storm sewer, sanitary sewer, water lines, other public/private utilities shall be extended along the entire frontage of the proposed development.**

Response: As shown on the Preliminary Plans (Exhibit A), applicable street improvements are provided on Donald Road NE and on streets internal to the subdivision. Sheet P09 illustrates the 4-foot right-of-way dedication along Donald Road NE (to accommodate a 68-foot Collector Street section per Marion County standards). Sheet P12 details the 25-foot right-of-way dedication along Matthieu Street NE (to accommodate a 50-foot Rural Local Street section per City of Donald standards). The criterion is met.

B. ***Project streets.* All public or private streets within the subdivision shall be constructed as required by the provisions of §2.302.**

Response: As shown on the Preliminary Plans (Exhibit A), street improvements are planned to be constructed in accordance with the provisions of §2.302. The criterion is met.

C. ***Monuments.* Upon completion of street improvements, centerline monuments shall be established and protected in monument boxes at every street intersection and all points of curvature and points of tangency of street center lines.**

D. *Bench marks.* Elevation bench marks shall be set at intervals established by the City Engineer. The bench marks shall consist of a brass cap set in a curb or other immovable structure.

Response: Centerline monuments and elevation benchmarks are planned to be established where required. The above criteria can be met.

E. *Surface drainage and storm sewer system.* Drainage facilities shall be provided within the subdivision and to connect the subdivision drainage to drainage ways or to storm sewers outside the subdivision. Design of drainage within the subdivision shall take into account the capacity and grade necessary to maintain unrestricted flow from areas draining through the subdivision and to allow extension of the system to serve such areas.

Response: Harvest Gardens includes a stormwater collection and conveyance system that will capture stormwater runoff and route it to the existing City of Donald regional stormwater facility off site. As detailed in the Preliminary Stormwater Report (Exhibit H), stormwater runoff is planned to be captured from Donald Road NE and Matthieu Street NE, routed through a system of underground pipes, and conveyed to the existing regional stormwater facility west of the project site. The stormwater facility has been designed to over-detain post to pre-developed flows in order to offset the flows from the southern portion of the project that can't be routed to the facility due to topographic constraints. From there, stormwater will be rerouted through public right-of-way to the east consistent with the historic direction of flow from the property. Please see the Preliminary Stormwater Report for further details. The criterion is met.

F. *Sanitary sewers.* Sanitary sewer shall be installed to serve the subdivision and to connect the subdivision to existing mains both on and off the property being subdivided.

If the required sewer facilities will, without further sewer construction, directly serve property outside the subdivision, the Commission may recommend to the City Council construction as an assessment project with such arrangement with the subdivider as is equitable to assure financing the subdivider's share of the construction.

The City may require that the subdivider construct sewage lines of a size in excess of that necessary to adequately service the development in question, where such facilities are or will be necessary to serve the entire area within which the development is located when the area is ultimately developed. The City may also require that the construction take place as an assessment project with such arrangement with the subdivider as is desirable to assure his share of the construction.

Response: As discussed in this written document, there are a variety of factors which affect public services to the project site. Donald's wastewater treatment facility must be upgraded to accommodate the needed residential development dictated by the 2018 UGB expansion. Through a variety of finance means—including project investment funds, grants from the Pilot Project Fund, Business Oregon, etc., and SDC credits—the sanitary sewer infrastructure is planned to be updated to provide for needed housing. The City is in the process of amending the Wastewater Facilities Plan and is investigating options for increasing the wastewater treatment plant facility. In addition, the Applicant will work

with the City in the future to develop a new sanitary lagoon and/or provide a potential irrigation site to supplement planned capacity.

Sanitary sewer services are planned to be extended from Donald Road NE and provided to the PUD concurrently, per the scheduled phasing plan. Offsite sanitary improvements are planned to occur in Matthieu Street NE to extend and connect to existing sanitary sewer mains. The sanitary force mains in Donald Road NE and Matthieu Street NE will be constructed by the Applicant. The City currently operates on a Septic Tank Effluent Pump (STEP) design, providing individual septic tank service on separate lots. Sanitary sewage is planned to be conveyed to a public sanitary sewer with adequate capacity. System development charge (SDC) credits from the City of Donald will be the financial catalyst for the City to expand the needed facilities. The required improvement criteria can be provided.

> G. *Water system.* Water lines with valves and fire hydrants serving the subdivision and connecting the subdivision to the City mains shall be installed. The design shall take into account provisions for extension beyond the subdivision to adequately grid the City system and to serve the area within which the development is located when the area is ultimately developed. However, the City will not expect the developer to pay for the extra pipe material cost of mains exceeding ten inches in size.

Response: Parallel to the sanitary sewer discussion, Donald's water resource and treatment facilities must be upgraded to accommodate the needed residential development dictated by the 2018 UGB expansion. Through a variety of finance means—including project investment funds, grants from the Pilot Project Fund, Business Oregon, etc., and SDC credits—the water infrastructure is planned to be updated to provide for needed housing. At the time of this application submittal, the City is in the process of modifying the existing water right permit for the current municipal wellhead and investigating construction of a new well. Regardless of the new well, the City anticipates providing capacity for approximately 200 new homes from the Harvest Gardens PUD. In addition, the Applicant may work with the City in the future to develop a new well to provide supplementary capacity to the area.

Water services are planned to be extended from Donald Road NE and provided to the PUD concurrently per the scheduled phasing plan, which is intended to be flexible in configuration. Offsite water improvements are planned to occur in Matthieu Street NE to extend and connect to existing water mains. Water lines with valves and fire hydrants serving the subdivision will be installed per City standards and in adequate locations to provide future extension beyond the subject site. The required improvement criteria can be met.

> H. *Sidewalks.* Sidewalks shall be installed along both sides of each public street and in any pedestrian ways within the subdivision. The City may defer sidewalk construction until the dwellings or structures fronting the sidewalk are constructed. Any required off-site sidewalks (e.g. pedestrian walkways) or sidewalks fronting public property shall not be deferred.

Response: Harvest gardens includes looped, local street sections without sidewalks. This feature is designed to separate vehicular movement and allow for a condensed transportation circulation pattern resulting in a robust pedestrian network that is separated from cars.

As illustrated on the Preliminary Plans (Exhibit A), the interconnected pedestrian circulation system includes a network of multi-use pathways with 6-foot-wide sidewalks and street sections with 5-foot-wide sidewalks, which fully connect (in between local streets) and span throughout the site. This design promotes pedestrian safety and emphasizes natural features and open space to encourage residents to take advantage of the active community lifestyle Harvest Gardens aims to achieve. Please see Section §3.113.01 for responses addressing flexibility in development standards allowed through the PUD provisions. The criterion above is not applicable to the application.

I. *Street lights.* The installation of street lights is required at locations and of a type required by City standards.

J. Street signs. The installation of street name signs and traffic control signs is required at locations determined to be appropriate by the City and shall be of a type required by City standards.

K. *Public works requirements.* Facility improvements shall conform to the requirements and specifications of the Donald Public Works Design and Construction Standards.

Response: Street lights, street signs, and facility improvements are planned to be provided where required and in conformance with City standards. Please see the Composite Utility Plan within the Preliminary Plans (Exhibit A) for available details regarding planned locations and type, though review will occur at future construction plan submittal. The above criteria can be met.

L. *Curb cuts.* Curb cuts and driveway installations, excluding common drives, are not required of the subdivider, but if installed, shall be according to the City standards.

Response: Curb cuts and driveway installations are provided according to City standards, as detailed on the Preliminary Plans (Exhibit A). The criterion is met.

M. *Financial requirements.* All improvements required under this section shall be completed to City standards or assured through a performance bond or other instrument acceptable to the City Attorney, prior to the approval of the final plat of the subdivision.

Response: Required improvements will be assured through a Developers Agreement acceptable to the City Attorney. The criterion is met.

2.307.07 *Improvement procedures.* In addition to other requirements, improvements installed by a developer for any land division, either as a requirement of these regulations or at his own option, shall conform to the requirements of this Development Ordinance and improvement standards and specifications adopted by the City, and shall be installed in accordance with the following procedure:

A. *Plan review.* Improvement work shall not commence until plans have been checked for adequacy and approved by the City. Plans shall be prepared in accordance with requirements of the City.

B. *Notification.* Improvement work shall not commence until the City has been notified in advance; and, if work has been discontinued for any reason, it shall not be resumed until the City has been notified.

C. *Inspection.* Improvements shall be constructed under the inspection and to the satisfaction of the City Engineer and the Director of Public Works. The

City may require changes in typical sections and details in the public interest, if unusual conditions arise during construction to warrant the change.

D. *Underground facilities.* All underground utilities, sanitary sewers, and storm drains installed in streets by the developer shall be constructed prior to the surfacing of the streets. Stubs for service connections for underground utilities and sanitary sewers shall be placed to a length eliminating the necessity for disturbing the street improvements when service connections are made.

E. *Final engineering plans.* Upon completion of the public improvements and prior to final acceptance of the improvements by the City, the developer shall provide certified as-built drawings of all public utility improvements to the City. The as-built drawings and electronic files shall be submitted to the City by the developer's engineer.

Response: The improvement procedures above are understood. There is no additional response necessary at this time.

§2.308 YARD AND LOT STANDARDS.

2.308.01 *Lot coverage, generally.* Specific standards for lot size or area, for lot dimensions, and for lot coverage are set forth in the applicable Zone. Where a standard for lot coverage is expressed as a percentage, such standard means the percentage of total lot area covered by buildings and by roofed but unenclosed structures, whether or not attached to buildings. Covered structures less than five feet in height and having less than 20 square feet of gross floor area shall not be included in calculating lot coverage.

2.308.02 *Yards and yard area, generally.*

Response: Harvest Gardens is a PUD and therefore the yard and lot standards of the underlying zones, R-7 and RM, are permitted to be adjusted with the flexible provisions of §3.113. Please see the response addressing §3.113.05.G.3 for information related to the above development standards.

2.308.03 Separation of lot or yard areas.

Response: Harvest Gardens is a PUD and therefore the yard and lot standards of the underlying zones, R-7 and RM, are permitted to be adjusted with the flexible provisions of §3.113. Please see the response addressing §3.113.05.G.3 for information related to the above development standards.

2.308.04 No parking in front yard, yards adjacent to a street.

A. *Yard parking restrictions.* Exclusive of driveways, no parking shall be allowed within the required front yard area or yards located adjacent to a street. The side yard and rear yard areas may be used for parking of vehicles unless otherwise prohibited.

B. *Storage restrictions.* The yard areas adjacent to a street shall not be used for the permanent storage of utility trailers, house or vacation trailers, boats, or other similar vehicles, unless the storage area is screened by a six foot sight-obscuring fence, wall or hedge. The enclosure shall comply with the provisions regarding the location for fences and maintaining a clear vision area.

Response: This application does not include parking in required yards or intend for outdoor storage. The criteria above can be met.

2.308.05 *Front yard projections.* Planter boxes, chimneys and flues, steps, cornices, eaves, gutters, belt courses, leaders, sills, pilasters, lintels, and other ornamental features of

not more than two feet, from main buildings, uncovered porches and covered but unenclosed porches when not more than one story high and which do not extend more than ten feet beyond the front walls of the building are exempt from the front yard setback provisions.

2.308.06 *Side yard projections.*

A. *Building features.* Cornices, eaves, gutters and fire escapes when not prohibitive by any other code or ordinance, may project into a required side yard not more than one-third of the width of the side yard, nor more than four feet in any case.

B. *Architectural features.* Chimneys, flues, belt courses, leaders, sills, pilasters, lintels and ornamental features may project up to one and a half feet into a required side yard, provided, however, chimneys and flues shall not exceed six feet in width.

C. *Decks and patios.* Uncovered decks and patios attached to the main building when measured directly beneath the outside edge of the deck or patio may be extended to the side yard property line when they are three feet or less in height from ground level.

2.308.07 *Rear yard projections.*

A. *Architectural features.* Chimneys, flues, belt courses, leaders, sills, pilasters, lintels, gutters and other ornamental features, may project up to one and one half feet into a required rear yard, provided, however, chimneys and flues shall not exceed six feet in width.

B. *Building features.* A fire escape, balcony, outside stairway, cornice or other unenclosed, unroofed projections may project not more than five feet into a required rear yard and set back at least six feet from any property line.

C. *Steps and porches.* Planter boxes, steps, uncovered porches, covered but unenclosed porches, including covered patios when not more than one story high, which are not more than four feet above grade, are exempt from the minimum rear yard depth requirements.

D. *Setbacks.* No permitted projection into a required rear yard shall extend within ten feet of the center line of an alley or of a rear lot line if no alley exists.

E. *Decks and patios.* Uncovered decks and patios attached to the main building when measured directly beneath the outside edge of the deck or patio may be extended to the rear yard property line when they are three feet or less in height from ground level.

Response: As shown on the Preliminary Setback Plan (sheets P14-17), each individual lot is provided with an adequate building envelope area where front, side, and rear yard setbacks and building projections can be met. Various design elements listed above including architectural and building features, decks and patios, and steps and porches will be reviewed at time of future building permit submittal. The criteria above are satisfied.

2.308.08 *Clear vision area.* For the purposes of traffic safety, a triangular clear vision area shall be maintained on property corners where public rights-of-way and private points of access intersect. The clear vision area shall conform with the following dimensions:

A. *Driveways, alleys and private drives.* A clear vision area at the intersection of a public street and a point of access shall be the triangular area established according to the following procedure:

1. A line extending 20 feet from the intersection point along the property line;

2. A line extending 20 feet from the intersection point along the driveway;

3. A third line that creates the triangular clear vision area by connecting the ends of the lines described in divisions 1. and 2. above.

B. *Corner lots.* Corner lots formed by the intersection of two right-of-ways shall have a minimum of 20 feet per leg, as measured along the property line from the intersection point at the lot corner.

C. *Rounded corners.* Where the lines at the intersections have rounded corners, the property lines will be extended in a straight line to a point of intersection for measurement purposes.

Response: The Preliminary Plans (Exhibit A) demonstrate that clear vision areas can be maintained in accordance with the requirements above. Corner lots and rounded corners comply with the measurement purposes above. The criteria are met.

D. *Prohibited development.* A clear vision area shall contain no planting, fence, wall, structure, or temporary or permanent obstruction exceeding 36 inches in height, measured from the top of the curb or, where no curb exist, from the established street centerline grade, except that the following may be allowed in the clear vision area:

1. Trees, provided all branches and foliage are removed to a height of eight feet above grade;

2. Telephone, power, and cable television poles; and

3. Telephone switch boxes provided they are less than ten inches wide at the widest dimension.

Response: Clear vision areas are intended to comply with the above standards. The criteria are understood and can be met.

2.308.09 *Fences, walls and hedges.*

A. *Residential, public and semi-public uses.*

1. *Height, location.* Fences, walls and hedges may be located in any required yard or along the edge of any yard, subject to the maintenance of clear vision area. A fence, wall, or hedge may not exceed six feet in height without approval of a variance. Fences and walls shall not exceed a height of four feet along, and within, ten feet of any property line adjacent to the street and containing a street access. Fences and walls may be subject to a building permit Application, in compliance with Oregon State Building Code standards.

2. *Construction material.* Fences or walls constructed of unsafe materials, including, but not limited to barbed wire, electric fencing, broken glass, and spikes shall be prohibited.

Response: Harvest Gardens PUD does not include planned fences, walls, or hedges exceeding six feet in height (four feet adjacent to a street) or use of the prohibited materials listed above. The criteria are satisfied.

3. *Swimming pool requirements.* Swimming pools shall be enclosed by a locking fence of six feet in height. The dwelling may be used to meet part of the enclosure requirement.

Response: This application does not involve swimming pools. The criterion is not applicable.

4. An entrance wall to a subdivision or other residential development shall be permitted provided the wall or gate does not exceed six feet in height nor violate provisions of the clear vision area.

Response: Harvest Gardens does not involve an entrance wall or gate to the subdivision that exceeds six feet in height or violates the clear vision area. The criterion is met.

B. *Commercial and industrial uses.*

1. *Height, location.* Fences, walls and hedges may be located in any required yard or along the edge of any yard, subject to the maintenance of clear vision area. A fence, wall, or hedge may not exceed 12 feet in height without approval of a variance. Fences and walls may be subject to a building permit Application, in compliance with Oregon State Building Code standards.

2. *Construction material.* Electric and barbed wire fencing shall be permitted in the C, I, EI and P Zones. Barbed wire fencing shall be angled inward.

Response: This application does not involve construction of fences, walls, or hedges for a commercial or industrial use at this time. It is understood that fences and walls may be subject to building permit approval, if necessary. The criteria above are met.

SUBCHAPTER 3.1: APPLICATION REQUIREMENTS AND REVIEW PROCEDURES

§3.109 SUBDIVISIONS.

3.109.01 Area of Application. A subdivision is required for any land division which creates more than three parcels in a calendar year.

Response: Harvest Gardens is a PUD and concurrent land division pursuant to §3.113.03.C. Therefore, the following standards are applicable.

3.109.02 Submittal requirements; submittal material. The following submittal requirements shall apply to all major partition Applications and to Preliminary Plan Applications for subdivisions.

A. All Applications shall be submitted on forms provided by the City to the City along with the appropriate fee. It shall be the applicant's responsibility to submit a complete Application which addresses the review criteria of this section.

Response: This submittal package contains complete City application forms (Exhibit B) and fee. Additionally, a written consent form (Exhibit C) is included as a petition for annexation.

B. In addition to the information listed in §3.107.03 of this Development Ordinance, applicants for subdivisions shall submit the following:

1. The name, address and phone number of the applicant engineer, land surveyor, or person preparing the Application.

2. Name of the subdivision.

3. Date the drawing was made.

4. Vicinity sketch showing location of the proposed land division.

5. Identification of each lot by number.

6. Gross acreage of property being subdivided or partitioned.

7. Direction of drainage and approximate grade of abutting streets.

8. Streets proposed and their names, approximate grade, and radius of curves.

9. Any other legal access to the subdivision, partition other than a public street.

10. Contour lines at two foot intervals if 10% slope or less, five foot intervals if exceeding 10% slope, and a statement of the source of contour information.

11. All areas to be offered for public dedication.

Response: Please see the Preliminary Plans (Exhibit A) detailing the applicable information required above. The submittal requirements above are provided in this complete application package.

3.109.03 Review procedures.

A. Planning Commission. All preliminary plans for subdivisions shall be heard by the Planning Commission pursuant to the requirements for a Type II procedure as set forth in the §3.203.

B. Time limit. Approvals of any preliminary plans for a subdivision shall be valid for one year after the date of the written decision. A final plat for a final plan for a subdivision shall be recorded within this time period or the approval shall lapse.

C. Re-Application required. If the approval period is allowed to lapse, the applicant must resubmit the proposal, including all applicable fees, for public hearing before the Planning Commission. The applicant will be subject to all applicable standards currently in effect.

Response: Harvest Gardens is a PUD with concurrent land division pursuant to §3.113.03.C. Therefore, the consolidated application will be reviewed through a Type III procedure. Additionally, the Applicant seeks to extend the approvals of the preliminary plans for PUD and tentative subdivision plat be valid for three years after the date of the written decision.

3.109.04 Review criteria. Approval of a subdivision shall require compliance with the following:

A. Each lot shall satisfy the dimensional standards and density standard of the applicable zoning district, unless a variance from these standards is approved.

Response: Harvest Gardens is a PUD with concurrent land division pursuant to §3.113.03.C. The dimensional standards for the lots within the site vary from the underlying zone districts, R-7 and RM, as allowed through the PUD's flexible design standards. Therefore, a variance from the above standard is not required. The density standards of the underlying zones are fulfilled per §3.113.07. To the extent applicable, the criteria are met.

B. Adequate Public facilities shall be available to serve the existing and newly created parcels.

Response: Public facilities and services are planned to be provided to each lot concurrently with the associated phase of development of the property. The criterion is met.

C. The proposal shall comply with the applicable development standards in §2.307.

Response: As described in this written narrative, the development standards of §2.307 are met, as applicable. The PUD provisions of §3.113 override various subdivision provisions of §2.307.

3.109.05 Form of final subdivision plat; final plat requirements. The final plat shall be prepared in a form and with information consistent with ORS 92.010 to 92.160, and approved by the County Surveyor. All subdivision names shall conform to ORS 92.090.

3.109.06 Final plat review of subdivisions.

A. Final review. The final subdivision plat shall be submitted to the City staff for review. Staff shall review the plat to assure compliance with the approved preliminary plat and with the conditions of approval. The City Manager, or designee, shall signify staff approval of the final plat by signing the document.

B. Filing final plat. The final subdivision plat shall be filed with the Marion County Clerk's Office.

C. Improvements/bonding. Prior to approval of the final plat, all improvements required by the conditions of approval shall be constructed or the construction shall be guaranteed through a performance bond or other instrument acceptable to the City Attorney.

Response: Pursuant to §3.113.03.C, the tentative plat will be combined with the preliminary PUD review and the final plat with the final PUD review. The above review procedures are understood, though not directly applicable.

3.109.07 Expedited land division.

A. Eligibility. Land designated for residential use, including recreational and open space uses accessory to residential use, is eligible to apply for an expedited land division process when creating three or less parcels. The expedited land division process may be used in lieu of a Type II process.

B. Exclusion.

1. Property and process exclusions include properties specifically mapped and designated in the Comprehensive Plan or Development Ordinance for full or partial protection of natural features under the statewide planning goals that protect open space, scenic and historic areas and natural features and not eligible for the construction of dwelling units or accessory buildings.

2. The expedited land division process is not a land use or limited land use decision and is not subject to the permit requirements of City enabling legislation. Decisions are not subject to the Comprehensive Plan and not eligible for appeal to the Land Use Board of Appeals (LUBA).

Response: This application does not involve an expedited land division because the consolidated application includes a PUD. The criteria are not applicable and have been omitted for brevity.

(…)

H. Decision criteria. Criteria for approving the subdivision shall be as follows:

1. The criteria established in §3.109.04.

2. Density. The Application must be able to establish at least 80% of the allowable density of the applicable Residential Zone.

3. **Street standards. The Application must comply with the most recent City of Donald Public Works Design and Construction Standards or provide evidence of meeting the City's minimum street connectivity standards contained within this Development Ordinance.**

Response: As described in this written document, Harvest Gardens Agrihood is a consolidated application that includes a PUD, subdivision, and zone change.

- The decision criteria established in §3.109.04 for subdivision approval is met, as applicable.
- The density requirements of the underlying zones (R-7 and RM) are satisfied per §3.113.07.
- As shown on the Preliminary Plans, the subdivision layout provides safe, convenient, and direct pedestrian, vehicular, and traffic circulation throughout the site and "nearby," interpreted to mean uses within a quarter mile of the subdivision boundary.

Therefore, Harvest Gardens is in compliance with the decision criteria above for subdivision approval.

§3.111 ZONE CHANGE.

3.111.01 ***Process.*** **Zone changes shall be reviewed in accordance with the Type III review procedures specified in §3.201. Type III reviews shall be limited to Zone changes affecting five or fewer adjacent parcels ownerships. Zone changes affecting more than five parcels ownerships shall be considered legislative actions and subject to a Type IV review process.**

Response: The application involves a zoning designation change and should be reviewed through a Type III process. The map amendments affect two parcels and therefore are not considered legislative actions subject to a Type IV review process.

3.111.02 ***Application and fee.*** **An Application for a Zone change shall be filed with the City and accompanied by the appropriate fee. It shall be the applicant's responsibility to submit a complete Application which addresses the review criteria of this section.**

Response: This submittal package contains a complete application (Exhibit B) and fee.

3.111.03 ***Criteria for approval.*** **Zone change proposals shall be approved if the applicant provides evidence substantiating the following:**

A. **The proposed Zone is appropriate for the Comprehensive Plan land use designation on the property and is consistent with the description and policies for the applicable Comprehensive Plan land use classification.**

B. **The uses permitted in the proposed Zone can be accommodated on the proposed site without exceeding its physical capacity.**

Response: On June 12, 2018, the Donald City Council passed Ordinance No. 171-2018, an ordinance which amended the Donald Comprehensive Plan to expand the City's UGB. This ordinance amended the Donald Comprehensive Plan and placed Residential land use designation on 76.7 acres of property, including the 61.8-acre subject site to be annexed. Additionally, the ordinance states the City Council intends to place the future land use designation of R-7 – Single-Family Residential Zone and RM – Multi-Family Residential Zone for

development within the Donald South Expansion Area once annexed into the City Limits, as depicted on Map 2.103.

The subject site is designated Residential in the Donald Comprehensive Plan and is therefore appropriately planned and consistent with applicable policies for residential land use. The site is planned to blend the zoning designation boundaries of R-7 – Single-Family and RM – Multi-family zoning within the PUD and can accommodate the uses permitted without exceeding its physical capacity. The approval criteria above met.

C. Allowed uses in the proposed Zone can be established in compliance with the development requirements in this Development Ordinance.

Response: Allowed uses in the R-7 and RM zones, as well as uses allowed within a PUD, can be established in compliance with the applicable requirements of the DDO. The criterion is met.

D. Adequate Public facilities, services, and transportation networks are in place or are planned to be provided concurrently with the development of the property.

Response: Public facilities, services, and transportation networks are planned to be provided concurrently with the phased development of the property. Infrastructure is discussed in detail in section §2.307.04. Please see the TIS for transportation network and TPR rule findings which demonstrate compliance with the planned zone change. The criterion is met.

E. For Residential Zone changes, the criteria listed in the purpose statement for the proposed Zone shall be met.

Response: This application involves a residential zone change. The purpose statements for the zones are addressed within the respective Sections of this narrative. The criterion is met.

3.111.04 Zone change conditions.

A. *Imposition of conditions.* Approval of a Zone change Application may be conditioned to require provisions for buffering or provision of off site Public facilities. In order to impose conditions on a Zone change, findings must be adopted showing that:

1. The Zone change will allow uses more intensive than allowed in the current Zone; and

2. The conditions are reasonably related to impacts caused by development allowed in the proposed Zone or to impacts caused by the specific development proposed on the subject property; and

3. Conditions will serve a public purpose such as mitigating the negative impacts of allowed uses on adjacent properties; and

B. *Conditions.* Conditions that could meet the criteria in A., include, but are not limited to:

1. Dedication of right-of-way for public streets, utility easements, etc.

2. Improvement of private roadways or public streets, including bike paths, curbs, and sidewalks.

3. Provision of storm drainage facilities.

4. Extension of public sewer, storm drain, and water service including over sizing to permit development on other lands.

5. Provision of fire suppression facilities and equipment.

6. Provision of transit and traffic control facilities.

7. Special building setbacks, orientation, landscaping, fencing, berming, and retention of natural vegetation.

8. Special locations for truck loading, parking, access routes, or any outdoor activity that could impact adjacent property.

9. Financial contributions to public agencies to offset increased costs for providing services or facilities related to the intensification of the use of the property.

Response: It is understood that the approval of this application may impose reasonable conditions as necessary. No additional response is necessary at this time.

§3.113 PLANNED UNIT DEVELOPMENTS.

3.113.01 Purpose. The purposes of the Planned Unit Development (PUD) provisions are to:

A. Implement the Comprehensive Plan by providing a means for planning larger development sites as an alternative to piecemeal subdivision development;

Response: This application involves annexation of a ±61.8-acre site. The PUD provisions allow consistent and comprehensive planning for the subject site as a whole to create a complete and sustainable community. Please see the responses addressing compliance with the Donald Comprehensive Plan goals and policies.

B. Encourage innovative planning that results in projects that benefit the community, for example, through greater efficiency in land use, improved protection of open spaces, transportation efficiency, and housing choices;

Response: Harvest Gardens is designed with open space and agricultural land as the centerpiece of the community to foster social ties, provide residents with access to fresh and local goods, and promote educational opportunities. The Agrihood provides a clustered residential design which allows the community to conserve productive farmland and natural areas. This concept mitigates increases in impervious surfaces and lowers infrastructure expenditures and maintenance costs. The interconnected transportation network and inclusion of multi-use trail system is intended to encourage physical fitness and recreation uses for healthy living. The open courtyard areas provide opportunities for passive recreation and relaxation. This PUD application uses innovative planning that will provide a variety of needed workforce housing and ultimately benefit the City of Donald by bringing a live/work concept to fruition and allow controlled, logical growth in an area characterized by high employment and low housing.

C. Promote an economic arrangement of land use, buildings, circulation systems, open space, and utilities;

Response: This application introduces a clustered residential design which generally results in lower infrastructure capital expenditures and reduced maintenance costs for local jurisdictions. As described in this written narrative and illustrated on the Preliminary Plans (Exhibit A), Harvest Gardens is arranged to provide a complete and sustainable community.

D. **Preserve existing landscape features and natural resources, and better integrate such features and resources into site design;**

Response: Harvest Gardens provides a clustered residential design around open space and adjacent working farms which allows the community to conserve productive farmland and natural areas and to mitigate increases in impervious services. The layout adapts to the property's existing topography to create views and points of interest, while creating centrally-located open space areas for residents and visitors. The community design ultimately creates a vibrant sense of place that people desire to live in while supporting the local workforce and the community's rural character.

E. **Provide usable and suitably sited public and common facilities;**

Response: As shown on the Preliminary Plans (Exhibit A), public facilities as available will be provided to serve the site, including but not limited to stormwater management, sanitary sewer facilities, municipal water, and franchise utilities. Infrastructure is planned to be completed with the build out of the associated phase. Additionally, this narrative contains statements which delve into the regional infrastructure upgrades, associated costs, and system development charges associated with this project.

F. **Allow for increased residential densities and encourage greater variety of housing types; and**

Response: The PUD provisions provide flexibility in lot design standards which allow a variety of lot sizes and housing types including single-family detached homes, townhomes, and multi-family units. This variety of housing types is important to meet the needs of employees and their families – directly addressing the workforce housing initiative associated with this application. Harvest Gardens includes a range of housing options so that families at a variety of household income levels can live in the same community. The City of Donald will be able to ease issues which stem from a lack of housing, reduce commuting, and embrace a high local employment rate. In turn, local businesses like GK Machine will have the opportunity to attract and retain employees and the ability to take advantage of business investments, market opportunities, growth and expansion, etc.

G. **Provide flexibility in development standards, consistent with the above purposes.**

Response: Harvest Gardens proposes to comply with the purpose of the PUD provisions by applying flexibility in design standards consistent with the goals above. Please see the narrative section for §3.113.04 and responses addressing the specific modifications to development standards Harvest Gardens seeks to achieve through the PUD provisions, as described above.

3.113.02 *Applicability and allowed uses.*

A. **A PUD may be requested for any Residentially-Zoned property (R-7 or RM) that is at least two acres in size.**

Response: As explained prior in this written narrative, On June 12, 2018, the Donald City Council passed Ordinance No. 171-2018 which amended the Donald Comprehensive Plan and placed the future land use designation of R-7 and RM on the property once annexed into the City Limits (as shown in the Exhibit A, Figure 2 in the Ordinance). Most of the subject

site, approximately ±53.5 acres are designated R-7. Approximately ±7.5 acres are designated RM, located in the northwestern most corner of the site.

B. PUD approval allows development of a site with a mixture of uses. The following uses are allowed with PUD approval:

1. All uses allowed in the underlying Zone.

2. Housing types not otherwise permitted in the underlying Zone, including cottage clusters and zero lot line development.

3. Neighborhood-scale commercial retail uses, consistent with the standards in §3.113.06.

Response: Harvest Gardens incorporates a variety of housing types, though cottage clusters and zero lot line development are not proposed in this application. The PUD provides for uses allowed in the R-7 and RM zoning designations and includes up to two acres of commercial use as detailed in §3.113.06. The approval criteria above are met.

3.113.03 ***Review and approval process.*** A PUD shall be reviewed through a two-step process, as follows:

A. ***Preliminary plan.*** The preliminary plan is reviewed under a Type III procedure. The preliminary plan review examines the PUD plan with respect to items such as density, including the number, type, and location of dwelling units; parking; impacts on surrounding areas; adequacy of services; and conceptual plan for service improvements. Preliminary plan approval will only be granted when there is a reasonable certainty that the PUD will fulfill all applicable requirements of the City Codes.

1. The Planning Commission may require a second hearing to review the preliminary plan if modifications are needed to satisfy applicable standards and criteria for approval.

B. ***Final plan.*** The final plan for the PUD is reviewed under Type I administrative procedures. The applicant must submit the detailed and technical information necessary to demonstrate that all applicable City standards, requirements, and conditions have been met. Approval will only be granted if the final plan is in substantial conformance with the preliminary plan.

1. If City staff finds that the final plan is not substantially in conformance with the preliminary plan, staff may require a second Planning Commission hearing to review the final plan prior to approval.

Response: The above two-step process is understood. The criteria can be met.

C. ***Concurrent land division.*** A PUD may be filed and processed concurrently with a partition or subdivision Application. All submittal requirements and review standards of §§3.105 and 3.109 will apply to a concurrent PUD/land division request. The tentative plat will be combined with the preliminary PUD review and the final plat will be combined with the final PUD review.

Response: This application involves a PUD and concurrent land division. The review standards of DDC Section §3.105 and §3.109 are addressed within this written narrative and the submittal contains the required materials. The criteria are met.

D. ***Site Development Review.*** The PUD approval may remove the requirement for subsequent Site Development Review, if the PUD includes building

elevations and sufficient information to demonstrate compliance with the applicable Site Development Review standards. The PUD decision shall expressly state whether individual buildings within the PUD (such as commercial or multi-family buildings) require additional Site Development Review approval.

Response: It is understood that the PUD decision may expressly require additional Site Development Review approval for individual buildings. A future application submittal will include building elevations and sufficient information to demonstrate compliance with the applicable Site Development Review standards.

E. ***Modifications to an approved PUD.*** Once a final PUD plan has been approved, the PUD may be modified as follows:

1. Minor modifications to an approved PUD will require a Type I administrative review.

2. Major modifications to an approved PUD will require a Type III quasi-judicial review by the Planning Commission.

3. Determination of the appropriate review type for a PUD modification will be made by City planning staff.

Response: The process for modifications to an approved PUD is understood. No additional response is necessary.

3.113.04 ***Modifications to development standards.*** The development standards of the Donald Development Code may be modified through the PUD process without the need for variance if the City finds that the proposal, on balance, exceeds the City's minimum requirements and provides greater community benefits than would otherwise occur under the base Development Code requirements. In evaluating community benefits, the City shall apply the approval criteria in §3.113.05. New homes within PUDs are subject to the residential design standards in §2.312 and will be reviewed for conformance during the building permit process.

Response: Harvest Gardens proposes to comply with the purpose and goals of the underlying zoning districts through alternate means. The Harvest Gardens modifications to development standards enable the project to be innovative, desirable, include diversity in location and design, and incorporate public benefits consistent with the Comprehensive Plan. The application seeks the following adjustments:

Harvest Gardens Planned Unit Development Requested Design Alternatives to Development Standards		
Code Section	**Development Standard**	**Design Alternative**
Section 2.103.05 – R-7 Dimensional Standards	7,000 square foot minimum lot size	4,000 square foot minimum lot size
	8-foot interior side setback	5-foot interior side setback
	15-foot rear setback for 1-story house; 20-foot rear setback for 2-story house	15-foot rear setback for all homes

Section 2.303.11.G.1 – Parking and Loading Areas	Parking facilities containing more than four spaces shall be accessed by a driveway	Several public off-street parking areas (Tracts C, E, G, I, J, M, S, W, Y) contain more than four spaces and back onto a public street right-of-way. Similarly, backing movements for parked cars onto public right-of-way is currently allowed from driveways for up to two cars. Additionally, removal of the requirement for a parking aisle driveway at the rear of the stalls reduces unnecessary impervious surfaces and enhances the rural character of the community.
Section 2.307.04.A – Block Length	600-foot maximum length	The central park in Tract N results in blocks that exceed 600 feet in length. The provision of pedestrian and bicycle accessways at approximately 100-foot intervals on Streets 1 and 2, essentially creates "pedestrian blocks" which meet the 600-foot length and encourage safe and convenient pedestrian trips.
Section 2.307.04.D.1 – Pedestrian Accessways	15-foot minimum dedicated tract width	The pedestrian and bicycle accessways are largely designed to be dedicated in 15-foot-wide tracts. There are three exceptions: the tracts located between looped local streets (Streets 5, 6, and 7) are decreased (but still improved) to 10-foot widths to incorporate an access easement and stormwater facilities on the eastern portion of the PUD.
Section 2.307.06.H – Sidewalks	Sidewalks on both sides of streets	The secondary residential "loop streets" have been designed with a rural/agricultural cross section. This is a 28-foot wide roadway with two travel lanes and parking on one side. Pedestrian access to the homes is provided through the central courtyards and the perimeter looped trail system that connects all the courtyards together.
Section 3.109.03.B – Time Limit	The approvals of any preliminary plans for a subdivision shall be valid for one year after the date of the written decision	This application requests approvals of any preliminary plans for PUD and tentative subdivision be valid for three years after the date of the written decision.
Section 3.113.06.I – Phased Development	The timeframe for all phases combined shall not exceed seven years	This application requests a 12-year phasing schedule to allow anticipated market absorption and proper scalability of the site as phases progress.
Section 2.302.05 – Street Standards	Modification of right-of-way and improvement width	All proposed streets allow for two travel lanes that are appropriate for traffic volumes project for this development. Street improvements are intended to be completed in accordance with the Section 2.302.05 narrative response and the modified typical sections shown on the plans and described below.

Street Design and Construction Standards – Core Area Local	40-foot curb to curb with 8-foot parking; 60-foot right-of-way	Planned L1 Typical Section 38-foot curb to curb with 8-foot parking (both sides), 5-foot landscape strip, and 5-foot sidewalk; 60-foot right-of-way
Street Design and Construction Standards – Rural Local Street	34-foot curb to curb with 7-foot parking; 50-foot right-of-way	Planned L2 Typical Section 28-foot curb to curb with 8-foot parking (one side), 5-foot landscape strip, 5-foot sidewalk; 50-foot right-of-way Planned L3 Typical Section 28-foot curb to curb with 8-foot parking (one side); 28-foot right-of-way
Street Design and Construction Standards – Public Utility Easement (PUE)	12-foot minimum PUE on all lots fronting onto a public right-of-way	8-foot PUE on all lots fronting onto a public-right-of-way and 15-foot septic tank bump out where needed for each lot

Harvest Gardens Planned Unit Development Community Benefits and Improvements to City of Donald	
Nature of Development	**Public Benefit Provided**
Planned Unit Development – provides a means for innovative planning for larger development sites	• This application involves annexation of a ±61.8-acre site. • The PUD provisions allow consistent and comprehensive planning for the subject site wholly to create a complete and sustainable community as an alternative to piecemeal subdivision development. • Harvest Gardens is planned as a "Agrihood". This is an innovative community concept that provides clustered residential development around open space and adjacent working farms which allows the community to celebrate productive farmland. The community concept and its benefits are described in detail in Exhibit L.
Provides needed workforce housing	• As described with the expansion of the Urban Growth Boundary, Donald has a significant need for workforce housing. Harvest Gardens provides a variety of housing types to meet the needs of Donald employees and their families including single-family homes, attached townhomes, and apartments units.
Open Space	• Harvest Gardens is designed around a central hourglass shaped park. Homes all front shared courtyards. Overall, the project includes ±9 acres of shared open space (15 percent of the overall site) featuring natural areas, off-street trails, interpretive signage, benches, and other amenities

	such as opportunities for composting organic material and water reuse. • Spans throughout the site and connects to a majority of the planned residential lots. • At least 75 percent of the required open space is available for public use. • The PUD encourages physical fitness and recreation use with the inclusion of a perimeter trail system. • Open space will be phased for construction as shown on the preliminary phasing plan. • The future multi-family site and commercial site will also provide landscaping in addition to the PUD open space. • The clustered design reduces the amount of impervious surface per dwelling unit
Greater variety of housing types and lot sizes than would be achieved under the base Donald Development Code standards	• Harvest Gardens PUD is associated with a workforce housing initiative funded by the State of Oregon. • To meet a wide range of housing needs in Donald, a variety of single-family and multi-family options must be provided in the community. This is directly related to the lot size design flexibility requested by the PUD. • Harvest Gardens includes a range of housing options so that families at a variety of household income levels can live in the same community. • The City of Donald will be able to ease issues which stem from a lack of housing, reduce commuting, and embrace a high local employment rate. • Local businesses will have the opportunity to attract and retain employees and the ability to take advantage of business investments, market opportunities, growth and expansion, etc.
Mixed-use development	• Harvest Gardens includes two acres of planned future commercial use to incorporate a farm service center, which is less than five percent of the total site area. • The commercial component will serve as an activity center for the community, create an event and market space, permit the sale of farm products, and promote other farm-to-table initiatives. • Leverages the advantages of a farm-adjacent location • This use will be subject to a future land use application outlining the details of the design. This center will be a phased improvement as the new homes create demand. It will start with a small outdoor flex space to accommodate

	events like a farmers market, and then expand to a permanent structure as the market allows.
Ample Parking	• 424 public parking spaces provided (on-street) • 89 public off-street parking spaces provided (within tracts) • 1,188 private parking spaces provided (within individual lots in garages and driveways)
Improved transportation connectivity, such as the provision of pathways, that would not otherwise be provided under the base Donald Development Code requirements	• The site will be served by a comprehensive transportation network that includes northerly access from Donald Road NE and a centralized, hourglass-shaped street pattern with looped, local street connections. • Harvest Gardens generally has two types of streets. Primary public streets form the transportation framework. These are traditional streets with two travel lanes, parking on both sides, sidewalks, and planter strips. Two of these primary streets run north south on either side of the central greenspace, and then an east-west street at the southern end connecting to the separate parcel to the southwest. The second street type is the looped residential streets. These provide limited access to the residential courtyards. They are rural in character with only 28-feet of asphalt. There is room for two travel lanes and parking on one side. Sidewalks are located in the central courtyards for primary pedestrian access. This design slows traffic, reduces impervious surfaces, and supports the agricultural character of the community. • A trail system loops around the perimeter of the project for connectivity and recreational opportunities. • This extensive system of pedestrian trails, connections, and pathways creates a walkable community and encourages active lifestyles
Greater efficiency in land use	• Harvest Gardens is designed with open space and agricultural land as the centerpiece of the community to foster social ties, provide residents with access to fresh and local goods, and promote educational opportunities. The Agrihood provides a clustered residential design which allows the community to conserve productive farmland and natural areas. This concept mitigates increases in impervious surfaces and lowers infrastructure expenditures and maintenance costs. The interconnected transportation network and inclusion of multi-use trail system is intended to encourage physical fitness and recreation uses for healthy living. The open courtyard areas provide opportunities for passive recreation and relaxation. This PUD application uses innovative planning that will provide a variety of needed workforce housing and ultimately benefit the City of Donald

	by bringing a live/work concept to fruition and allow controlled, logical growth in an area characterized by high employment and low housing.
Greater reduction of impervious surfaces	• This application introduces a clustered residential design which generally results in less pavement per dwelling unit and reduced maintenance costs for local jurisdictions. As described in this written narrative and illustrated on the Preliminary Plans (Exhibit A), Harvest Gardens is arranged to provide a complete and sustainable community.
Future Street Connections	• The intent of the PUD layout and design considers the prospect of future residential development and allows logical infrastructure connectivity. • The two main thoroughfares (Street 1 and 2) are stubbed at the south property boundary of Tax Lot 2600 for future connection. • Street 3 is stubbed to the west property boundary of Tax Lot 2600 and north property boundary of Tax Lot 300. Streets 12, 13, and 14 within Tax Lot 300 are stubbed to the property boundaries for future connectivity. • Additionally, the looped local street sections are designed to construct right-of-way up to the edge of the east and west property lines.

3.113.05 ***Preliminary PUD plan submittal requirements.*** **The following information shall be submitted as part of a complete Application for preliminary (Type III) PUD review:**

A. **A completed land use Application form signed by the applicant or applicant's representative and the property owner or owner's representative.**

B. **Payment in full of the appropriate Application fee, based on the fee schedule in effect on the date of submittal.**

Response: The signed land use application form (Exhibit B) and appropriate fee are within this submittal. The above submittal requirements are met.

C. **An existing conditions plan containing, at a minimum, the following information:**

1. **The applicant's entire property and the surrounding property to a distance sufficient to determine the location of the development in the City, and the relationship between the proposed development site and adjacent property and development. The property boundaries, dimensions, and gross area shall be identified;**

2. **The location of existing structures;**

3. **The location and width of all public and private streets, drives, sidewalks, pathways, rights-of-way, and easements on the site and adjoining the site;**

4. Other site features, including pavement, large rock outcroppings, areas of significant vegetation, trees over six-inch diameter at four feet above grade, areas having unique views, and drainage ways, canals, and ditches.

Response: The Preliminary Plans (Exhibit A) include Existing Conditions Plan sheets which contain a vicinity map, location of existing structures, transportation facilities and easements, and other site features listed above. The submittal criteria above are met.

D. Concept plan sets including but not limited to the following:

1. Pedestrian and vehicle site circulation;

2. Development pattern, including approximate location, acreage, type and density of proposed development, housing types, unit densities, and generalized lot sizes at their proposed locations on the site;

3. Conceptual residential design, including proposed housing types and illustrative examples;

4. For any commercial development, provide conceptual architectural designs, including drawings, exterior elevations, and exterior building materials board or photos.

5. Open space and natural resources, including percentage of site area and approximate locations of proposed parks, playgrounds or other outdoor play areas, common areas and usable open space; and natural, historic and cultural resource areas or features proposed for preservation.

Response: The Preliminary Plans (Exhibit A) provide development details as required in this Section. Please note that the commercial development and the multi-family/attached single family development sites will be subject to future Site Development Review. Architectural and site plan details will be provided in those future land use applications.

E. Preliminary partition or subdivision plat if land division is included in the development proposal.

Response: This application involves land division and the Preliminary Plat is included within the Preliminary Plans (Exhibit A).

F. Preliminary phasing plan including infrastructure phasing, if project phasing is proposed.

Response: Harvest Gardens is being submitted as a phased project. Please see the Preliminary Plat Overview and Phasing plan (Exhibit A) that illustrates the phases and scheduled timeline for the project. The configuration and order of phasing is intended to be flexible and will be subject to change based on a variety of factors, including jurisdictional limitations regarding various infrastructure and capacity constraints which may affect the project timeline. The Preliminary Plans (Exhibit A) demonstrate that all necessary public facilities will be constructed as part of the associated phase.

G. Narrative statements including but not limited to the following:

1. Demonstration of compliance with partition, subdivision, and/or Site Development Review approval criteria if applicable;

Response: This written document contains narrative statements which demonstrate compliance with the subdivision criteria of §3.109. It is understood that the PUD decision may

expressly require additional Site Development Review approval for individual buildings, and associated approval criteria will be addressed in a future submittal if required. The submittal requirements are met.

2. Description, approximate location and timing of each proposed phase of development, if applicable;

Response: As shown on the Preliminary Plat (Exhibit A), the PUD is planned to be completed in flexible increments and provide necessary public improvements concurrently with each phase. The configuration and phasing are subject to change based on a variety of factors. Harvest Gardens has requested a full buildout timeline of up to twelve years to accommodate anticipated market demand. Please see in the response to §3.113.06.I for specific details.

3. Demonstration of compliance with the development standards of the underlying Zone and/or description of how standards have been adjusted consistent with the purpose of the PUD;

Response: Please see the narrative section for R-7 and RM. Additionally, the narrative section which addresses the PUD requirements details compliance with the flexible design standards and adjustments from the underlying zone requirements. The criterion is met.

4. Explanation of how the proposed PUD is consistent with the approval criteria in

Response: This written document contains narrative statements which demonstrate compliance with the applicable approval criteria.

H. Table showing applicable density calculations.

Response: The Sheet P08 of the Preliminary Plans (Exhibit A) includes a table notating the density calculations for the PUD. The minimum and maximum densities of the underlying R-7 and RM zoning designations are calculated and blended to achieve the total PUD density. It should be noted that the future multi-family and/or attached townhouse phase on Lot 246 will have an allowed density range the matches the remaining range of the allowed density for Harvest Gardens (49 to 133 DU).

3.113.06 ***Preliminary PUD plan approval criteria.*** In evaluating a preliminary PUD plan, the City shall apply the following criteria; the City may deny an Application for PUD approval that does not meet all the following criteria:

A. The proposal is consistent with the PUD purpose statements listed in §3.113.01.

Response: This application addresses and is consistent with the purpose statements of the PUD, in addition to the underlying zones. The above approval criteria are met.

B. The proposal meets the submittal requirements of §3.113.04.

Response: This application includes modifications to development standards permitted through the PUD process without the need for variance pursuant to §3.113.04. The submittal requirements of §3.113.04 and §3.113.05 are met.

C. Adequate public services exist or can be provided to serve the proposed PUD.

Response: As shown on the Preliminary Plans (Exhibit A), public services are planned to be provided to serve the proposed PUD. The phasing plan is designed to be carried out in a manner that provides necessary public improvements for each phase as the project moves forward. The above approval criterion is met.

D. Except as may be modified under this section, all the requirements for land divisions under subchapter 3.1 are met;

Response: The applicable requirements for land divisions are met or modified by the PUD provisions; see the narrative under subchapter §3.1. The above approval criterion is met.

E. Usable open space is provided consistent with §3.113.08.

Response: As illustrated on the Preliminary Plans (Exhibit A), usable open space is provided and connected to the majority of the residential lots in the PUD. Additionally, see the narrative describing specific open space characteristics under §3.113.08. The above approval criterion is met.

F. The proposal provides a public benefit by incorporating one or more of the following:

1. Greater variety of housing types or lot sizes than would be achieved under the base Development Code standards;

Response: As described in this written document, Harvest Gardens PUD is associated with a workforce housing initiative funded by the State of Oregon. To meet a wide range of housing needs in Donald, a variety of single-family and multi-family options must be provided in the community. As shown on the Preliminary Plans (Exhibit A), Harvest Gardens is planned to include a variety of lot sizes for detached single-family housing, as well as multi-family unit options to meet the needs of employees and their families. The lot size design flexibility is achievable through the PUD where components of the underlying base zones do not allow; additionally, the underlying residential base zone boundaries, R-7 and RM, may be blended throughout the site per §3.113.07. The approval criterion is met.

2. Greater protection of natural features than would be required under the base Development Code standards;

Response: The Harvest Gardens property does not contain any protected natural features; it is actively farmed. This approval criterion does not apply.

3. Improved transportation connectivity, such as the provision of pathways and/or other transportation facilities, that would not otherwise be provided pursuant to base Development Code requirements.

Response: The site will be served by a comprehensive transportation network that includes northerly access from Donald Road NE and a centralized, hourglass-shaped street pattern with looped, local street connections. Between each street connection there is a greenway pedestrian connection including grassy areas, landscaping, and sidewalks on both sides. Said multi-use connections are provided at five intervals along Street 1 and six intervals along Street 2 to allow convenient, safe, and direct bicycle and pedestrian access. This extensive system of pedestrian trails, connections, and pathways creates a walkable

community and encourages active lifestyles. Additionally, this design provides access throughout the site and stubs street and multi-use connectivity sections at the property boundaries for future connectivity, where appropriate. Generally, pedestrians and bicyclists "nearby," or within a quarter mile of the site, will be traveling west toward the City of Donald or east toward Interstate 5. The criteria above are satisfied.

> 4. **Sustainable building and site design elements, consistent with §3.113.09.**

Response: This application does not propose specific sustainable building and site design elements; the criterion is not required. It should be noted that stormwater will be treated as outlined in the Preliminary Stormwater Report (Exhibit H). The application provides for other public benefits as demonstrated above.

> G. **If the proposal includes commercial development, the land area devoted to commercial development shall not exceed five percent of the total land area of the PUD site, or two acres, whichever is less.**
>
> 1. **Individual commercial buildings shall not exceed a gross floor area of 25,000 square feet to ensure neighborhood-scaled development.**

Response: Harvest Gardens includes two acres of planned future commercial use to incorporate a farm service corridor, which is less than five percent of the total site area. The commercial component will serve as an activity center for the community, create an event and market space, permit the sale of farm products, and promote other farm-to-table initiatives. Individual commercial buildings are not proposed at this time and will be reviewed through the future Site Development Review process (if required by §3.113.03.D) and subsequent building permit submittal. This complex is expected to evolve over time with phases as the population of Donald increases and the center attracts a customer base. The approval criteria are met.

> H. **The proposal is consistent with the density standards of the underlying Zone, except where a density bonus is proposed per §3.113.07.**

Response: Harvest Gardens is a PUD comprised of more than one residential zone (i.e. R-7 and RM). As shown on the Density Calculation Table within the Preliminary Plat (Exhibit A), the overall minimum and maximum densities are calculated separately for each zone, then totaled, as detailed in §3.113.07 below. The densities planned are consistent with the requirements of the underlying zones. The approval criterion is met.

> I. **If phased development is proposed, the applicant shall provide a time schedule for developing the site in phases, but in no case, shall the time period for all phases combined be greater than seven years, unless otherwise approved by the Planning Commission. For all phases, the applicant shall demonstrate that all necessary Public facilities will be constructed as part of each phase.**

Response: Harvest Gardens is being submitted as a phased project. Please see the Preliminary Plat Overview and Phasing Plan (Exhibit A) that illustrates the scheduled timeline for the project. The configuration and order of phasing is intended to be flexible and will be subject to change based on a variety of factors, including jurisdictional limitations regarding various infrastructure and capacity constraints which may affect the project

timeline. The Preliminary Plans (Exhibit A) demonstrate that all necessary public facilities will be constructed as part of each associated phase.

Due to the scale of the project, phasing is anticipated to exceed seven years, upon approval by the Planning Commission. This application requests a 12-year phasing schedule as generally shown in the Preliminary Plans (Exhibit A), allowing anticipated market absorption and proper scalability of the site as phases progress. This standard is satisfied.

3.113.07 Residential density bonus.

A. For PUD proposals that are comprised of more than one Residential Zone, the overall minimum and maximum densities shall be calculated separately for each Zone, then totaled. The total minimum and maximum densities shall apply to the PUD as a whole; Residential Zone boundaries may be blended within the PUD site.

B. Maximum allowed density for a PUD may be increased by up to 20%.

Response: Harvest Gardens is a PUD comprised of more than one residential zone (i.e. R-7 and RM). As shown on the density calculations (Exhibit A), the overall minimum and maximum densities are calculated separately for each zone, then totaled, as detailed in §3.113.07 below. The densities planned are consistent with the requirements of the underlying zones and zone boundaries are blended throughout the site. This application does not seek a density bonus up to 20 percent. The approval criteria are met.

3.113.08 *Usable open space.* Residential PUDs shall comply with the following usable open space requirements:

A. PUDs shall contain a minimum of 15% usable open space, consistent with the following:

1. Required open space shall be calculated based on the total gross square footage of the PUD.

2. At least 75% of the required open space shall be open and available for public use.

3. Open space shall be integral to the PUD plan and connect to a majority of the proposed residential lots.

4. Plans shall provide space for both active and passive recreational uses, and may include, but are not limited to, neighborhood parks, dog parks, community recreation centers, pathways/trails, natural areas, plazas, and play fields.

Response: As shown on the Preliminary Plans (Exhibit A) the open space configuration spans throughout the site and connects to a majority of the planned residential lots. Harvest Gardens includes ±9 acres of open space (over 15 percent of the overall site) featuring natural areas, off-street trails, interpretive signage, benches, and other amenities such as opportunities for composting organic material and water reuse. At least 75 percent of the required open space is available for public use. The PUD encourages physical fitness and recreation use with the inclusion of a trail system.

5. Open space areas shall be shown on the final plan and recorded with the final plat or separate instrument; the open space shall be conveyed in accordance with one of the following methods:

a. By dedication to the City as publicly owned and maintained open space. Open space proposed for dedication to the City must be acceptable to the Planning Commission with regard to the size, shape, location, improvement, environmental condition (i.e., the applicant may be required to provide an environmental assessment), and approved by City Council based on budgetary, maintenance, and liability considerations; or

b. By leasing or conveying title (including beneficial ownership) to a corporation, homeowners' association, or other legal entity. The terms of such lease or other instrument of conveyance must include provisions for maintenance and property tax payment acceptable to the City. The City, through conditions of approval, may also require public access be provided, where the open space is deemed necessary, based on impacts of the development and to meet public recreational needs pursuant to the Comprehensive Plan.

c. By some other written agreement between the applicant and the City.

Response: As shown on the Preliminary Plans (Exhibit A) the open space configuration spans throughout the site and connects to a majority of the planned residential lots. Harvest Gardens includes ±9 acres of open space (over 15 percent of the overall site) featuring natural areas, off-street trails, interpretive signage, benches, and other amenities such as opportunities for composting organic material and water reuse. At least 75 percent of the required open space is available for public use. The PUD encourages physical fitness and recreation use with the inclusion of a trail system.

3.113.09 ***Sustainable site and building design standards.*** When an applicant proposes to provide sustainable building and site design per §3113.06.F.4., the following requirements apply:

A. The PUD shall include at least one of the elements from the list below.

Response: Sustainable site and building design elements consistent with §3113.06.F.4. are not included within this application; the criterion is not required per §3113.09 and the list has been omitted for brevity purposes. The application provides for other public benefits as demonstrated in §3113.06.F.

SUBCHAPTER 3.2: ADMINISTRATIVE PROCEDURES

§3.202 PROCEDURES.

3.202.01 *Procedure for Type I review.*

A. Upon receipt of an Application for a Type I land use action, the City staff shall review the Application for completeness.

1. Incomplete Applications shall not be reviewed until all required information has been submitted by the applicant.

2. If incomplete, the applicant shall be notified and provided additional time of up to 30 days to submit supplemental information as necessary.

B. The Application shall be deemed complete for the purposes of issuing a staff report and related timing provisions either:

1. Upon receipt of the additional information; or

2. If the applicant refuses to submit the information the Application shall be deemed complete for review purposes on the thirty-first day after the original submittal.

C. Referrals may be sent to interested agencies such as City departments, police and departments, school district, utility companies, and applicable state agencies at discretion of the Manager, or designee.

D. Within 30 days of receipt of a complete Application, staff shall review the Application and shall make a decision based on an evaluation of the proposal and on applicable criteria as set forth in this Development Ordinance.

E. Approvals of a Type I action may be granted subject to conditions and performance agreement requirements.

F. Notice of the decision shall comply with the provisions in §3.204.

G. A Type I land use decision may be appealed to the Planning Commission, by either the applicant or persons receiving notice of the decision. The appeal shall be filed within 15 days from the date of the final decision, pursuant to the provisions of §3.207.

3.202.02 *Procedures for Type II and Type III actions.*

A. Upon receipt of an Application for Type II or Type III land use action, the City staff shall review the Application for completeness.

1. Incomplete Applications shall not be scheduled for Type II or Type III review until all required information has been submitted by the applicant.

2. If incomplete, the applicant shall be notified and provided additional time of up to 30 days to submit supplemental information as necessary.

B. The Application shall be deemed complete for the purposes of scheduling the hearing and all related timing provisions either:

1. Upon receipt of the additional information; or

2. If the applicant refuses to submit the information, the Application shall be deemed complete for scheduling purposes only on the thirty-first day after the original submittal.

C. Referrals will be sent to interested agencies such as City departments, police and departments, school district, utility companies, and applicable state agencies.

D. The public hearing shall be scheduled and notice shall be mailed to the applicant and adjacent property owners. Notice requirements shall comply with §3.204.

E. Staff shall prepare and have available within seven days of the scheduled hearing a written recommendation concerning the proposed action. This report shall be mailed to the applicant and available at City Hall for all interested parties.

F. The public hearing before the Planning Commission shall comply with the provisions in §3.205.

G. Approvals of any Type II or Type III action may be granted subject to conditions and performance agreement requirements.

H. The applicant shall be notified, in writing, of the Planning Commission's decision or recommendation. In addition, notice of the Commission's decision or recommendation shall be mailed to individuals who request such notice at the public hearing, or, by those individuals who submitted a written request for notice prior to the public hearing.

I. A Type II land use decision may be appealed to the City Council by either the applicant, persons receiving notice of the decision of the Manager. The appeal shall be filed within 15 days from the date of the decision, pursuant to the provisions of §3.207. Type III land use Applications are automatically reviewed by the City Council.

Response: Harvest Gardens is a consolidated application involving an annexation, PUD, and subdivision. This application should be reviewed through a Type III process as described above. The procedures above are understood.

3.204 PUBLIC NOTICE REQUIREMENTS.

3.204.01 *Type I Action.* Written notice of a Type I decision shall be mailed to the applicant and all property owners within 100 feet of the subject property. Written notice for a Type I shall include the following:

1. Summary of the request.
2. Relevant decision criteria.
3. Findings of fact indicating how the request does or does not comply with the decision criteria.
4. Conclusionary statement indicating approval or denial of the request including (where appropriate) conditions of approval.
5. Information regarding the appeal process including who may appeal, where appeal must be submitted, fees and the appeal deadline.

3.204.02 *Type II and Type III actions.* Written notice of any public hearing shall be mailed at least 20 days prior to the hearing date to the applicant and owners of property within 200 feet of the boundaries of the subject property.

3.204.03 *Type IV actions.* Written notice of a hearing before the Planning Commission or City Council hearings shall be given by publication of a notice in a newspaper of general circulation in the City not less than ten days prior to the date of the hearing before the Planning Commission or City Council.

3.204.04 *Notice for appeals.* An appeal to either Planning Commission or City Council shall include written notice at least ten days prior to hearing to the appellant, the applicant and any other individuals who received notice of the original decision.

3.204.05 *Public hearing notice requirements.* Notice for any public hearing, including appeals, shall include the following:

A. Explain the nature of the Application and the proposed use or uses which could be authorized.

B. Cite the applicable criteria from the ordinance and the plan which apply to the Application at issue.

C. Set forth the street address or other easily understood geographical reference to the subject property.

D. State the date, time and location of the hearing.

E. State that failure of an issue to be raised in a hearing, in person or by letter, or failure to provide sufficient specificity to afford the decision maker an

opportunity to respond to the issue precludes appeal to the Land Use Appeals Board of Appeals.

F. Include the name and phone number of the City representative where additional information may be obtained.

G. State that a copy of the Application, all documents and evidence relied upon by the applicant and Application criteria are available for inspection at no cost and a copy will be available at reasonable cost.

H. State that a copy of the staff report will be available for inspection at no cost at least seven days prior to the hearing and a copy will be provided at reasonable cost.

I. Include a general explanation of the requirements for submission of testimony and the procedure for conduct of hearing.

Response: The above public noticing requirements are understood and do not require action of the Applicant.

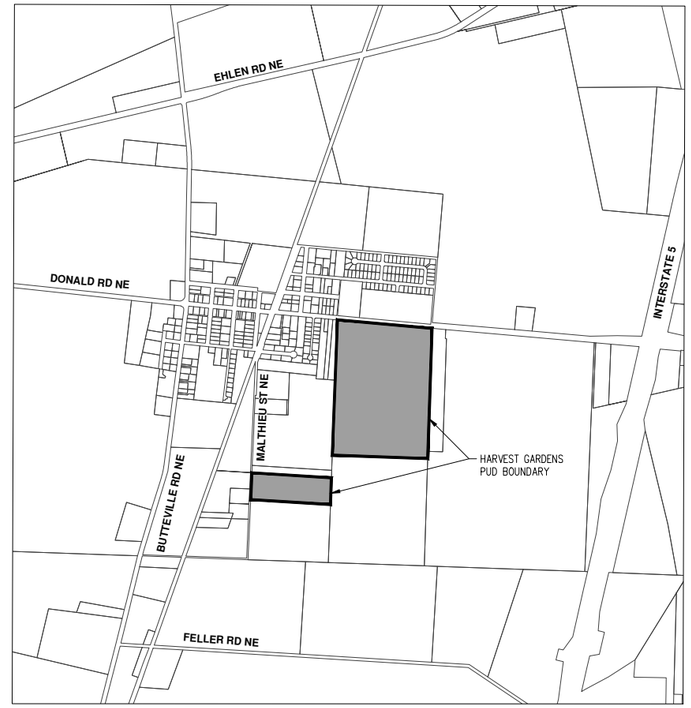
IV. Conclusion

This written narrative, together with the Preliminary Plans, supplemental reports, and other documentation included in the submittal materials, establishes that the land use application complies with the applicable approval criteria. These findings and documentation provide the basis for the City to recommend approval of this consolidated application.

Exhibit A: Preliminary Plans

HARVEST GARDENS

LAND USE APPLICATION



APPLICANT/DEVELOPER

GRC LAND HOLDINGS, LLC
CONTACT: MIKE MADER
10590 DONALD RD NE
DONALD, OR 97020

PLANNING/SURVEYING/NATURAL RESOURCE/CIVIL ENGINEERING/ LANDSCAPE ARCHITECTURE FIRM

AKS ENGINEERING & FORESTRY, LLC.
CONTACT: MIMI DOUKAS, AICP, RLA
12965 SW HERMAN ROAD, SUITE 100
TUALATIN, OR 97062
PH: 503-563-6151

PROJECT LOCATION:

LOCATED WEST OF INTERSTATE 5, EAST OF BUTTEVILLE RD NE, NORTH OF FELLER RD NE, SOUTH OF DONALD RD NE

PROPERTY DESCRIPTION:

TAX LOT 2600 (MARION COUNTY ASSESSOR'S MAP) LOCATED IN SECTION 4. TOWNSHIP 1 WEST, RANGE 17 AND TAX LOT 300 LOCATED IN SECTION 4, SECTION 1 WEST, RANGE 20, WILLAMETTE MERIDIAN, MARION COUNTY, OREGON,

EXISTING LAND USE:

AGRICULTURAL FIELD

PROJECT PURPOSE:

299 LOT PLANNED UNIT DEVELOPMENT.
- 297 SINGLE-FAMILY LOTS
- 1 MULTI-FAMILY PAD WITH 49-133 UNITS
- 1 COMMERCIAL PAD

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

COVER SHEET WITH VICINITY AND SITE MAP
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY NOT FOR CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

P01

AKS DRAWING FILE: 6732 COVERJDWG | LAYOUT: P01

SHEET INDEX

LEGEND

	EXISTING	PROPOSED		EXISTING	PROPOSED
DECIDUOUS TREE			STORM DRAIN CLEAN OUT		
CONIFEROUS TREE			STORM DRAIN CATCH BASIN		
FIRE HYDRANT			STORM DRAIN AREA DRAIN		
WATER BLOWOFF			STORM DRAIN MANHOLE		
WATER METER			GAS METER		
WATER VALVE			GAS VALVE		
DOUBLE CHECK VALVE			GUY WIRE ANCHOR		
AIR RELEASE VALVE			UTILITY POLE		
SANITARY SEWER CLEAN OUT			POWER VAULT	P	P
SANITARY SEWER MANHOLE			POWER JUNCTION BOX		
SIGN			POWER PEDESTAL		
STREET LIGHT			COMMUNICATIONS VAULT	C	C
MAILBOX	MB	MB	COMMUNICATIONS JUNCTION BOX		
			COMMUNICATIONS RISER		

	EXISTING	PROPOSED
RIGHT-OF-WAY LINE		
BOUNDARY LINE		
PROPERTY LINE		
CENTERLINE		
DITCH		
CURB		
EDGE OF PAVEMENT		
EASEMENT		
FENCE LINE	XXX XXX XXX	
GRAVEL EDGE		
POWER LINE	PWR PWR	PWR PWR
OVERHEAD WIRE	OHW	OHW OHW
COMMUNICATIONS LINE	COM COM	COM COM
FIBER OPTIC LINE	CFO CFO	CFO CFO
GAS LINE	GAS GAS	GAS GAS GAS
STORM DRAIN LINE	STM STM	STM STM
SANITARY SEWER LINE	SAN SAN	SAN SAN
WATER LINE	WAT WAT	WAT WAT

DATUM:

VERTICAL DATUM: ELEVATIONS ARE BASED ON NGS BENCHMARK ID# RD0294, WITH A PUBLISHED ELEVATION OF 198.57 (NAVD 88). PER MARION COUNTY REQUIREMENTS, AND USING NGS VERTCON SOFTWARE, ELEVATIONS WERE ADJUSTED DOWN 3.42 FEET TO CORRESPOND TO THE NGVD 29 DATUM. ALL ELEVATIONS SHOWN ARE BASED ON THE NGVD 29 DATUM.

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

SHEET INDEX AND LEGEND
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY
NOT FOR
CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

P02

AKS DRAWING FILE: 6732 COVER.DWG | LAYOUT: P02


TAX LOT 2000
TAX MAP 4.1.17
TAX LOT 2100
TAX MAP 4.1.17
HUCKLEBERRY LANE
TAX LOT 2100
TAX MAP 4.1.17
TAX LOT 102
TAX MAP 4.1.17
DONALD ROAD NE
TAX LOT 300
TAX MAP 4.1.17C
TAX LOT 400
TAX MAP 4.1.17C
TAX LOT 200
TAX MAP 4.1.17C
TAX LOT 100
TAX MAP 4.1.17C
TAX LOT 700
TAX MAP 4.1.17C
PROJECT BOUNDARY
TAX LOT 2600
TAX MAP 4.1.17
AREA: 52.30 ACRES±
TAX LOT 2500
TAX MAP 4.1.17
TAX LOT 1200
TAX MAP 4.1.17C
TAX LOT 800
TAX MAP 4.1.17C
TAX LOT 1000
TAX MAP 4.1.17C
TAX LOT 1201
TAX MAP 4.1.17C
TAX LOT 1202
TAX MAP 4.1.17C
TAX LOT 1100
TAX MAP 4.1.17C
TAX LOT 1100
TAX MAP 4.1.20
TAX LOT 2400
TAX MAP 4.1.17
MATTHIEU STREET
TAX LOT 400
TAX MAP 4.1.20
PROJECT BOUNDARY
TAX LOT 300
TAX MAP 4.1.20
AREA: 9.32 ACRES±
TAX LOT 500
TAX MAP 4.1.20
TAX LOT 600
TAX MAP 4.1.20
TAX LOT 1100
TAX MAP 4.1.20

SCALE: 1"=150 FEET

150 0 30 75 150

ORIGINAL PAGE SIZE: 22" x 34"

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

NOTES:

1. UTILITIES SHOWN ARE BASED ON UNDERGROUND UTILITY LOCATE MARKINGS AS PROVIDED BY OTHERS, PROVIDED PER UTILITY LOCATE TICKET NUMBER 19044852 AND 19044893. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND LOCATES REPRESENT THE ONLY UTILITIES IN THE AREA. CONTRACTORS ARE RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION.
2. FIELD WORK WAS CONDUCTED FEBRUARY 12 – MARCH 26, 2019.
3. VERTICAL DATUM: ELEVATIONS ARE BASED ON NGS BENCHMARK ID# RD0294, WITH A PUBLISHED ELEVATION OF 198.57 (NAVD 88). PER MARION COUNTY REQUIREMENTS, AND USING NGS VERTCON SOFTWARE, ELEVATIONS WERE ADJUSTED DOWN 3.42 FEET TO CORRESPOND TO THE NGVD 29 DATUM. ALL ELEVATIONS SHOWN ARE BASED ON THE NGVD 29 DATUM.
4. THIS MAP DOES NOT CONSTITUTE A PROPERTY BOUNDARY SURVEY.
5. SURVEY IS ONLY VALID WITH SURVEYOR'S STAMP AND SIGNATURE.
6. BUILDING FOOTPRINTS ARE MEASURED TO SIDING UNLESS NOTED OTHERWISE. CONTACT SURVEYOR WITH QUESTIONS REGARDING BUILDING TIES.
7. CONTOUR INTERVAL IS 1 FOOT.
8. TREES WITH DIAMETER OF 6" AND GREATER ARE SHOWN. TREE DIAMETERS WERE DETERMINED BY VISUAL INSPECTION. TREE INFORMATION IS SUBJECT TO CHANGE UPON ARBORIST INSPECTION.

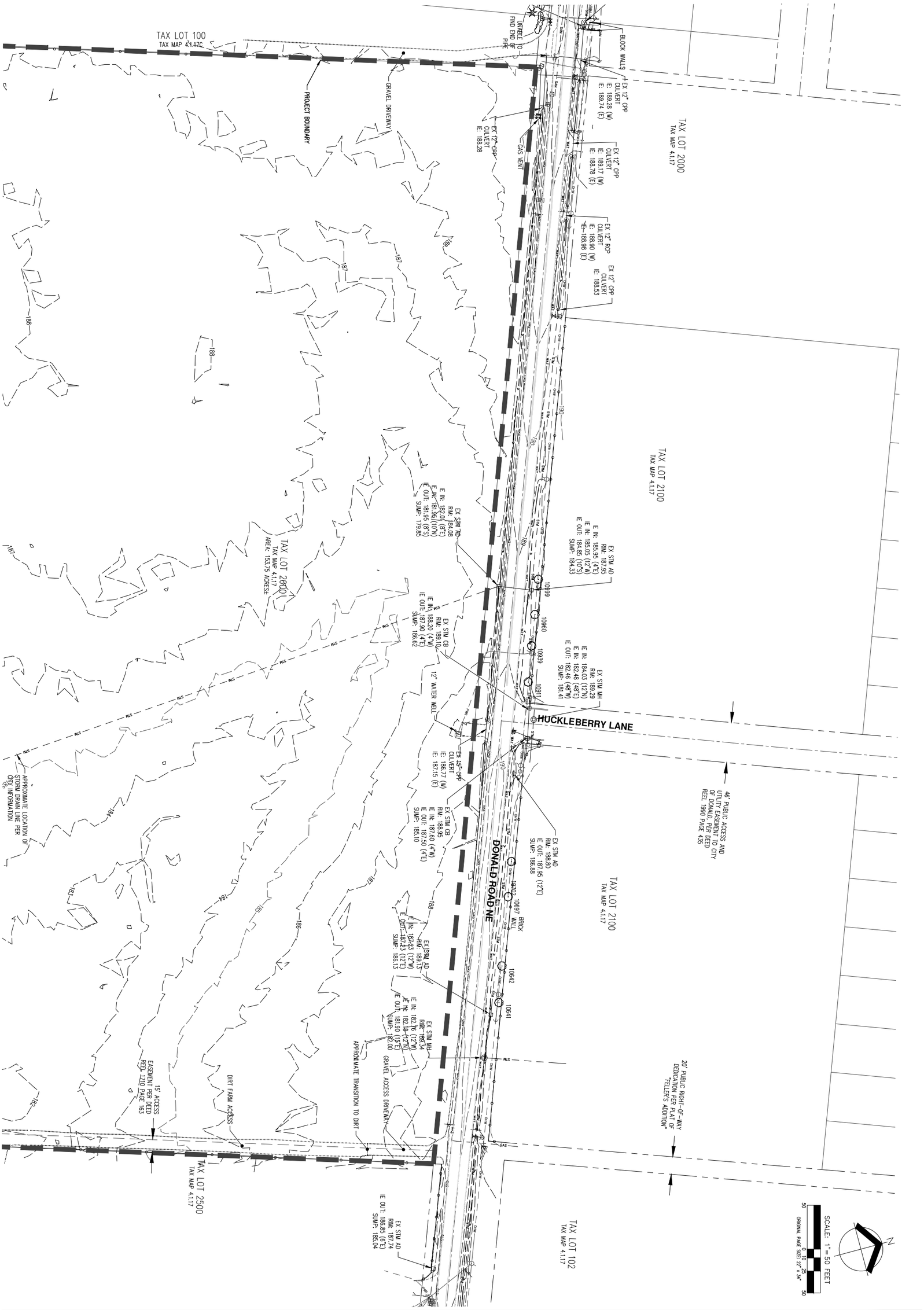
EXISTING CONDITIONS OVERVIEW
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY
NOT FOR
CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

P03

AKS DRAWING FILE: 6732 EXISTING CONDITIONS.DWG | LAYOUT: OVERVIEW



P04

PRELIMINARY NOT FOR CONSTRUCTION

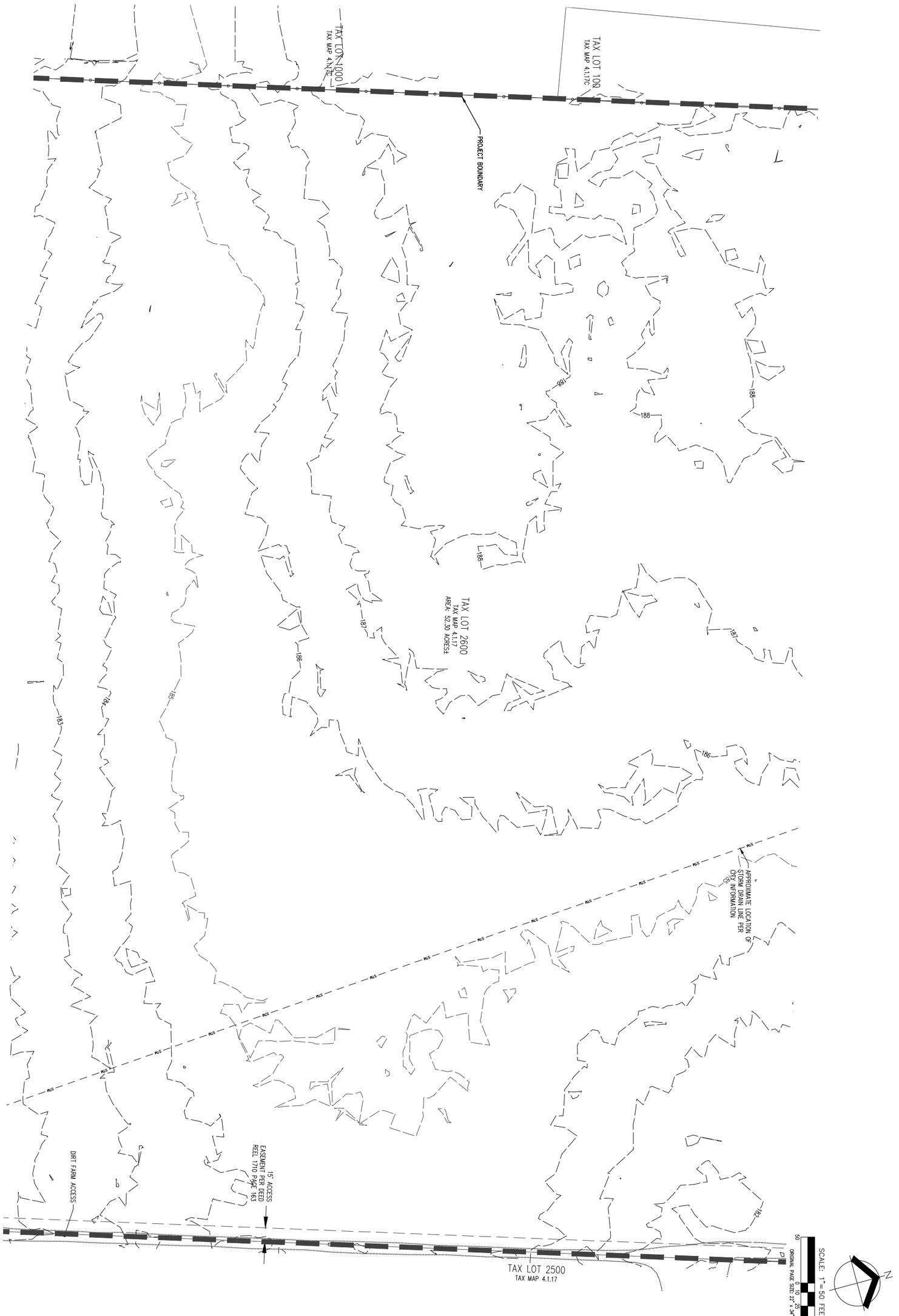
JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

EXISTING CONDITIONS PLAN
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

AKS

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE



P05

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AMH

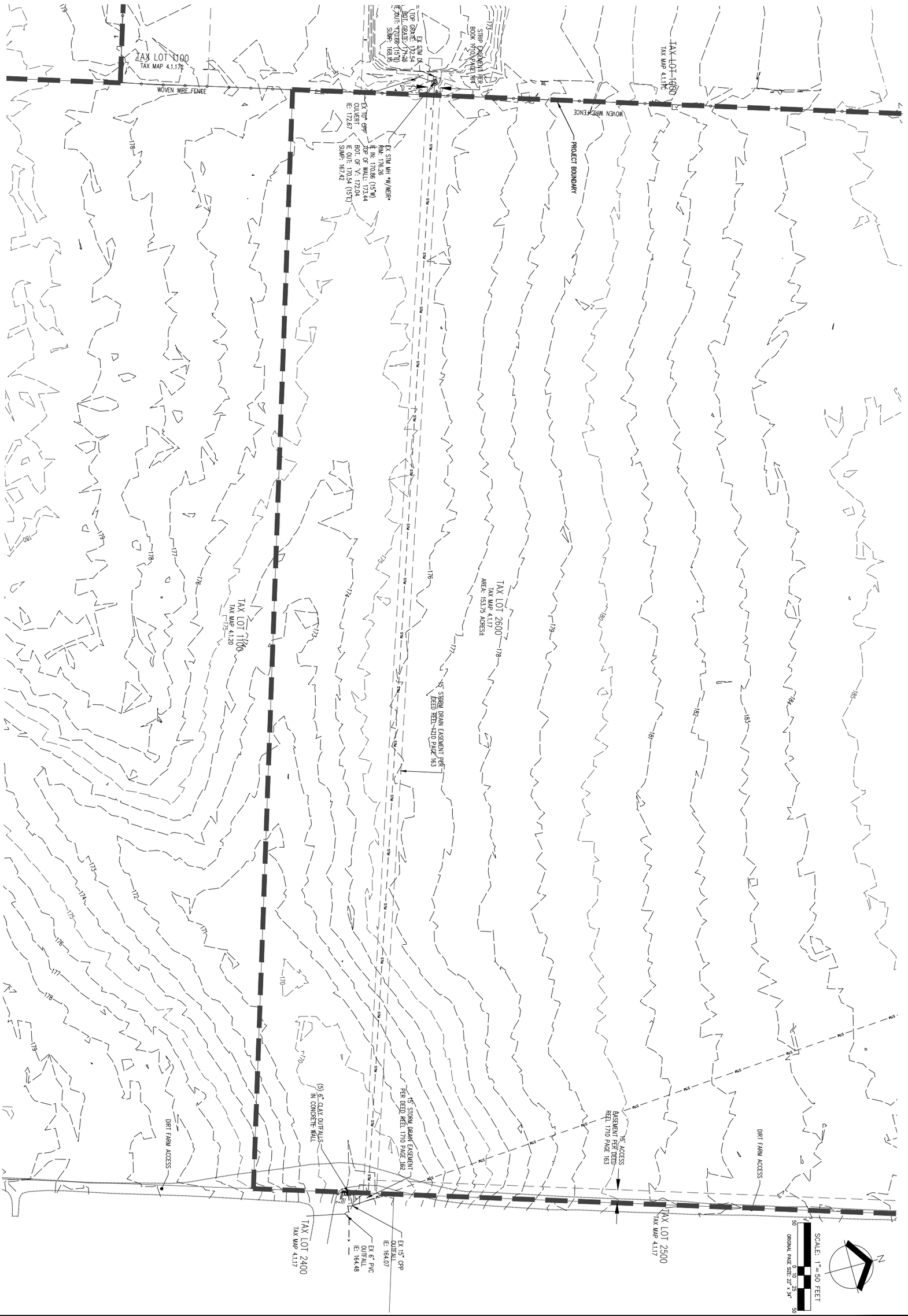
PRELIMINARY NOT FOR CONSTRUCTION

EXISTING CONDITIONS PLAN
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

AKS

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE



P06

PRELIMINARY NOT FOR CONSTRUCTION

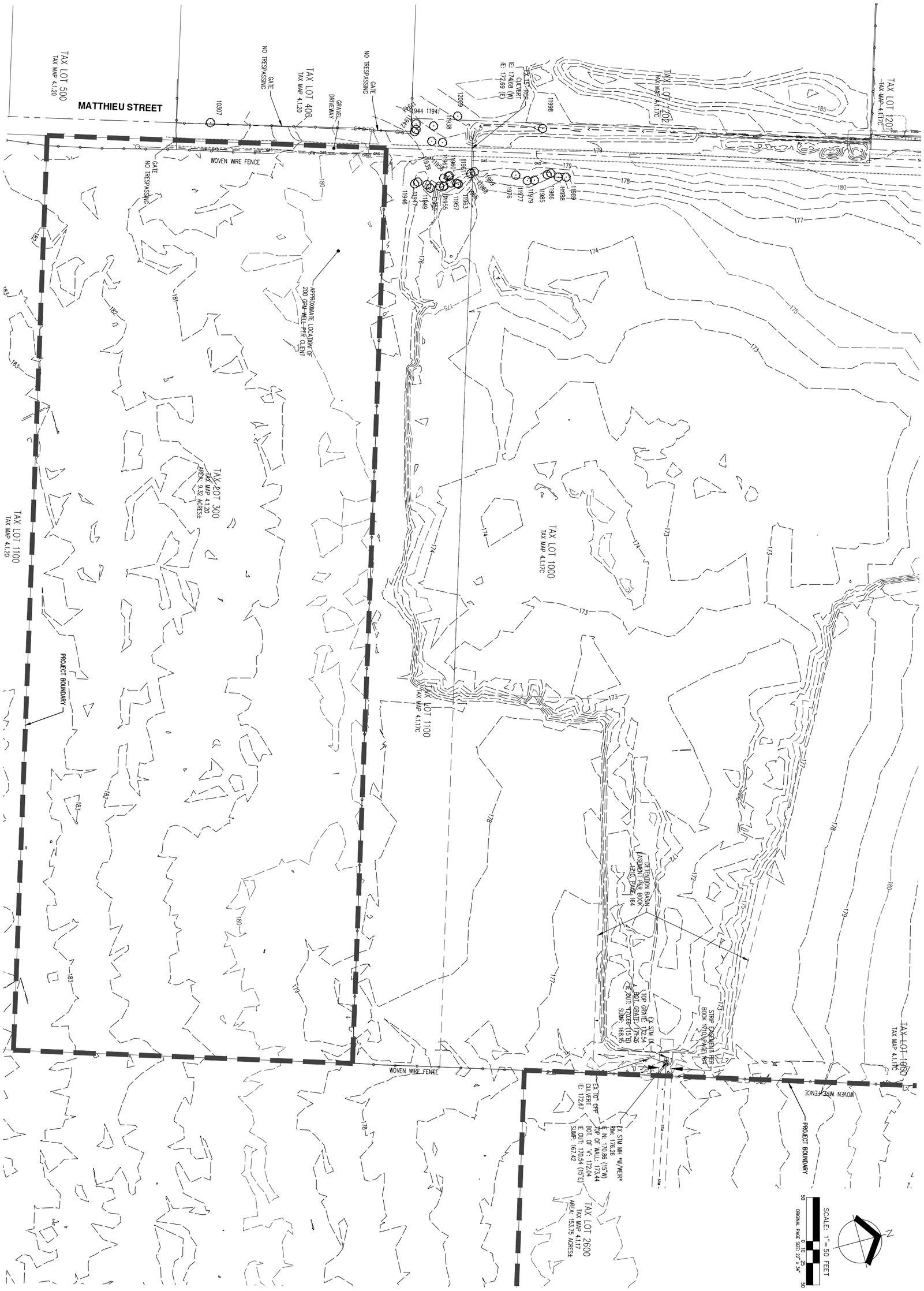
JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

EXISTING CONDITIONS PLAN
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

AKS

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE



P07

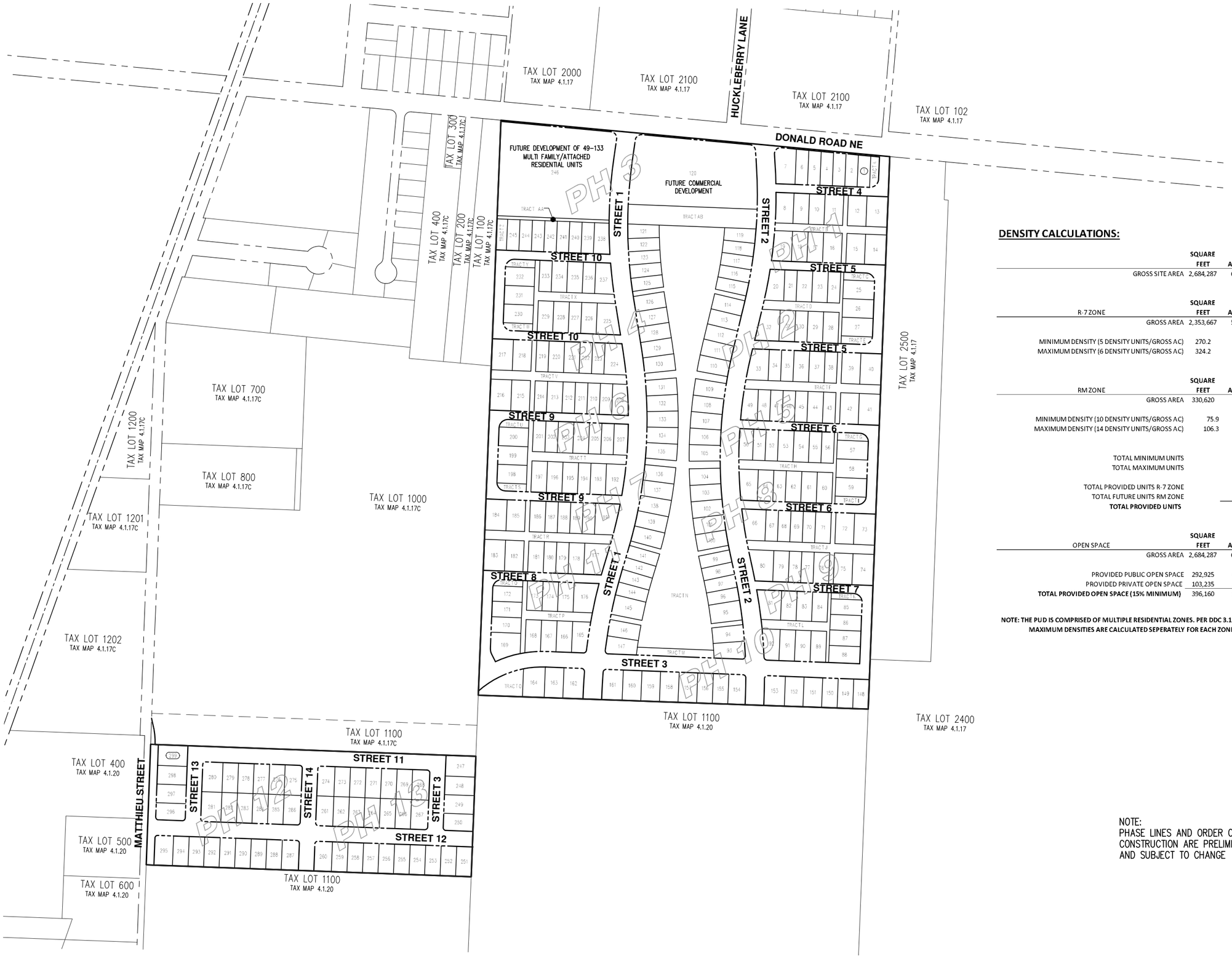
PRELIMINARY NOT FOR CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

EXISTING CONDITIONS PLAN
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE



SCALE: 1" = 150 FEET

150 0 30 75 150

ORIGINAL PAGE SIZE: 22" x 34"

DENSITY CALCULATIONS:

	SQUARE FEET	ACRES
GROSS SITE AREA	2,684,287	61.6

R-7 ZONE	SQUARE FEET	ACRES		
GROSS AREA	2,353,667	54.0		
MINIMUM DENSITY (5 DENSITY UNITS/GROSS AC)	270.2	=	270	UNITS
MAXIMUM DENSITY (6 DENSITY UNITS/GROSS AC)	324.2	=	324	UNITS

RM ZONE	SQUARE FEET	ACRES		
GROSS AREA	330,620	7.6		
MINIMUM DENSITY (10 DENSITY UNITS/GROSS AC)	75.9	=	76	UNITS
MAXIMUM DENSITY (14 DENSITY UNITS/GROSS AC)	106.3	=	106	UNITS

TOTAL MINIMUM UNITS	=	346	UNITS
TOTAL MAXIMUM UNITS	=	430	UNITS
TOTAL PROVIDED UNITS R-7 ZONE	=	297	UNITS
TOTAL FUTURE UNITS RM ZONE	=	49 - 133	UNITS
TOTAL PROVIDED UNITS	=	**346 - 430**	**UNITS**

OPEN SPACE	SQUARE FEET	ACRES		
GROSS AREA	2,684,287	61.6		
PROVIDED PUBLIC OPEN SPACE	292,925	6.7		
PROVIDED PRIVATE OPEN SPACE	103,235	2.4		
TOTAL PROVIDED OPEN SPACE (15% MINIMUM)	396,160	9.1	=	**15%**

NOTE: THE PUD IS COMPRISED OF MULTIPLE RESIDENTIAL ZONES. PER DDC 3.113.07, THE MINIMUM AND MAXIMUM DENSITIES ARE CALCULATED SEPERATELY FOR EACH ZONE, THEN TOTALED.

NOTE:
PHASE LINES AND ORDER OF CONSTRUCTION ARE PRELIMINARY AND SUBJECT TO CHANGE

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, SITE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

PRELIMINARY PLAT OVERVIEW AND PHASING PLAN
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY NOT FOR CONSTRUCTION

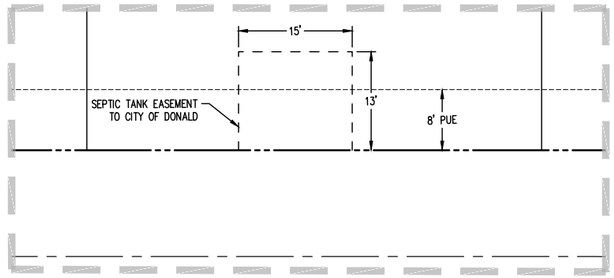
JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

P08

AKS DRAWING FILE: 6732 PRELIM PLAT.DWG | LAYOUT: PLAT OVERVIEW

TRACT NOTES:

1. TRACTS A, AA, AB, C, E, G, I, K, M, N, O, Q, S, U, W, Y, AND Z SHALL BE DEDICATED TO THE HARVEST GARDENS HOMEOWNER'S ASSOCIATION, IT'S SUCCESSORS, OR ASSIGNS AND SHALL HAVE A PUBLIC ACCESS EASEMENT OVER ITS ENTIRETY.
2. TRACT B, D, F, H, J, L, P, R, T, V, AND X SHALL BE DEDICATED TO THE HARVEST GARDENS HOMEOWNER'S ASSOCIATION, IT'S SUCCESSORS, OR ASSIGNS.
3. TRACTS B, D, F, H, J, L, P, R, T, V, AND X SHALL HAVE A 10' OR 15' WIDE PUBLIC PEDESTRIAN ACCESS EASEMENT DEDICATED TO THE CITY OF DONALD AS SHOWN ON THE PLANS.



TYPICAL LOT SEPTIC TANK EASEMENT
1" = 10'

N

SCALE: 1"=50 FEET
50 0 10 25 50
ORIGINAL PAGE SIZE: 22" x 34"

TAX LOT 2000
TAX MAP 4.1.17

TAX LOT 2100
TAX MAP 4.1.17

HUCKLEBERRY LANE

TAX LOT 2100
TAX MAP 4.1.17

TAX LOT 102
TAX MAP 4.1.17

DONALD ROAD NE

355.84'
4' ROW DEDICATION
1256.33'
348.53'
VISION CLEARANCE TRIANGLE (TYP)
N23°07'24"E 119.57'
N11°21'03"E 95.65'
30'

246
±107,055 SF

120
±87,080 SF

8' PUE (TYP)
STREET 1
STREET 2
STREET 4
STREET 5
STREET 10
N72°45'47"W 330.82'
S72°45'47"E 338.03'
S72°45'47"E 337.89'
S71°14'13"W 104.47'
S71°14'13"W 174.00'

TRACT AA OPEN SPACE ±3,604 SF
TRACT Z OPEN SPACE ±3,406 SF
TRACT AB OPEN SPACE ±26,259 SF
TRACT A OPEN SPACE ±2,830 SF
TRACT B OPEN SPACE ±11,931 SF
TRACT C OPEN SPACE ±2,332 SF
TRACT D OPEN SPACE ±9,664 SF
TRACT X OPEN SPACE ±10,818 SF
TRACT Y OPEN SPACE ±2,207 SF

15' PUBLIC PEDESTRIAN ACCESS EASEMENT
10' PUBLIC PEDESTRIAN ACCESS EASEMENT
SEPTIC TANK EASEMENT (TYP)

15' ACCESS EASEMENT PER DEED REEL 1710 PAGE 163 TO BE RELINQUISHED AS PHASES ARE CONSTRUCTED. LEGAL ACCESS TO CITY STORMWATER CONVEYANCE SYSTEM TO BE MAINTAINED AT ALL TIMES.

TAX LOT 100
TAX MAP 4.1.17C

TAX LOT 2500
TAX MAP 4.1.17

AKS DRAWING FILE: 6732 PRELIM PLATDWG | LAYOUT: P09

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

PRELIMINARY PLAT
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

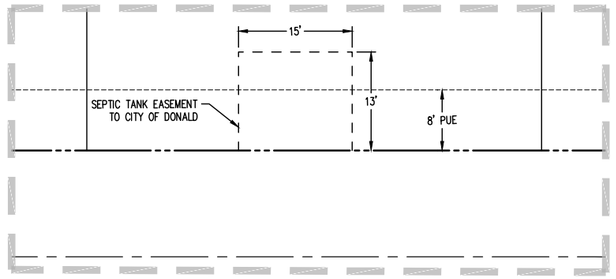
PRELIMINARY
NOT FOR CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

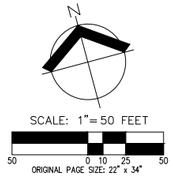
P09

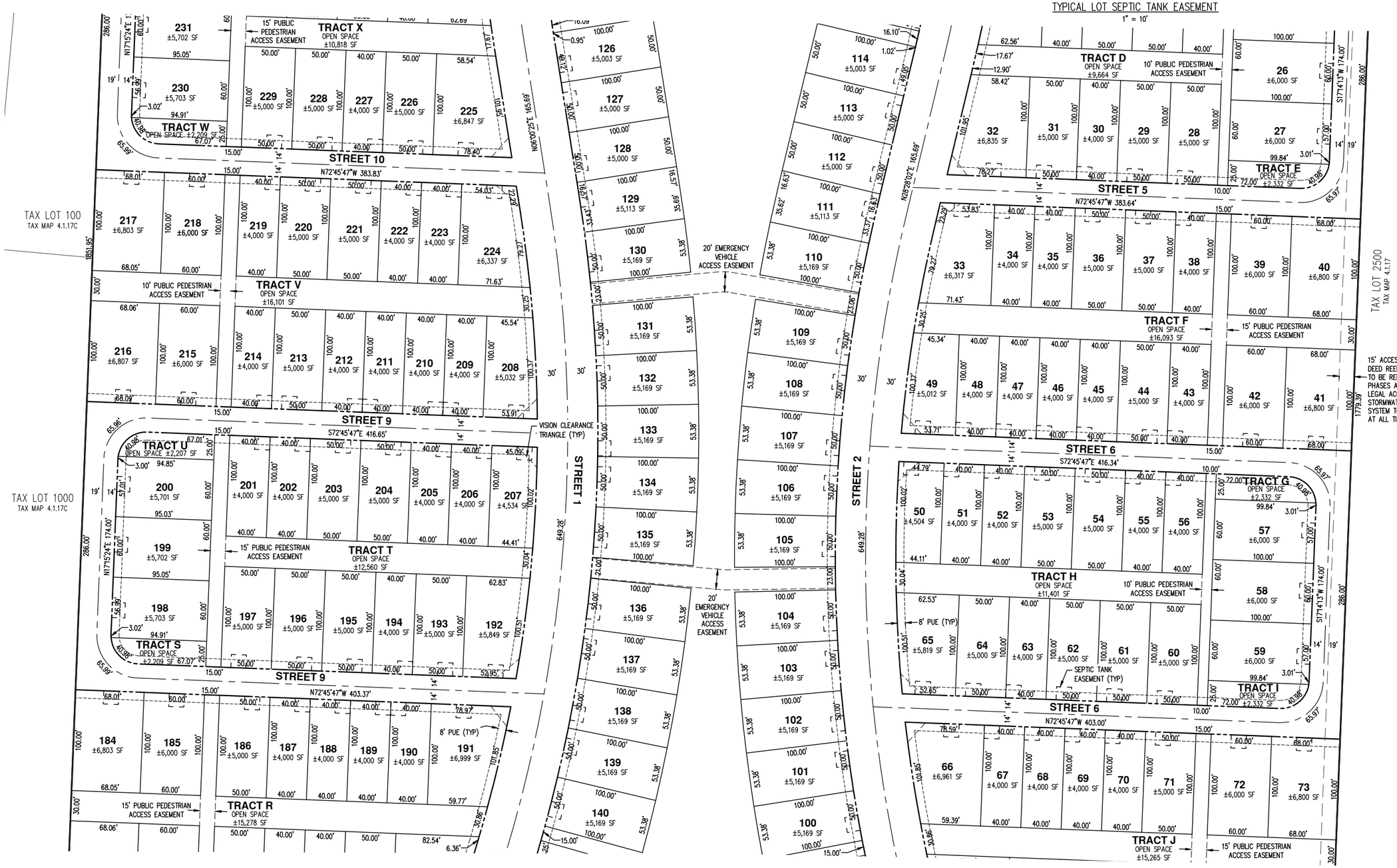
TRACT NOTES:

1. TRACTS A, AA, AB, C, E, G, I, K, M, N, O, Q, S, U, W, Y, AND Z SHALL BE DEDICATED TO THE HARVEST GARDENS HOMEOWNER'S ASSOCIATION, IT'S SUCCESSORS, OR ASSIGNS AND SHALL HAVE A PUBLIC ACCESS EASEMENT OVER ITS ENTIRETY.
2. TRACT B, D, F, H, J, L, P, R, T, V, AND X SHALL BE DEDICATED TO THE HARVEST GARDENS HOMEOWNER'S ASSOCIATION, IT'S SUCCESSORS, OR ASSIGNS.
3. TRACTS B, D, F, H, J, L, P, R, T, V, AND X SHALL HAVE A 10' OR 15' WIDE PUBLIC PEDESTRIAN ACCESS EASEMENT DEDICATED TO THE CITY OF DONALD AS SHOWN ON THE PLANS.



TYPICAL LOT SEPTIC TANK EASEMENT
1" = 10'





AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, SITE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

PRELIMINARY PLAT
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

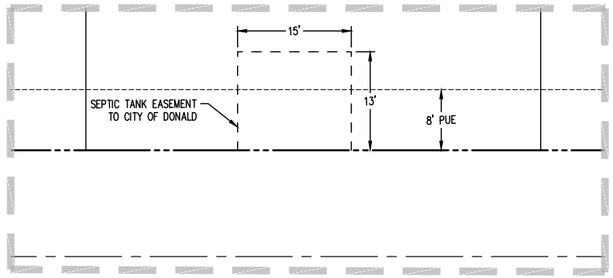
PRELIMINARY
NOT FOR
CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

P10

TRACT NOTES:

1. TRACTS A, AA, AB, C, E, G, I, K, M, N, O, Q, S, U, W, Y, AND Z SHALL BE DEDICATED TO THE HARVEST GARDENS HOMEOWNER'S ASSOCIATION, IT'S SUCCESSORS, OR ASSIGNS AND SHALL HAVE A PUBLIC ACCESS EASEMENT OVER ITS ENTIRETY.
2. TRACT B, D, F, H, J, L, P, R, T, V, AND X SHALL BE DEDICATED TO THE HARVEST GARDENS HOMEOWNER'S ASSOCIATION, IT'S SUCCESSORS, OR ASSIGNS.
3. TRACTS B, D, F, H, J, L, P, R, T, V, AND X SHALL HAVE A 10' OR 15' WIDE PUBLIC PEDESTRIAN ACCESS EASEMENT DEDICATED TO THE CITY OF DONALD AS SHOWN ON THE PLANS.



TYPICAL LOT SEPTIC TANK EASEMENT
1" = 10'

SCALE: 1" = 50 FEET
50 0 10 25 50
ORIGINAL PAGE SIZE: 22" x 34"

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

TAX LOT 1000
TAX MAP 4.1.17C

TAX LOT 2500
TAX MAP 4.1.17

TAX LOT 2400
TAX MAP 4.1.17

TAX LOT 1100
TAX MAP 4.1.20

STRIP EASEMENT PER BOOK 1710, PAGE 164

DETENTION BASIN EASEMENT PER BOOK 1710, PAGE 164

15' ACCESS EASEMENT PER DEED REEL 1710 PAGE 163 TO BE RELINQUISHED AS PHASES ARE CONSTRUCTED. LEGAL ACCESS TO CITY STORMWATER CONVEYANCE SYSTEM TO BE MAINTAINED AT ALL TIMES.

15' STORM DRAIN EASEMENT PER DEED REEL 1710 PAGE 162

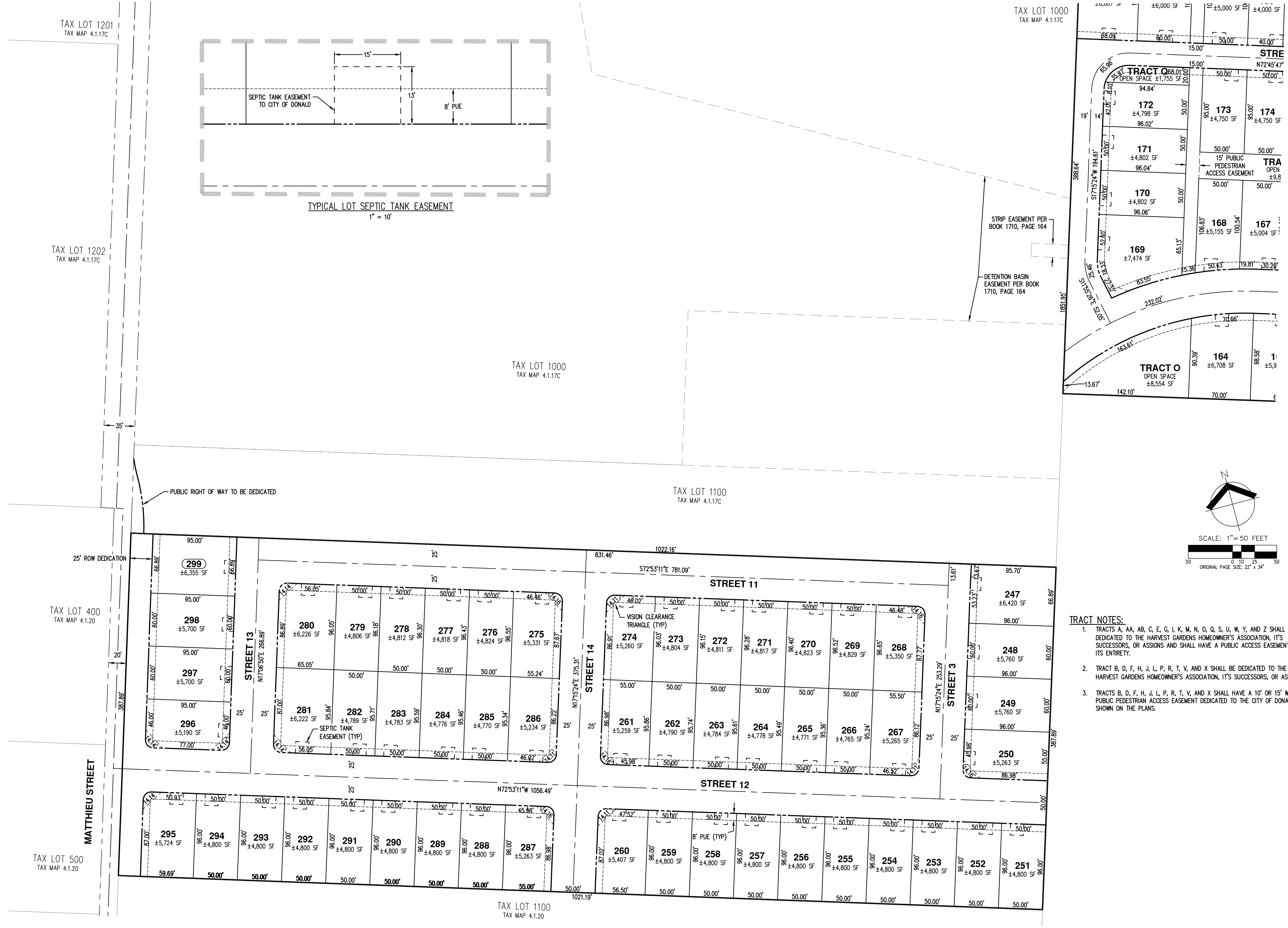
PRELIMINARY PLAT
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY NOT FOR CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

P11

AKS DRAWING FILE: 6732 PRELIM PLAT.DWG | LAYOUT: P11



TRACT NOTES:

1. TRACTS A, AA, AB, C, E, G, I, K, M, N, O, Q, S, U, W, Y, AND Z SHALL BE DEDICATED TO THE HARVEST GARDENS HOMEOWNER'S ASSOCIATION, IT'S SUCCESSORS, OR ASSIGNS AND SHALL HAVE A PUBLIC ACCESS EASEMENT OVER ITS ENTIRETY.
2. TRACT B, D, F, H, J, L, P, R, T, V, AND X SHALL BE DEDICATED TO THE HARVEST GARDENS HOMEOWNER'S ASSOCIATION, IT'S SUCCESSORS, OR ASSIGNS.
3. TRACTS B, D, F, H, J, L, P, R, T, V, AND X SHALL HAVE A 10' OR 15' WIDE PUBLIC PEDESTRIAN ACCESS EASEMENT DEDICATED TO THE CITY OF DONALD AS SHOWN ON THE PLANS.

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

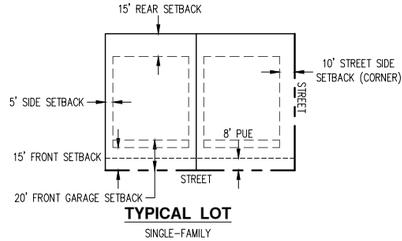
AKS
ENGINEERING · SURVEYING · NATURAL RESOURCES
FORESTRY · PLANNING · LANDSCAPE ARCHITECTURE

PRELIMINARY PLAT
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

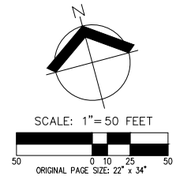
PRELIMINARY
NOT FOR
CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

P12



TYPICAL LOT
SINGLE-FAMILY



AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

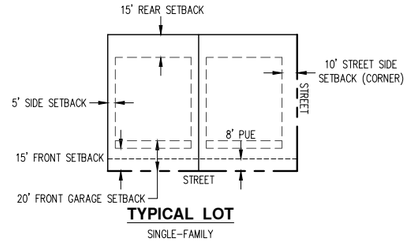
PRELIMINARY SETBACK PLAN
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY
NOT FOR
CONSTRUCTION

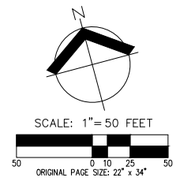
JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

P13

AKS DRAWING FILE: 6732 SETBACKS.DWG | LAYOUT: P13



TYPICAL LOT
SINGLE-FAMILY



AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

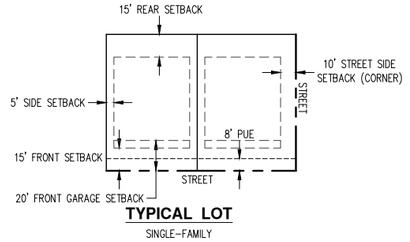
PRELIMINARY SETBACK PLAN
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY
NOT FOR
CONSTRUCTION

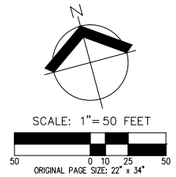
JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

P14

AKS DRAWING FILE: 6732 SETBACKS.DWG | LAYOUT: P14



TYPICAL LOT
SINGLE-FAMILY



AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

TAX LOT 1000
TAX MAP 4.1.17C

TAX LOT 2500
TAX MAP 4.1.17

TAX LOT 2400
TAX MAP 4.1.17

TAX LOT 1100
TAX MAP 4.1.20

ACCESS EASEMENT

TRACT S
TRACT R
TRACT Q
TRACT P
TRACT O
TRACT N
TRACT M
TRACT L
TRACT K
TRACT J
TRACT I

STREET 1
STREET 2
STREET 3
STREET 6
STREET 7
STREET 8
STREET 9

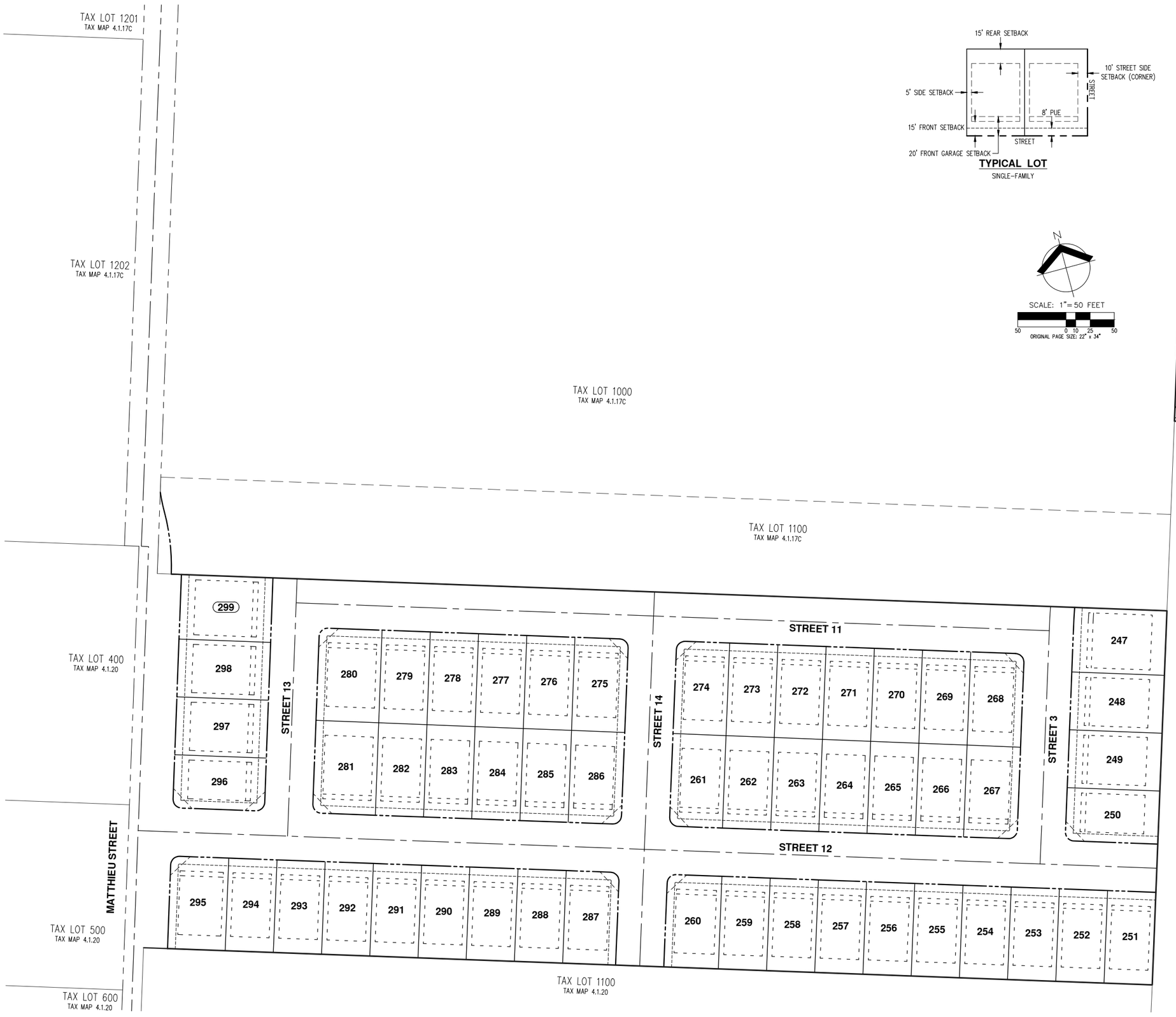
PRELIMINARY SETBACK PLAN
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY
NOT FOR
CONSTRUCTION

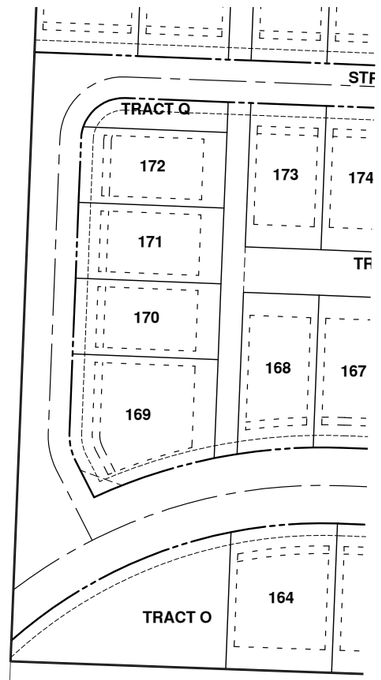
JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

P15

AKS DRAWING FILE: 6732 SETBACKS.DWG | LAYOUT: P15



TYPICAL LOT
SINGLE-FAMILY



AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

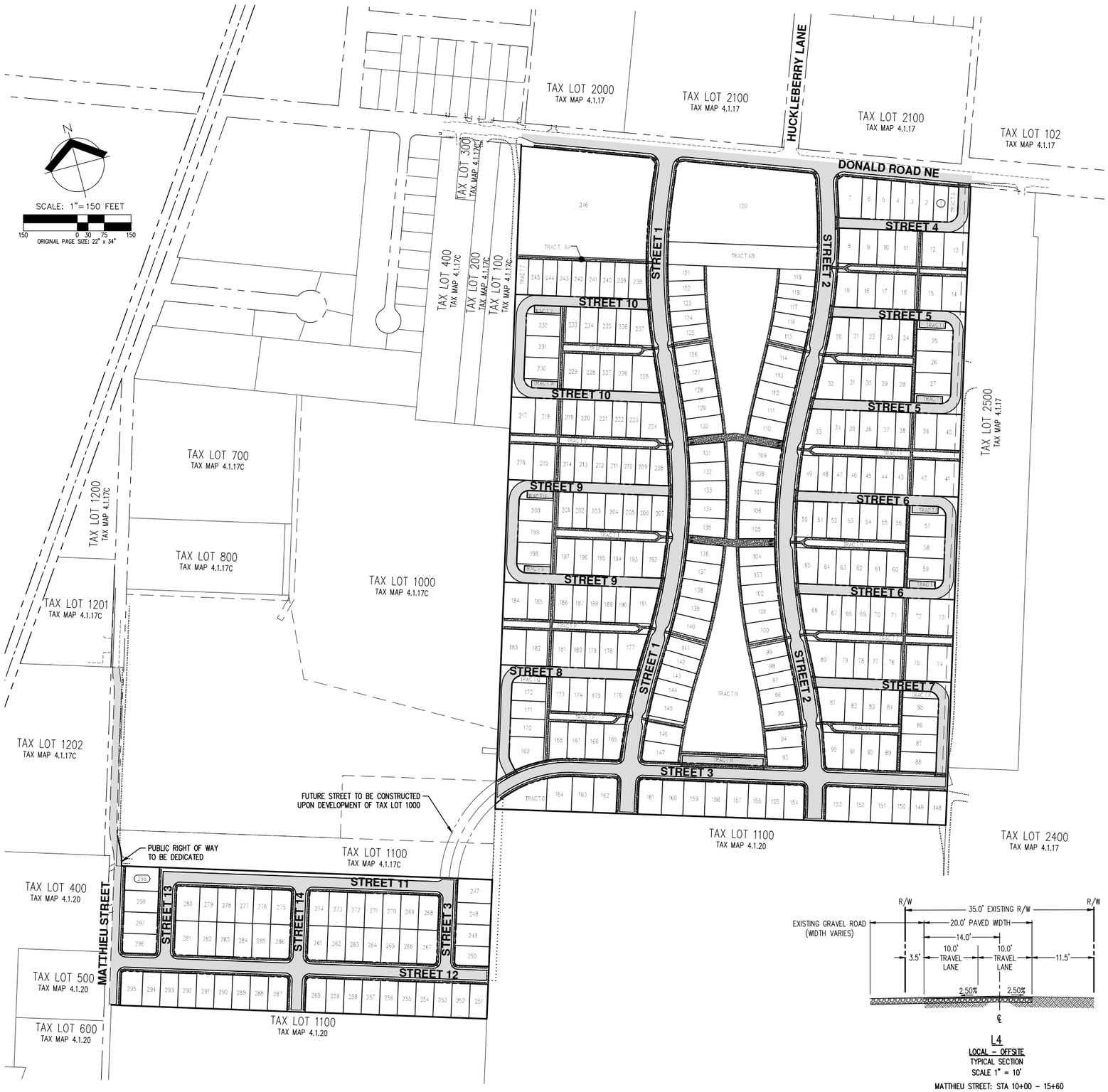
PRELIMINARY SETBACK PLAN
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

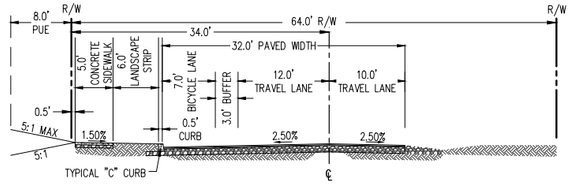
PRELIMINARY
NOT FOR
CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

P16

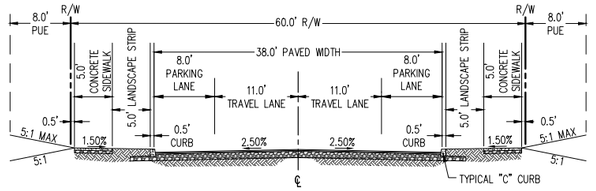
AKS DRAWING FILE: 6732 SETBACKS.DWG | LAYOUT: P16





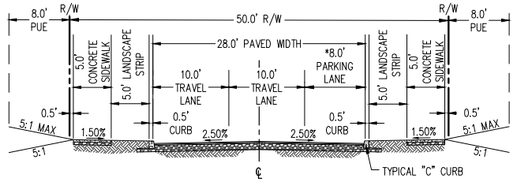
COLLECTOR
MARION COUNTY
TYPICAL SECTION
SCALE 1" = 10'

DONALD RD NE: STA 2+71 – 14+90



L1
LOCAL – PARKING BOTH SIDES
TYPICAL SECTION
SCALE 1" = 10'

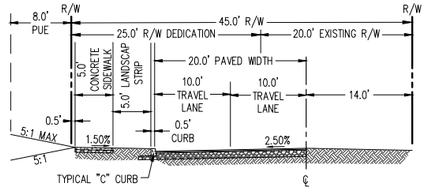
STREET 1
STREET 2



L2
LOCAL – PARKING ONE SIDE
TYPICAL SECTION
SCALE 1" = 10'

*SEE PLANS FOR PARKING LANE LOCATION

STREET 3
STREET 11
STREET 12
STREET 13
STREET 14

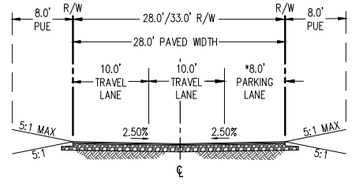


L2
LOCAL – HALF STREET
TYPICAL SECTION
SCALE 1" = 10'

MATTHIEU STREET: STA 15+60 – 19+45

L4
LOCAL – OFFSITE
TYPICAL SECTION
SCALE 1" = 10'

MATTHIEU STREET: STA 10+00 – 15+60



L3
LOCAL – PARKING ONE SIDE
TYPICAL SECTION
SCALE 1" = 10'

*SEE PLANS FOR PARKING LANE LOCATION

STREET 4
STREET 5
STREET 6
STREET 7
STREET 8
STREET 9
STREET 10

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

PRELIMINARY STREET PLAN OVERVIEW & CROSS SECTIONS

HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY
NOT FOR
CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

P17

AKS DRAWING FILE: 6732 STREET PLAN.DWG | LAYOUT: OVERVIEW

TAX LOT 2000
TAX MAP 4.1.17

TAX LOT 2100
TAX MAP 4.1.17

HUCKLEBERRY LANE

TAX LOT 2100
TAX MAP 4.1.17

TAX LOT 102
TAX MAP 4.1.17

SCALE: 1"= 50 FEET
50 0 10 25 50
ORIGINAL PAGE SIZE: 22" x 34"

DONALD ROAD NE

246

120

5' PLANTER STRIP (TYP)

VISION CLEARANCE TRIANGLE (TYP)

7 6 5 4 3 2 ① TRACT A

STREET 4

5' SIDEWALK (TYP)

STREET 1

STREET 2

TRACT AB

8 9 10 11 12 13

6' SIDEWALK (TYP)

TRACT B

TRACT AA

TRACT Z

245 244 243 242 241 240 239 238

121 122 123 124 125 126 127

119 118 117 116 115 114 113

19 18 17 16 15 14

TAX LOT 100
TAX MAP 4.1.17C

TAX LOT 2500
TAX MAP 4.1.17

STREET 10

STREET 5

TRACT Y

TRACT C

232 231 230

233 234 235 236 237

229 228 227 226 225

20 21 22 23 24 25 26

6' SIDEWALK (TYP)

TRACT X

TRACT D

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

PRELIMINARY STREET PLAN
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY NOT FOR CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

P18

AKS DRAWING FILE: 6732 STREET PLAN.DWG | LAYOUT: P18

SCALE: 1" = 50 FEET

50 0 10 25 50

ORIGINAL PAGE SIZE: 22" x 34"

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

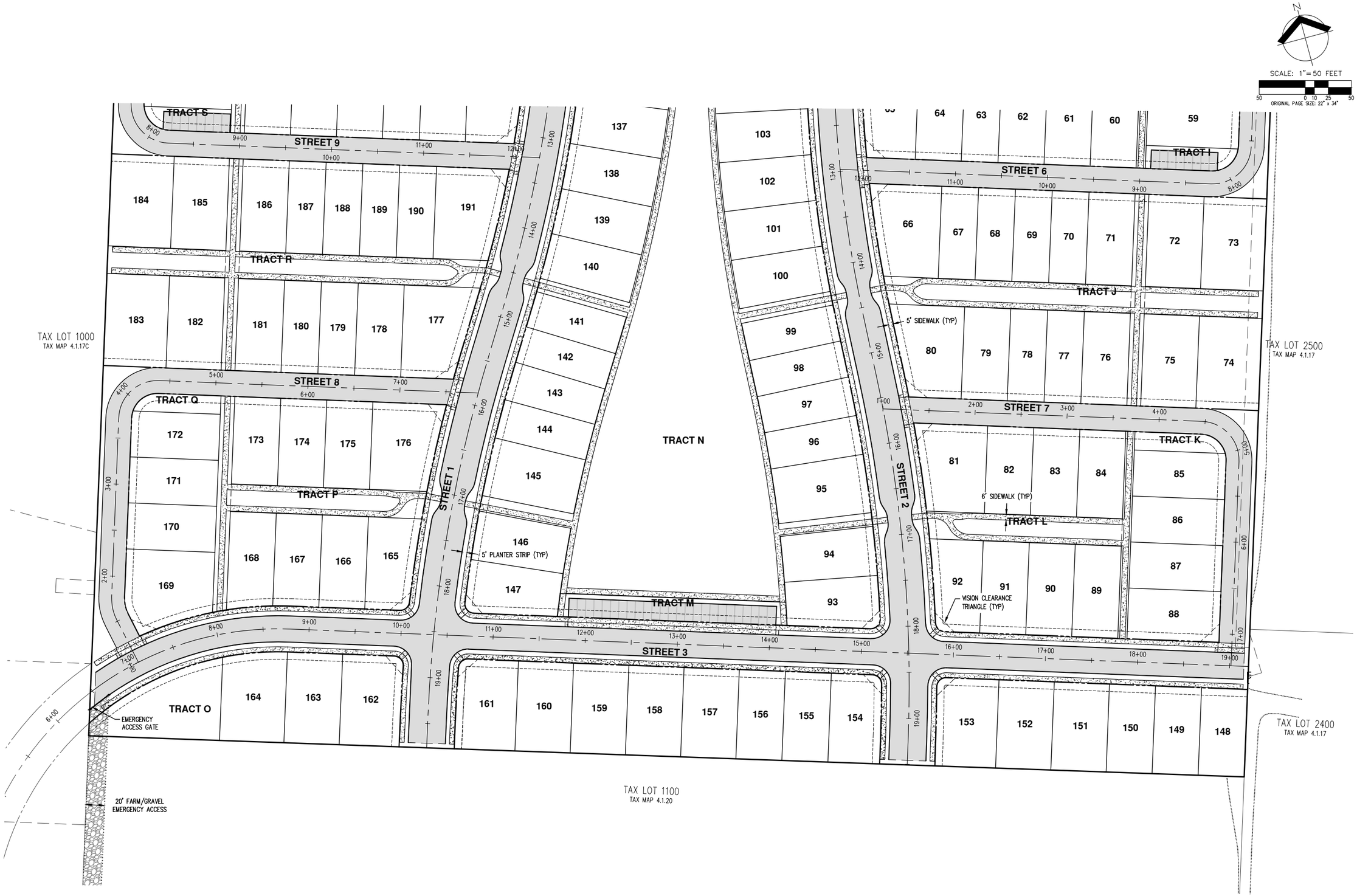
PRELIMINARY STREET PLAN
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY
NOT FOR
CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

P19

AKS DRAWING FILE: 6732 STREET PLAN.DWG | LAYOUT: P19



AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

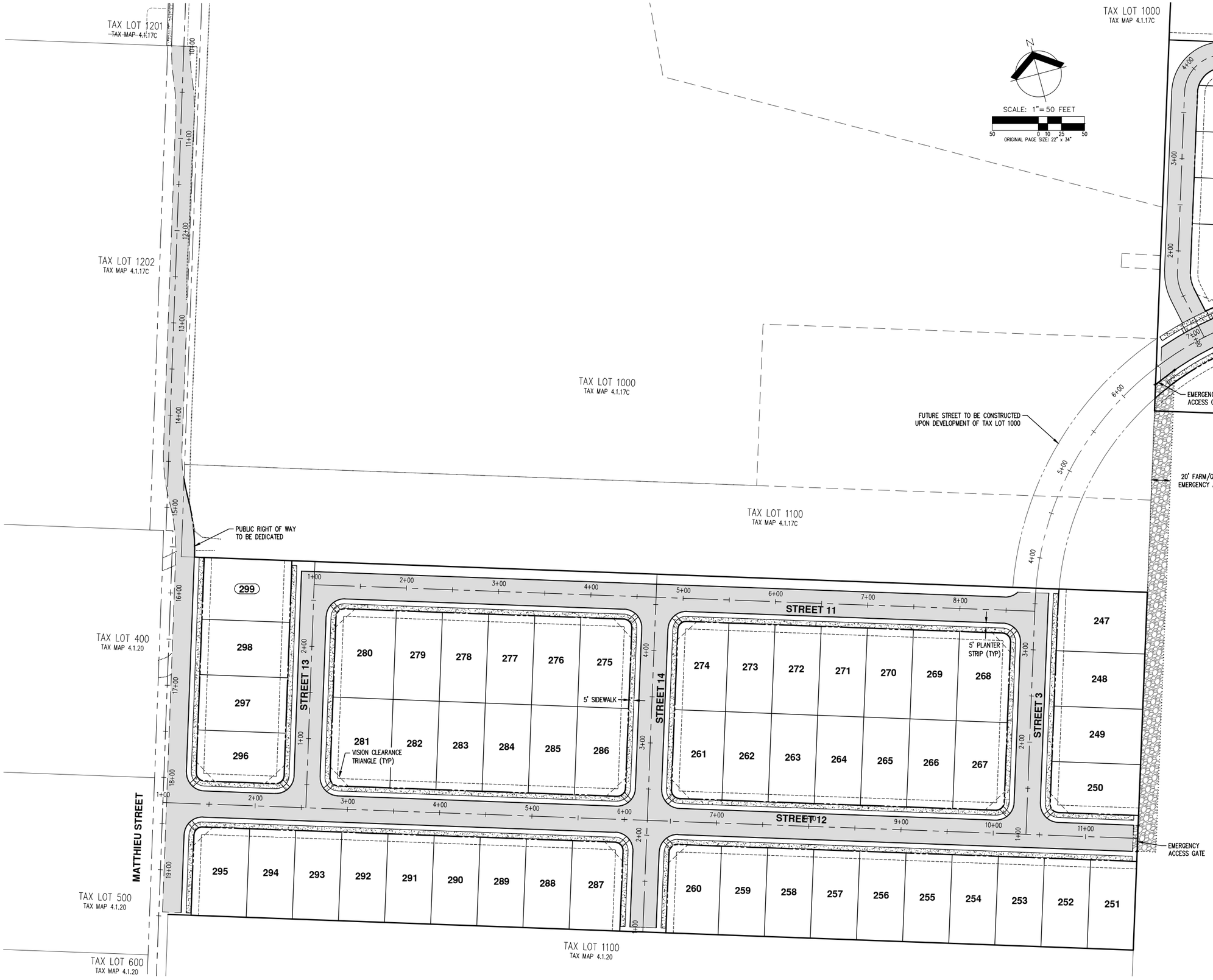
PRELIMINARY STREET PLAN
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY
NOT FOR
CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

P20

AKS DRAWING FILE: 6732 STREET PLAN.DWG | LAYOUT: P20



AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

PRELIMINARY STREET PLAN
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY NOT FOR CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

P21

AKS DRAWING FILE: 6732 STREET PLAN.DWG | LAYOUT: P21

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

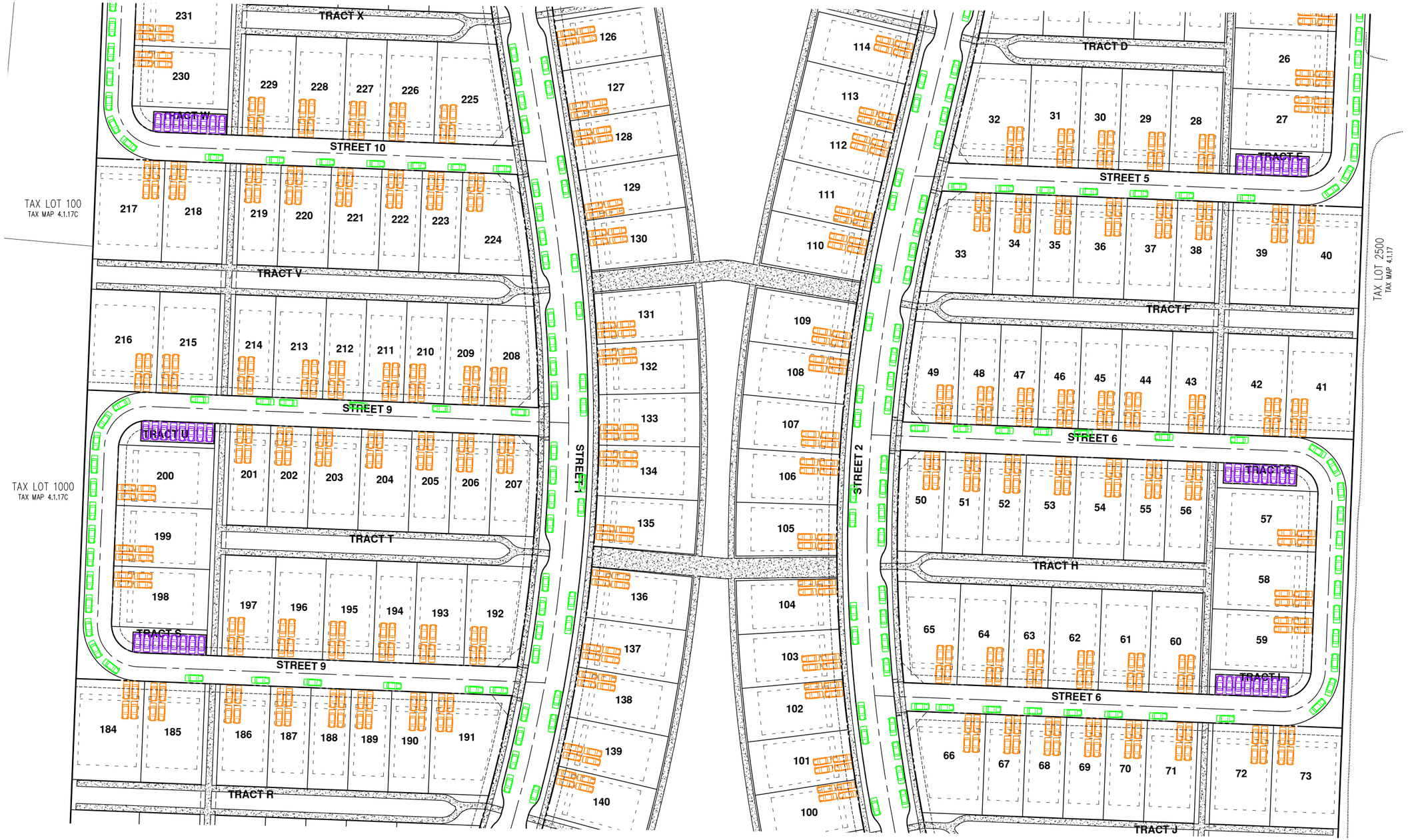
PRELIMINARY PARKING PLAN
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY
NOT FOR
CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

P22

AKS DRAWING FILE: 6732 PARKING PLANLDWG | LAYOUT: P22



AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

PRELIMINARY PARKING PLAN
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY
NOT FOR
CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

P23

AKS DRAWING FILE: 6732 PARKING PLANLDWG | LAYOUT: P23

LEGEND

PRIVATE PARKING		1188
PUBLIC PARKING (24' TYPICAL LENGTH)		424
PUBLIC OFF-STREET PARKING		89
TOTAL PARKING SPOTS		1701

N

SCALE: 1" = 50 FEET

50 0 10 25 50

ORIGINAL PAGE SIZE: 22" x 34"

TAX LOT 1000
TAX MAP 4.1.17C

TAX LOT 2500
TAX MAP 4.1.17

TAX LOT 2400
TAX MAP 4.1.17

TAX LOT 1100
TAX MAP 4.1.20

TRACT S
TRACT R
TRACT Q
TRACT P
TRACT O
TRACT N
TRACT M
TRACT J
TRACT K
TRACT L
TRACT I

STREET 9
STREET 8
STREET 7
STREET 6
STREET 5
STREET 4
STREET 3
STREET 2

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

PRELIMINARY PARKING PLAN
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY
NOT FOR
CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

P24

AKS DRAWING FILE: 6732 PARKING PLAN.DWG | LAYOUT: P24

TAX LOT 1201
TAX MAP 4.1.17C

TAX LOT 1202
TAX MAP 4.1.17C

TAX LOT 1000
TAX MAP 4.1.17C

TAX LOT 1100
TAX MAP 4.1.17C

TAX LOT 400
TAX MAP 4.1.20

TAX LOT 500
TAX MAP 4.1.20

TAX LOT 600
TAX MAP 4.1.20

TAX LOT 1100
TAX MAP 4.1.20

MATTHIEU STREET

STREET 11
STREET 12
STREET 13
STREET 14
STREET 3

LEGEND

PRIVATE PARKING	1188
PUBLIC PARKING (24' TYPICAL LENGTH)	424
PUBLIC OFF-STREET PARKING	89
TOTAL PARKING SPOTS	1701

N

SCALE: 1"= 50 FEET

50 0 10 25 50

ORIGINAL PAGE SIZE: 22" x 34"

TRACT Q

TRACT O

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

PRELIMINARY PARKING PLAN
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY
NOT FOR
CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAC
CHECKED BY:	AAH

P25

NOTE:
A TEMPORARY HDPE STORM LINE WILL BE INSTALLED TO ROUTE INITIAL PHASES TO REGIONAL STORMWATER FACILITY UNTIL SITE IS FULLY BUILT OUT.

SCALE: 1" = 150 FEET
ORIGINAL PAGE SIZE: 22" x 34"

P26

PRELIMINARY NOT FOR CONSTRUCTION

JOB NUMBER: 6732
DATE: 05/21/2020
DESIGNED BY: JMS
DRAWN BY: AAG
CHECKED BY: AAH

PRELIMINARY COMPOSITE UTILITY OVERVIEW
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

NOTES:

1. ALL LOTS TO RECEIVE INDIVIDUAL SERVICE CONNECTIONS. SERVICES TO INCLUDE STORM WEEPHOLES, INDIVIDUAL STANDARD SEPTIC TANKS, AND 3/4" WATER SERVICES. (ALL INDIVIDUAL SERVICES EXCEPT SEPTIC TANKS ARE NOT SHOWN)
2. OPEN SPACE TRACTS TO BE IRRIGATED FROM EXISTING IRRIGATION WELL.
3. ABBREVIATIONS:
   STM – STORM
   FM SAN – SANITARY FORCE MAIN
   WAT – WATER
4. WATER MAINS SIZED AS SHOWN ON PLAN.
   8 WAT: 8" WATER MAIN
5. PIPE MATERIAL TO BE DETERMINED DURING FINAL ENGINEERING. STORM MAINS WILL BE SIZED DURING FINAL ENGINEERING.
6. A TEMPORARY HDPE STORM LINE WILL BE INSTALLED TO ROUTE INITIAL PHASES TO REGIONAL STORMWATER FACILITY UNTIL SITE IS FULLY BUILT OUT.

SCALE: 1"=50 FEET
50 0 10 25 50
ORIGINAL PAGE SIZE: 22" x 34"

TAX LOT 2000
TAX MAP 4.1.17

TAX LOT 2100
TAX MAP 4.1.17

TAX LOT 2100
TAX MAP 4.1.17

TAX LOT 102
TAX MAP 4.1.17

TAX LOT 100
TAX MAP 4.1.17C

TAX LOT 2500
TAX MAP 4.1.17

HUCKLEBERRY LANE

DONALD ROAD NE

CONNECT TO EXISTING SANITARY FORCE MAIN

EXISTING FIRE HYDRANT

EXISTING OVERHEAD WIRE (TYP)

CONNECT TO EXISTING 12" WATER MAIN

EXISTING UTILITY POLE (TYP)

EXISTING FIRE HYDRANT

CONNECT TO EXISTING 12" WATER MAIN

EXISTING STORM MANHOLE (TYP)

CONNECT TO EXISTING 12" WATER MAIN

EXISTING FIRE HYDRANT

CONNECT TO EXISTING STORM MAIN

EXISTING SIGN (TYP)

CATCH BASIN (TYP)

IRRIGATION WELL

SANITARY FORCE MAIN STUB FOR FUTURE CONNECTION

WATER MAIN STUB FOR FUTURE CONNECTION

STORM MANHOLE (TYP)

SANITARY FORCE MAIN STUB FOR FUTURE CONNECTION

WATER MAIN STUB FOR FUTURE CONNECTION

SEPTIC TANK (TYP)

SEPTIC TANK EASEMENT (TYP)

SANITARY FORCE MAIN STUB

8' PUE (TYP)

FIRE HYDRANT (TYP)

AREA DRAIN (TYP)

15' ACCESS EASEMENT PER DEED REEL 1710 PAGE 163 TO BE RELINQUISHED AS PHASES ARE CONSTRUCTED. LEGAL ACCESS TO CITY STORMWATER CONVEYANCE SYSTEM TO BE MAINTAINED AT ALL TIMES.

TRACT A
TRACT AA
TRACT AB
TRACT B
TRACT C
TRACT D
TRACT X
TRACT Y
TRACT Z

STREET 1
STREET 2
STREET 3
STREET 4
STREET 5
STREET 10

246 245 244 243 242 241 240 239 238 237 236 235 234 233 232 231 230 229 228 227 226 225
120 121 122 123 124 125 126 127
119 118 117 116 115 114 113
7 6 5 4 3 2 ① 8 9 10 11 12 13 19 18 17 16 15 14 20 21 22 23 24 25 26

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, SITE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

PRELIMINARY COMPOSITE UTILITY PLAN

HARVEST GARDENS

GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY
NOT FOR
CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

P27

AKS DRAWING FILE: 6732 PRELIMINARY COMPOSITE UTILITY PLAN.DWG | LAYOUT: P27

NOTES:

1. ALL LOTS TO RECEIVE INDIVIDUAL SERVICE CONNECTIONS. SERVICES TO INCLUDE STORM WEEPHOLES, INDIVIDUAL STANDARD SEPTIC TANKS, AND 3/4" WATER SERVICES. (ALL INDIVIDUAL SERVICES EXCEPT SEPTIC TANKS ARE NOT SHOWN)
2. OPEN SPACE TRACTS TO BE IRRIGATED FROM EXISTING IRRIGATION WELL.
3. ABBREVIATIONS:
   STM – STORM
   FM SAN – SANITARY FORCE MAIN
   WAT – WATER
4. WATER MAINS SIZED AS SHOWN ON PLAN.
   8 WAT: 8" WATER MAIN
5. PIPE MATERIAL TO BE DETERMINED DURING FINAL ENGINEERING. STORM MAINS WILL BE SIZED DURING FINAL ENGINEERING.
6. A TEMPORARY HDPE STORM LINE WILL BE INSTALLED TO ROUTE INITIAL PHASES TO REGIONAL STORMWATER FACILITY UNTIL SITE IS FULLY BUILT OUT.

N

SCALE: 1"=50 FEET

50 0 10 25 50

ORIGINAL PAGE SIZE: 22" x 34"

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, SITE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

PRELIMINARY COMPOSITE UTILITY PLAN

HARVEST GARDENS

GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY
NOT FOR
CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

P28

AKS DRAWING FILE: 6732 PRELIMINARY COMPOSITE UTILITY PLAN.DWG | LAYOUT: P28

NOTES:

1. ALL LOTS TO RECEIVE INDIVIDUAL SERVICE CONNECTIONS. SERVICES TO INCLUDE STORM WEEPHOLES, INDIVIDUAL STANDARD SEPTIC TANKS, AND 3/4" WATER SERVICES. (ALL INDIVIDUAL SERVICES EXCEPT SEPTIC TANKS ARE NOT SHOWN)
2. OPEN SPACE TRACTS TO BE IRRIGATED FROM EXISTING IRRIGATION WELL.
3. ABBREVIATIONS:
   STM – STORM
   FM SAN – SANITARY FORCE MAIN
   WAT – WATER
4. WATER MAINS SIZED AS SHOWN ON PLAN.
   8 WAT: 8" WATER MAIN
5. PIPE MATERIAL TO BE DETERMINED DURING FINAL ENGINEERING. STORM MAINS WILL BE SIZED DURING FINAL ENGINEERING.
6. A TEMPORARY HDPE STORM LINE WILL BE INSTALLED TO ROUTE INITIAL PHASES TO REGIONAL STORMWATER FACILITY UNTIL SITE IS FULLY BUILT OUT.

N

SCALE: 1"= 50 FEET

50 0 10 25 50

ORIGINAL PAGE SIZE: 22" x 34"

TAX LOT 1000
TAX MAP 4.1.17C

TAX LOT 2500
TAX MAP 4.1.17

TAX LOT 2400
TAX MAP 4.1.17

TAX LOT 1100
TAX MAP 4.1.20

STREET 9 · STREET 8 · STREET 6 · STREET 1 · STREET 2 · STREET 3

TRACT S · TRACT R · TRACT Q · TRACT P · TRACT O · TRACT N · TRACT M · TRACT J · TRACT I · TRACT L · TRACT K

SEPTIC TANK EASEMENT (TYP)

FIRE HYDRANT (TYP)

AREA DRAIN (TYP)

STORM MANHOLE (TYP)

CATCH BASIN (TYP)

8' PUE (TYP)

15' ACCESS EASEMENT PER DEED REEL 1710 PAGE 163 TO BE RELINQUISHED AS PHASES ARE CONSTRUCTED. LEGAL ACCESS TO CITY STORMWATER CONVEYANCE SYSTEM TO BE MAINTAINED AT ALL TIMES.

15' STORM DRAIN EASEMENT PER DEED REEL 1710 PAGE 162

ULTIMATE STORMWATER DISCHARGE POINT

STORMWATER OUTFALL INTO REGIONAL STORMWATER FACILITY

STRIP EASEMENT PER BOOK 1710, PAGE 164

SANITARY FORCE MAIN STUB FOR FUTURE CONNECTION

WATER STUB FOR FUTURE CONNECTION

SANITARY FORCE MAIN STUB FOR FUTURE CONNECTION

WATER STUB FOR FUTURE CONNECTION

SANITARY FORCE MAIN STUB FOR FUTURE CONNECTION

WATER STUB FOR FUTURE CONNECTION

20' FARM/GRAVEL EMERGENCY ACCESS

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

PRELIMINARY COMPOSITE UTILITY PLAN

HARVEST GARDENS

GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY
NOT FOR
CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

P29

AKS DRAWING FILE: 6732 PRELIMINARY COMPOSITE UTILITY PLAN.DWG | LAYOUT: P29

NOTES:

1. ALL LOTS TO RECEIVE INDIVIDUAL SERVICE CONNECTIONS. SERVICES TO INCLUDE STORM WEEPHOLES, INDIVIDUAL STANDARD SEPTIC TANKS, AND 3/4" WATER SERVICES. (ALL INDIVIDUAL SERVICES EXCEPT SEPTIC TANKS ARE NOT SHOWN)
2. OPEN SPACE TRACTS TO BE IRRIGATED FROM EXISTING IRRIGATION WELL.
3. ABBREVIATIONS:
   STM – STORM
   FM SAN – SANITARY FORCE MAIN
   WAT – WATER
4. WATER MAINS SIZED AS SHOWN ON PLAN.
   8 WAT: 8" WATER MAIN
5. PIPE MATERIAL TO BE DETERMINED DURING FINAL ENGINEERING. STORM MAINS WILL BE SIZED DURING FINAL ENGINEERING.
6. A TEMPORARY HDPE STORM LINE WILL BE INSTALLED TO ROUTE INITIAL PHASES TO REGIONAL STORMWATER FACILITY UNTIL SITE IS FULLY BUILT OUT.

SCALE: 1"=50 FEET
50 0 10 25 50
ORIGINAL PAGE SIZE: 22" x 34"

TAX LOT 1201
TAX MAP 4.1.17C

CONNECT TO EXISTING 10" WATER MAIN

CONNECT TO EXISTING 6" SANITARY FORCE MAIN

TAX LOT 1202
TAX MAP 4.1.17C

CONNECT TO EXISTING STORM CULVERT

CITY OF DONALD REGIONAL STORMWATER FACILITY

TAX LOT 1000
TAX MAP 4.1.17C

DETENTION BASIN EASEMENT PER BOOK 1710, PAGE 164

TAX LOT 1000
TAX MAP 4.1.17C

183 182 181

TRACT Q

172 173

171

AREA DRAIN (TYP

170 168

169

STORMWATER OUTFALL INTO REGIONAL STORMWATER FACILITY

STRIP EASEMENT PER BOOK 1710, PAGE 164

SANITARY FORCE MAIN STUB FOR FUTURE CONNECTION

164

TRACT O

WATER STUB FOR FUTURE CONNECTION

20' FARM/GRAVEL EMERGENCY ACCESS

TAX LOT 1100
TAX MAP 4.1.17C

TAX LOT 400
TAX MAP 4.1.20

EXISTING UTILITY POLE TO BE RELOCATED
299
EXISTING OVERHEAD WIRE TO BE RELOCATED

298 297 296

280 279 278 277 276 275

8' PUE (TYP)

281 282 283 284 285 286

SEPTIC TANK EASEMENT (TYP)

STREET 13

STREET 11

274 273 272 271 270 269 268

261 262 263 264 265 266 267

CATCH BASIN (TYP)

SEPTIC TANK (TYP)

STREET 12

STREET 3

STORM MANHOLE (TYP)

SANITARY FORCE MAIN STUB FOR FUTURE CONNECTION

WATER STUB FOR FUTURE CONNECTION

247 248 249 250

FIRE HYDRANT (TYP)

SANITARY FORCE MAIN STUB FOR FUTURE CONNECTION

WATER STUB FOR FUTURE CONNECTION

MATTHIEU STREET

TAX LOT 500
TAX MAP 4.1.20

EXISTING UTILITY POLE TO BE RELOCATED

295 294 293 292 291 290 289 288 287

260 259 258 257 256 255 254 253 252 251

WATER STUB FOR FUTURE CONNECTION

SANITARY FORCE MAIN STUB FOR FUTURE CONNECTION

TAX LOT 1100
TAX MAP 4.1.20

WATER STUB FOR FUTURE CONNECTION

SANITARY FORCE MAIN STUB FOR FUTURE CONNECTION

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

PRELIMINARY COMPOSITE UTILITY PLAN

HARVEST GARDENS

GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY
NOT FOR
CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

P30

COMMUNITY GARDEN/CSA

DEDICATED COMMUNITY GARDEN AREAS, & DEMONSTRATION AND TEST GARDEN PLOTS, PROVIDE SOCIAL GATHERING AND FOOD PRODUCTION FOR RESIDENTS.

SHARED GREENSPACE

MULTIPLE SHARED GREENSPACE ON BACKYARD SIDE OF HOMES CREATES GATHERING AND ACTIVITY OPPORTUNITIES.

SHARED COMMUNITY SPACE

SHARED AMENITIES INCLUDE OPEN FIELDS, KIDS PLAY AREA , EDIBLE PLANTING, WALKING TRAILS, AND COMMUNITY GATHERING AREAS.

COMMUNITY CENTER AND COMMERCIAL SPACE

A COMMUNITY CENTER (TO BE COMPLETED IN A FUTURE PHASE) HOSTS COMMUNITY AND COMPANY EVENTS, MEETING AND EVENT SPACE RENTAL, SEASONAL ACTIVITIES, FARM STORE/RETAIL, CLASSROOMS, FARM-TO-TABLE RESTAURANT, AND FARM STAND.

POTENTIAL AMENITY KEY

This plan shows the long term vision for Harvest Gardens. The list of potential amenities below is an example of what may be installed. The final design will be phased and may vary from this initial concept.

1. Gravel event parking.
2. Community center building (future phase) including retail, classroom, event rental, and farm to table restaurant space.
3. Paver patio area with temporary farm stand structure. Farm stand to be replaced with the community center building in future phase.
4. Raised planters for retail display.
5. Community garden and demonstration garden area.
6. Herb garden.
7. Shade structure.
8. Public access formal lawn and event space.
9. Edible plantings (fruit trees, fruiting bushes, and edible groundcover).
10. Looped walking trail.
11. Antique farm equipment display area.
12. Art installation/farm equipment display area
13. Event and fire vehicular access road.
14. Bench with evergreen screening separates public and private use areas.
15. Rest area along trail with bench seating.
16. Multi-use play lawn area.
17. Seating area
18. Farm themed playground area.
19. Off-street parking.
20. Private shared courtyard area with lawn.
21. Greenhouse.

N

SCALE: 1"=100 FEET

100 0 20 50 100

ORIGINAL PAGE SIZE: 22" x 34"

NOTE: POTENTIAL PLAN ELEMENTS, FURNISHINGS AND AMENITIES, LOCATIONS, AND DETAILS AS SHOWN ARE CONCEPTUAL AND SUBJECT TO CHANGE.

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING · SURVEYING · NATURAL RESOURCES
FORESTRY · PLANNING · LANDSCAPE ARCHITECTURE

PRELIMINARY LANDSCAPE CONCEPT PLAN

HARVEST GARDENS

GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY NOT FOR CONSTRUCTION

JOB NUMBER:	6732
DATE:	3/16/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

AKS DRAWING FILE: 6732 20200405 LA COLOR.DWG | LAYOUT: COLOR OVERALL (2)

P32

PRELIMINARY NOT FOR CONSTRUCTION

JOB NUMBER: 6732
DATE: 3/16/2020
DESIGNED BY: JMS
DRAWN BY: AAG
CHECKED BY: AAH

PRELIMINARY LANDSCAPE CONCEPT PLAN
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

AKS

ENGINEERING · SURVEYING · NATURAL RESOURCES
FORESTRY · PLANNING · LANDSCAPE ARCHITECTURE

EXISTING GROUND CONTOUR (1 FT) 182
EXISTING GROUND CONTOUR (5 FT) 180
FINISHED GRADE CONTOUR (1 FT) 182
FINISHED GRADE CONTOUR (5 FT) 180
DISTURBED AREA

SCALE: 1"= 50 FEET
50 0 10 25 50
ORIGINAL PAGE SIZE: 22" x 34"

TAX LOT 2000
TAX MAP 4.1.17

TAX LOT 2100
TAX MAP 4.1.17

TAX LOT 2100
TAX MAP 4.1.17

HUCKLEBERRY LANE

DONALD ROAD NE

TRACT AA

TRACT Z

TRACT Y

TRACT X

TRACT AB

STREET 1

STREET 2

STREET 4

STREET 5

STREET 10

TRACT A

TRACT B

TRACT C

TRACT D

DISTURBED AREA BOUNDARY

TAX LOT 100
TAX MAP 4N 1 22C

TAX LOT 2500
TAX MAP 4.1.17

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

PRELIMINARY GRADING PLAN
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY
NOT FOR
CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

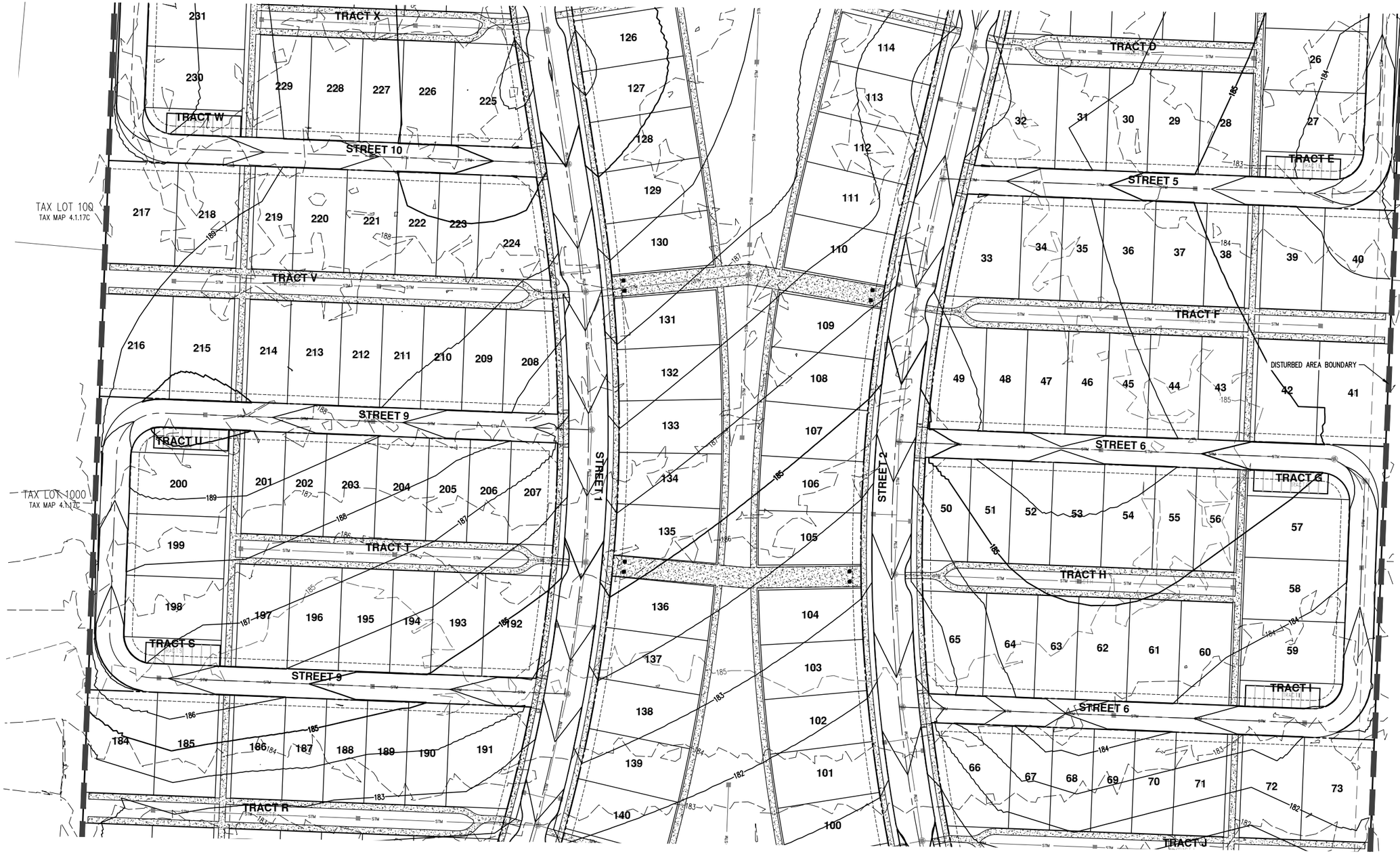
P33

AKS DRAWING FILE: 6732 GRADING.DWG | LAYOUT: P33

EXISTING GROUND CONTOUR (1 FT) — 182 —
EXISTING GROUND CONTOUR (5 FT) — 180 —
FINISHED GRADE CONTOUR (1 FT) — 182 —
FINISHED GRADE CONTOUR (5 FT) — 180 —
DISTURBED AREA

N

SCALE: 1" = 50 FEET
50 0 10 25 50
ORIGINAL PAGE SIZE: 22" x 34"



AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, SITE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

PRELIMINARY GRADING PLAN
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY
NOT FOR
CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

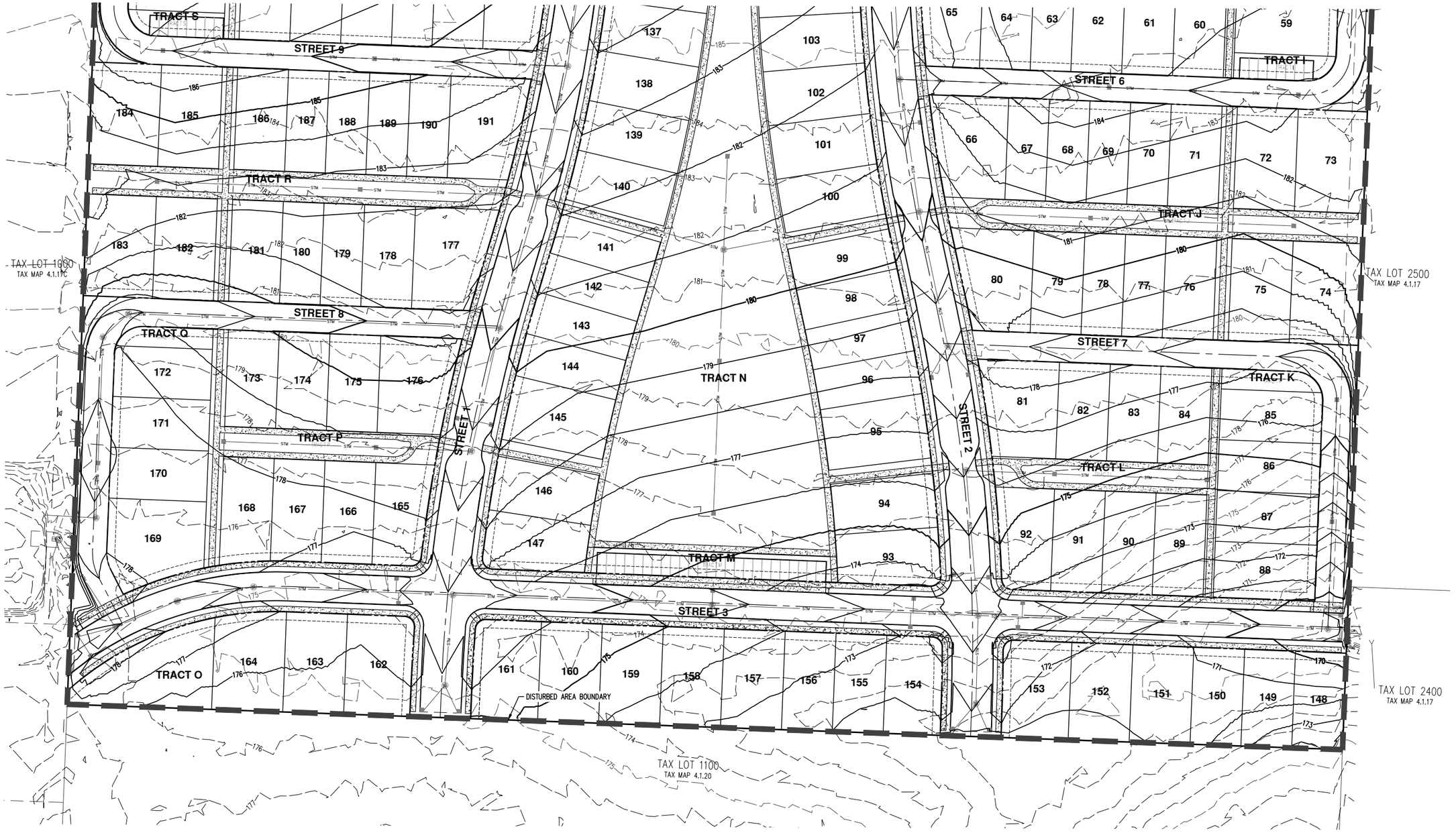
P34

AKS DRAWING FILE: 6732 GRADING.DWG | LAYOUT: P34

EXISTING GROUND CONTOUR (1 FT) — —182— —
EXISTING GROUND CONTOUR (5 FT) — —180— —
FINISHED GRADE CONTOUR (1 FT) ——182——
FINISHED GRADE CONTOUR (5 FT) ——180——
DISTURBED AREA

N

SCALE: 1"= 50 FEET
50 0 10 25 50
ORIGINAL PAGE SIZE: 22" x 34"



AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

PRELIMINARY GRADING PLAN
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY
NOT FOR
CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

P35

AKS DRAWING FILE: 6732 GRADING.DWG | LAYOUT: P35

EXISTING GROUND CONTOUR (1 FT)
EXISTING GROUND CONTOUR (5 FT)
FINISHED GRADE CONTOUR (1 FT)
FINISHED GRADE CONTOUR (5 FT)
DISTURBED AREA

SCALE: 1" = 50 FEET
ORIGINAL PAGE SIZE: 22" x 34"

TAX LOT 1201
TAX MAP 4.1.17C

TAX LOT 1202
TAX MAP 4.1.17C

TAX LOT 1000
TAX MAP 4.1.17C

TAX LOT 1000
TAX MAP 4.1.17C

TRACT Q

TRACT O

TAX LOT 1100
TAX MAP 4.1.17C

TAX LOT 400
TAX MAP 4.1.20

MATTHIEU STREET

TAX LOT 500
TAX MAP 4.1.20

TAX LOT 600
TAX MAP 4.1.20

TAX LOT 1100
TAX MAP 4.1.20

STREET 11
STREET 12
STREET 13
STREET 14
STREET 3

DISTURBED AREA BOUNDARY

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

PRELIMINARY GRADING PLAN
HARVEST GARDENS
GRC LAND HOLDINGS, LLC
DONALD, OREGON

PRELIMINARY
NOT FOR
CONSTRUCTION

JOB NUMBER:	6732
DATE:	05/21/2020
DESIGNED BY:	JMS
DRAWN BY:	AAG
CHECKED BY:	AAH

P36

Exhibit B: City Application Forms and Checklist

CITY OF DONALD

10710 Main Street N.E. • P.O. Box 388 • Donald, OR 97020-0388
Phone 503-678-5543 • Fax 503-678-2750
www.donaldoregon.gov
Emergency pager for Water and Sewer: 503-301-6479

Office Use Only:
Permit No. _____
Date _____
Fee _____

LAND USE ACTION APPLICATION

Donald Development Code Section 3.1

Applicant:

GRC Land Holdings, LLC
Name
10773 Feller Road, NE
Mailing Address
Hubbard | OR | 97032
City | State | Zip
N/A | N/A
Phone | Fax
Please Contact Applicant's Consultant
Email

Property Owner:
(if different than Applicant)

Same as Applicant
Name

Mailing Address

City | State | Zip

Phone | Fax
Please Contact Applicant's Consultant
Email

Contractor:
(if applicable)

Consultant: Mimi Doukas; AKS Engineering & Forestry, LLC
Name
12965 SW Herman Road, Suite 100
Mailing Address
Tualatin | OR | 97062
City | State | Zip
(503) 563-6151 | (503) 563-6152
Phone | Fax
mimid@aks-eng.com
Email

Location:

Street Address: No situs

Map and Tax Lot No: Map 041W17, Tax Lot 2600; Map 041W20, Tax Lot 300

Legal Description: Southeast corner of Donald, OR

Property Size: ±52.3 acres; ±9.32 acres

Existing Structure/Use: Vacant field

CITY OF DONALD

Supplemental Materials

Must Be Submitted With Application

In order to complete the processing of this application, the City of Donald requires that all pertinent material required for review of the application is submitted at the time application is made along with the application fee. If the application is found to be incomplete, review and processing of the application will not begin until the application is made complete. The submittal requirements relative to the application may be obtained from the specific sections of the Donald Development Ordinance pertaining to the application but include, at a minimum, those items outlined below.

In submitting this application, the applicant must be prepared to give evidence and information which will justify the request and satisfy all the required applicable criteria. The filing fee must be paid at the time of submission. This fee in no way assures approval of the application.

Submit one paper copy and one electronic version of the following:

✓ A brief statement describing how the proposed action satisfies the required findings criteria contained in the Land Development Ordinance for the action requested. (Mark "Exhibit A"). Please see narrative document in binder

✓ Plans, with dimensions, of the proposed action (if applicable). These would include vicinity maps, plot plans, development plans, etc. For maps larger than 11x17, include 10 copies (Mark "Exhibit B"). Please see Exhibit A

✓ An accurate list of names and addresses of all owners of property within 100 feet of all boundaries for a Type I action and 200 feet of all boundaries for a Type II or Type III action. The applicant assumes notification problems associated with notification lists which are more than 30 days old. (Mark "Exhibit C"). Please see Exhibit F

✓ A copy of the applicable County Assessor's map. (Mark "Exhibit D"). Please see Exhibit D

✓ Applicable existing conditions and proposed development plan information. (Mark "Exhibit E") Please see Exhibit A

Office Use Only:

Application Received by _____ Date _____
Planning Dept. Review by _____ Date _____
Public Works Review by _____ Date _____
Engineer Review by _____ Date _____
Legal Review by _____ Date _____
Fire Dept. Review by _____ Date _____
School Dist. Review by _____ Date _____
Marion Co Sheriff Office Review by _____ Date _____

Level of Decision

Staff Approval by _____ Date _____

Planning Commission Approval _____ Public Hearing Date _____
Council Approval - 1st Public Hearing Date _____ 2nd Public Hearing Date _____

Description: Comp. Plan Designation: Residential

Current Zoning: Urban Transition (UT-20)

Proposed Action: Annexation, Zone Change, Planned Unit Development, Subdivision

Purpose and Description of Proposed Action:

The applicant plans to annex the property into the City of Donald for future residential use to accommodate needed workforce housing. This application will provide a vibrant community that features a variety of lot sizes and housing types, open space and natural areas, and an interconnected transportation network with multi-use trails.

Number of proposed parcels/lots: ±299

Are you applying for an Expedited Land Division?

____ Yes (If yes, attach a written description of how the proposal satisfies ORS 197.360)

✓ No

Applicant Name: N/A Phone: N/A

Applicant Mailing Address: N/A

Site Address: N/A

Signature	N/A Print Name	N/A Date

Authorization and Finalization Signatures

I am the owner/authorized agent of the owner empowered to submit this application and affirm that the information submitted with this application is correct to the best of my knowledge. I further acknowledge that I have read the applicable standards for review of the land use action I am requesting and understand that I must demonstrate to the City review authorities compliance with these standards prior to approval of my request. I understand that the filing fee is nonrefundable and that I am responsible for all additional costs of processing this application in excess of the filing fee, including but not limited to, all planning, engineering, city attorney, and city administration fees and costs. I understand that no final application approval shall be given and/or building permit shall be issued until all actual costs for processing this application are paid in full.

Applicant's Signature Doug MacDonald **Date** 2/28/2020

Owner's Signature Doug MacDonald **Date** 2/28/2020

See Attached: Supplemental Materials

CITY OF DONALD
10710 Main Street N.E. • P.O. Box 388 • Donald, OR 97020-0388
Phone 503-678-5543 • Fax 503-678-2750
www.donaldoregon.gov
Emergency pager for Water and Sewer: 503-301-6479

LAND USE FEE SCHEDULE ACKNOWLEDGMENT

Resolution No. 466-18 requires a fee for land use applications. The City of Donald staff will collect the fee at the time of application.

This fee will cover the actual costs of technical services including but not limited to planning, engineering, legal, surveying and other related technical services. Administrative overhead shall be billed at 30% of the City's actual costs for technical services. In the event the actual costs of these services exceed the application fee, the applicant shall make payment of this deficiency within fifteen (15) days of notification by the City Manager. The City shall discontinue processing the application until the deficiency is paid.

Hourly Rate for Land Use Services: Zoning confirmations, interpretations of development code criteria, land use compatibility statements or other services/assistance related to the development ordinance not listed above shall be the responsibility of the interested party/applicant. Services requiring in excess of fifteen (15) minutes of staff time shall require a deposit with the City of $125 to cover costs. Time/fees in excess of the $125 deposit shall be the responsibility of the interested party and billed to them as such.

The following are types of charges and amounts per hour. ***The Contracted Service provider fees are subject to change and may also include their hired staff time.***

City Planner	**$ 85.00**
City Engineer	**$165.00**
City Attorney	**$200.00**

I have read this information and understand that the land use fee is a deposit and the application may cost more.

Applicant Signature

2/28/2020
Date

LAND USE APPLICATION FEE SCHEDULE

(per Resolution No. 466-18)

	FEE
PRE-APPLICATION CONFERENCE	$400
ANNEXATION	$1200
APPEAL	$300
CONDITIONAL USE PERMIT	$450
HOME OCCUPATION PERMIT	$75
LAND PARTITIONS	
A. Lot Line Adjustment	$150
B. Manufactured Home Park	$1200
C. Partitions	$425
D. Planned Unit Development (PUD)	$1200
E. Subdivision	$1500
EXPEDITED LAND DIVISION (per ORS 197.370) – addition to C, D or F above	$500
PLAN MAP AMENDMENT	$700
SIGN PERMIT	$50
SITE PLAN REVIEW	$400
TEXT AMENDMENT	$700
VARIANCE	
A. Minor Variance	$250
B. Major Variance	$450
ZONE CHANGE	$850

Total fees included: $4,750

FEE IN-LIEU PROGRAMS

Landscaping Fee In-Lieu:

Land use applicant is to secure a bid from a professional landscaping company for the shortfall in landscaped area. The City will collect 80% of the bid for the landscaping fee. The fee is to be expended as per Donald Development Code Section 2.306.07.

Frontage Improvement Fee In-Lieu: see Donald Development Code Section 2.302.09

	Construction Cost	***Engineering 15%***	***Total Per Foot***
6" Curb, Including excavation and 4" base rock, per foot	$22	$3	$25
5' Sidewalk, including excavation and 4" leveling rock, per foot	$52	$8	$60
Street Improvement, 17' half street with excavation, 12" base rock, and 4" HMAC, per foot	$100	$15	$115

Exhibit C: Written Consent Form for Annexation to City of Donald

Written Consent Form

We, the undersigned property owners of and/or registered voters in the area described below, hereby petition for, and give our consent to, annexation of the area to the City of Donald.

Note: This petition may be signed by qualified persons even though they may not know their property description or precinct number.

Date	Signature	Printed Name	I am a: PO	RV	OV	Address	Property Description or Parcel ID	Precinct Number
2/28/2020	Gary Grossen	Gary Grossen	X			No situs	Map 041W17, Tax Lot 2600	N/A
2/28/2020	Gary Grossen	Gary Grossen	X			No Situs	Map 041W20, Tax Lot 300	N/A

PO- Property Owner

RV – Registered Voter

OV – Owner and Registered Voter

Written Consent Form

We, the undersigned property owners of and/or registered voters in the area described below, hereby petition for, and give our consent to, annexation of the area to the City of Donald.

Note: This petition may be signed by qualified persons even though they may not know their property description or precinct number.

Date	Signature	Printed Name	I am a: PO	RV	OV	Address	Property Description or Parcel ID	Precinct Number
2-28-20		JoAnn Agee	X			No situs	Map 041W17, Tax Lot 2600	N/A
2-28-20		JoAnn Agee	X			No Situs	Map 041W20, Tax Lot 300	N/A

PO- Property Owner

RV – Registered Voter

OV – Owner and Registered Voter

AMENDED ANNUAL REPORT

Corporation Division
www.filinginoregon.com

E-FILED
Nov 22, 2019
OREGON SECRETARY OF STATE

REGISTRY NUMBER

117475293

REGISTRATION DATE

01/04/2016

BUSINESS NAME

GRC LAND HOLDINGS LLC

BUSINESS ACTIVITY

LAND HOLDING AND RENTAL

MAILING ADDRESS

PO BOX 427
DONALD OR 97020 USA

TYPE

DOMESTIC LIMITED LIABILITY COMPANY

PRIMARY PLACE OF BUSINESS

10773 FELLER RD NE
HUBBARD OR 97032 USA

JURISDICTION

OREGON

REGISTERED AGENT

JOANN AGEE

10773 FELLER RD NE
HUBBARD OR 97032 USA

If the Registered Agent has changed, the new agent has consented to the appointment.

MEMBER

JOANN AGEE

10773 FELLER RD NE
HUBBARD OR 97032 USA

MEMBER

STEVE CATTS

PO BOX 504
DONALD OR 97020 USA

MEMBER

GARY GROSSEN

PO BOX 331
DONALD OR 97020 USA

MEMBER

MARK REILING

PO BOX 504
DONALD OR 97020 USA

I declare, under penalty of perjury, that this document does not fraudulently conceal, fraudulently obscure, fraudulently alter or otherwise misrepresent the identity of the person or any officers, managers, members or agents of the limited liability company on behalf of which the person signs. This filing has been examined by me and is, to the best of my knowledge and belief, true, correct, and complete. Making false statements in this document is against the law and may be penalized by fines, imprisonment, or both.

By typing my name in the electronic signature field, I am agreeing to conduct business electronically with the State of Oregon. I understand that transactions and/or signatures in records may not be denied legal effect solely because they are conducted, executed, or prepared in electronic form and that if a law requires a record or signature to be in writing, an electronic record or signature satisfies that requirement.

ELECTRONIC SIGNATURE

NAME

JOANN AGEE

TITLE

MEMBER

DATE SIGNED

11-22-2019

Written Consent Form

We, the undersigned property owners of and/or registered voters in the area described below, hereby petition for, and give our consent to, annexation of the area to the City of **Donald.**

Note: This petition may be signed by qualified persons even though they may not know their property description or precinct number.

Date	Signature	Printed Name	I am a: PO	RV	OV	Address	Property Description or Parcel ID	Precinct Number
3-17-20	Mark Reiling	Mark Reiling	X			No situs	Map 041W17, Tax Lot 2600	N/A
3.17.20	Mark Reiling	Mark Reiling	X			No Situs	Map 041W20, Tax Lot 300	N/A

PO- Property Owner

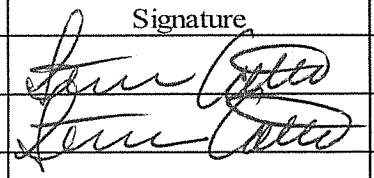
RV – Registered Voter

OV – Owner and Registered Voter

Written Consent Form

We, the undersigned property owners of and/or registered voters in the area described below, hereby petition for, and give our consent to, annexation of the area to the City of Donald.

Note: This petition may be signed by qualified persons even though they may not know their property description or precinct number.

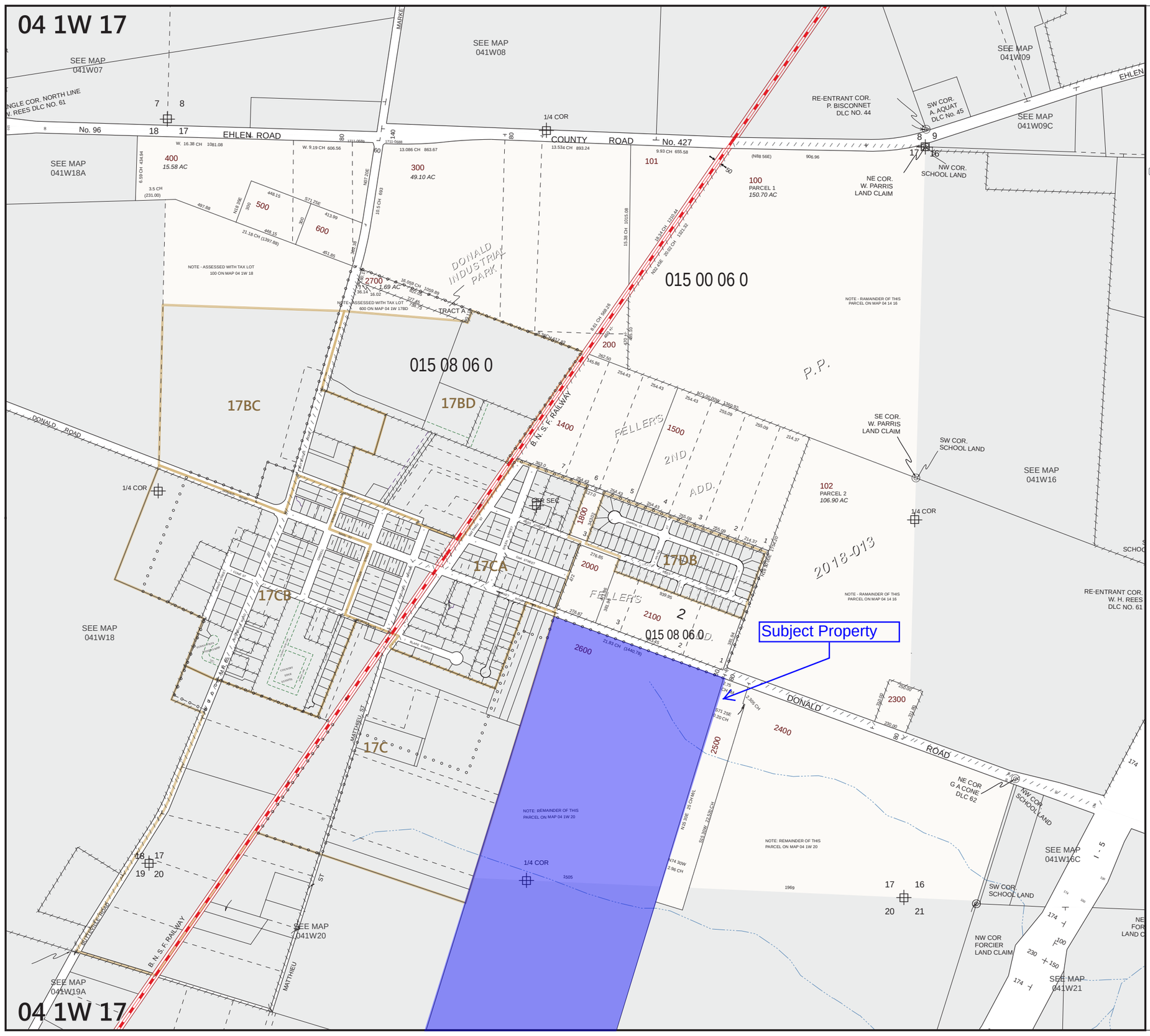
Date	Signature	Printed Name	I am a: PO	RV	OV	Address	Property Description or Parcel ID	Precinct Number
		Steve Catts	X			No situs	Map 041W17, Tax Lot 2600	N/A
		Steve Catts	X			No Situs	Map 041W20, Tax Lot 300	N/A

PO- Property Owner

RV – Registered Voter

OV – Owner and Registered Voter

Exhibit D: Marion County Assessor's Maps



04 1W 17
DONALD

MARION COUNTY, OREGON
SEC 17 T4S R1W W.M.
SCALE 1" = 400'

LEGEND

LINE TYPES

- Taxlot Boundary
- Historical Boundary
- Road Right-of-Way
- Easement
- Railroad Right-of-Way
- Railroad Centerline
- Private Road ROW
- Taxcode Line
- Subdivision/Plat Bndry
- Map Boundary
- Waterline - Taxlot Bndry
- Waterline - Non Bndry

CORNER TYPES

- 1/16TH Section Cor.
- 1/4 Section Cor.
- DLC Corner
- Section Corner (16, 15 / 21, 22)

NUMBERS

Tax Code Number

000 00 00 0

Acreage *0.25 AC*

All acres listed are Net Acres, excluding any portions of the taxlot within public ROWs

NOTES

Tick Marks: A tick mark in the road indicates that the labeled dimension extends into the public ROW

200.00
175.00

CANCELLED NUMBERS

800	2200
900	
1000	
1001	
1002	
1003	
1004	
1005	
1006	
1007	
1100	
1200	
1300	
1700	
1900	
1901	
2101	

DISCLAIMER: THIS MAP WAS PREPARED FOR ASSESSMENT PURPOSES ONLY

Marion County OREGON — Assessors Office Cartography Dept

FOR ADDITIONAL MAPS VISIT OUR WEBSITE AT www.co.marion.or.us

PLOT DATE: 4/18/2018

DONALD
04 1W 17

04 1W 20
DONALD

MARION COUNTY, OREGON
SEC 20 T4S R1W W.M.
SCALE 1" = 400'

LEGEND

LINE TYPES

- Taxlot Boundary
- Historical Boundary
- Road Right-of-Way
- Easement
- Railroad Right-of-Way
- Railroad Centerline
- Private Road ROW
- Taxcode Line
- Subdivision/Plat Bndry
- Map Boundary
- Waterline - Taxlot Bndry
- Waterline - Non Bndry

CORNER TYPES

- + 1/16TH Section Cor.
- 1/4 Section Cor.
- DLC Corner
- 16 15 / 21 22 Section Corner

NUMBERS

Tax Code Number
000 00 00 0

Acreage
0.25 AC

All acres listed are Net Acres, excluding any portions of the taxlot within public ROWs

NOTES

Tick Marks: A tick mark in the road indicates that the labeled dimension extends into the public ROW

200.00
175.00

CANCELLED NUMBERS

1700

DISCLAIMER: THIS MAP WAS PREPARED FOR ASSESSMENT PURPOSES ONLY

Marion County OREGON — Assessors Office Cartography Dept

FOR ADDITIONAL MAPS VISIT OUR WEBSITE AT
www.co.marion.or.us

PLOT DATE: 5/22/2018

DONALD
04 1W 20

Exhibit E: Property Ownership Information

TL 300

Fidelity National Title
Company of Oregon

1433 SW 6th Ave
(503)646-4444

OWNERSHIP AND ENCUMBRANCES REPORT WITH GENERAL INDEX LIENS
Informational Report of Ownership and Monetary and Non-Monetary Encumbrances

To ("Customer"): GK Machine Inc
PO Box 427
Donald, OR 97020

Customer Ref.: R11019
Order No.: 60221803129
Effective Date: May 24, 2018 at 08:00 AM
Charge: $400.00

The information contained in this report is furnished by Fidelity National Title Company of Oregon (the "Company") as a real property information service based on the records and indices maintained by the Company for the county identified below. THIS IS NOT TITLE INSURANCE OR A PRELIMINARY TITLE REPORT FOR, OR COMMITMENT FOR, TITLE INSURANCE. No examination has been made of the title to the herein described property, other than as specifically set forth herein. Liability for any loss arising from errors and/or omissions is limited to the lesser of the charge or the actual loss, and the Company will have no greater liability by reason of this report. THIS REPORT IS SUBJECT TO THE LIMITATIONS OF LIABILITY STATED BELOW, WHICH LIMITATIONS OF LIABILITY ARE A PART OF THIS REPORT.

THIS REPORT INCLUDES MONETARY AND NON-MONETARY ENCUMBRANCES.

Part One - Ownership and Property Description

Owner. The apparent vested owner of property ("the Property") as of the Effective Date is:

GRC Land Holdings LLC, an Oregon limited liability company

Premises. The Property is:

(a) Street Address:

R11019, OR

(b) Legal Description:

SEE EXHIBIT "A" ATTACHED HERETO AND MADE A PART HEREOF

Part Two - Encumbrances

Encumbrances. As of the Effective Date, the Property appears subject to the following monetary and non-monetary encumbrances of record, not necessarily listed in order of priority, including liens specific to the subject property and general index liens (liens that are not property specific but affect any real property of the named person in the same county):

EXCEPTIONS

SPECIFIC ITEMS AND EXCEPTIONS:

1. The Land has been classified as Farm Land, as disclosed by the tax roll. If the Land becomes disqualified, said Land may be subject to additional taxes and/or penalties.

2. Rights of the public to any portion of the Land lying within the area commonly known as streets, roads and highways.

3. Easement(s) for the purpose(s) shown below and rights incidental thereto, as granted in a document:

   Granted to: AT&T Communications -East, Inc. (formerly AT&T Communications, Inc.)
   Purpose: maintenance, upgrading and expanding cable, as well as to install new conduits and fiber or replacement technology
   Recording Date: October 28, 2008
   Recording No: Reel 3005, page 266

4. A deed of trust to secure an indebtedness in the amount shown below,

   Amount: $3,510,000.00
   Dated: February 2, 2016
   Trustor/Grantor: Stephen Dean Catts and Barbara Anne Catts, husband and wife, Gary Roy Grossen and Jeana Maria Grossen, husband and wife, Mark Allen Reiling and Faith Angela Reiling, husband and wife, GRC Land Holdings LLC, an Oregon limited liability company, Twin Springs Nursery Incorporated, an Oregon corporation, GK Machine Inc., an Oregon corporation and Reiling Farms, Inc., an Oregon corporation
   Trustee: First American Title Company of Oregon
   Beneficiary: Harvest Capital Company
   Loan No.: 21501960
   Recording Date: February 5, 2016
   Recording No.: Reel 3780, Page 500
   Affects: Includes additional property

   An assignment of the beneficial interest under said deed of trust which names:

   Assignee: U.S. Bank National Association, as Custodian/Trustee for Federal Agricultural Mortgage Corporation Programs
   Loan No.: 21501960
   Recording Date: February 5, 2016
   Recording No.: Reel 3781, Page 1

   NOTES:

   Note: Property taxes for the fiscal year shown below are paid in full.

   Fiscal Year: 2017-2018
   Amount: $397.12
   Levy Code: 1500060

Account No.: R11019
Map No.: 041W20 00300

Note: This map/plat is being furnished as an aid in locating the herein described Land in relation to adjoining streets, natural boundaries and other land. Except to the extent a policy of title insurance is expressly modified by endorsement, if any, the Company does not insure dimensions, distances or acreage shown thereon.

End of Reported Information

There will be additional charges for additional information or copies. For questions or additional requests, contact:

Chris Owen
503-796-6647
Chris.Owen@titlegroup.fntg.com

Fidelity National Title Company of Oregon
1433 SW 6th Ave
Portland, OR 97201

EXHIBIT "A"

Legal Description

Beginning at an iron pipe at the Southwest corner of the East one-half of the G. A. Cone Donation Land Claim in Township 4 South, Range 1 West of the Willamette Meridian in Marion County, Oregon; thence North 15°30' East, along the West line of the East one-half of said claim, 1170.00 feet; thence South 74°30' East, parallel with the South line of said Cone Donation Land Claim, 1049.99 feet to an iron pipe; thence South 15°30' West 1170.00 feet to the South line of said claim; thence North 74°30' West 1049.99 feet to the place of beginning.

LIMITATIONS OF LIABILITY

"CUSTOMER" REFERS TO THE RECIPIENT OF THIS REPORT.

CUSTOMER EXPRESSLY AGREES AND ACKNOWLEDGES THAT IT IS EXTREMELY DIFFICULT, IF NOT IMPOSSIBLE, TO DETERMINE THE EXTENT OF LOSS WHICH COULD ARISE FROM ERRORS OR OMISSIONS IN, OR THE COMPANY'S NEGLIGENCE IN PRODUCING, THE REQUESTED REPORT, HEREIN "THE REPORT." CUSTOMER RECOGNIZES THAT THE FEE CHARGED IS NOMINAL IN RELATION TO THE POTENTIAL LIABILITY WHICH COULD ARISE FROM SUCH ERRORS OR OMISSIONS OR NEGLIGENCE. THEREFORE, CUSTOMER UNDERSTANDS THAT THE COMPANY IS NOT WILLING TO PROCEED IN THE PREPARATION AND ISSUANCE OF THE REPORT UNLESS THE COMPANY'S LIABILITY IS STRICTLY LIMITED. CUSTOMER AGREES WITH THE PROPRIETY OF SUCH LIMITATION AND AGREES TO BE BOUND BY ITS TERMS

THE LIMITATIONS ARE AS FOLLOWS AND THE LIMITATIONS WILL SURVIVE THE CONTRACT:

ONLY MATTERS IDENTIFIED IN THIS REPORT AS THE SUBJECT OF THE REPORT ARE WITHIN ITS SCOPE. ALL OTHER MATTERS ARE OUTSIDE THE SCOPE OF THE REPORT.

CUSTOMER AGREES, AS PART OF THE CONSIDERATION FOR THE ISSUANCE OF THE REPORT AND TO THE FULLEST EXTENT PERMITTED BY LAW, TO LIMIT THE LIABILITY OF THE COMPANY, ITS LICENSORS, AGENTS, SUPPLIERS, RESELLERS, SERVICE PROVIDERS, CONTENT PROVIDERS AND ALL OTHER SUBSCRIBERS OR SUPPLIERS, SUBSIDIARIES, AFFILIATES, EMPLOYEES, AND SUBCONTRACTORS FOR ANY AND ALL CLAIMS, LIABILITIES, CAUSES OF ACTION, LOSSES, COSTS, DAMAGES AND EXPENSES OF ANY NATURE WHATSOEVER, INCLUDING ATTORNEY'S FEES, HOWEVER ALLEGED OR ARISING, INCLUDING BUT NOT LIMITED TO THOSE ARISING FROM BREACH OF CONTRACT, NEGLIGENCE, THE COMPANY'S OWN FAULT AND/OR NEGLIGENCE, ERRORS, OMISSIONS, STRICT LIABILITY, BREACH OF WARRANTY, EQUITY, THE COMMON LAW, STATUTE OR ANY OTHER THEORY OF RECOVERY, OR FROM ANY PERSON'S USE, MISUSE, OR INABILITY TO USE THE REPORT OR ANY OF THE MATERIALS CONTAINED THEREIN OR PRODUCED**, SO THAT THE TOTAL AGGREGATE LIABILITY OF THE COMPANY AND ITS AGENTS, SUBSIDIARIES, AFFILIATES, EMPLOYEES, AND SUBCONTRACTORS SHALL NOT IN ANY EVENT EXCEED THE COMPANY'S TOTAL FEE FOR THE REPORT.**

CUSTOMER AGREES THAT THE FOREGOING LIMITATION ON LIABILITY IS A TERM MATERIAL TO THE PRICE THE CUSTOMER IS PAYING, WHICH PRICE IS LOWER THAN WOULD OTHERWISE BE OFFERED TO THE CUSTOMER WITHOUT SAID TERM. CUSTOMER RECOGNIZES THAT THE COMPANY WOULD NOT ISSUE THE REPORT BUT FOR THIS CUSTOMER AGREEMENT, AS PART OF THE CONSIDERATION GIVEN FOR THE REPORT, TO THE FOREGOING LIMITATION OF LIABILITY AND THAT ANY SUCH LIABILITY IS CONDITIONED AND PREDICATED UPON THE FULL AND TIMELY PAYMENT OF THE COMPANY'S INVOICE FOR THE REPORT.

THE REPORT IS LIMITED IN SCOPE AND IS NOT AN ABSTRACT OF TITLE, TITLE OPINION, PRELIMINARY TITLE REPORT, TITLE REPORT, COMMITMENT TO ISSUE TITLE INSURANCE, OR A TITLE POLICY, AND SHOULD NOT BE RELIED UPON AS SUCH. THE REPORT DOES NOT PROVIDE OR OFFER ANY TITLE INSURANCE, LIABILITY COVERAGE OR ERRORS AND OMISSIONS COVERAGE. THE REPORT IS NOT TO BE RELIED UPON AS A REPRESENTATION OF THE STATUS OF TITLE TO THE PROPERTY. THE COMPANY MAKES NO REPRESENTATIONS AS TO THE REPORT'S ACCURACY, DISCLAIMS ANY WARRANTY AS TO THE REPORT, ASSUMES NO DUTIES TO CUSTOMER, DOES NOT INTEND FOR CUSTOMER TO RELY ON THE REPORT, AND ASSUMES NO LIABILITY FOR ANY LOSS OCCURRING BY REASON OF RELIANCE ON THE REPORT OR OTHERWISE.

IF CUSTOMER (A) HAS OR WILL HAVE AN INSURABLE INTEREST IN THE SUBJECT REAL PROPERTY, (B) DOES NOT WISH TO LIMIT LIABILITY AS STATED HEREIN AND (C) DESIRES THAT ADDITIONAL LIABILITY BE ASSUMED BY THE COMPANY, THEN CUSTOMER MAY REQUEST AND PURCHASE A POLICY OF TITLE INSURANCE, A BINDER, OR A COMMITMENT TO ISSUE A POLICY OF TITLE INSURANCE. NO ASSURANCE IS GIVEN AS TO THE INSURABILITY OF THE TITLE OR STATUS OF TITLE. CUSTOMER EXPRESSLY AGREES AND ACKNOWLEDGES IT HAS AN INDEPENDENT DUTY TO ENSURE AND/OR RESEARCH THE ACCURACY OF ANY INFORMATION OBTAINED FROM THE COMPANY OR ANY PRODUCT OR SERVICE PURCHASED.

NO THIRD PARTY IS PERMITTED TO USE OR RELY UPON THE INFORMATION SET FORTH IN THE REPORT, AND NO LIABILITY TO ANY THIRD PARTY IS UNDERTAKEN BY THE COMPANY.

CUSTOMER AGREES THAT, TO THE FULLEST EXTENT PERMITTED BY LAW, IN NO EVENT WILL THE COMPANY, ITS LICENSORS, AGENTS, SUPPLIERS, RESELLERS, SERVICE PROVIDERS, CONTENT PROVIDERS, AND ALL OTHER SUBSCRIBERS OR SUPPLIERS, SUBSIDIARIES, AFFILIATES, EMPLOYEES AND SUBCONTRACTORS BE LIABLE FOR CONSEQUENTIAL, INCIDENTAL, INDIRECT, PUNITIVE, EXEMPLARY, OR SPECIAL DAMAGES, OR LOSS OF PROFITS, REVENUE, INCOME, SAVINGS, DATA, BUSINESS, OPPORTUNITY, OR GOODWILL, PAIN AND SUFFERING, EMOTIONAL DISTRESS, NON-OPERATION OR INCREASED EXPENSE OF OPERATION, BUSINESS INTERRUPTION OR DELAY, COST OF CAPITAL, OR COST OF REPLACEMENT PRODUCTS OR SERVICES, REGARDLESS OF WHETHER SUCH LIABILITY IS BASED ON BREACH OF CONTRACT, TORT, NEGLIGENCE, THE COMPANY'S OWN FAULT AND/OR NEGLIGENCE, STRICT LIABILITY, BREACH OF WARRANTIES, FAILURE OF ESSENTIAL PURPOSE, OR OTHERWISE AND WHETHER CAUSED BY NEGLIGENCE, ERRORS, OMISSIONS, STRICT LIABILITY, BREACH OF CONTRACT, BREACH OF WARRANTY, THE COMPANY'S OWN FAULT AND/OR NEGLIGENCE OR ANY OTHER CAUSE WHATSOEVER, AND EVEN IF THE COMPANY HAS BEEN ADVISED OF THE LIKELIHOOD OF SUCH DAMAGES OR KNEW OR SHOULD HAVE KNOWN OF THE POSSIBILITY FOR SUCH DAMAGES.

END OF THE LIMITATIONS OF LIABILITY

TL 2600

Fidelity National Title
Company of Oregon

1433 SW 6th Ave
(503)646-4444

OWNERSHIP AND ENCUMBRANCES REPORT WITH GENERAL INDEX LIENS
Informational Report of Ownership and Monetary and Non-Monetary Encumbrances

To ("Customer"): GK Machine Inc
PO Box 427
Donald, OR 97020

Customer Ref.: R11018
Order No.: 60221803130
Effective Date: May 24, 2018 at 08:00 AM
Charge: $400.00

The information contained in this report is furnished by Fidelity National Title Company of Oregon (the "Company") as a real property information service based on the records and indices maintained by the Company for the county identified below. THIS IS NOT TITLE INSURANCE OR A PRELIMINARY TITLE REPORT FOR, OR COMMITMENT FOR, TITLE INSURANCE. No examination has been made of the title to the herein described property, other than as specifically set forth herein. Liability for any loss arising from errors and/or omissions is limited to the lesser of the charge or the actual loss, and the Company will have no greater liability by reason of this report. THIS REPORT IS SUBJECT TO THE LIMITATIONS OF LIABILITY STATED BELOW, WHICH LIMITATIONS OF LIABILITY ARE A PART OF THIS REPORT.

THIS REPORT INCLUDES MONETARY AND NON-MONETARY ENCUMBRANCES.

Part One - Ownership and Property Description

Owner. The apparent vested owner of property ("the Property") as of the Effective Date is:

GRC Land Holdings LLC, an Oregon limited liability company

Premises. The Property is:

(a) Street Address:

R11018, OR

(b) Legal Description:

SEE EXHIBIT "A" ATTACHED HERETO AND MADE A PART HEREOF

Part Two - Encumbrances

Encumbrances. As of the Effective Date, the Property appears subject to the following monetary and non-monetary encumbrances of record, not necessarily listed in order of priority, including liens specific to the subject property and general index liens (liens that are not property specific but affect any real property of the named person in the same county):

EXCEPTIONS

SPECIFIC ITEMS AND EXCEPTIONS:

1. The Land has been classified as Farm Land, as disclosed by the tax roll. If the Land becomes disqualified, said Land may be subject to additional taxes and/or penalties.

2. Rights of the public to any portion of the Land lying within the area commonly known as streets, roads and highways.

3. The rights of the public and governmental bodies for fishing, navigation and commerce in and to any portion of the Land herein described, lying below the high water line of the Seneschal Creek.

4. The right, title and interest of the State of Oregon in and to any portion lying below the high water line of Seneschal Creek.

5. Easement(s) for the purpose(s) shown below and rights incidental thereto, as granted in a document:

   Granted to: Telephone Utilities of Oregon
   Purpose: telephone line or system and appurtenances
   Recording Date: September 17, 1982
   Recording No: Reel 290, page 1786
   Affects: Exact location not set forth.

6. A deed of trust to secure an indebtedness in the amount shown below,

   Amount: $3,510,000.00
   Dated: February 2, 2016
   Trustor/Grantor: Stephen Dean Catts and Barbara Anne Catts, husband and wife, Gary Roy Grossen and Jeana Maria Grossen, husband and wife, Mark Allen Reiling and Faith Angela Reiling, husband and wife, GRC Land Holdings LLC, an Oregon limited liability company, Twin Springs Nursery Incorporated, an Oregon corporation, GK Machine Inc., an Oregon corporation and Reiling Farms, Inc., an Oregon corporation
   Trustee: First American Title Company of Oregon
   Beneficiary: Harvest Capital Company
   Loan No.: 21501960
   Recording Date: February 5, 2016
   Recording No.: Reel 3780, Page 500
   Affects: Includes additional property

   An assignment of the beneficial interest under said deed of trust which names:

   Assignee: U.S. Bank National Association, as Custodian/Trustee for Federal Agricultural Mortgage Corporation Programs
   Loan No.: 21501960
   Recording Date: February 5, 2016
   Recording No.: Reel 3781, Page 1

   NOTES:

Note: Property taxes for the fiscal year shown below are paid in full.

Fiscal Year:	2017-2018
Amount:	$1,299.81
Levy Code:	1500060
Account No.:	R11018
Map No.:	041W17 02600

Note: This map/plat is being furnished as an aid in locating the herein described Land in relation to adjoining streets, natural boundaries and other land. Except to the extent a policy of title insurance is expressly modified by endorsement, if any, the Company does not insure dimensions, distances or acreage shown thereon.

End of Reported Information

There will be additional charges for additional information or copies. For questions or additional requests, contact:

Chris Owen
503-796-6647
Chris.Owen@titlegroup.fntg.com

Fidelity National Title Company of Oregon
1433 SW 6th Ave
Portland, OR 97201

EXHIBIT "A"

Legal Description

Beginning on the North line of the G. A. Cone Donation Land Claim in Township 4 South, Range 1 West of the Willamette Meridian in Marion County, Oregon, at a point which is 15.984 chains South 71°25' East from the Northwest corner of the East one half of said claim, said point being also the Northwest corner of a tract of land conveyed in Volume 158, page 422 of the Marion County Deed Records; thence South 71°25' East, along the North line of said Cone Donation Land Claim, 1254.55 feet to the Northwest corner of a tract of land conveyed in Volume 544, page 460 of Marion County Deed Records; thence South 15°27' West, along the West line of said tract and the West line of a tract of land convey in Volume 471, page 301 of Marion County Deed Records, a distance of 3174.90 feet to the South line of said Cone Donation Land Claim; thence North 74°30' West, along the South line of said Cone Donation Land Claim, 1255.45 feet to the Southwest corner of said tract of land conveyed in Volume 158, page 422, Marion County Deed Records; thence North 15°30' East, along the West line of said tact of land conveyed in Volume 158, page 422, a distance of 3243.47 feet to the place of beginning.

LIMITATIONS OF LIABILITY

"CUSTOMER" REFERS TO THE RECIPIENT OF THIS REPORT.

CUSTOMER EXPRESSLY AGREES AND ACKNOWLEDGES THAT IT IS EXTREMELY DIFFICULT, IF NOT IMPOSSIBLE, TO DETERMINE THE EXTENT OF LOSS WHICH COULD ARISE FROM ERRORS OR OMISSIONS IN, OR THE COMPANY'S NEGLIGENCE IN PRODUCING, THE REQUESTED REPORT, HEREIN "THE REPORT." CUSTOMER RECOGNIZES THAT THE FEE CHARGED IS NOMINAL IN RELATION TO THE POTENTIAL LIABILITY WHICH COULD ARISE FROM SUCH ERRORS OR OMISSIONS OR NEGLIGENCE. THEREFORE, CUSTOMER UNDERSTANDS THAT THE COMPANY IS NOT WILLING TO PROCEED IN THE PREPARATION AND ISSUANCE OF THE REPORT UNLESS THE COMPANY'S LIABILITY IS STRICTLY LIMITED. CUSTOMER AGREES WITH THE PROPRIETY OF SUCH LIMITATION AND AGREES TO BE BOUND BY ITS TERMS

THE LIMITATIONS ARE AS FOLLOWS AND THE LIMITATIONS WILL SURVIVE THE CONTRACT:

ONLY MATTERS IDENTIFIED IN THIS REPORT AS THE SUBJECT OF THE REPORT ARE WITHIN ITS SCOPE. ALL OTHER MATTERS ARE OUTSIDE THE SCOPE OF THE REPORT.

CUSTOMER AGREES, AS PART OF THE CONSIDERATION FOR THE ISSUANCE OF THE REPORT AND TO THE FULLEST EXTENT PERMITTED BY LAW, TO LIMIT THE LIABILITY OF THE COMPANY, ITS LICENSORS, AGENTS, SUPPLIERS, RESELLERS, SERVICE PROVIDERS, CONTENT PROVIDERS AND ALL OTHER SUBSCRIBERS OR SUPPLIERS, SUBSIDIARIES, AFFILIATES, EMPLOYEES, AND SUBCONTRACTORS FOR ANY AND ALL CLAIMS, LIABILITIES, CAUSES OF ACTION, LOSSES, COSTS, DAMAGES AND EXPENSES OF ANY NATURE WHATSOEVER, INCLUDING ATTORNEY'S FEES, HOWEVER ALLEGED OR ARISING, INCLUDING BUT NOT LIMITED TO THOSE ARISING FROM BREACH OF CONTRACT, NEGLIGENCE, THE COMPANY'S OWN FAULT AND/OR NEGLIGENCE, ERRORS, OMISSIONS, STRICT LIABILITY, BREACH OF WARRANTY, EQUITY, THE COMMON LAW, STATUTE OR ANY OTHER THEORY OF RECOVERY, OR FROM ANY PERSON'S USE, MISUSE, OR INABILITY TO USE THE REPORT OR ANY OF THE MATERIALS CONTAINED THEREIN OR PRODUCED**, SO THAT THE TOTAL AGGREGATE LIABILITY OF THE COMPANY AND ITS AGENTS, SUBSIDIARIES, AFFILIATES, EMPLOYEES, AND SUBCONTRACTORS SHALL NOT IN ANY EVENT EXCEED THE COMPANY'S TOTAL FEE FOR THE REPORT.**

CUSTOMER AGREES THAT THE FOREGOING LIMITATION ON LIABILITY IS A TERM MATERIAL TO THE PRICE THE CUSTOMER IS PAYING, WHICH PRICE IS LOWER THAN WOULD OTHERWISE BE OFFERED TO THE CUSTOMER WITHOUT SAID TERM. CUSTOMER RECOGNIZES THAT THE COMPANY WOULD NOT ISSUE THE REPORT BUT FOR THIS CUSTOMER AGREEMENT, AS PART OF THE CONSIDERATION GIVEN FOR THE REPORT, TO THE FOREGOING LIMITATION OF LIABILITY AND THAT ANY SUCH LIABILITY IS CONDITIONED AND PREDICATED UPON THE FULL AND TIMELY PAYMENT OF THE COMPANY'S INVOICE FOR THE REPORT.

THE REPORT IS LIMITED IN SCOPE AND IS NOT AN ABSTRACT OF TITLE, TITLE OPINION, PRELIMINARY TITLE REPORT, TITLE REPORT, COMMITMENT TO ISSUE TITLE INSURANCE, OR A TITLE POLICY, AND SHOULD NOT BE RELIED UPON AS SUCH. THE REPORT DOES NOT PROVIDE OR OFFER ANY TITLE INSURANCE, LIABILITY COVERAGE OR ERRORS AND OMISSIONS COVERAGE. THE REPORT IS NOT TO BE RELIED UPON AS A REPRESENTATION OF THE STATUS OF TITLE TO THE PROPERTY. THE COMPANY MAKES NO REPRESENTATIONS AS TO THE REPORT'S ACCURACY, DISCLAIMS ANY WARRANTY AS TO THE REPORT, ASSUMES NO DUTIES TO CUSTOMER, DOES NOT INTEND FOR CUSTOMER TO RELY ON THE REPORT, AND ASSUMES NO LIABILITY FOR ANY LOSS OCCURRING BY REASON OF RELIANCE ON THE REPORT OR OTHERWISE.

IF CUSTOMER (A) HAS OR WILL HAVE AN INSURABLE INTEREST IN THE SUBJECT REAL PROPERTY, (B) DOES NOT WISH TO LIMIT LIABILITY AS STATED HEREIN AND (C) DESIRES THAT ADDITIONAL LIABILITY BE ASSUMED BY THE COMPANY, THEN CUSTOMER MAY REQUEST AND PURCHASE A POLICY OF TITLE INSURANCE, A BINDER, OR A COMMITMENT TO ISSUE A POLICY OF TITLE INSURANCE. NO ASSURANCE IS GIVEN AS TO THE INSURABILITY OF THE TITLE OR STATUS OF TITLE. CUSTOMER EXPRESSLY AGREES AND ACKNOWLEDGES IT HAS AN INDEPENDENT DUTY TO ENSURE AND/OR RESEARCH THE ACCURACY OF ANY INFORMATION OBTAINED FROM THE COMPANY OR ANY PRODUCT OR SERVICE PURCHASED.

NO THIRD PARTY IS PERMITTED TO USE OR RELY UPON THE INFORMATION SET FORTH IN THE REPORT, AND NO LIABILITY TO ANY THIRD PARTY IS UNDERTAKEN BY THE COMPANY.

CUSTOMER AGREES THAT, TO THE FULLEST EXTENT PERMITTED BY LAW, IN NO EVENT WILL THE COMPANY, ITS LICENSORS, AGENTS, SUPPLIERS, RESELLERS, SERVICE PROVIDERS, CONTENT PROVIDERS, AND ALL OTHER SUBSCRIBERS OR SUPPLIERS, SUBSIDIARIES, AFFILIATES, EMPLOYEES AND SUBCONTRACTORS BE LIABLE FOR CONSEQUENTIAL, INCIDENTAL, INDIRECT, PUNITIVE, EXEMPLARY, OR SPECIAL DAMAGES, OR LOSS OF PROFITS, REVENUE, INCOME, SAVINGS, DATA, BUSINESS, OPPORTUNITY, OR GOODWILL, PAIN AND SUFFERING, EMOTIONAL DISTRESS, NON-OPERATION OR INCREASED EXPENSE OF OPERATION, BUSINESS INTERRUPTION OR DELAY, COST OF CAPITAL, OR COST OF REPLACEMENT PRODUCTS OR SERVICES, REGARDLESS OF WHETHER SUCH LIABILITY IS BASED ON BREACH OF CONTRACT, TORT, NEGLIGENCE, THE COMPANY'S OWN FAULT AND/OR NEGLIGENCE, STRICT LIABILITY, BREACH OF WARRANTIES, FAILURE OF ESSENTIAL PURPOSE, OR OTHERWISE AND WHETHER CAUSED BY NEGLIGENCE, ERRORS, OMISSIONS, STRICT LIABILITY, BREACH OF CONTRACT, BREACH OF WARRANTY, THE COMPANY'S OWN FAULT AND/OR NEGLIGENCE OR ANY OTHER CAUSE WHATSOEVER, AND EVEN IF THE COMPANY HAS BEEN ADVISED OF THE LIKELIHOOD OF SUCH DAMAGES OR KNEW OR SHOULD HAVE KNOWN OF THE POSSIBILITY FOR SUCH DAMAGES.

END OF THE LIMITATIONS OF LIABILITY

REEL 4251 PAGE 406
MARION COUNTY
BILL BURGESS, COUNTY CLERK
10-08-2019 02:43 pm.
Control Number 571691 $ 106.00
Instrument 2019 00048444

REEL 4251 PAGE 338
MARION COUNTY
BILL BURGESS, COUNTY CLERK
10-08-2019 11:29 am.
Control Number 571631 $ 86.00
Instrument 2019 00048376

After recording return to:
JoAnn Agee
PO Box 427
Donald, OR 97020

Sent Tax Statements To:
No changes

This instrument filed for record by LEX/ Fidelity National Title as an accommodation only. It has not been examined as to its execution or as to its effect upon the title.
#33594CCO

BARGAIN AND SALE DEED
Property Line Adjustment

GRC Land Holdings LLC, an Oregon limited liability company, Grantor, conveys to GRC Land Holdings LLC, an Oregon limited liability company, Grantee, the following real property situated in Marion County, State of Oregon.

Exhibit D: Exchange Areas

BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSONS RIGHTS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009, AND SECTIONS 2 TO 7, CHAPTER 8, OREGON LAWS 2010. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009, AND SECTIONS 2 TO 7, CHAPTER 8, OREGON LAWS 2010.

The purpose of this conveyance is to effectuate a property line adjustment.

Grantors adjusted legal:
Exhibit A (Took title under Parcel I of Deed Reel 3780, Page 499)
Exhibit B (Took title under Parcel IV of Deed Reel 3780, Page 499)

Grantees adjusted legal:
Exhibit C (Took title under Exhibit D of Deed Reel 4065, Page 435)

Re-recording Reel 4251 Page 338 at request of Fidelity National Title to include exhibits.

Dated this 3 day of October, 2019.

GRC Land Holdings LLC

By: JoAnn Agee
Title: Member

OFFICIAL STAMP
YVETTE ANGELA CARRAZCO
NOTARY PUBLIC - OREGON
COMMISSION NO. 983140
MY COMMISSION EXPIRES JANUARY 16, 2023

STATE OF OREGON, County of Marion) ss

This instrument was acknowledged before me on this 3 day of October, 2019 by JoAnn Agee, as Member of GRC Land Holdings LLC.

Notary Public for Oregon
My commission expires: January 16, 2023

AKS ENGINEERING & FORESTRY, LLC
12965 SW Herman Road, Suite 100, Tualatin, OR 97062
P: (503) 563-6151 F: (503) 563-6152
OFFICES IN: TUALATIN, OR - VANCOUVER, WA - KEIZER, OR - BEND, OR

AKS Job #6732

EXHIBIT A

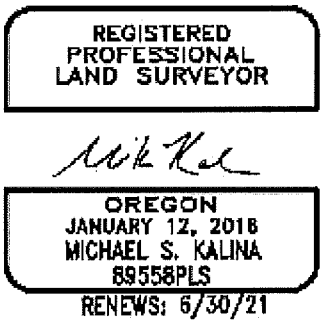
Adjusted Parcel I of Deed Reel 3780, Page 499

A portion of the East One-Half of the G.A. Cone Donation Land Claim Number 62, located in the South One-Half of Section 17 and the North One-Half of Section 20, Township 4 South, Range 1 West, Willamette Meridian, Marion County, Oregon, and being more particularly described as follows:

Beginning at the northwest corner of the East One-Half of said G.A. Cone Donation Land Claim Number 62, being a 3-inch brass disk on the centerline of Donald Road NE; thence along said centerline, South 69°38'57" East 1054.00 feet to the northerly extension of the west line of Parcel I of Deed Reel 3780, Page 499; thence along said northerly extension, South 17°15'24" West 30.04 feet to the south right-of-way line of said Donald Road NE (30.00 feet from the centerline), and the northwest corner of said Parcel I and the True Point of Beginning; thence along said south right-of-way line (30.00 feet from the centerline), South 69°38'57" East 1256.32 feet to the east line of said Parcel I; thence along said east line, South 17°14'13" West 1779.39 feet; thence leaving said east line, North 72°57'36" West 1255.11 feet to the west line of said Parcel I; thence along said west line, North 17°15'24" East 1851.95 feet to the True Point of Beginning.

The above described tract of land contains 52.30 acres, more or less.

7/31/2019



AKS ENGINEERING & FORESTRY, LLC
12965 SW Herman Road, Suite 100, Tualatin, OR 97062
P: (503) 563-6151 F: (503) 563-6152
OFFICES IN: TUALATIN, OR - VANCOUVER, WA - KEIZER, OR - BEND, OR

AKS Job #6732

EXHIBIT B

Adjusted Parcel IV of Deed Reel 3780, Page 499

A portion of the East One-Half of the G.A. Cone Donation Land Claim Number 62, located in the South One-Half of Section 17 and the North One-Half of Section 20, Township 4 South, Range 1 West, Willamette Meridian, Marion County, Oregon, and being more particularly described as follows:

Beginning at the southwest corner of the East One-Half of said G.A. Cone Donation Land Claim Number 62, being a 3/4-inch iron pipe at the southwest corner of Parcel IV of Deed Reel 3780, Page 499; thence along the west line of the East One-Half of said Donation Land Claim Number 62, North 17°06'50" East 784.80 feet to the True Point of Beginning; thence continuing along said west line, North 17°06'50" East 387.89 feet to the north line of said Parcel IV; thence along said north line, South 72°53'11" East 1047.16 feet to the east line of said Parcel IV; thence along said east line, South 17°15'24" West 387.89 feet; thence leaving said east line, North 72°53'11" West 1046.19 feet to the True Point of Beginning.

The above described tract of land contains 9.32 acres, more or less.

7/31/2019

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
JANUARY 12, 2016
MICHAEL S. KALINA
89558PLS
RENEWS: 6/30/21

AKS ENGINEERING & FORESTRY, LLC
12965 SW Herman Road, Suite 100, Tualatin, OR 97062
P: (503) 563-6151 F: (503) 563-6152
OFFICES IN: TUALATIN, OR - VANCOUVER, WA - KEIZER, OR - BEND, OR

AKS Job #6732

EXHIBIT C

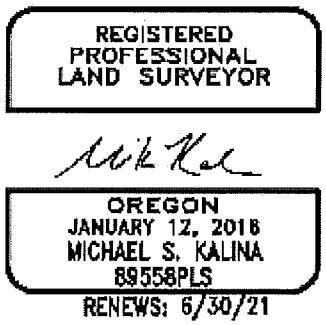
Adjusted Exhibit D of Deed Reel 4065, Page 435

A portion of the East One-Half of the G.A. Cone Donation Land Claim Number 62 located in the South One-Half of Section 17 and the North One-Half of Section 20, Township 4 South, Range 1 West, Willamette Meridian, Marion County, Oregon, and being more particularly described as follows:

Beginning at the southwest corner of the East One-Half of said G.A. Cone Donation Land Claim Number 62, being a 3/4-inch iron pipe at the southwest corner of Parcel IV of Deed Reel 3780, Page 499; thence along the west line of the East One-Half of said Donation Land Claim Number 62, North 17°06'50" East 784.80 feet; thence leaving said west line, South 72°53'11" East 1046.19 feet to the west line of Parcel I of Deed Reel 3780, Page 499; thence along said west line, North 17°15'24" East 584.60 feet; thence leaving said west line, South 72°57'36" East 1255.11 feet to the east line of said Parcel I; thence along said east line, South 17°14'13" West 1367.95 feet to the south line of said Donation Land Claim Number 62; thence along said south line, North 72°57'36" West 409.14 feet to the east line of Exhibit D of Deed Reel 4065, Page 435; thence along said east line, South 18°22'30" West 1255.41 feet to the north right-of way line of Feller Road NE (20.00 feet from the centerline); thence along said north right-of-way line, North 71°37'56" West 1189.14 feet to the west line of said Exhibit D; thence along said west line, North 18°22'30" East 1227.82 feet to the south line of said Donation Land Claim Number 62; thence along said south line, North 72°57'57" West 701.21 feet to the Point of Beginning.

The above described tract of land contains 92.13 acres, more or less.

7/31/2019



AKS ENGINEERING & FORESTRY, LLC
12965 SW Herman Road, Suite 100, Tualatin, OR 97062
P: (503) 563-6151 F: (503) 563-6152
OFFICES IN: TUALATIN, OR - VANCOUVER, WA - KEIZER, OR - BEND, OR

AKS Job #6732

EXHIBIT D

Exchange Areas

Tracts of land, being portions of the East One-Half of the G.A. Cone Donation Land Claim Number 62 located in the South One-Half of Section 17 and the North One-Half of Section 20, Township 4 South, Range 1 West, Willamette Meridian, Marion County, Oregon, and being more particularly described as follows:

Exchange Area 1:
Beginning at the southwest corner of the East One-Half of said G.A. Cone Donation Land Claim Number 62, being a 3/4-inch iron pipe at the southwest corner of Parcel IV of Deed Reel 3780, Page 499; thence along the west line of the East One-Half of said Donation Land Claim Number 62, North 17°06'50" East 784.80 feet; thence leaving said west line, South 72°53'11" East 1046.19 feet to the east line of said Parcel IV; thence along said east line, South 17°15'24" 783.35 feet to the south line of said Donation Land Claim Number 62; thence along said south line, North 72°57'57" West 1044.24 feet to the Point of Beginning.

The above described tract of land contains 18.81 acres, more or less.

Exchange Area 2:
Beginning at the southwest corner of the East One-Half of said G.A. Cone Donation Land Claim Number 62, being a 3/4-inch iron pipe at the southwest corner of Parcel IV of Deed Reel 3780, Page 499; thence along the south line of said Donation Land Claim Number 62, South 72°57'57" East 1044.24 feet to True Point of Beginning, said point also being the southwest corner of Parcel I of Deed Reel 3780, Page 499; thence along the west line of said Parcel I, North 17°15'24" East 1367.95 feet; thence leaving said west line, South 72°57'36" East 1255.11 feet to the east line of said Parcel I; thence along the east line of said Parcel I, South 17°14'13" West 1367.95 feet to the south line of said Donation Land Claim Number 62; thence along said south line, North 72°57'36" West 1255.58 feet to the True Point of Beginning.

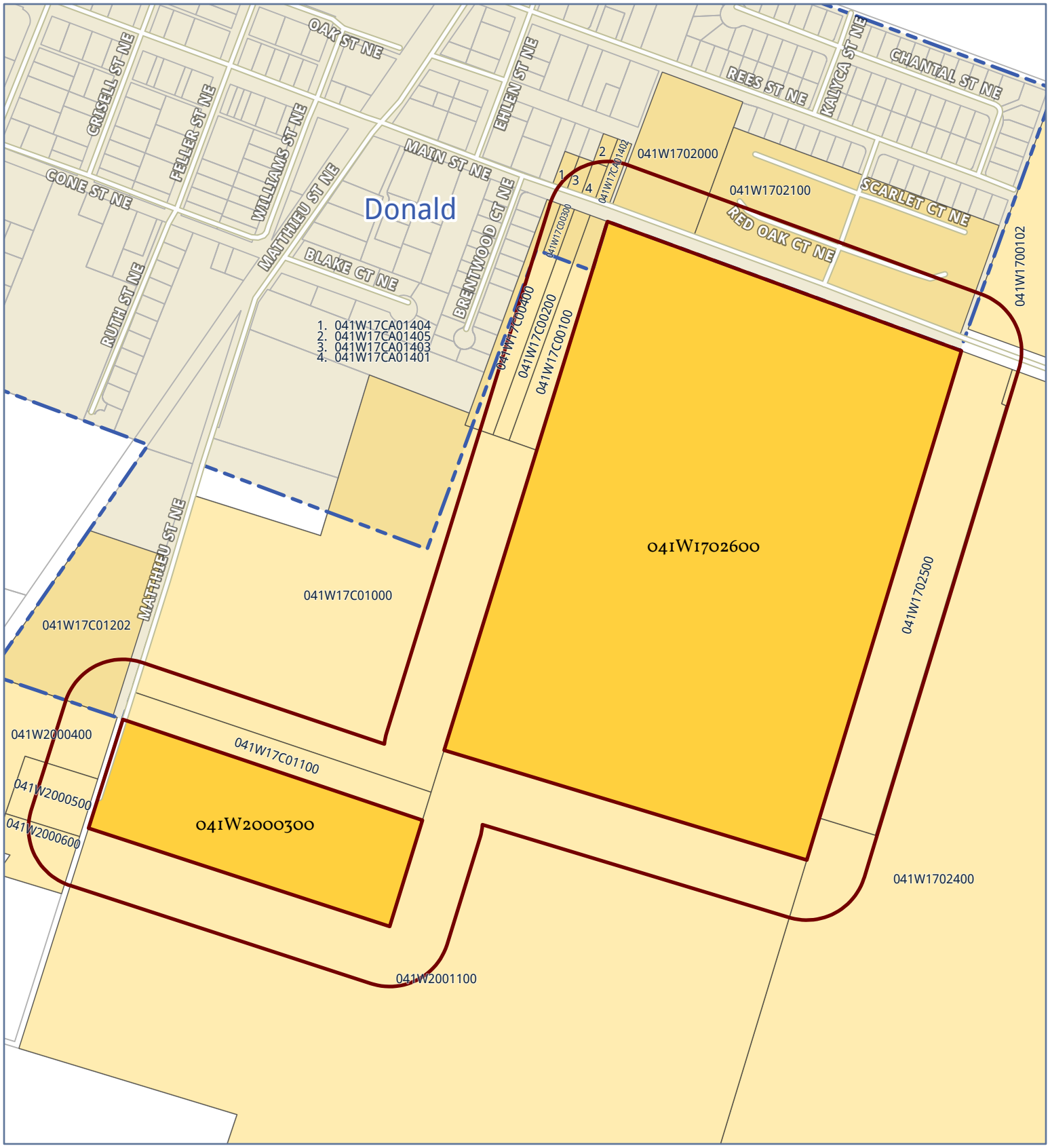
The above described tract of land contains 39.42 acres, more or less.

7/31/2019

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
JANUARY 12, 2016
MICHAEL S. KALINA
89558PLS
RENEWS: 6/30/21

Exhibit F: Noticing Labels



Feet
0 100 200

Notification Area

- Subject property
- Buffer
- Notification parcels
- City limits
- Incorporated area

Fidelity National Title
PORTLAND

Map prepared 3/16/2020
by Fidelity National Title
503.227.5478 ~ csrequest@fnf.com

This map/plat is being furnished as an aid in locating the herein described Land in relation to adjoining streets, natural boundaries and other land, and is not a survey of the land depicted. Except to the extent a policy of title insurance is expressly modified by endorsement, if any, the Company does not insure dimensions, distances, location of easements, acreage or other matters shown thereon.

Data Sources: Metro RLIS, CoreLogic
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

041W17 00102
Haener, Marie Louise 16.6
11424 Ehlen Rd NE
Aurora, OR 97002

041W17 02000
Marty, Anton-Estate Of
11101 Main St NE
Donald, OR 97020

041W17 02400
Gilles Beverly & Lt Gilles
11200 Donald Rd NE
Aurora, OR 97002

041W17 02500
Gilles Beverly & Lt Gilles
11200 Donald Rd NE
Aurora, OR 97002

041W17C 00100
Frank & Judy Vanderwood
PO Box 396
Donald, OR 97020

041W17C 00200
Frank & Judy Vanderwood
PO Box 396
Donald, OR 97020

041W17C 00300
Nick & Holly Diede
10960 Main St NE
Donald, OR 97020

041W17C 00400
Kbde LLC
6401 S Miller Rd
Hubbard, OR 97032

041W17C 01000
Kbde LLC
6401 S Miller Rd
Hubbard, OR 97032

041W17C 01100
Kbde LLC
6401 S Miller Rd
Hubbard, OR 97032

041W17C 01202
Donald Hutt
PO Box 1478
Sisters, OR 97759

041W17CA01401
Lt Casale
24264 Klupengen Rd NE
Aurora, OR 97002

041W17CA01402
Malcolm & Alice Bentz
PO Box 509
Donald, OR 97020

041W17CA01403
Darla Biggar
PO Box 365
Donald, OR 97020

041W17CA01404
Lori Spitler
10939 Main St NE
Donald, OR 97020

041W17CA01405
William Daily Jr
PO Box 649
Donald, OR 97020

041W20 00400
Sandra Snethen
20531 Matthieu St NE
Donald, OR 97020

041W20 00500
Maria Gostevskyh
20529 Matthieu St NE
Donald, OR 97020

041W20 00600
Maria Gostevskyh
20529 Matthieu St NE
Donald, OR 97020

041W20 01100
Grc Land Holdings LLC
PO Box 427
Donald, OR 97020

041W17 02100
Country Oak Estates LLC
PO BOX 626
Wilsonville, OR 97070

Exhibit G: Certification of Legal Description and Map

AKS ENGINEERING & FORESTRY, LLC
12965 SW Herman Road, Suite 100, Tualatin, OR 97062
P: (503) 563-6151 | www.aks-eng.com
OFFICES IN: BEND, OR - KEIZER, OR - TUALATIN, OR - VANCOUVER, WA

AKS Job #6732

EXHIBIT A

Annexation Description

A portion of the East One-Half of the G.A. Cone Donation Land Claim No. 62, located in the South One-Half of Section 17 and the North One-Half of Section 20, Township 4 South, Range 1 West, Willamette Meridian, Marion County, Oregon, and being more particularly described as follows:

Commencing at the northeast corner of said G.A. Cone Donation Land Claim No. 62, also being on the centerline of Donald Road NE; thence along said centerline, North 69º38'57" West 2095.56 feet; thence leaving said centerline, South 20º21'03" West 30.00 feet to the southerly right-of-way line of Donald Road NE (30.00 feet from centerline), also being the northeasterly corner of Exhibit A of Reel 4251, Page 406, Marion County Deed Records, and the Point of Beginning; thence along the easterly line of said Exhibit A, South 17º14'13" West 1779.39 feet to the southeasterly corner of said Exhibit A; thence along the southerly line of said Exhibit A, North 72º57'36" West 1255.11 feet to the southwesterly corner of said Exhibit A, also being Reference Point 'A'; thence along the westerly line of said Exhibit A, North 17º15'24" East 1684.25 feet to the City of Donald city limits line; thence continuing along said westerly line and said city limits line, North 17º15'24" East 167.70 feet to the northwesterly corner of said Exhibit A, also being on said southerly right-of-way line of Donald Road NE; thence along said southerly right-of-way line and said city limits line, South 69º38'57" East 1245.30 feet; thence leaving said city limits line continuing along said southerly right-of-way line, South 69º38'57" East 11.02 feet to the Point of Beginning.

Together with;
Commencing at Reference Point 'A', also being on the easterly line of Reel 4093, Page 195, Marion County Deed Records; thence along said easterly line, South 17º15'24" West 196.71 feet to the northeasterly corner of Exhibit B of Reel 4251, Page 406, Marion County Deed Records, and the Point of Beginning; thence along the easterly line of said Exhibit B, South 17º15'24" West 387.89 feet to the southeasterly corner of said Exhibit B; thence along the southerly line of said Exhibit B and the westerly extension thereof, North 72º53'11" West 1066.19 feet to the westerly right-of-way line of Matthieu Street NE (20.00 feet in width); thence along said westerly right-of-way line, North 17º06'50" East 415.51 feet to the northeasterly corner of Reel 3161, Page 479, Marion County Deed Records, and the City of Donald city limits line; thence along said city limits line, South 72º48'47" East 20.00 feet to the easterly line of said Matthieu Street NE; thence leaving said city limits line along said easterly right-of-way line, South 17º06'50" West 27.59 feet to the northwesterly corner of said Exhibit B; thence along the northerly line of said Exhibit B, South 72º53'11" East 1047.16 feet to the Point of Beginning.

The above described tract of land contains 61.81 acres, more or less.

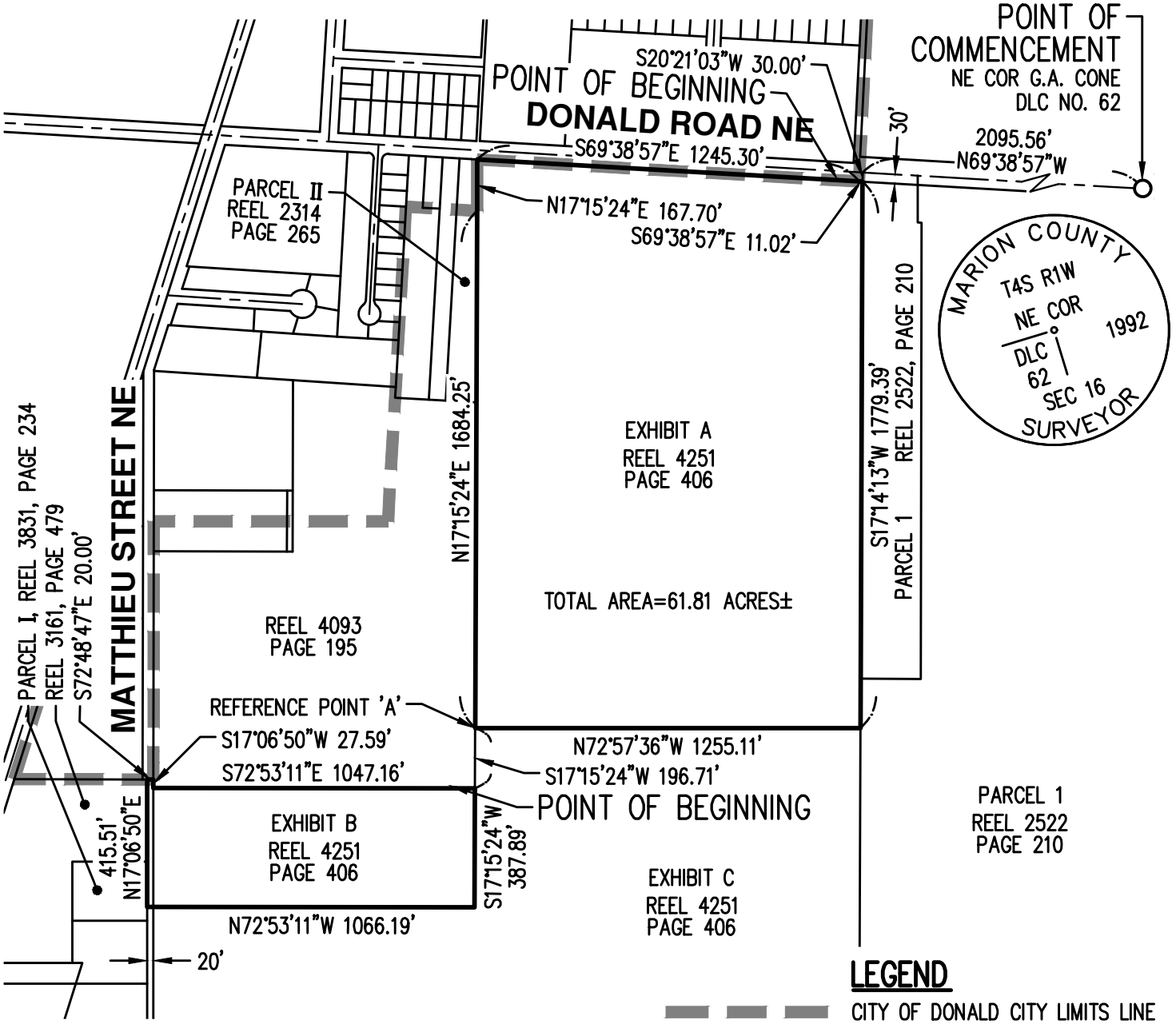
02/18/2020

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
JANUARY 12, 2016
MICHAEL S. KALINA
89558PLS
RENEWS: 6/30/21

EXHIBIT B

A PORTION OF THE EAST 1/2 OF THE G.A. CONE D.L.C. NO. 62,
LOCATED IN THE SOUTH 1/2 OF SECTION 17 AND THE NORTH 1/2 OF SECTION 20,
TOWNSHIP 4 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN,
MARION COUNTY, OREGON



LEGEND

CITY OF DONALD CITY LIMITS LINE

02/18/2020

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
JANUARY 12, 2016
MICHAEL S. KALINA
89558PLS
RENEWS: 6/30/21

PREPARED FOR

GRC LAND HOLDINGS, LLC
P. O. BOX 427
DONALD, OR 97020

SCALE: 1"= 500 FEET

500 0 100 250 500

ORIGINAL PAGE SIZE: 8.5" x 11"

ANNEXATION MAP	EXHIBIT B
AKS ENGINEERING & FORESTRY, LLC 12965 SW HERMAN RD, STE 100 TUALATIN, OR 97062 503.563.6151 WWW.AKS-ENG.COM	DRWN: WCB CHKD: NSW AKS JOB: 6732

DWG: 6732 20191206 EXB | EXB

Exhibit H: Preliminary Stormwater Report

Harvest Gardens PUD
Donald, Oregon

Preliminary Stormwater Report

Date:	March, 2020
Client:	GRC Land Holdings, LLC PO Box 427 Donald, OR 97020
Engineering Contact:	Mary Kate Knill, PE (503) 563-6151 | knillm@aks-eng.com
Engineering Firm:	AKS Engineering & Forestry, LLC 12965 SE Herman Road, Suite 100 Tualatin, OR 97062
AKS Job Number:	6732

AKS ENGINEERING & FORESTRY
www.aks-eng.com

Table of Contents

Tables

Figures

Appendices

Preliminary Stormwater Report
HARVEST GARDENS PUD
DONALD, OREGON

1.0 Purpose of Report
The purpose of this report is to analyze the effects the proposed development will have on the existing stormwater conveyance system; document the criteria, methodology, and informational sources used to evaluate the proposed stormwater system; and present the results of the hydraulic analysis.

2.0 Project Location/Description
The proposed Planned Unit Development (PUD) is a ±61.81-acre project located in the southeast corner of Donald, Oregon, consisting of Tax Lots 2600 of Marion County Assessor's Map 041W17, and Tax Lot 300 of Marion County Assessor's Map 041720.

The proposed project includes a 300-lot residential subdivision consisting of single-family detached homes and two lots for future development of multi-family and commercial area. The site improvements will include the construction of public streets, underground utilities, and mass grading of the future development lots.

3.0 Regulatory Design Criteria
3.1 STORMWATER QUANTITY
Stormwater quantity control has been provided for the project site in accordance with the city engineer's requirements. Detention for the site has been provided through an existing stormwater facility per direction of the city engineer.

4.0 Design Methodology
The Santa Barbara Urban Hydrograph (SBUH) Method was used to analyze stormwater runoff from the site. This method utilizes the SCS Type 1A 24-hour design storm. HydroCAD 10.0 computer software aided in the analysis. Representative CN numbers were obtained from the U.S. Department of Agriculture's (USDA's) *Urban Hydrology for Small Watersheds* (Technical Release 55) and are included in an appendix.

5.0 Design Parameters
5.1 DESIGN STORMS
Per the city engineer's requirements, the stormwater analysis utilized the 24-hour storm for the evaluation of the existing stormwater facility. The following 24-hour rainfall intensities were obtained from the NOAA Isopluvial Maps and were utilized as the design storms for the following recurrence interval:

Table 5-1: Rainfall Intensities

Recurrence Interval (Years)	Total Precipitation Depth (Inches)
10	3.00
25	3.50
100	4.00

5.2 PRE-DEVELOPED SITE CONDITIONS

5.2.1 Site Topography

Existing on-site grades generally vary from 2% to 5% with portions draining to the existing stormwater facility and generally discharges across private property to the southeast.

5.2.2 Land Use

The existing site consists of open farm fields.

5.3 SOIL TYPE

The soil beneath the project site and associated drainage basins is classified as woodburn silt loam and Dayton silt loam, according to the USDA Soil Survey for Marion County. The following table outlines the Hydrologic Soil Group rating for the soil types:

Table 5-2: Hydrologic Soil Group Ratings

NRCS Map Unit Identification	NRCS Soil Classification	Hydrologic Soil Group Rating
WuA	Woodburn silt loam	C
Da	Dayton silt loam	D

Further information on these soil types are included in the NRCS Soil Resource Report located in the Appendix of this report.

5.4 POST-DEVELOPED SITE CONDITIONS

5.4.1 Site Topography

The finished grades of the project site have been designed to generally match the existing terrain. Post-Developed stormwater runoff generally maintains the existing drainage patterns.

5.4.2 Land Use

The post-developed site will be developed into a combination of single-family detached homes and two lots for development of a future multi-family and commercial area. The finished grades consist of graded streets, padded-out lots and open space areas.

5.4.3 Post-Developed Input Parameters

See HydroCAD Analysis in the attached appendices.

5.4.4 Description of Off-Site Contributing Basins

There are several off-site basins that discharge flows and convey stormwater runoff onto the project site. These flows are accounted for within our analysis and a portion will be routed through the existing stormwater facility.

6.0 Stormwater Analyses

6.1 PROPOSED STORMWATER CONDUIT SIZING AND INLET SPACING

The proposed on-site curb inlets will be spaced per City requirements to properly convey stormwater runoff. The conveyance pipes have been sized using Manning's equation to convey the peak flows from the 25-year storm event.

6.2 PROPOSED STORMWATER QUANTITY CONTROL FACILITY

The existing stormwater facility has been evaluated with respect to its capacity to detain the post-developed basin flows to the pre-developed flows for the 10-year, 24-hr storm. The pre- and post-developed peak flow rates are listed in the table below. The facility has also been evaluated and is sized sufficiently to handle the 25-year, 24-hr storm event within the facility without overwhelming or flooding the system.

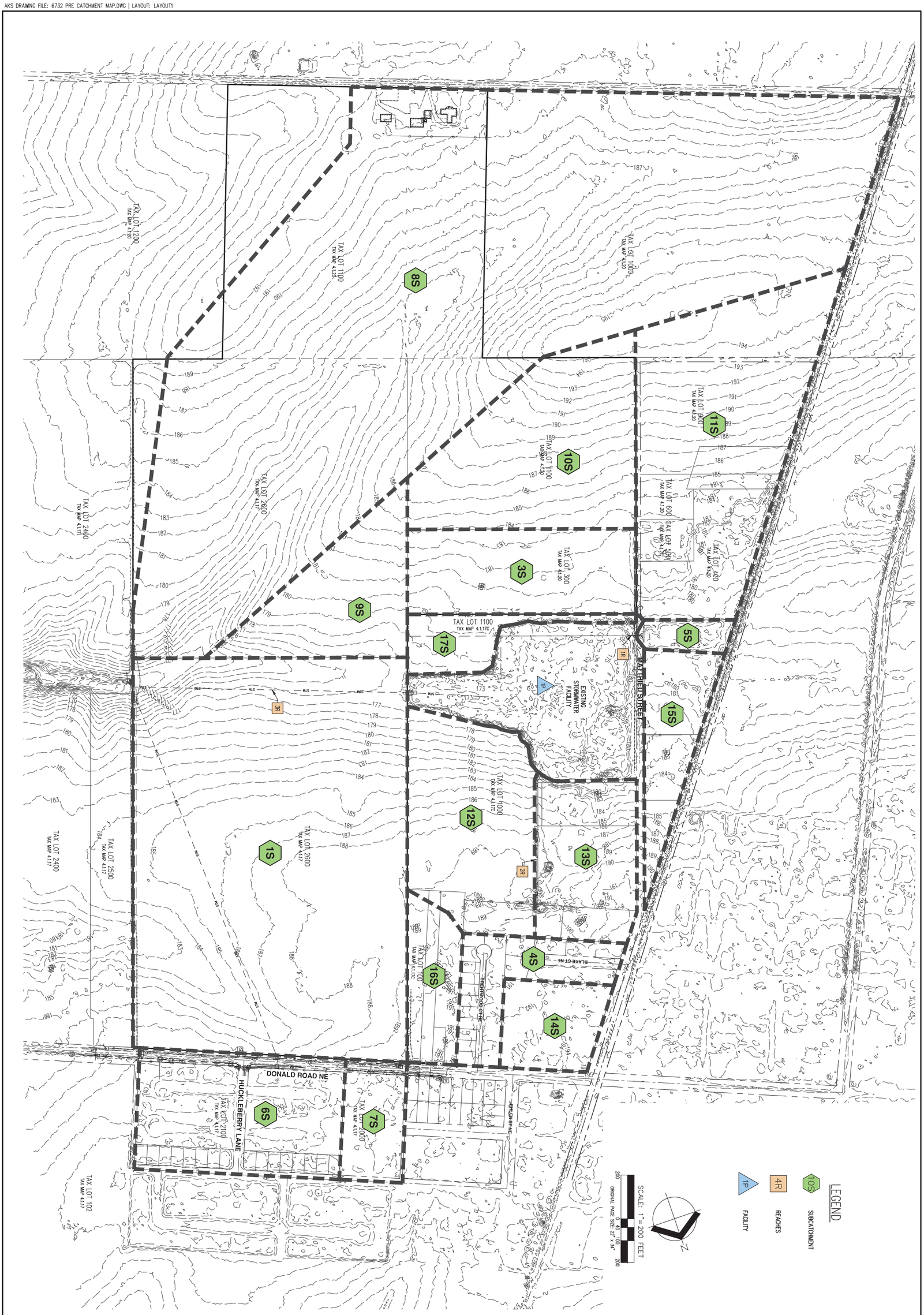
Table 6-1: Peak Flows Comparison

Storm Event	Peak Pre-Development Flows (cfs)	Peak Post-Development Flows (cfs)
10-Year	20.26	17.93
25-Year	29.09	22.82

6.3 DOWNSTREAM ANALYSIS

The post-developed peak flow rates have been detained to levels below the pre-developed peak flow rates. Therefore, due to the fact that flows to the downstream system are not increased, a downstream analysis is not required.

AKS DRAWING FILE: 6732 PRE CATCHMENT MAP.DWG | LAYOUT: LAYOUT1



JOB NUMBER 6732	**PRE-DEVELOPED CATCHMENT MAP**	**HARVEST GARDENS**	AKS ENGINEERING & FORESTRY, LLC 12965 SW HERMAN RD, STE 100 TUALATIN, OR 97062 P: 503.563.6151 F: 503.563.6152 aks-eng.com
SHEET A	REVISIONS	**DONALD** TAX LOTS 2600 AND 300	**OREGON** MARION COUNTY TAX MAPS 04.1W.17 AND 04.1W.20
	DESIGNED BY:		ENGINEERING • SURVEYING • NATURAL RESOURCES FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE
	DRAWN BY:		
	MANAGED BY:		
	CHECKED BY:		
	DATE: 03/16/2020		

AKS DRAWING FILE: 6732 POST DEVELOPED CATCHMENT MAP.DWG | LAYOUT: LAYOUT1

POST-DEVELOPED CATCHMENT MAP

HARVEST GARDENS

DONALD
TAX LOTS 2600 AND 300

OREGON
MARION COUNTY TAX MAPS 04.1W.17 AND 04.1W.20

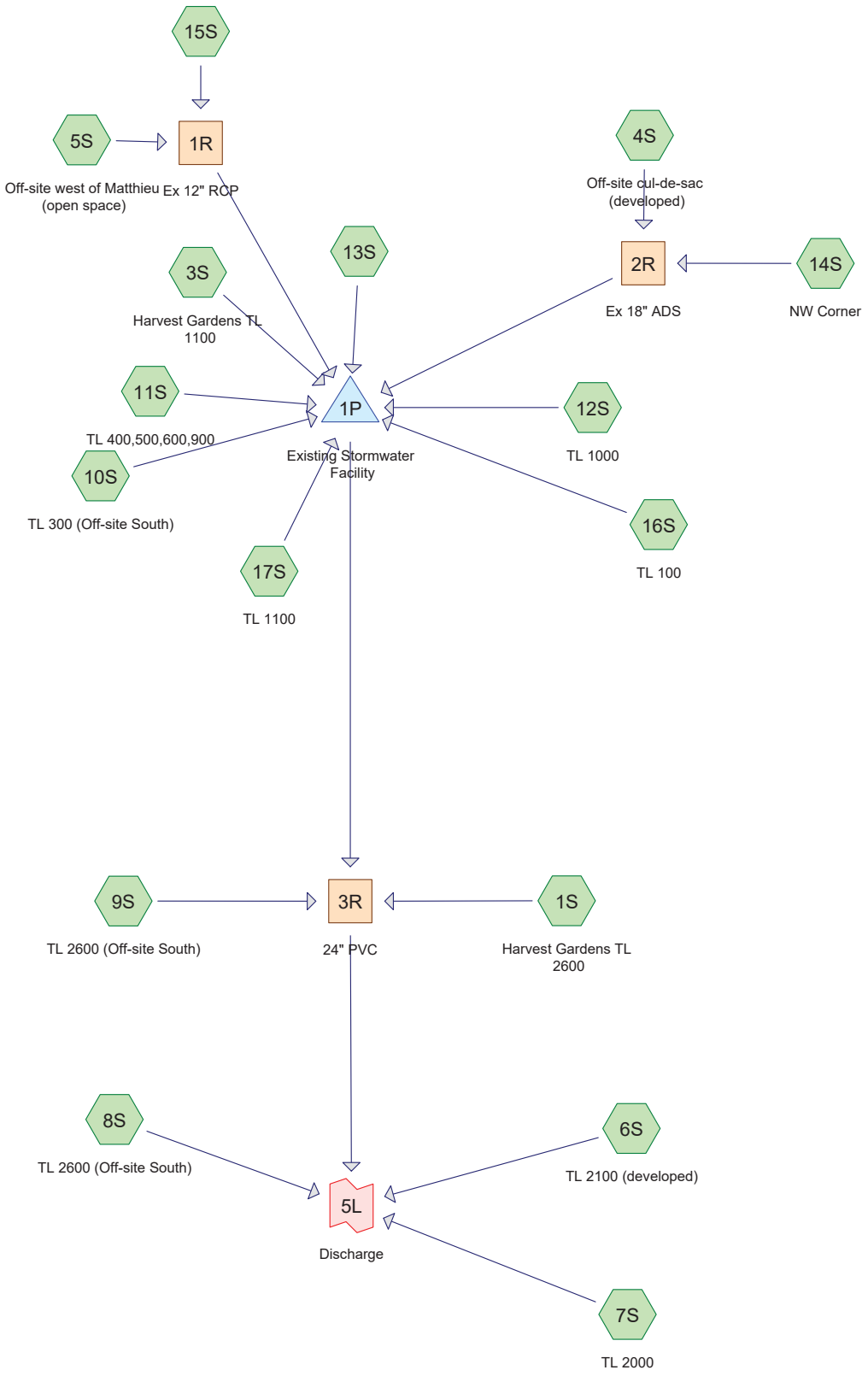
AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
P: 503.563.6151
F: 503.563.6152
aks-eng.com

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

JOB NUMBER 6732
SHEET B

REVISIONS

DESIGNED BY:
DRAWN BY:
MANAGED BY:
CHECKED BY:
DATE: 03/16/2020



Subcat Reach Pond Link

Routing Diagram for 6732 Harvest Gardens Pre Developed
Prepared by AKS Engineering and Forestry, Printed 3/16/2020
HydroCAD® 10.00-22 s/n 01338 © 2018 HydroCAD Software Solutions LLC

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Harvest Gardens TL Runoff Area=2,278,468 sf 0.00% Impervious Runoff Depth>0.87"
Flow Length=2,180' Tc=60.0 min CN=74/0 Runoff=4.01 cfs 3.793 af

Subcatchment 3S: Harvest Gardens TL Runoff Area=406,655 sf 0.00% Impervious Runoff Depth>0.90"
Flow Length=513' Tc=20.3 min CN=74/0 Runoff=1.10 cfs 0.697 af

Subcatchment 4S: Off-site cul-de-sac Runoff Area=223,632 sf 50.68% Impervious Runoff Depth>1.85"
Tc=5.0 min CN=74/98 Runoff=2.20 cfs 0.790 af

Subcatchment 5S: Off-site west of Matthieu Runoff Area=59,593 sf 0.00% Impervious Runoff Depth>0.79"
Flow Length=415' Tc=30.0 min CN=72/0 Runoff=0.11 cfs 0.090 af

Subcatchment 6S: TL 2100 (developed) Runoff Area=519,405 sf 63.26% Impervious Runoff Depth>2.08"
Tc=5.0 min CN=74/98 Runoff=5.92 cfs 2.068 af

Subcatchment 7S: TL 2000 Runoff Area=146,139 sf 16.26% Impervious Runoff Depth>1.19"
Flow Length=520' Tc=29.9 min CN=74/98 Runoff=0.55 cfs 0.333 af

Subcatchment 8S: TL 2600 (Off-site Runoff Area=4,393,660 sf 0.00% Impervious Runoff Depth>0.92"
Flow Length=4,393' Tc=56.6 min CN=75/0 Runoff=8.70 cfs 7.765 af

Subcatchment 9S: TL 2600 (Off-site South) Runoff Area=381,740 sf 0.00% Impervious Runoff Depth>0.94"
Flow Length=1,006' Tc=31.8 min CN=75/0 Runoff=0.96 cfs 0.687 af

Subcatchment 10S: TL 300 (Off-site South) Runoff Area=677,221 sf 0.00% Impervious Runoff Depth>0.89"
Flow Length=828' Slope=0.0150 '/' Tc=25.5 min CN=74/0 Runoff=1.67 cfs 1.156 af

Subcatchment 11S: TL 400,500,600,900 Runoff Area=1,001,660 sf 0.00% Impervious Runoff Depth>0.88"
Flow Length=1,774' Tc=52.6 min CN=74/0 Runoff=1.85 cfs 1.677 af

Subcatchment 12S: TL 1000 Runoff Area=531,627 sf 0.00% Impervious Runoff Depth>0.79"
Flow Length=989' Tc=28.6 min CN=72/0 Runoff=0.98 cfs 0.805 af

Subcatchment 13S: Runoff Area=341,174 sf 9.28% Impervious Runoff Depth>0.98"
Flow Length=763' Tc=22.5 min CN=72/98 Runoff=1.02 cfs 0.637 af

Subcatchment 14S: NW Corner Runoff Area=182,135 sf 0.00% Impervious Runoff Depth>0.89"
Flow Length=601' Tc=31.0 min CN=74/0 Runoff=0.42 cfs 0.310 af

Subcatchment 15S: Runoff Area=221,408 sf 0.00% Impervious Runoff Depth>0.88"
Flow Length=1,173' Tc=37.5 min CN=74/0 Runoff=0.47 cfs 0.375 af

Subcatchment 16S: TL 100 Runoff Area=173,055 sf 0.00% Impervious Runoff Depth>0.90"
Flow Length=293' Tc=19.2 min CN=74/0 Runoff=0.48 cfs 0.297 af

Subcatchment 17S: TL 1100 Runoff Area=134,571 sf 0.00% Impervious Runoff Depth>0.90"
Flow Length=308' Tc=19.3 min CN=74/0 Runoff=0.37 cfs 0.231 af

Reach 1R: Ex 12" RCP Avg. Flow Depth=0.19' Max Vel=5.61 fps Inflow=0.57 cfs 0.465 af
12.0" Round Pipe n=0.013 L=45.7' S=0.0435 '/' Capacity=7.43 cfs Outflow=0.57 cfs 0.465 af

Reach 2R: Ex 18" ADS Avg. Flow Depth=0.45' Max Vel=5.66 fps Inflow=2.57 cfs 1.100 af
18.0" Round Pipe n=0.013 L=830.0' S=0.0149 '/' Capacity=12.84 cfs Outflow=2.55 cfs 1.098 af

Reach 3R: 24" PVC Avg. Flow Depth=1.10' Max Vel=5.22 fps Inflow=9.26 cfs 11.062 af
24.0" Round Pipe n=0.013 L=1,162.0' S=0.0049 '/' Capacity=15.77 cfs Outflow=9.25 cfs 11.026 af

Pond 1P: Existing Stormwater Facility Peak Elev=173.39' Storage=35,823 cf Inflow=10.14 cfs 7.063 af
Outflow=5.25 cfs 6.583 af

Link 5L: Discharge Inflow=20.26 cfs 21.191 af
Primary=20.26 cfs 21.191 af

Total Runoff Area = 267.956 ac Runoff Volume = 21.710 af Average Runoff Depth = 0.97"
95.74% Pervious = 256.539 ac 4.26% Impervious = 11.417 ac

Summary for Subcatchment 1S: Harvest Gardens TL 2600

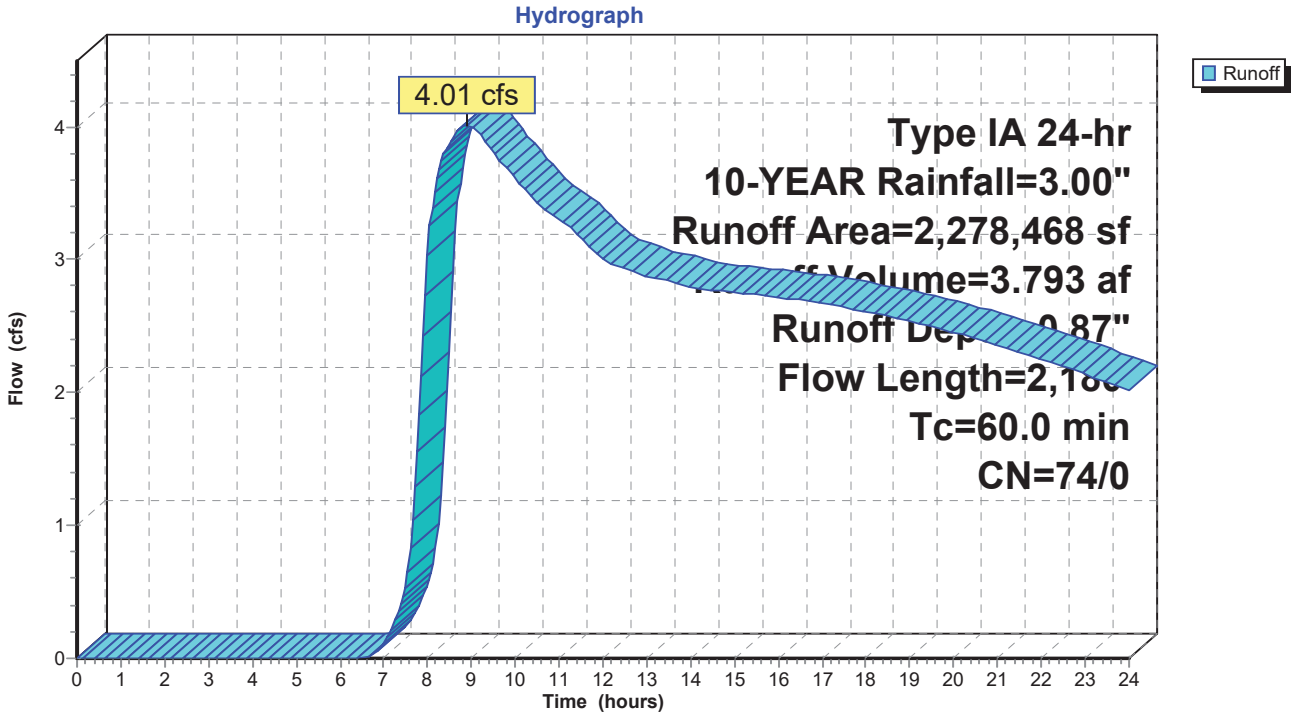
Runoff = 4.01 cfs @ 8.91 hrs, Volume= 3.793 af, Depth> 0.87"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

Area (sf)	CN	Description
2,278,468	74	Pasture/grassland/range, Good, HSG C
2,278,468	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0200	0.09		**Sheet Flow, sheet** Grass: Dense n= 0.240 P2= 2.50"
50.7	2,130	0.0100	0.70		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
60.0	2,180	Total			

Subcatchment 1S: Harvest Gardens TL 2600



Summary for Subcatchment 3S: Harvest Gardens TL 1100

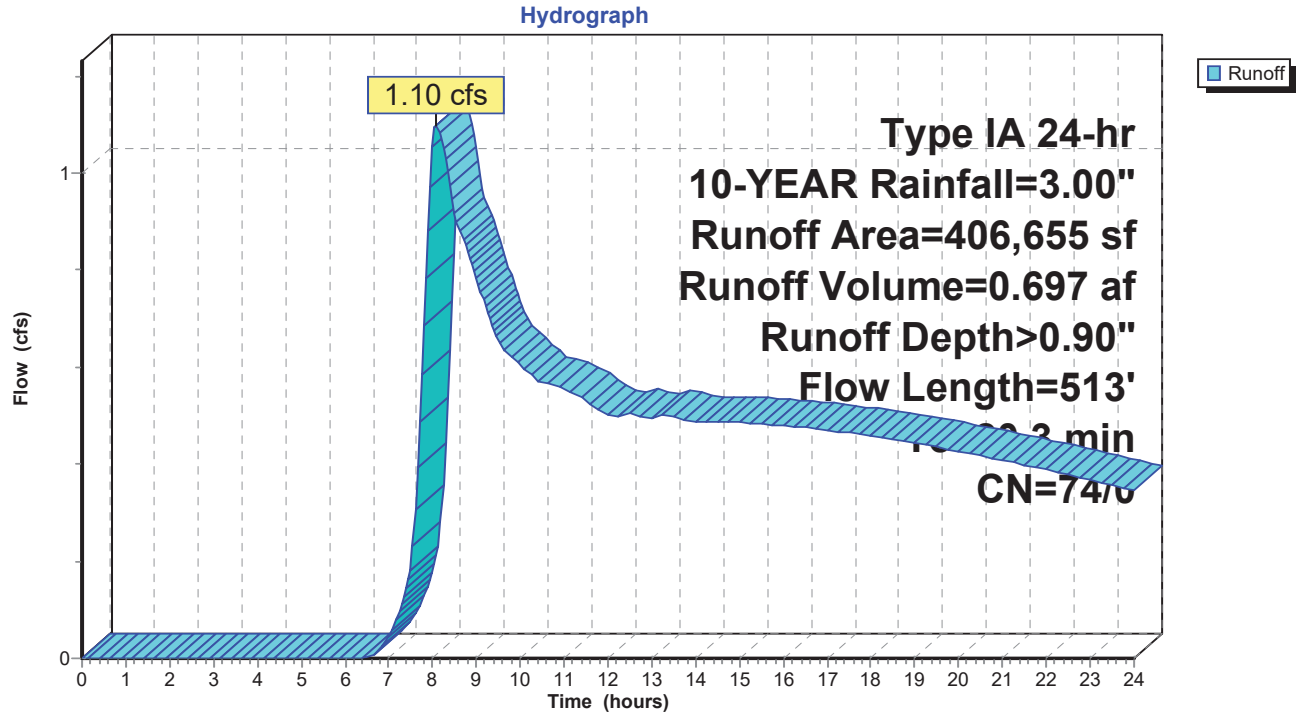
Runoff = 1.10 cfs @ 8.07 hrs, Volume= 0.697 af, Depth> 0.90"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

Area (sf)	CN	Description
406,655	74	Pasture/grassland/range, Good, HSG C
406,655	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0200	0.09		**Sheet Flow, sheet** Grass: Dense n= 0.240 P2= 2.50"
11.0	463	0.0100	0.70		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
20.3	513	Total			

Subcatchment 3S: Harvest Gardens TL 1100



Summary for Subcatchment 4S: Off-site cul-de-sac (developed)

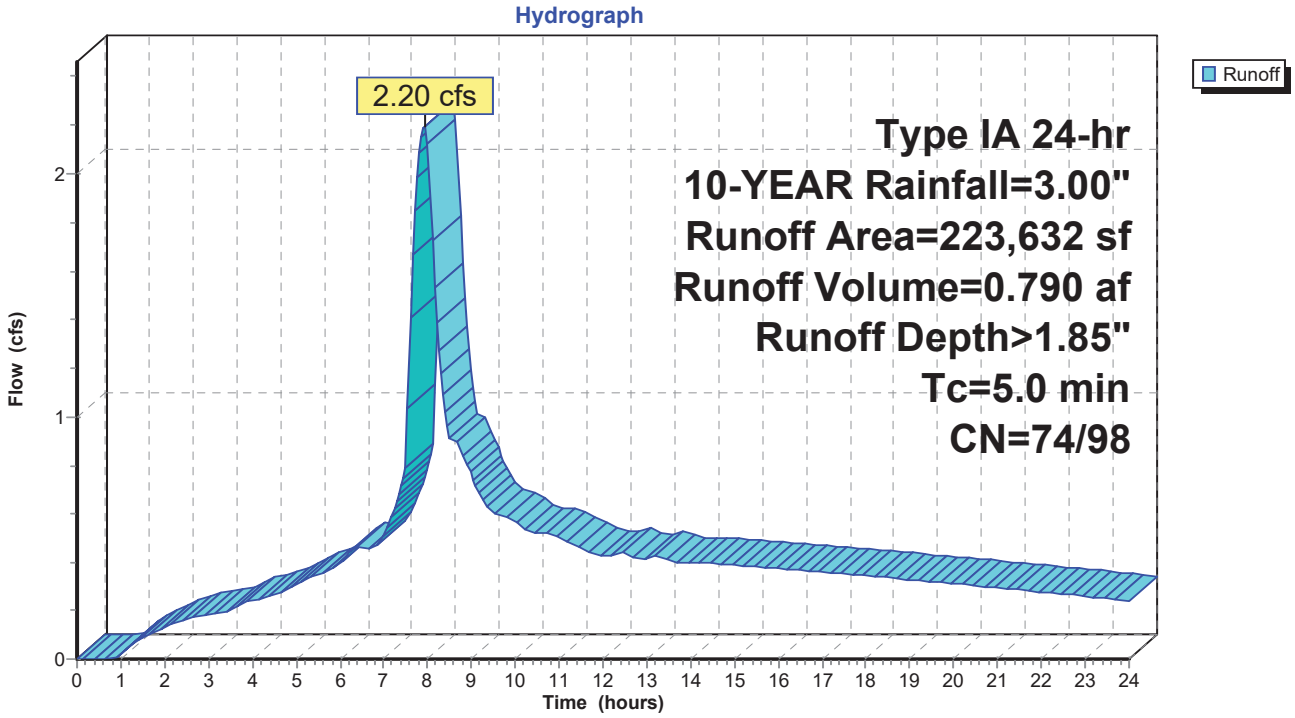
Runoff = 2.20 cfs @ 7.94 hrs, Volume= 0.790 af, Depth> 1.85"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

	Area (sf)	CN	Description
*	42,063	98	impervious, row, sidewalk, etc.
*	71,280	98	impervious (8 lots @ 2640)
	110,289	74	>75% Grass cover, Good, HSG C
	223,632	86	Weighted Average
	110,289	74	49.32% Pervious Area
	113,343	98	50.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 4S: Off-site cul-de-sac (developed)



Summary for Subcatchment 5S: Off-site west of Matthieu (open space)

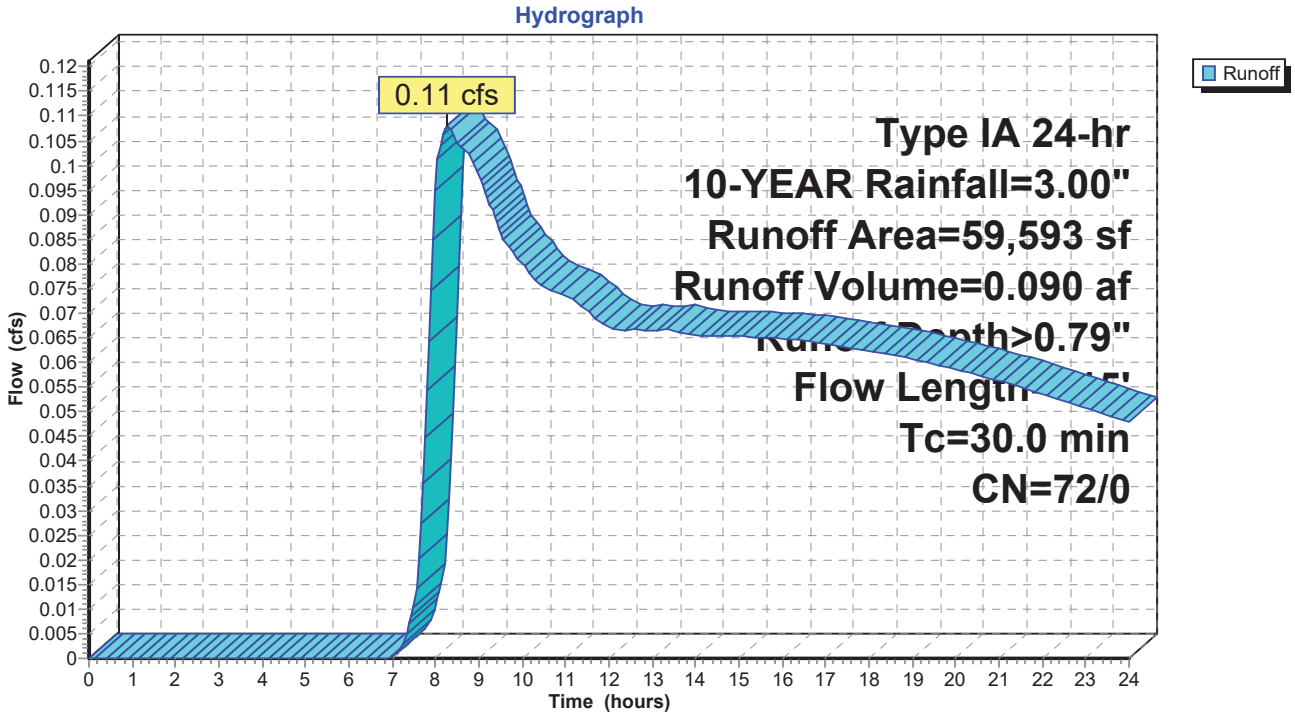
Runoff = 0.11 cfs @ 8.28 hrs, Volume= 0.090 af, Depth> 0.79"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

Area (sf)	CN	Description
59,593	72	Woods/grass comb., Good, HSG C
59,593	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.7	50	0.0040	0.05		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
12.3	365	0.0050	0.49		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
30.0	415	Total			

Subcatchment 5S: Off-site west of Matthieu (open space)



Summary for Subcatchment 6S: TL 2100 (developed)

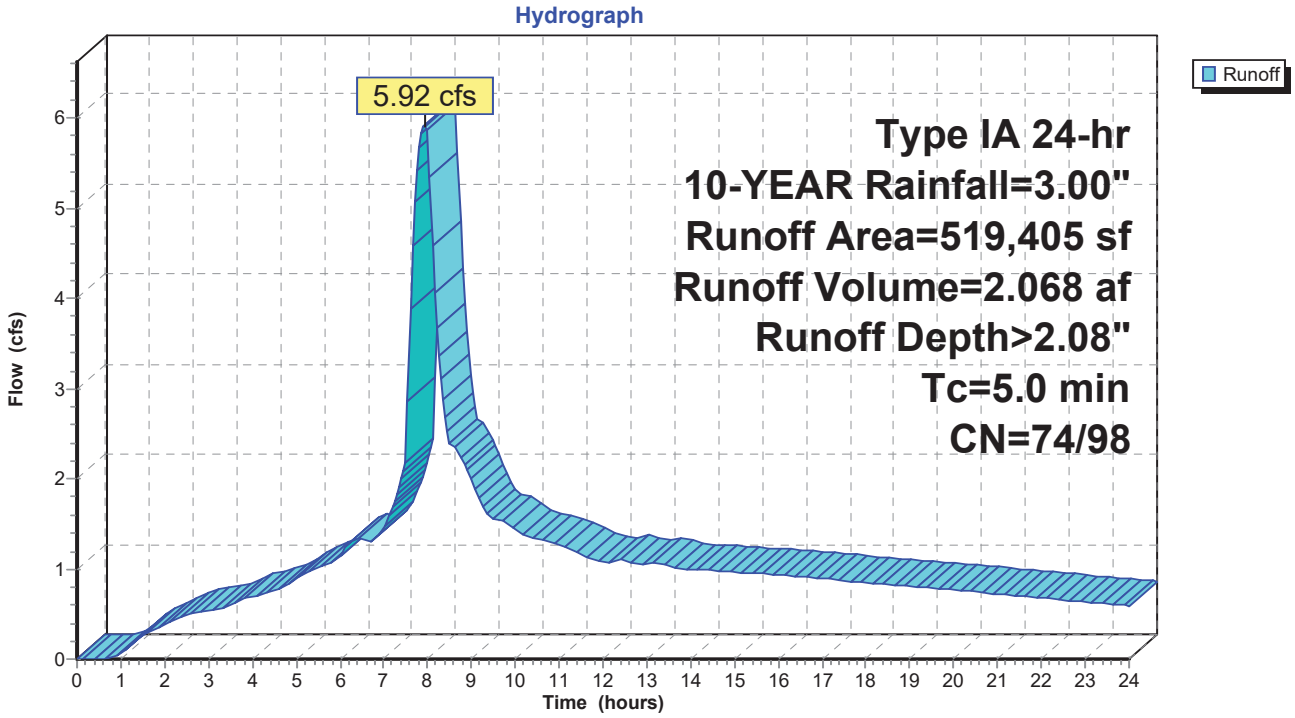
Runoff = 5.92 cfs @ 7.93 hrs, Volume= 2.068 af, Depth> 2.08"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

	Area (sf)	CN	Description
*	154,312	98	impervious, row, sidewalk, etc
*	174,240	98	Lots (66 @ 2640)
	190,853	74	>75% Grass cover, Good, HSG C
	519,405	89	Weighted Average
	190,853	74	36.74% Pervious Area
	328,552	98	63.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: TL 2100 (developed)



Summary for Subcatchment 7S: TL 2000

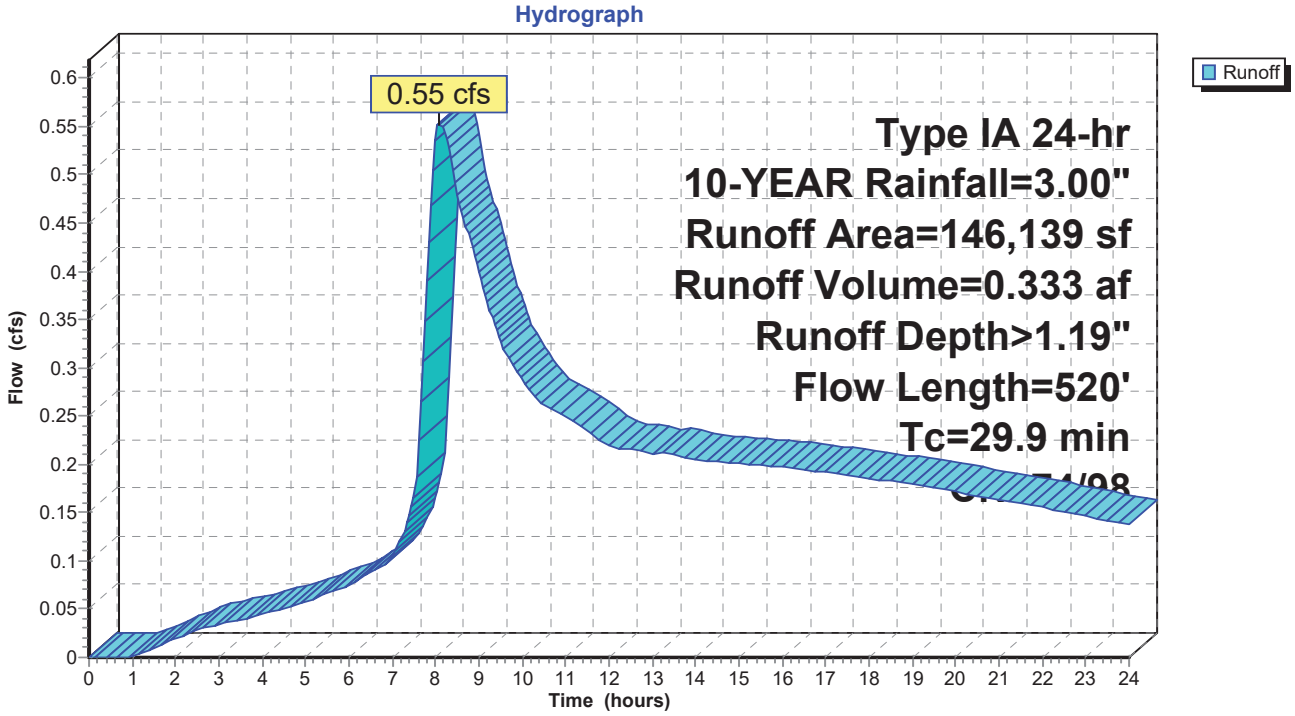
Runoff = 0.55 cfs @ 8.09 hrs, Volume= 0.333 af, Depth> 1.19"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

	Area (sf)	CN	Description
*	15,845	98	impervious, row, sidewalk, etc
*	7,920	98	Lots (3 @ 2640)
	122,374	74	>75% Grass cover, Good, HSG C
	146,139	78	Weighted Average
	122,374	74	83.74% Pervious Area
	23,765	98	16.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	50	0.0100	0.07		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
17.7	470	0.0040	0.44		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
29.9	520	Total			

Subcatchment 7S: TL 2000



Summary for Subcatchment 8S: TL 2600 (Off-site South)

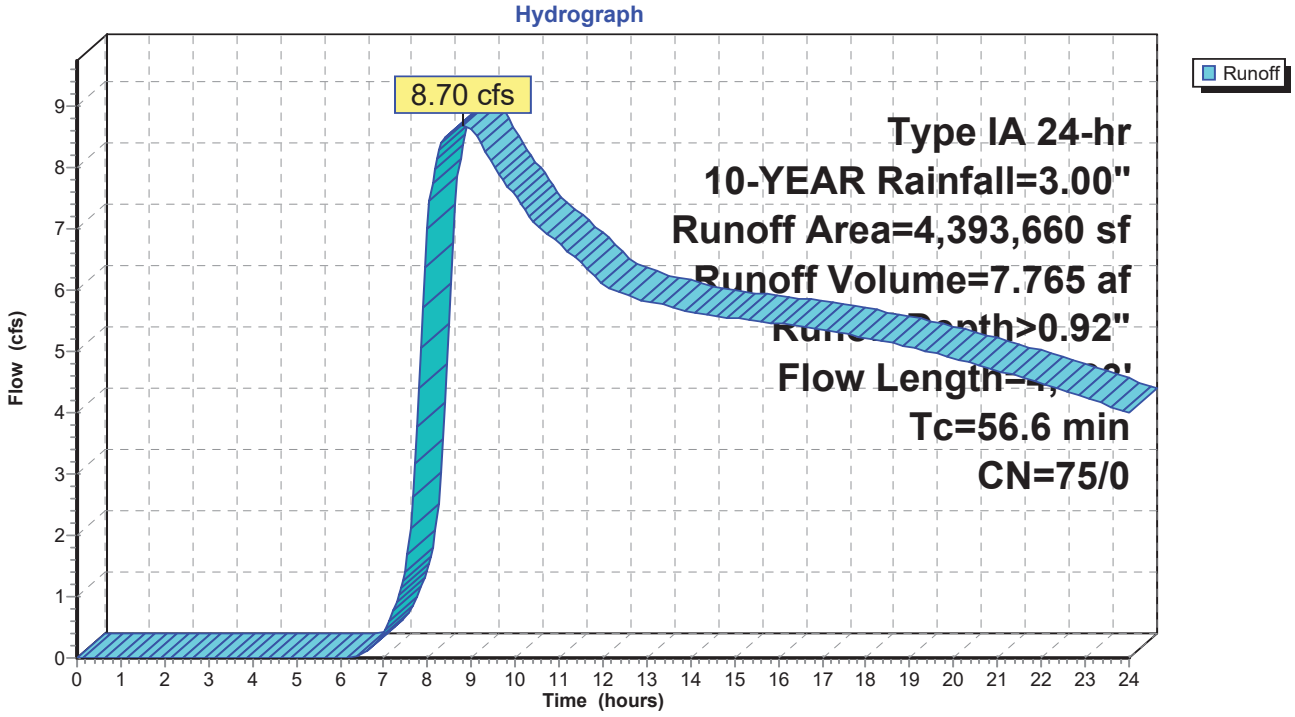
Runoff = 8.70 cfs @ 8.80 hrs, Volume= 7.765 af, Depth> 0.92"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

Area (sf)	CN	Description
3,824,683	74	Pasture/grassland/range, Good, HSG C
568,977	80	Pasture/grassland/range, Good, HSG D
4,393,660	75	Weighted Average
4,393,660	75	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.1	50	0.0050	0.05		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
15.7	510	0.0060	0.54		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
24.8	3,833	0.5000	2.58	2.58	**Channel Flow, channel** Area= 1.0 sf Perim= 50.0' r= 0.02' n= 0.030 Short grass
56.6	4,393	Total			

Subcatchment 8S: TL 2600 (Off-site South)



Summary for Subcatchment 9S: TL 2600 (Off-site South)

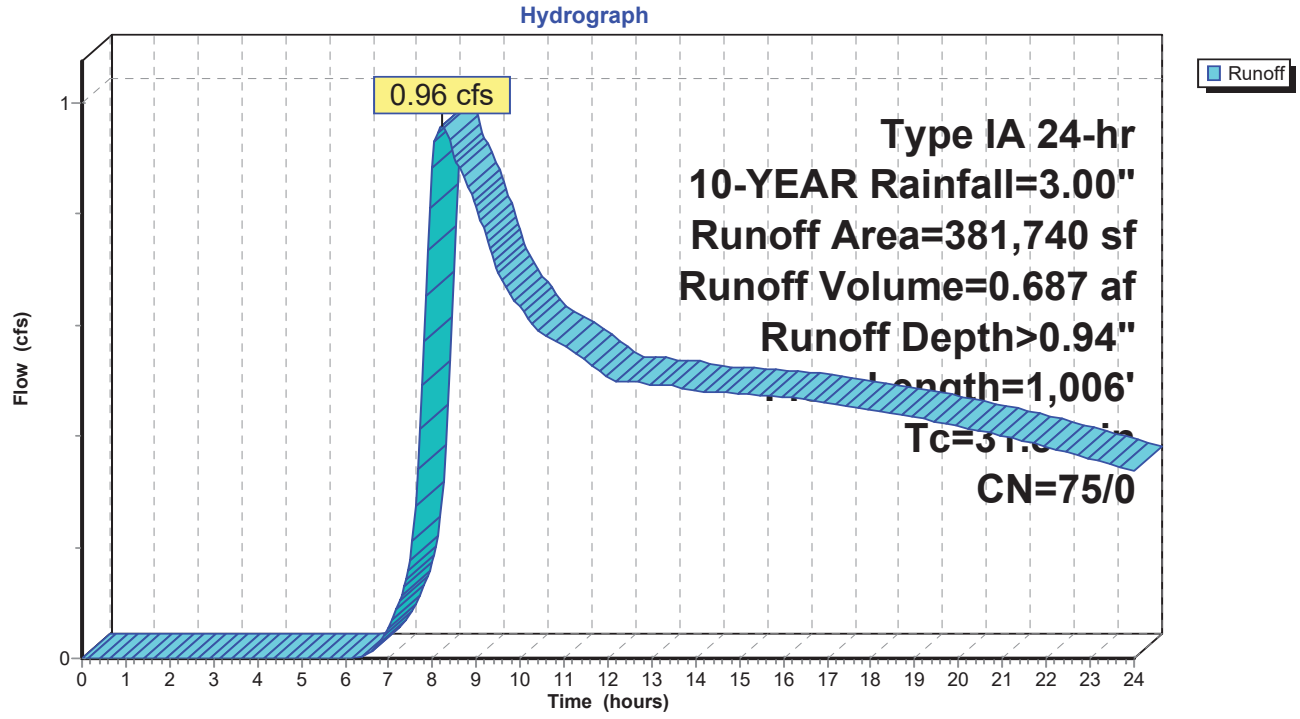
Runoff = 0.96 cfs @ 8.21 hrs, Volume= 0.687 af, Depth> 0.94"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

Area (sf)	CN	Description
322,671	74	Pasture/grassland/range, Good, HSG C
59,069	80	Pasture/grassland/range, Good, HSG D
381,740	75	Weighted Average
381,740	75	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	50	0.0130	0.08		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
20.8	956	0.0120	0.77		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
31.8	1,006	Total			

Subcatchment 9S: TL 2600 (Off-site South)



Summary for Subcatchment 10S: TL 300 (Off-site South)

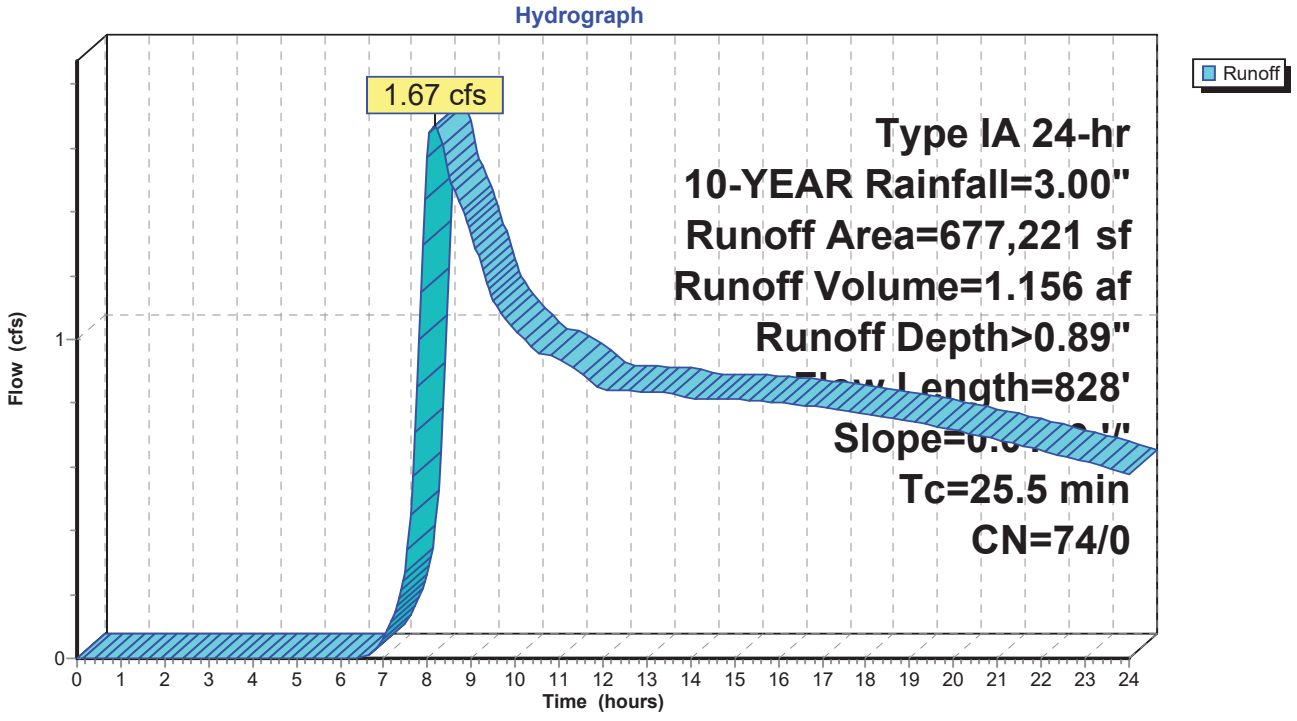
Runoff = 1.67 cfs @ 8.16 hrs, Volume= 1.156 af, Depth> 0.89"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

Area (sf)	CN	Description
677,221	74	Pasture/grassland/range, Good, HSG C
677,221	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	50	0.0150	0.08		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
15.1	778	0.0150	0.86		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
25.5	828	Total			

Subcatchment 10S: TL 300 (Off-site South)



Summary for Subcatchment 11S: TL 400,500,600,900

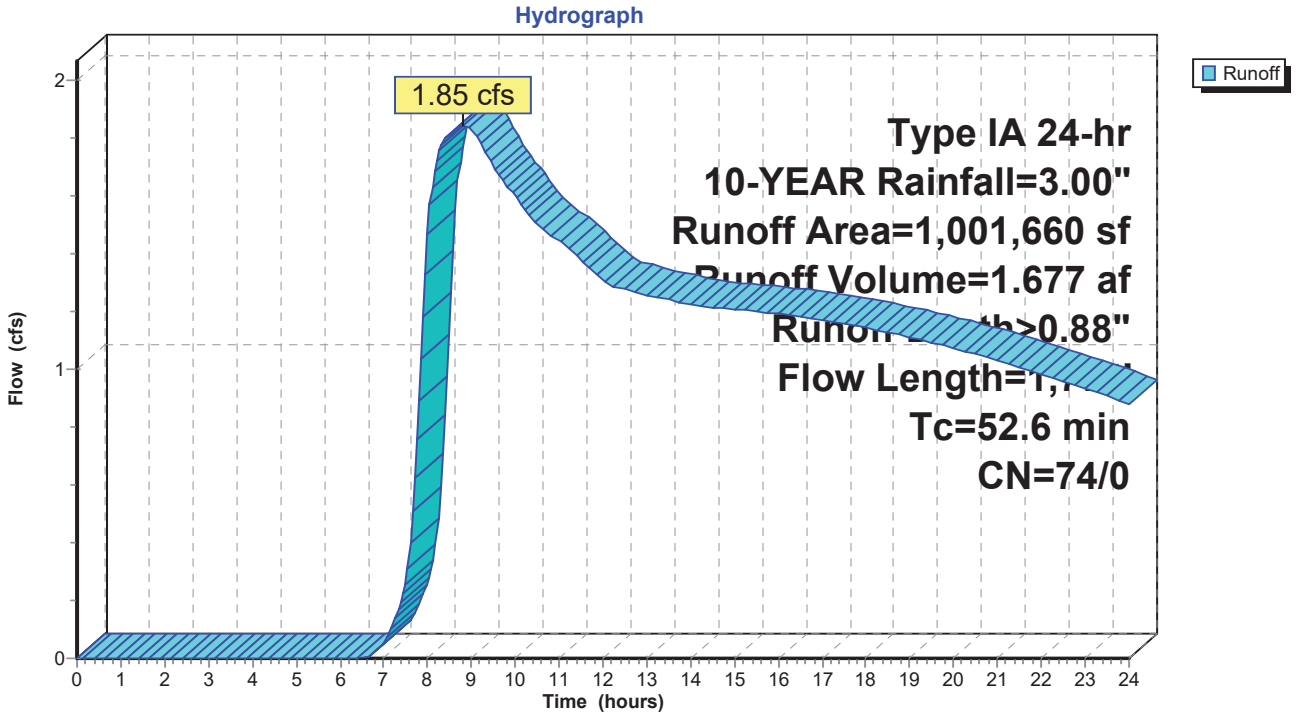
Runoff = 1.85 cfs @ 8.80 hrs, Volume= 1.677 af, Depth> 0.88"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

Area (sf)	CN	Description
1,001,660	74	Pasture/grassland/range, Good, HSG C
1,001,660	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0200	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
43.3	1,724	0.0090	0.66		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
52.6	1,774	Total			

Subcatchment 11S: TL 400,500,600,900



Summary for Subcatchment 12S: TL 1000

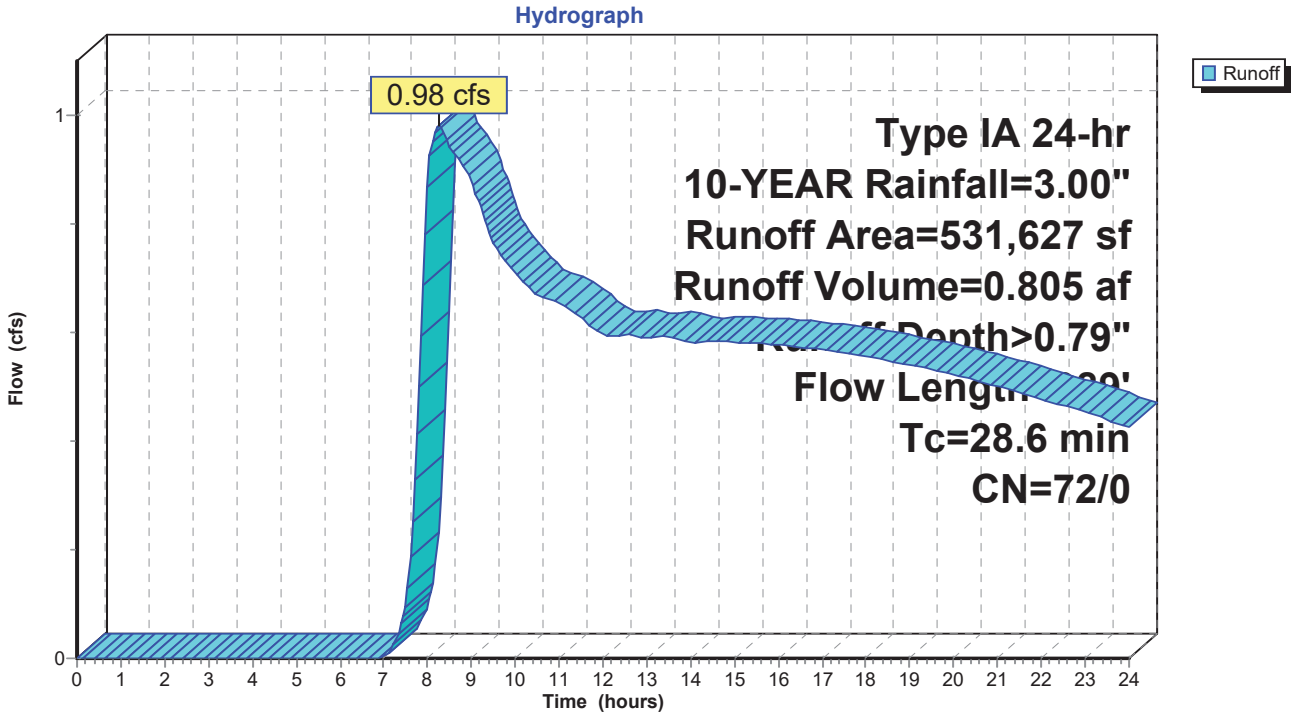
Runoff = 0.98 cfs @ 8.26 hrs, Volume= 0.805 af, Depth> 0.79"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

Area (sf)	CN	Description
531,627	72	Woods/grass comb., Good, HSG C
531,627	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	50	0.0180	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
18.9	939	0.0140	0.83		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
28.6	989	Total			

Subcatchment 12S: TL 1000



Summary for Subcatchment 13S:

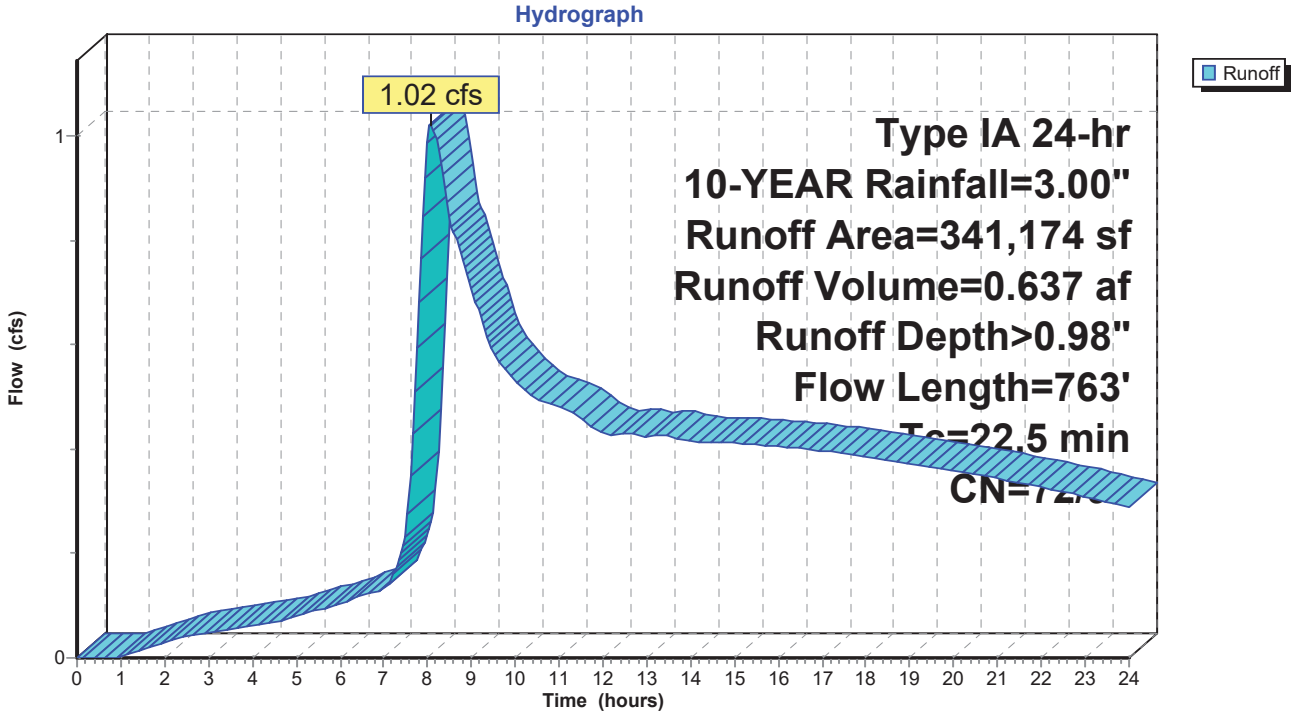
Runoff = 1.02 cfs @ 8.07 hrs, Volume= 0.637 af, Depth> 0.98"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

	Area (sf)	CN	Description
	309,516	72	Woods/grass comb., Good, HSG C
*	31,658	98	Impervious structures (4)
	341,174	74	Weighted Average
	309,516	72	90.72% Pervious Area
	31,658	98	9.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0240	0.10		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
13.9	713	0.0150	0.86		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
22.5	763	Total			

Subcatchment 13S:



Summary for Subcatchment 14S: NW Corner

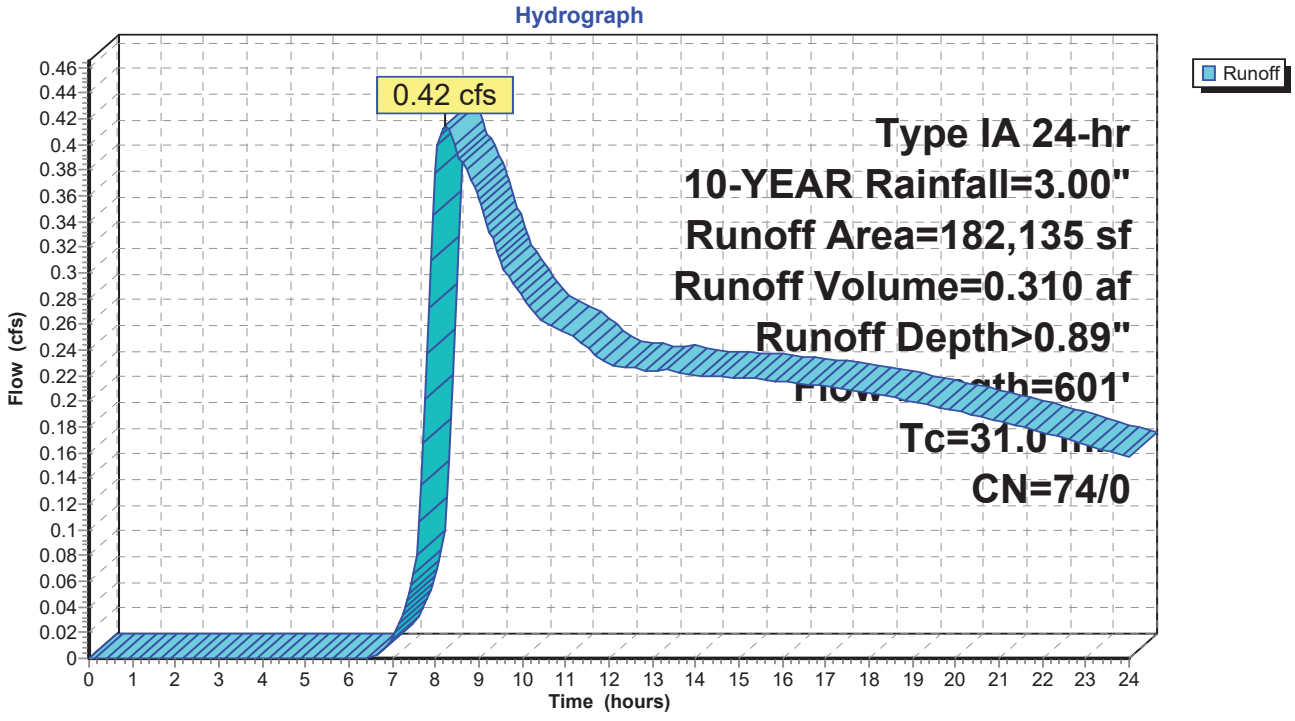
Runoff = 0.42 cfs @ 8.23 hrs, Volume= 0.310 af, Depth> 0.89"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

Area (sf)	CN	Description
182,135	74	>75% Grass cover, Good, HSG C
182,135	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	50	0.0070	0.06		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
16.9	551	0.0060	0.54		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
31.0	601	Total			

Subcatchment 14S: NW Corner



Summary for Subcatchment 15S:

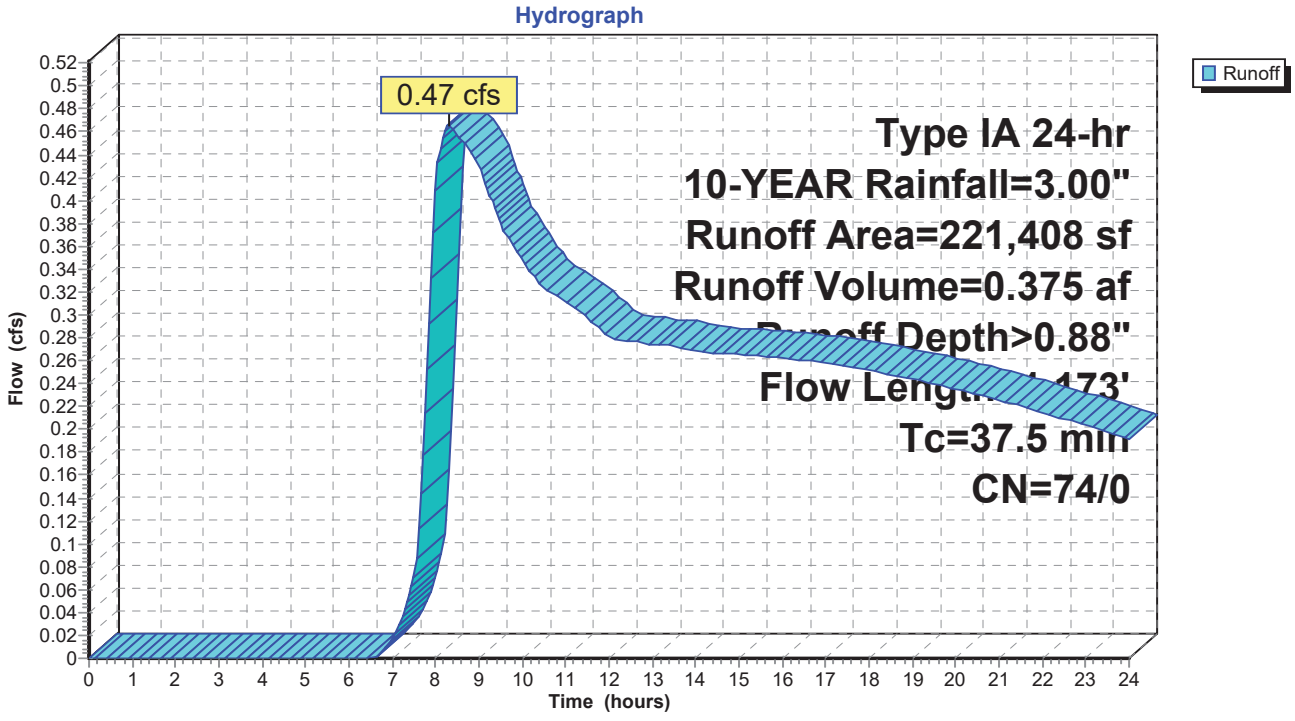
Runoff = 0.47 cfs @ 8.31 hrs, Volume= 0.375 af, Depth> 0.88"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

Area (sf)	CN	Description
221,408	74	Pasture/grassland/range, Good, HSG C
221,408	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0200	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
28.2	1,123	0.0090	0.66		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
37.5	1,173	Total			

Subcatchment 15S:



Summary for Subcatchment 16S: TL 100

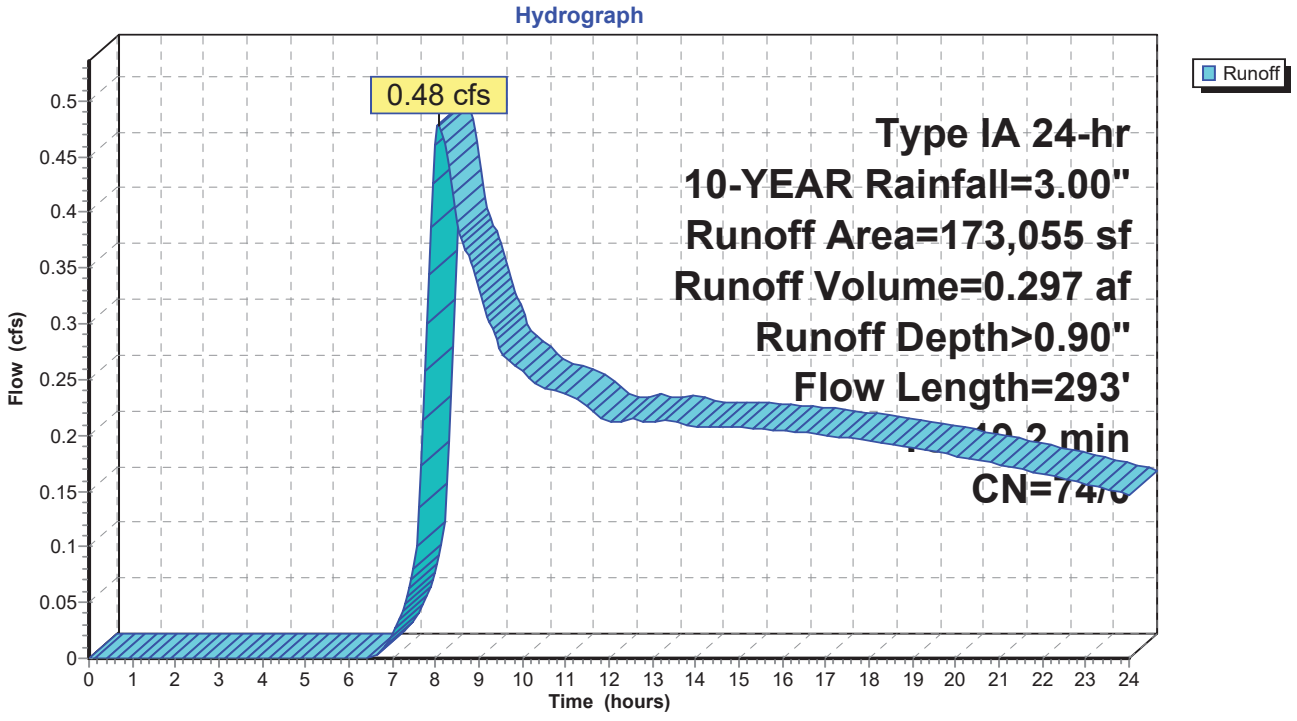
Runoff = 0.48 cfs @ 8.07 hrs, Volume= 0.297 af, Depth> 0.90"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

Area (sf)	CN	Description
173,055	74	Pasture/grassland/range, Good, HSG C
173,055	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	50	0.0130	0.08		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
8.2	243	0.0050	0.49		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
19.2	293	Total			

Subcatchment 16S: TL 100



Summary for Subcatchment 17S: TL 1100

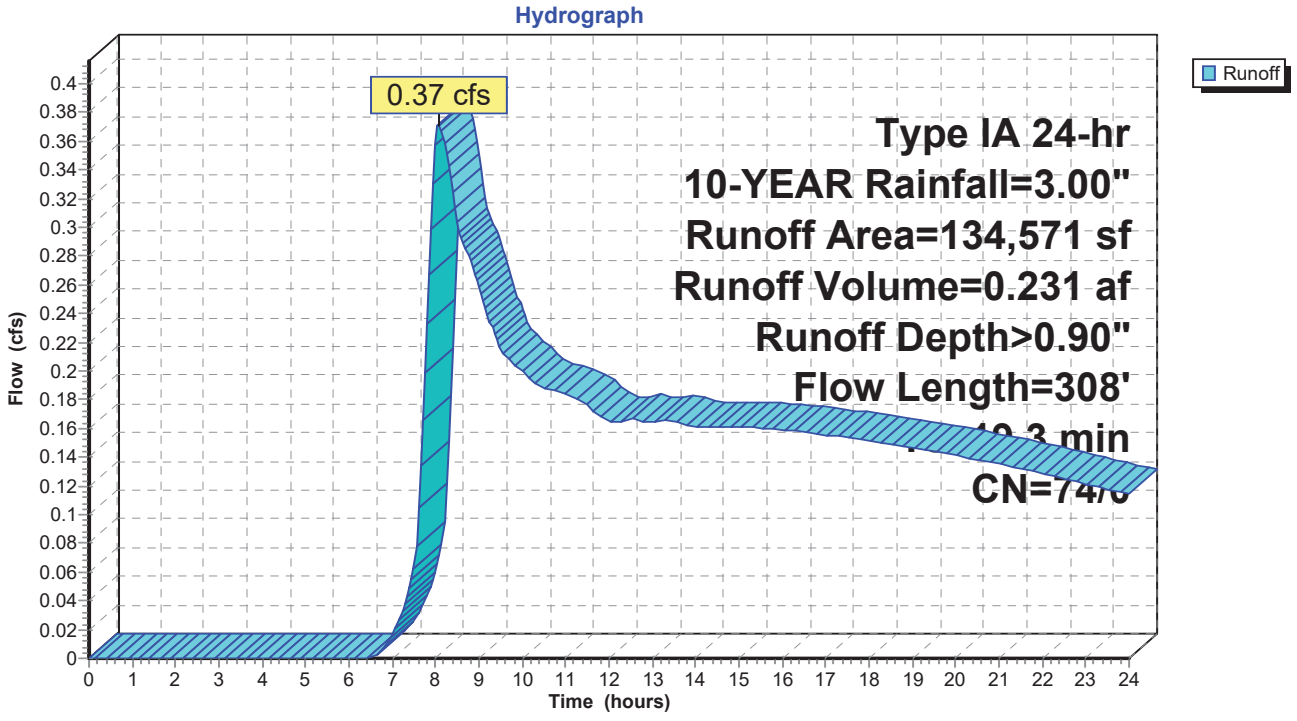
Runoff = 0.37 cfs @ 8.07 hrs, Volume= 0.231 af, Depth> 0.90"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

Area (sf)	CN	Description
134,571	74	Pasture/grassland/range, Good, HSG C
134,571	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	50	0.0080	0.06		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
5.9	258	0.0110	0.73		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
19.3	308	Total			

Subcatchment 17S: TL 1100



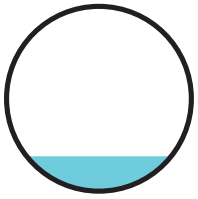
Summary for Reach 1R: Ex 12" RCP

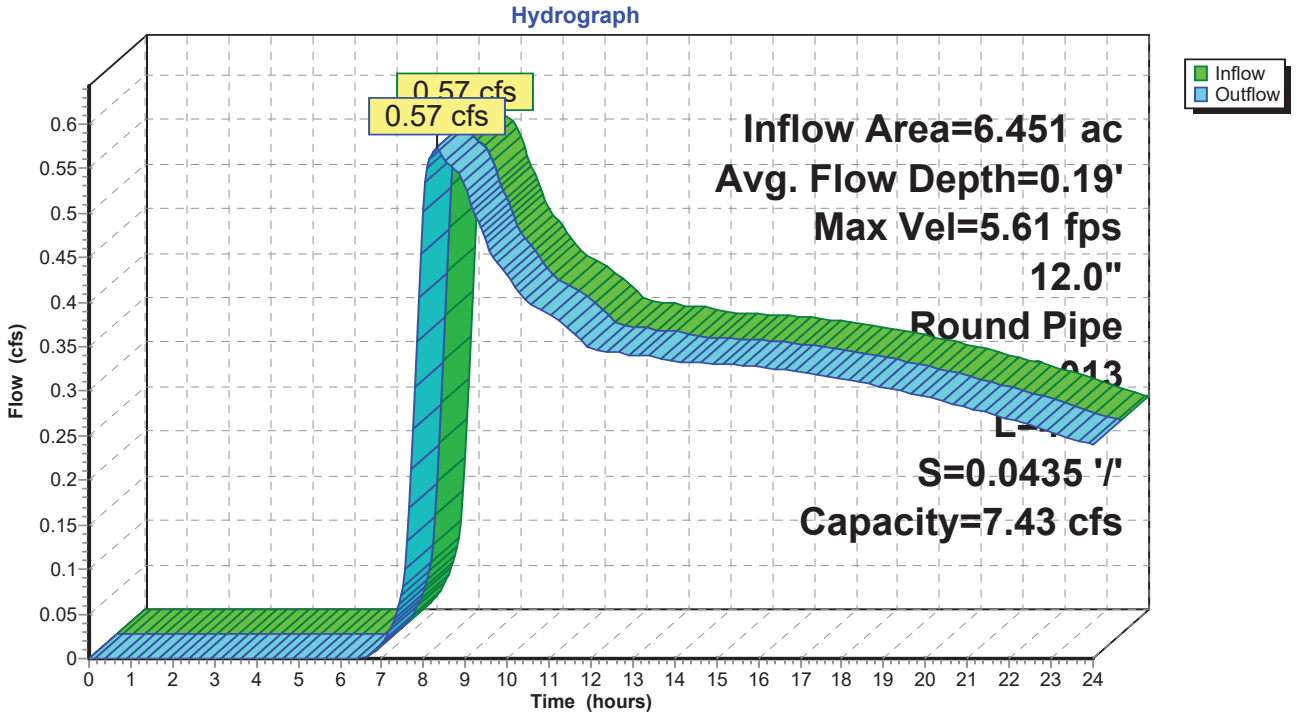
Inflow Area = 6.451 ac, 0.00% Impervious, Inflow Depth > 0.86" for 10-YEAR event
Inflow = 0.57 cfs @ 8.30 hrs, Volume= 0.465 af
Outflow = 0.57 cfs @ 8.30 hrs, Volume= 0.465 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.61 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.62 fps, Avg. Travel Time= 0.2 min

Peak Storage= 5 cf @ 8.30 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.43 cfs

12.0" Round Pipe
n= 0.013
Length= 45.7' Slope= 0.0435 '/'
Inlet Invert= 174.68', Outlet Invert= 172.69'





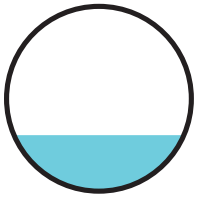
Summary for Reach 2R: Ex 18" ADS

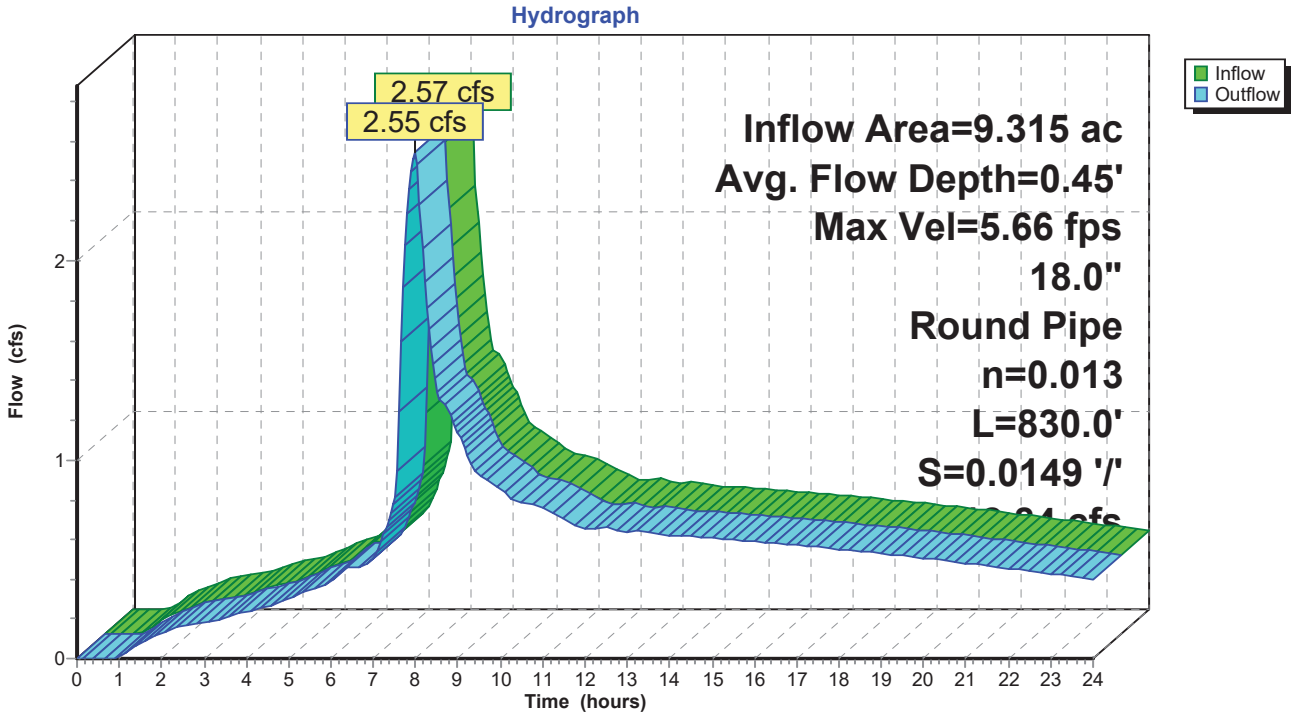
Inflow Area = 9.315 ac, 27.93% Impervious, Inflow Depth > 1.42" for 10-YEAR event
Inflow = 2.57 cfs @ 7.98 hrs, Volume= 1.100 af
Outflow = 2.55 cfs @ 7.99 hrs, Volume= 1.098 af, Atten= 1%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.66 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 3.50 fps, Avg. Travel Time= 4.0 min

Peak Storage= 374 cf @ 7.99 hrs
Average Depth at Peak Storage= 0.45'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 12.84 cfs

18.0" Round Pipe
n= 0.013
Length= 830.0' Slope= 0.0149 '/'
Inlet Invert= 187.30', Outlet Invert= 174.90'





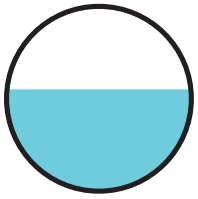
Summary for Reach 3R: 24" PVC

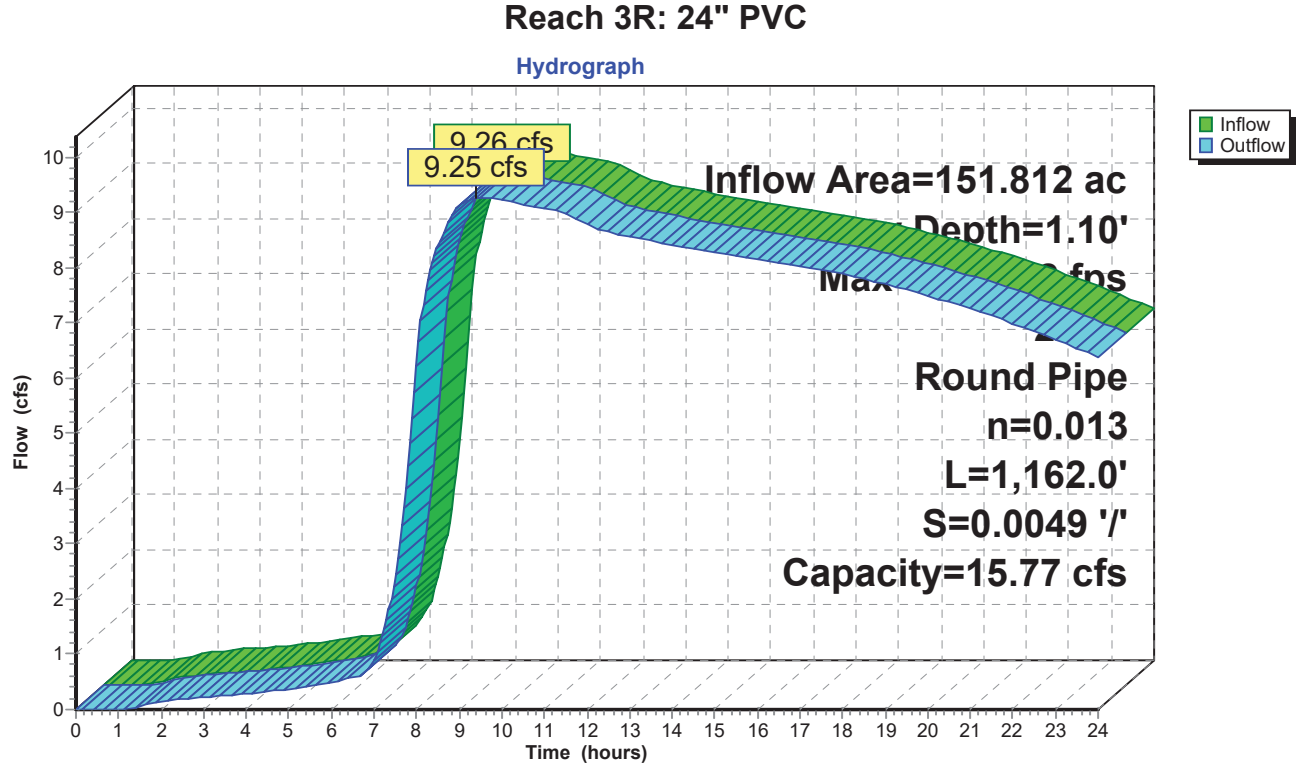
Inflow Area = 151.812 ac, 2.19% Impervious, Inflow Depth > 0.87" for 10-YEAR event
Inflow = 9.26 cfs @ 9.33 hrs, Volume= 11.062 af
Outflow = 9.25 cfs @ 9.38 hrs, Volume= 11.026 af, Atten= 0%, Lag= 3.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.22 fps, Min. Travel Time= 3.7 min
Avg. Velocity = 4.13 fps, Avg. Travel Time= 4.7 min

Peak Storage= 2,060 cf @ 9.38 hrs
Average Depth at Peak Storage= 1.10'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 15.77 cfs

24.0" Round Pipe
n= 0.013 PVC, smooth interior
Length= 1,162.0' Slope= 0.0049 '/'
Inlet Invert= 170.54', Outlet Invert= 164.89'





Summary for Pond 1P: Existing Stormwater Facility

Inflow Area = 90.742 ac, 3.67% Impervious, Inflow Depth > 0.93" for 10-YEAR event
Inflow = 10.14 cfs @ 8.06 hrs, Volume= 7.063 af
Outflow = 5.25 cfs @ 11.67 hrs, Volume= 6.583 af, Atten= 48%, Lag= 216.1 min
Primary = 5.25 cfs @ 11.67 hrs, Volume= 6.583 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 173.39' @ 11.67 hrs Surf.Area= 117,430 sf Storage= 35,823 cf
Flood Elev= 174.50' Surf.Area= 258,975 sf Storage= 245,604 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 57.6 min (925.2 - 867.5)

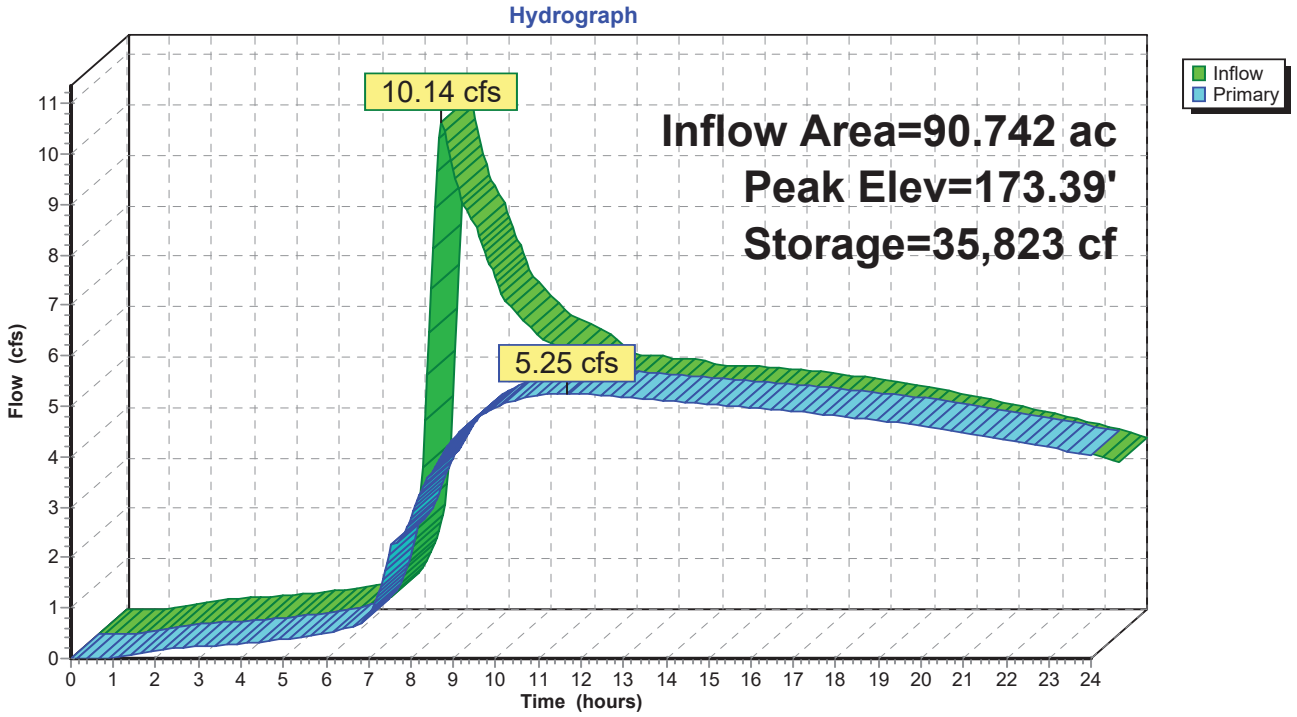
Volume	Invert	Avail.Storage	Storage Description
#1	173.00'	1,197,116 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
173.00	68,497	0	0
175.00	322,467	390,964	390,964
177.00	483,685	806,152	1,197,116

Device	Routing	Invert	Outlet Devices
#1	Primary	172.04'	**90.0 deg x 1.40' rise Sharp-Crested Vee/Trap Weir** Cv= 2.50 (C= 3.13)

Primary OutFlow Max=5.25 cfs @ 11.67 hrs HW=173.39' TW=171.62' (Dynamic Tailwater)
↑—**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 5.25 cfs @ 2.90 fps)

Pond 1P: Existing Stormwater Facility

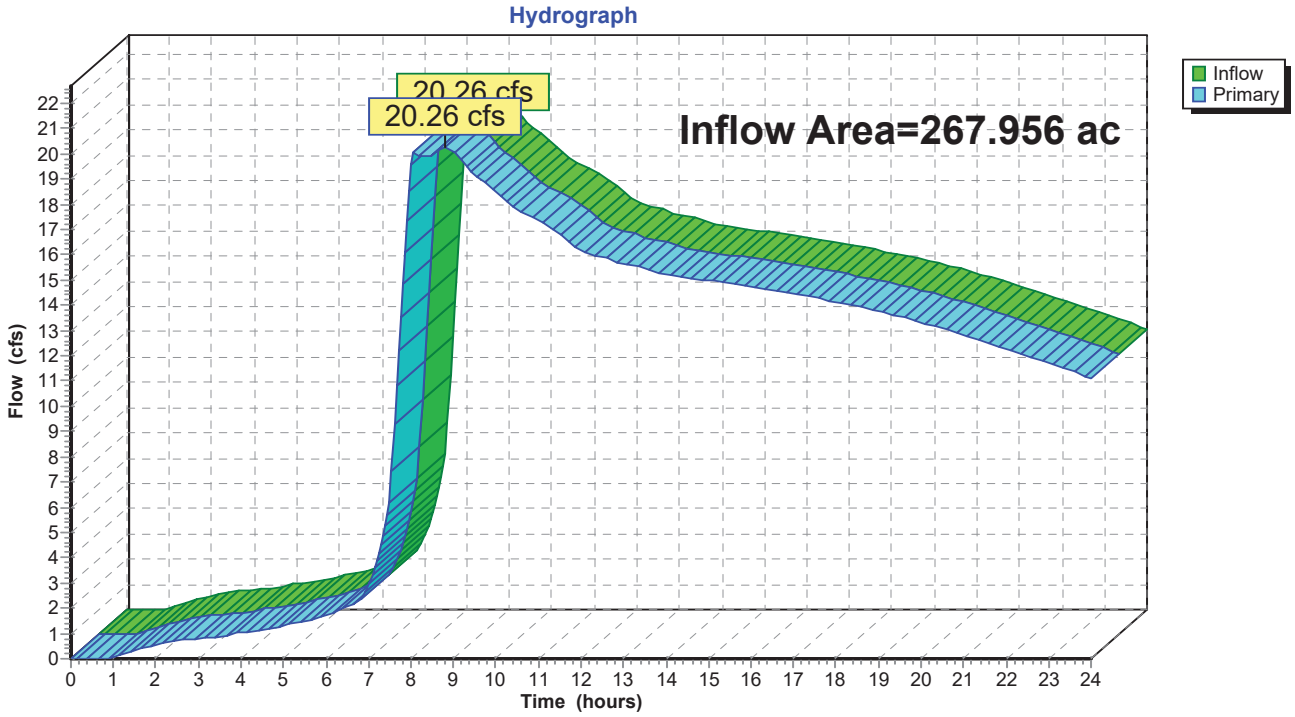


Summary for Link 5L: Discharge

Inflow Area = 267.956 ac, 4.26% Impervious, Inflow Depth > 0.95" for 10-YEAR event
Inflow = 20.26 cfs @ 8.80 hrs, Volume= 21.191 af
Primary = 20.26 cfs @ 8.80 hrs, Volume= 21.191 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 5L: Discharge



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Harvest Gardens TL Runoff Area=2,278,468 sf 0.00% Impervious Runoff Depth>1.19"
Flow Length=2,180' Tc=60.0 min CN=74/0 Runoff=6.10 cfs 5.193 af

Subcatchment 3S: Harvest Gardens TL Runoff Area=406,655 sf 0.00% Impervious Runoff Depth>1.22"
Flow Length=513' Tc=20.3 min CN=74/0 Runoff=1.73 cfs 0.952 af

Subcatchment 4S: Off-site cul-de-sac Runoff Area=223,632 sf 50.68% Impervious Runoff Depth>2.26"
Tc=5.0 min CN=74/98 Runoff=2.73 cfs 0.968 af

Subcatchment 5S: Off-site west of Matthieu Runoff Area=59,593 sf 0.00% Impervious Runoff Depth>1.10"
Flow Length=415' Tc=30.0 min CN=72/0 Runoff=0.18 cfs 0.125 af

Subcatchment 6S: TL 2100 (developed) Runoff Area=519,405 sf 63.26% Impervious Runoff Depth>2.52"
Tc=5.0 min CN=74/98 Runoff=7.20 cfs 2.501 af

Subcatchment 7S: TL 2000 Runoff Area=146,139 sf 16.26% Impervious Runoff Depth>1.54"
Flow Length=520' Tc=29.9 min CN=74/98 Runoff=0.77 cfs 0.432 af

Subcatchment 8S: TL 2600 (Off-site Runoff Area=4,393,660 sf 0.00% Impervious Runoff Depth>1.25"
Flow Length=4,393' Tc=56.6 min CN=75/0 Runoff=13.06 cfs 10.549 af

Subcatchment 9S: TL 2600 (Off-site South) Runoff Area=381,740 sf 0.00% Impervious Runoff Depth>1.28"
Flow Length=1,006' Tc=31.8 min CN=75/0 Runoff=1.47 cfs 0.932 af

Subcatchment 10S: TL 300 (Off-site South) Runoff Area=677,221 sf 0.00% Impervious Runoff Depth>1.22"
Flow Length=828' Slope=0.0150 '/' Tc=25.5 min CN=74/0 Runoff=2.62 cfs 1.581 af

Subcatchment 11S: TL 400,500,600,900 Runoff Area=1,001,660 sf 0.00% Impervious Runoff Depth>1.20"
Flow Length=1,774' Tc=52.6 min CN=74/0 Runoff=2.83 cfs 2.295 af

Subcatchment 12S: TL 1000 Runoff Area=531,627 sf 0.00% Impervious Runoff Depth>1.10"
Flow Length=989' Tc=28.6 min CN=72/0 Runoff=1.63 cfs 1.118 af

Subcatchment 13S: Runoff Area=341,174 sf 9.28% Impervious Runoff Depth>1.30"
Flow Length=763' Tc=22.5 min CN=72/98 Runoff=1.52 cfs 0.850 af

Subcatchment 14S: NW Corner Runoff Area=182,135 sf 0.00% Impervious Runoff Depth>1.22"
Flow Length=601' Tc=31.0 min CN=74/0 Runoff=0.65 cfs 0.424 af

Subcatchment 15S: Runoff Area=221,408 sf 0.00% Impervious Runoff Depth>1.21"
Flow Length=1,173' Tc=37.5 min CN=74/0 Runoff=0.73 cfs 0.513 af

Subcatchment 16S: TL 100 Runoff Area=173,055 sf 0.00% Impervious Runoff Depth>1.23"
Flow Length=293' Tc=19.2 min CN=74/0 Runoff=0.75 cfs 0.406 af

Subcatchment 17S: TL 1100 Runoff Area=134,571 sf 0.00% Impervious Runoff Depth>1.22"
Flow Length=308' Tc=19.3 min CN=74/0 Runoff=0.58 cfs 0.315 af

Reach 1R: Ex 12" RCP Avg. Flow Depth=0.24' Max Vel=6.42 fps Inflow=0.91 cfs 0.638 af
12.0" Round Pipe n=0.013 L=45.7' S=0.0435 '/' Capacity=7.43 cfs Outflow=0.91 cfs 0.638 af

Reach 2R: Ex 18" ADS Avg. Flow Depth=0.52' Max Vel=6.09 fps Inflow=3.33 cfs 1.391 af
18.0" Round Pipe n=0.013 L=830.0' S=0.0149 '/' Capacity=12.84 cfs Outflow=3.31 cfs 1.389 af

Reach 3R: 24" PVC Avg. Flow Depth=1.39' Max Vel=5.61 fps Inflow=13.07 cfs 14.858 af
24.0" Round Pipe n=0.013 L=1,162.0' S=0.0049 '/' Capacity=15.77 cfs Outflow=13.06 cfs 14.815 af

Pond 1P: Existing Stormwater Facility Peak Elev=173.58' Storage=61,192 cf Inflow=15.49 cfs 9.544 af
Outflow=6.89 cfs 8.733 af

Link 5L: Discharge Inflow=29.09 cfs 28.297 af
Primary=29.09 cfs 28.297 af

Total Runoff Area = 267.956 ac Runoff Volume = 29.154 af Average Runoff Depth = 1.31"
95.74% Pervious = 256.539 ac 4.26% Impervious = 11.417 ac

Summary for Subcatchment 1S: Harvest Gardens TL 2600

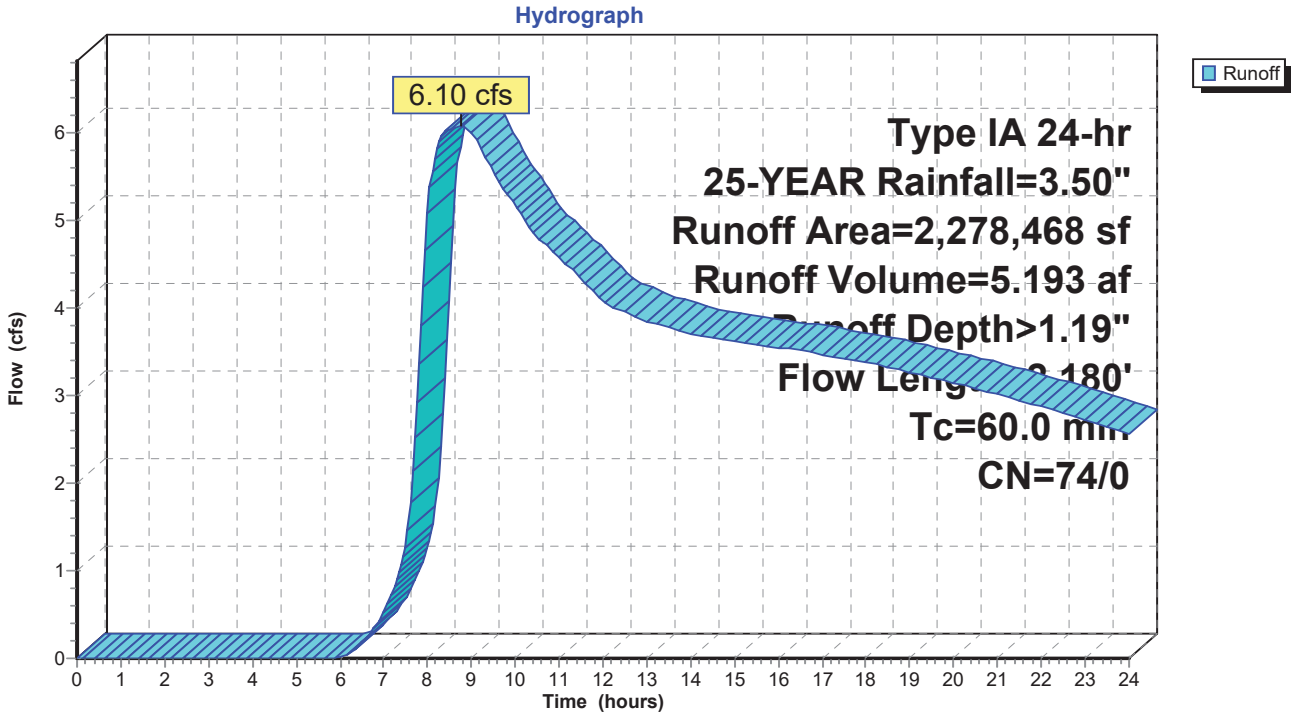
Runoff = 6.10 cfs @ 8.74 hrs, Volume= 5.193 af, Depth> 1.19"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

Area (sf)	CN	Description
2,278,468	74	Pasture/grassland/range, Good, HSG C
2,278,468	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0200	0.09		**Sheet Flow, sheet** Grass: Dense n= 0.240 P2= 2.50"
50.7	2,130	0.0100	0.70		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
60.0	2,180	Total			

Subcatchment 1S: Harvest Gardens TL 2600



Summary for Subcatchment 3S: Harvest Gardens TL 1100

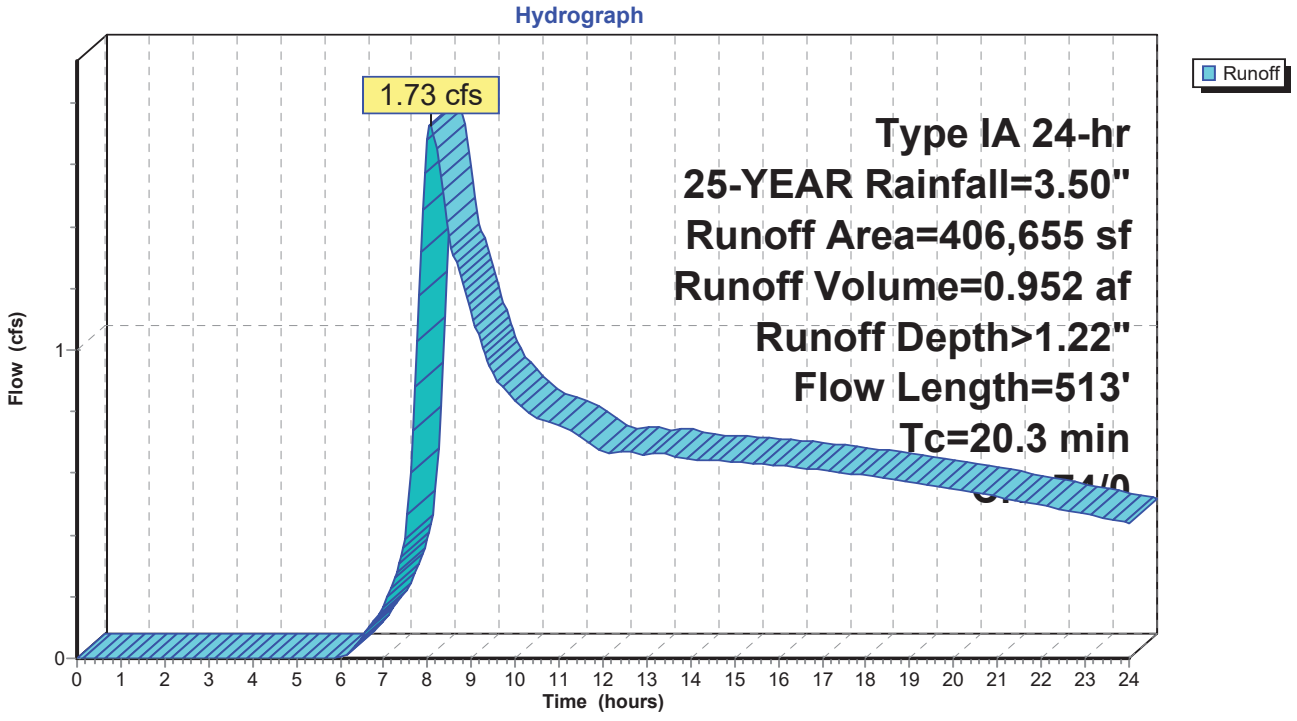
Runoff = 1.73 cfs @ 8.06 hrs, Volume= 0.952 af, Depth> 1.22"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

Area (sf)	CN	Description
406,655	74	Pasture/grassland/range, Good, HSG C
406,655	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0200	0.09		**Sheet Flow, sheet** Grass: Dense n= 0.240 P2= 2.50"
11.0	463	0.0100	0.70		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
20.3	513	Total			

Subcatchment 3S: Harvest Gardens TL 1100



Summary for Subcatchment 4S: Off-site cul-de-sac (developed)

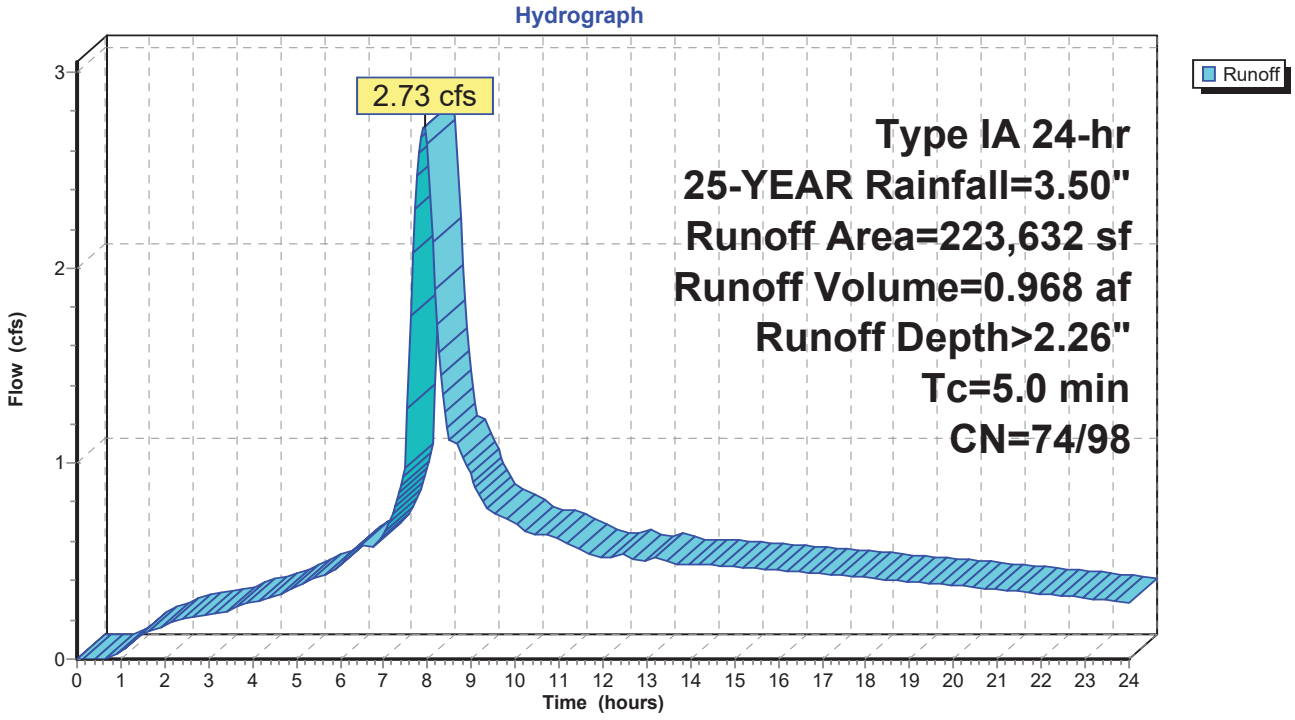
Runoff = 2.73 cfs @ 7.94 hrs, Volume= 0.968 af, Depth> 2.26"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

	Area (sf)	CN	Description
*	42,063	98	impervious, row, sidewalk, etc.
*	71,280	98	impervious (8 lots @ 2640)
	110,289	74	>75% Grass cover, Good, HSG C
	223,632	86	Weighted Average
	110,289	74	49.32% Pervious Area
	113,343	98	50.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 4S: Off-site cul-de-sac (developed)



Summary for Subcatchment 5S: Off-site west of Matthieu (open space)

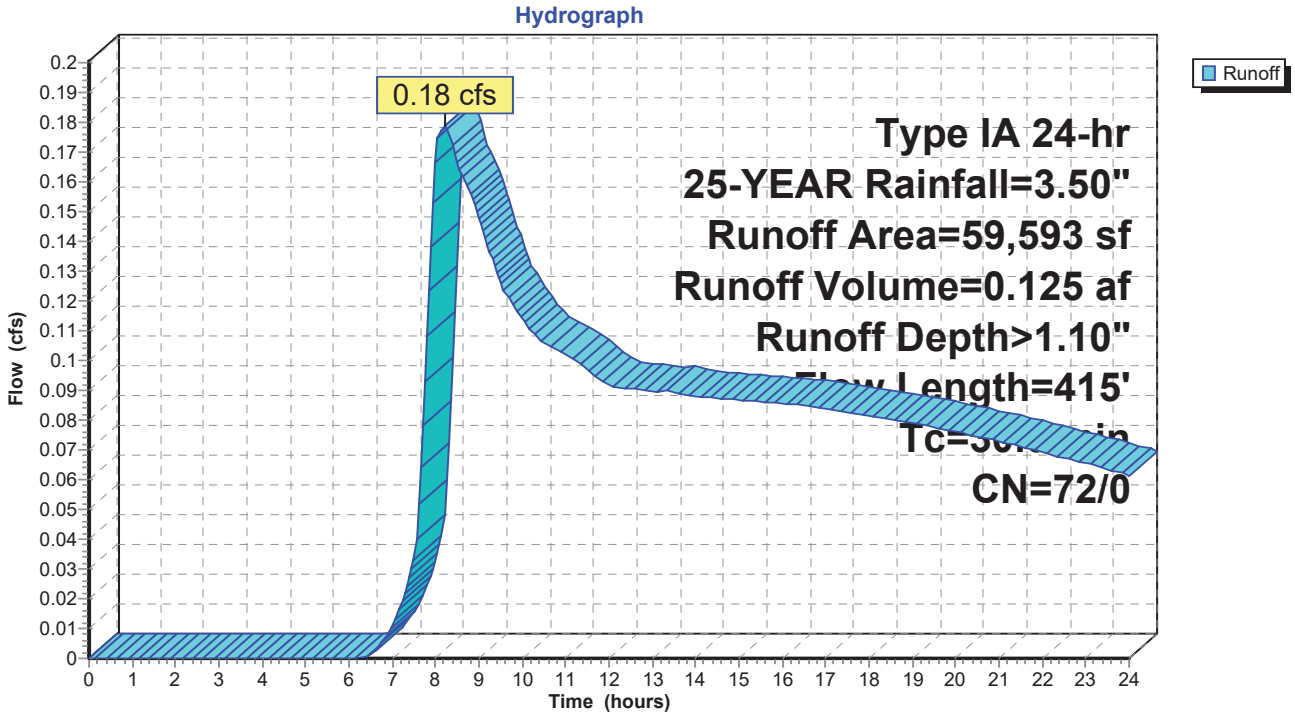
Runoff = 0.18 cfs @ 8.19 hrs, Volume= 0.125 af, Depth> 1.10"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

Area (sf)	CN	Description
59,593	72	Woods/grass comb., Good, HSG C
59,593	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.7	50	0.0040	0.05		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
12.3	365	0.0050	0.49		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
30.0	415	Total			

Subcatchment 5S: Off-site west of Matthieu (open space)



Summary for Subcatchment 6S: TL 2100 (developed)

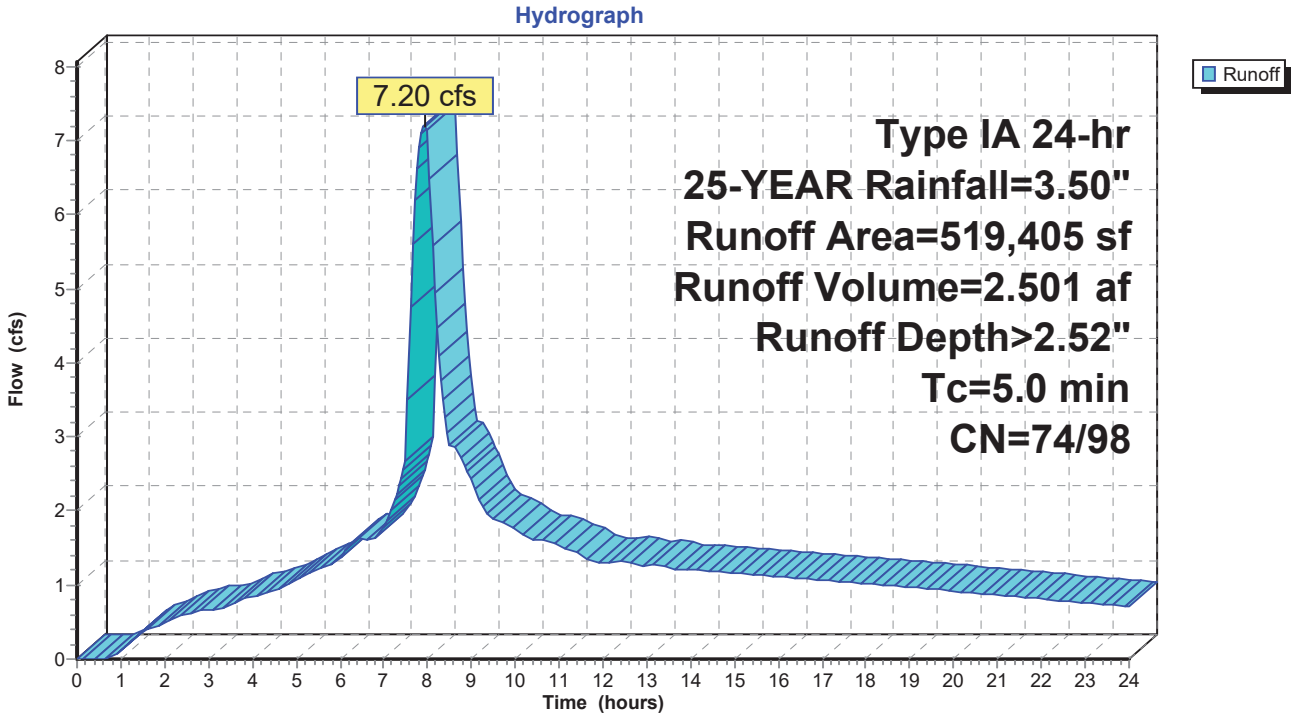
Runoff = 7.20 cfs @ 7.92 hrs, Volume= 2.501 af, Depth> 2.52"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

	Area (sf)	CN	Description
*	154,312	98	impervious, row, sidewalk, etc
*	174,240	98	Lots (66 @ 2640)
	190,853	74	>75% Grass cover, Good, HSG C
	519,405	89	Weighted Average
	190,853	74	36.74% Pervious Area
	328,552	98	63.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: TL 2100 (developed)



Summary for Subcatchment 7S: TL 2000

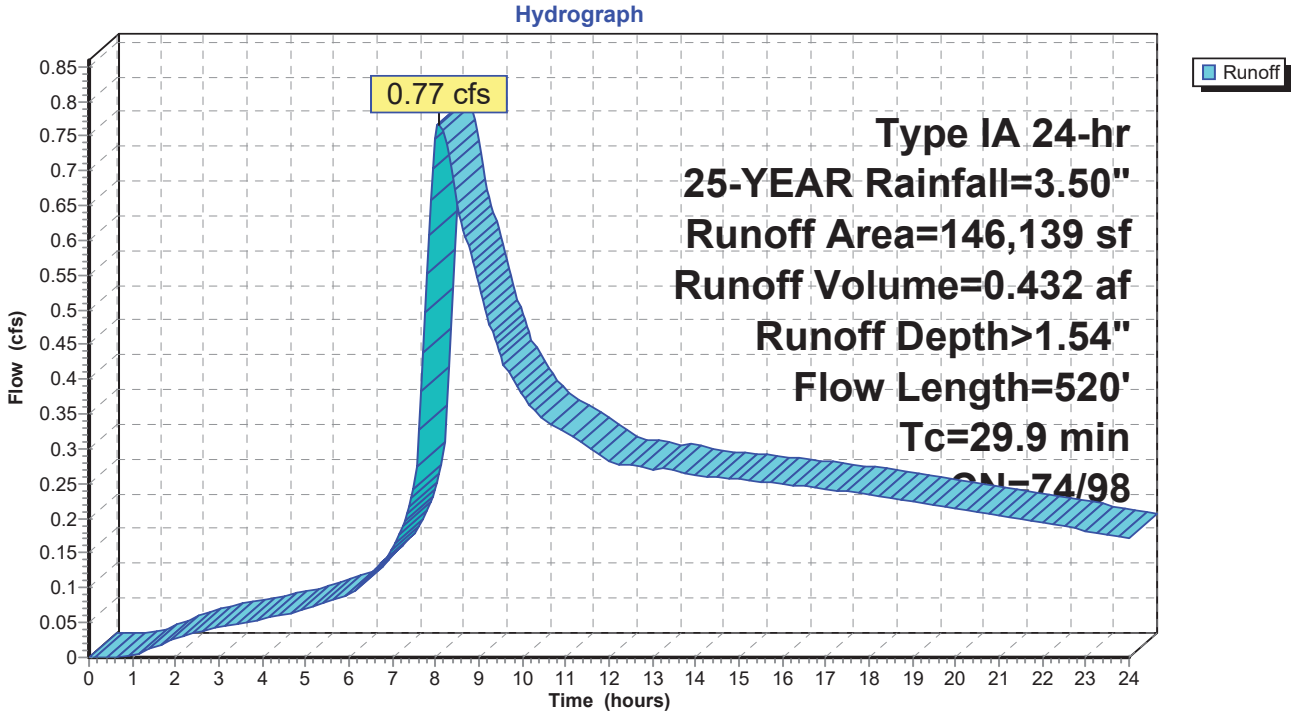
Runoff = 0.77 cfs @ 8.07 hrs, Volume= 0.432 af, Depth> 1.54"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

	Area (sf)	CN	Description
*	15,845	98	impervious, row, sidewalk, etc
*	7,920	98	Lots (3 @ 2640)
	122,374	74	>75% Grass cover, Good, HSG C
	146,139	78	Weighted Average
	122,374	74	83.74% Pervious Area
	23,765	98	16.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	50	0.0100	0.07		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
17.7	470	0.0040	0.44		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
29.9	520	Total			

Subcatchment 7S: TL 2000



Summary for Subcatchment 8S: TL 2600 (Off-site South)

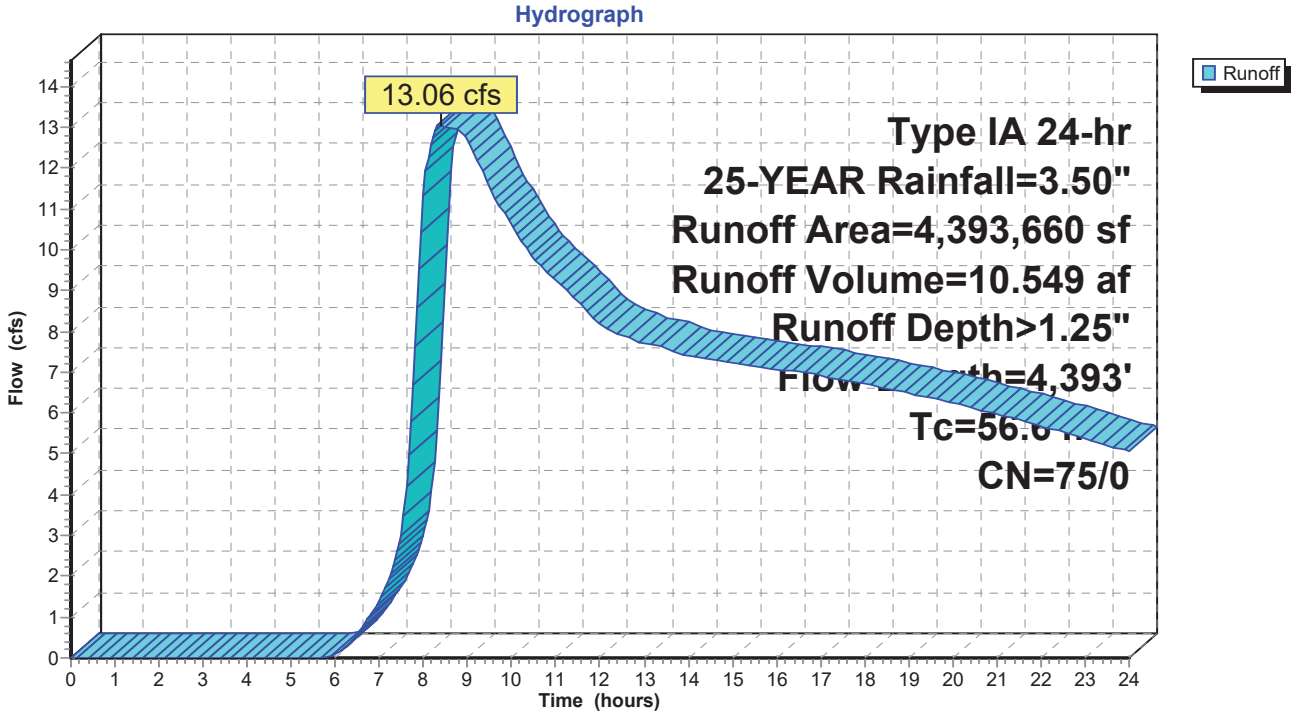
Runoff = 13.06 cfs @ 8.39 hrs, Volume= 10.549 af, Depth> 1.25"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

Area (sf)	CN	Description
3,824,683	74	Pasture/grassland/range, Good, HSG C
568,977	80	Pasture/grassland/range, Good, HSG D
4,393,660	75	Weighted Average
4,393,660	75	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.1	50	0.0050	0.05		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
15.7	510	0.0060	0.54		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
24.8	3,833	0.5000	2.58	2.58	**Channel Flow, channel** Area= 1.0 sf Perim= 50.0' r= 0.02' n= 0.030 Short grass
56.6	4,393	Total			

Subcatchment 8S: TL 2600 (Off-site South)



Summary for Subcatchment 9S: TL 2600 (Off-site South)

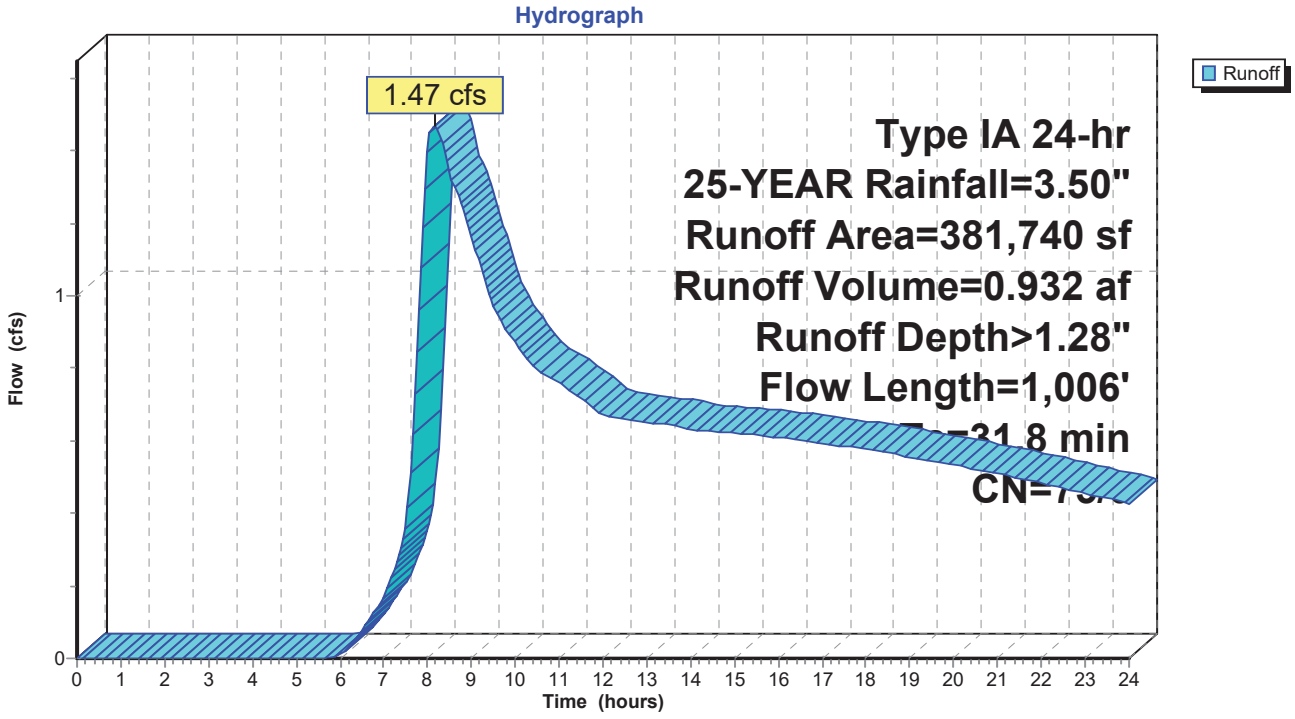
Runoff = 1.47 cfs @ 8.16 hrs, Volume= 0.932 af, Depth> 1.28"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

Area (sf)	CN	Description
322,671	74	Pasture/grassland/range, Good, HSG C
59,069	80	Pasture/grassland/range, Good, HSG D
381,740	75	Weighted Average
381,740	75	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	50	0.0130	0.08		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
20.8	956	0.0120	0.77		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
31.8	1,006	Total			

Subcatchment 9S: TL 2600 (Off-site South)



Summary for Subcatchment 10S: TL 300 (Off-site South)

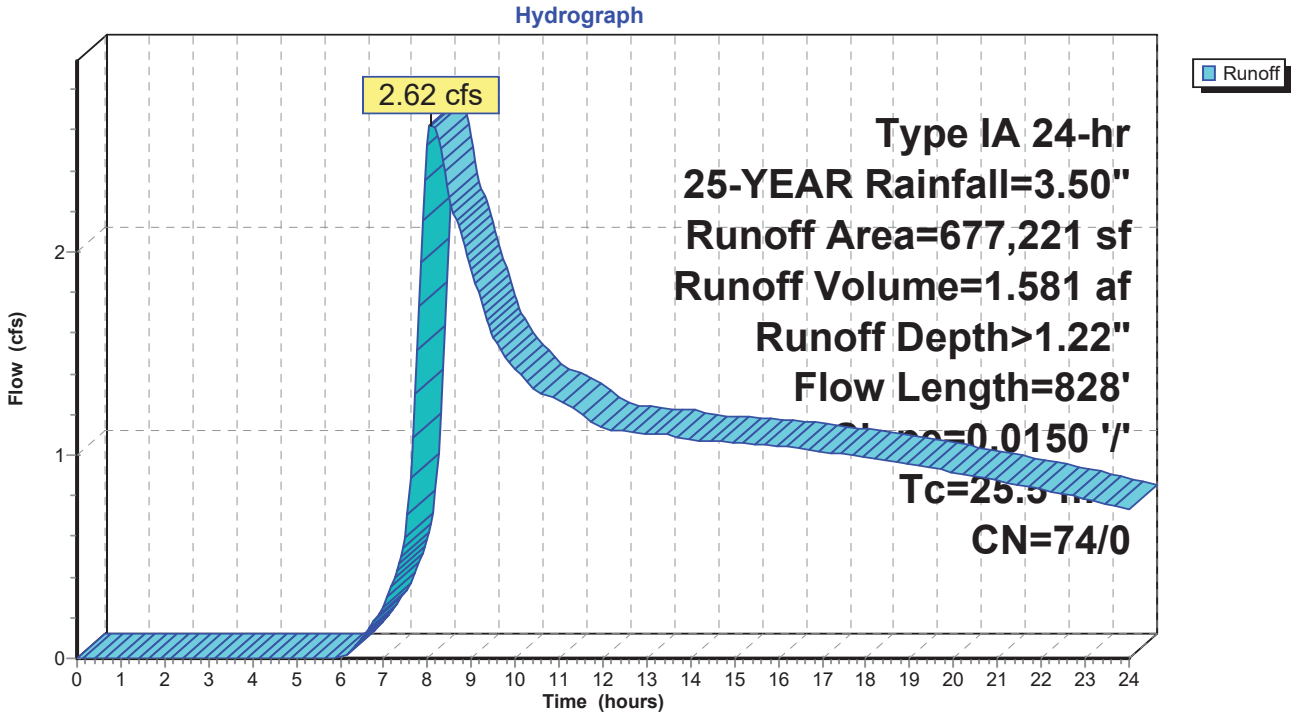
Runoff = 2.62 cfs @ 8.09 hrs, Volume= 1.581 af, Depth> 1.22"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

Area (sf)	CN	Description
677,221	74	Pasture/grassland/range, Good, HSG C
677,221	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	50	0.0150	0.08		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
15.1	778	0.0150	0.86		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
25.5	828	Total			

Subcatchment 10S: TL 300 (Off-site South)



Summary for Subcatchment 11S: TL 400,500,600,900

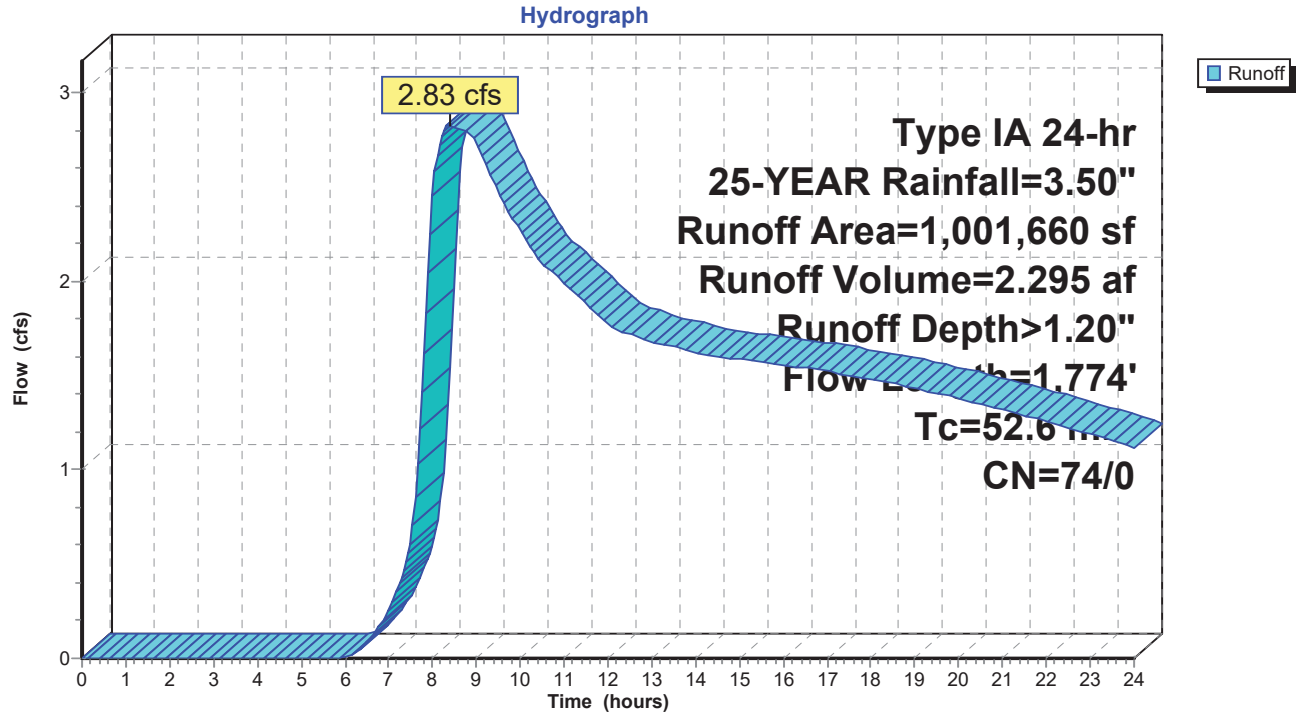
Runoff = 2.83 cfs @ 8.38 hrs, Volume= 2.295 af, Depth> 1.20"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

Area (sf)	CN	Description
1,001,660	74	Pasture/grassland/range, Good, HSG C
1,001,660	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0200	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
43.3	1,724	0.0090	0.66		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
52.6	1,774	Total			

Subcatchment 11S: TL 400,500,600,900



Summary for Subcatchment 12S: TL 1000

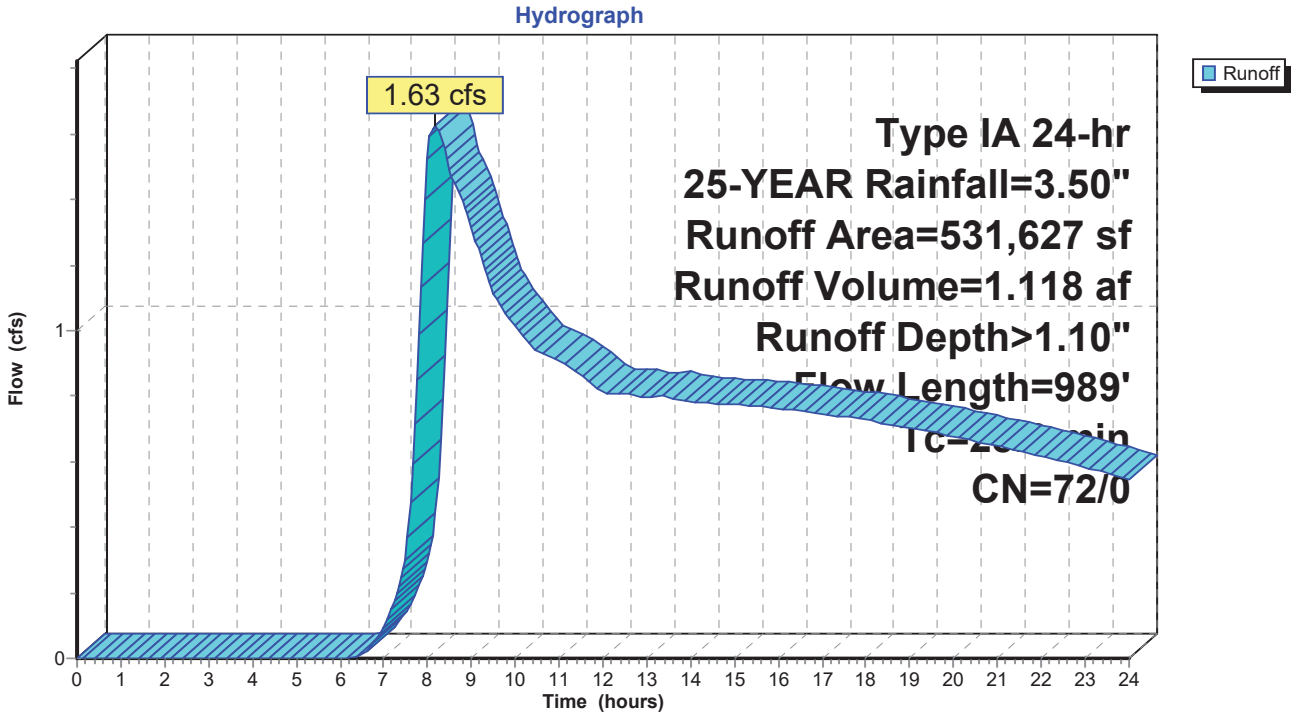
Runoff = 1.63 cfs @ 8.17 hrs, Volume= 1.118 af, Depth> 1.10"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

Area (sf)	CN	Description
531,627	72	Woods/grass comb., Good, HSG C
531,627	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	50	0.0180	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
18.9	939	0.0140	0.83		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
28.6	989	Total			

Subcatchment 12S: TL 1000



Summary for Subcatchment 13S:

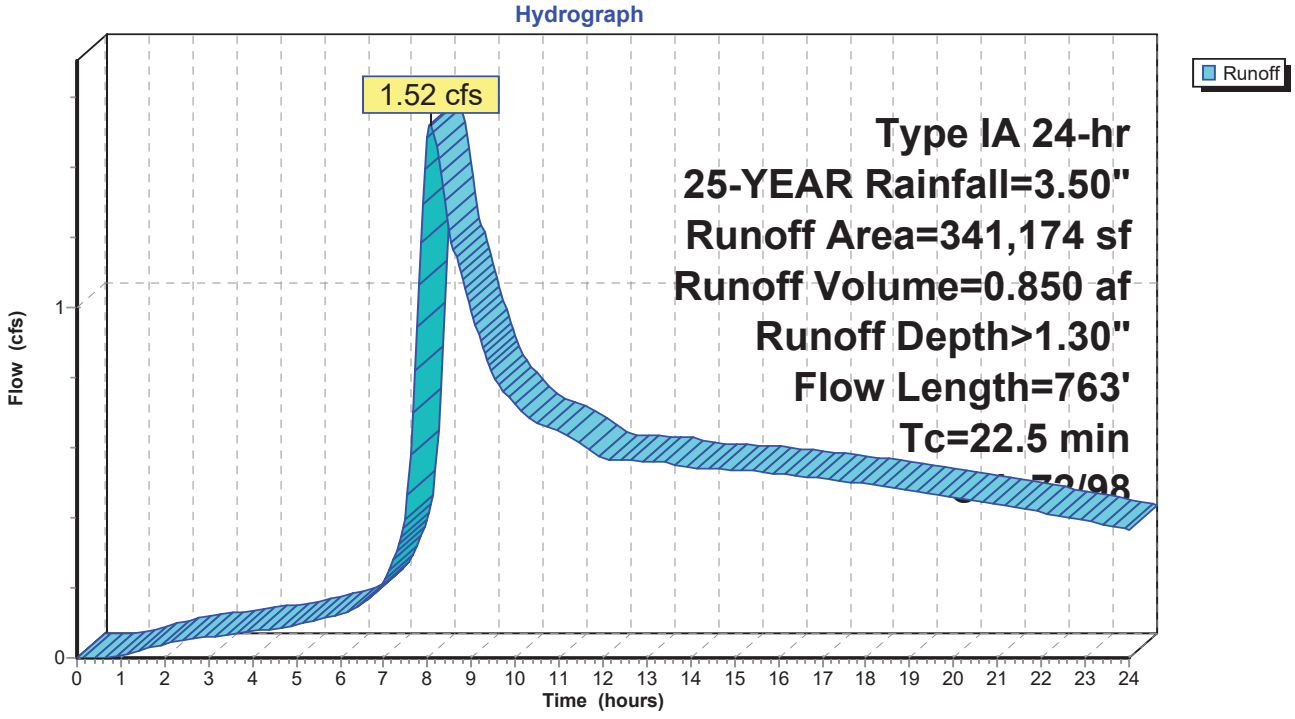
Runoff = 1.52 cfs @ 8.06 hrs, Volume= 0.850 af, Depth> 1.30"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

	Area (sf)	CN	Description
	309,516	72	Woods/grass comb., Good, HSG C
*	31,658	98	Impervious structures (4)
	341,174	74	Weighted Average
	309,516	72	90.72% Pervious Area
	31,658	98	9.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0240	0.10		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
13.9	713	0.0150	0.86		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
22.5	763	Total			

Subcatchment 13S:



Summary for Subcatchment 14S: NW Corner

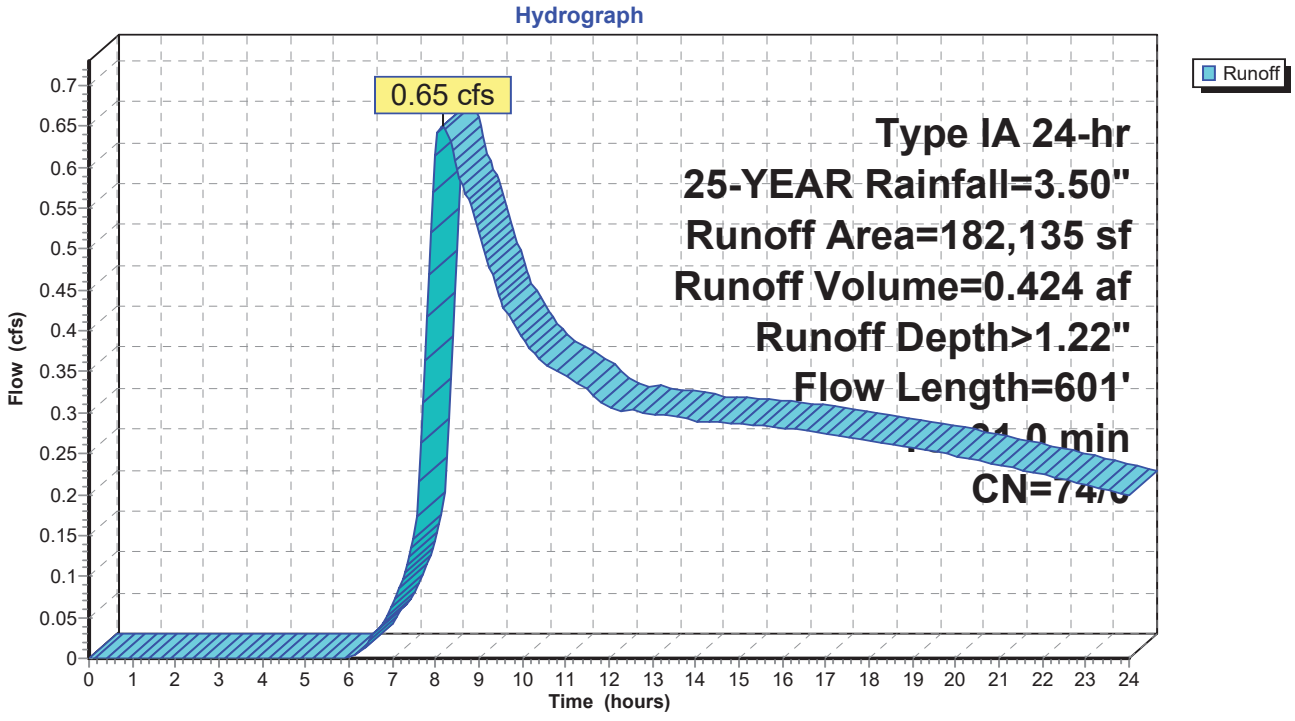
Runoff = 0.65 cfs @ 8.16 hrs, Volume= 0.424 af, Depth> 1.22"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

Area (sf)	CN	Description
182,135	74	>75% Grass cover, Good, HSG C
182,135	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	50	0.0070	0.06		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
16.9	551	0.0060	0.54		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
31.0	601	Total			

Subcatchment 14S: NW Corner



Summary for Subcatchment 15S:

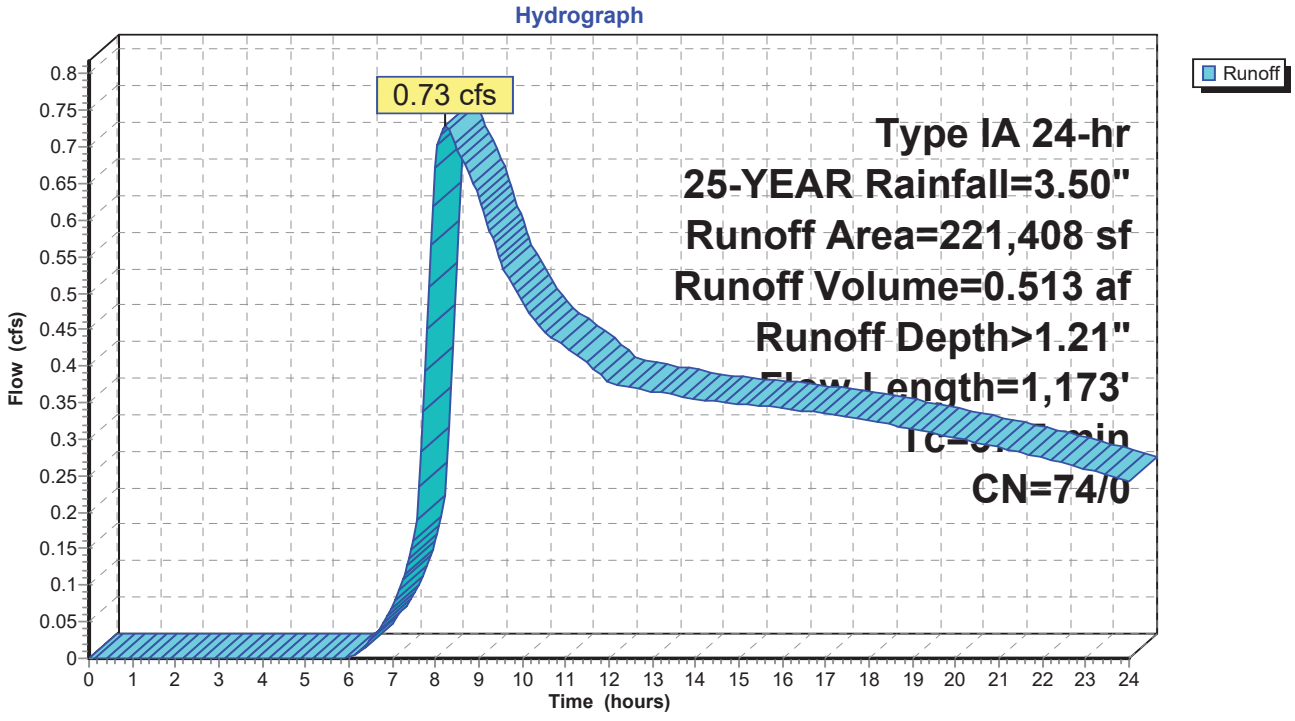
Runoff = 0.73 cfs @ 8.24 hrs, Volume= 0.513 af, Depth> 1.21"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

Area (sf)	CN	Description
221,408	74	Pasture/grassland/range, Good, HSG C
221,408	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0200	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
28.2	1,123	0.0090	0.66		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
37.5	1,173	Total			

Subcatchment 15S:



Summary for Subcatchment 16S: TL 100

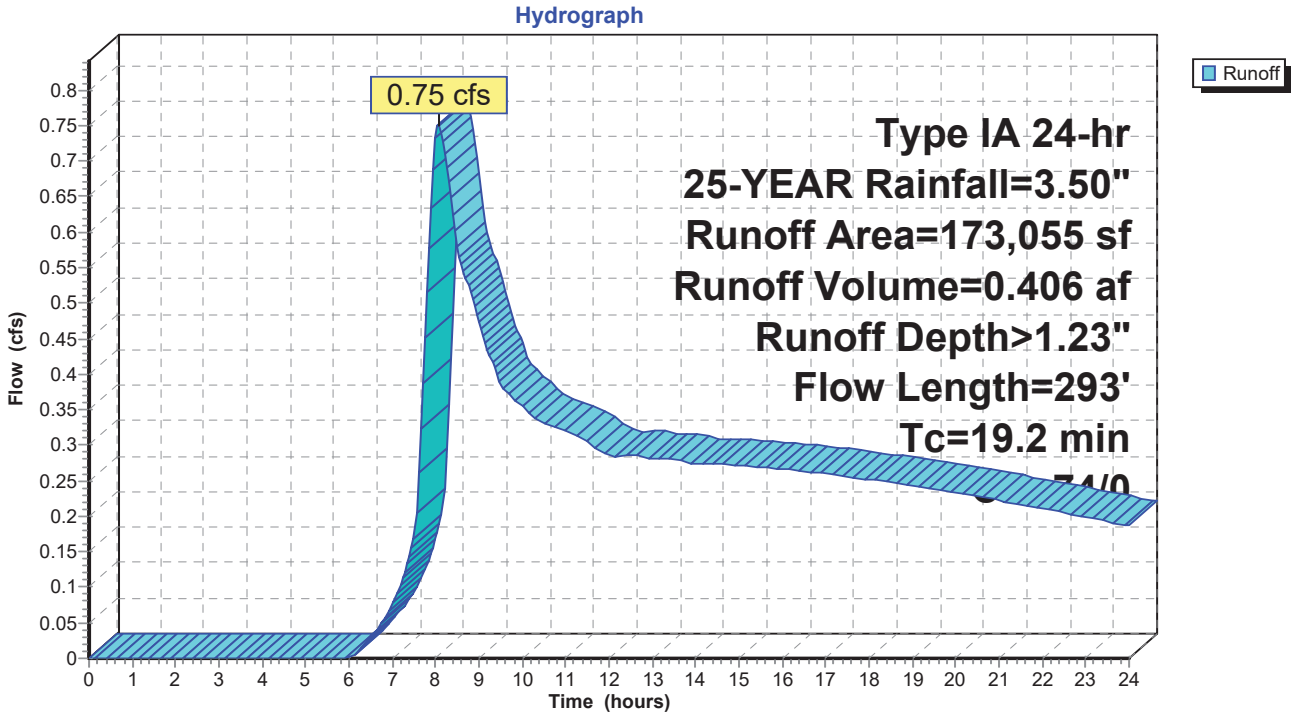
Runoff = 0.75 cfs @ 8.06 hrs, Volume= 0.406 af, Depth> 1.23"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

Area (sf)	CN	Description
173,055	74	Pasture/grassland/range, Good, HSG C
173,055	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	50	0.0130	0.08		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
8.2	243	0.0050	0.49		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
19.2	293	Total			

Subcatchment 16S: TL 100



Summary for Subcatchment 17S: TL 1100

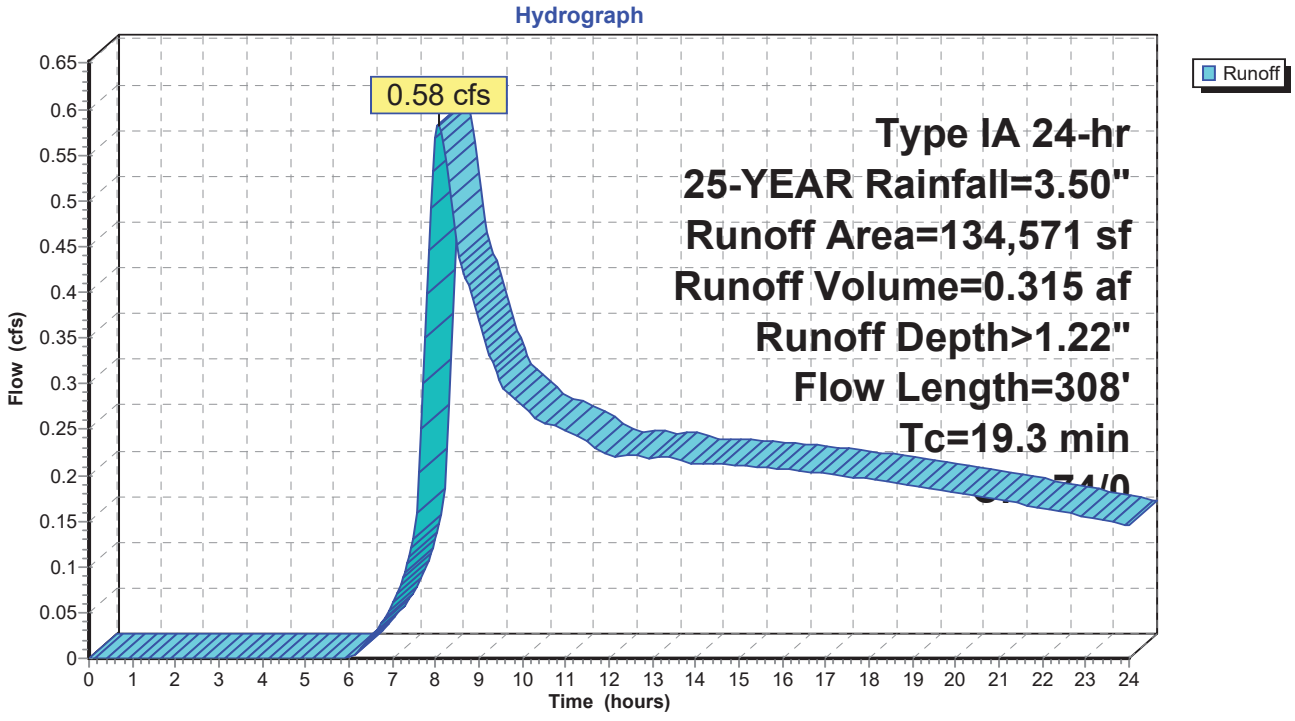
Runoff = 0.58 cfs @ 8.06 hrs, Volume= 0.315 af, Depth> 1.22"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

Area (sf)	CN	Description
134,571	74	Pasture/grassland/range, Good, HSG C
134,571	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	50	0.0080	0.06		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
5.9	258	0.0110	0.73		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
19.3	308	Total			

Subcatchment 17S: TL 1100



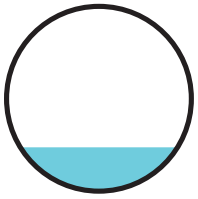
Summary for Reach 1R: Ex 12" RCP

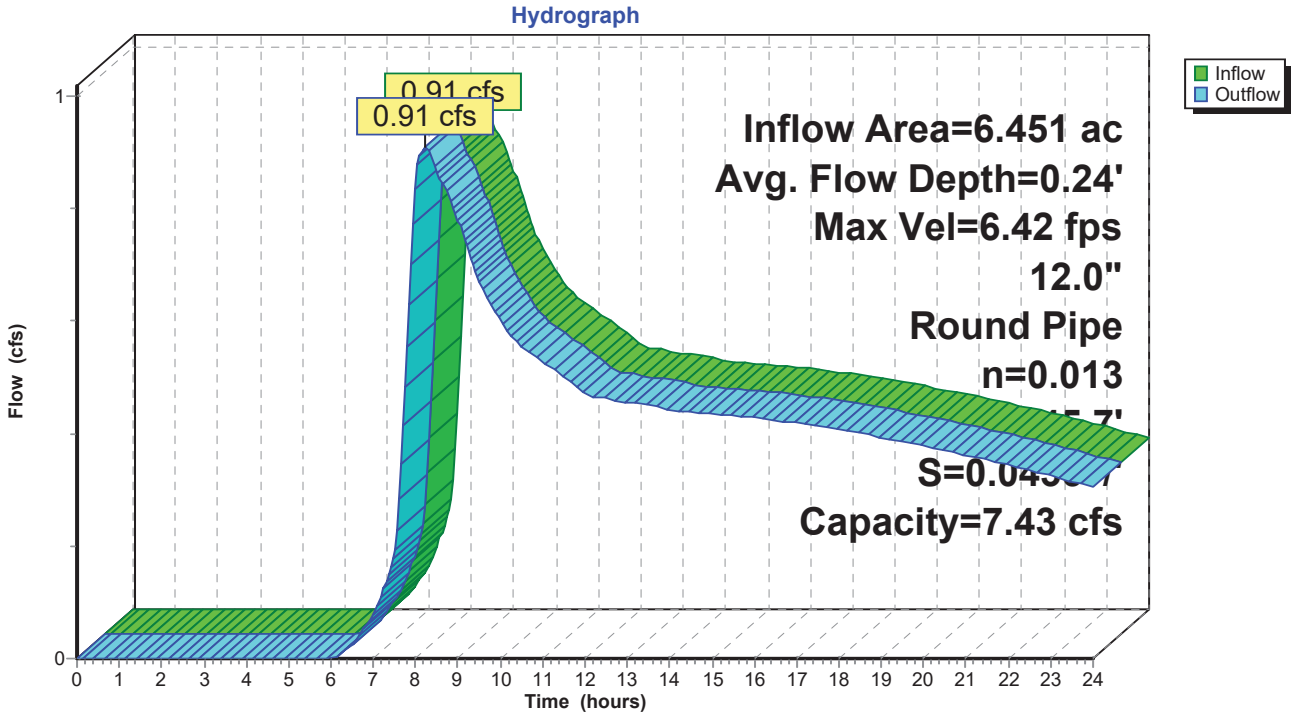
Inflow Area = 6.451 ac, 0.00% Impervious, Inflow Depth > 1.19" for 25-YEAR event
Inflow = 0.91 cfs @ 8.23 hrs, Volume= 0.638 af
Outflow = 0.91 cfs @ 8.23 hrs, Volume= 0.638 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.42 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.99 fps, Avg. Travel Time= 0.2 min

Peak Storage= 6 cf @ 8.23 hrs
Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.43 cfs

12.0" Round Pipe
n= 0.013
Length= 45.7' Slope= 0.0435 '/'
Inlet Invert= 174.68', Outlet Invert= 172.69'





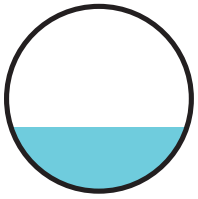
Summary for Reach 2R: Ex 18" ADS

Inflow Area = 9.315 ac, 27.93% Impervious, Inflow Depth > 1.79" for 25-YEAR event
Inflow = 3.33 cfs @ 7.98 hrs, Volume= 1.391 af
Outflow = 3.31 cfs @ 7.99 hrs, Volume= 1.389 af, Atten= 1%, Lag= 0.7 min

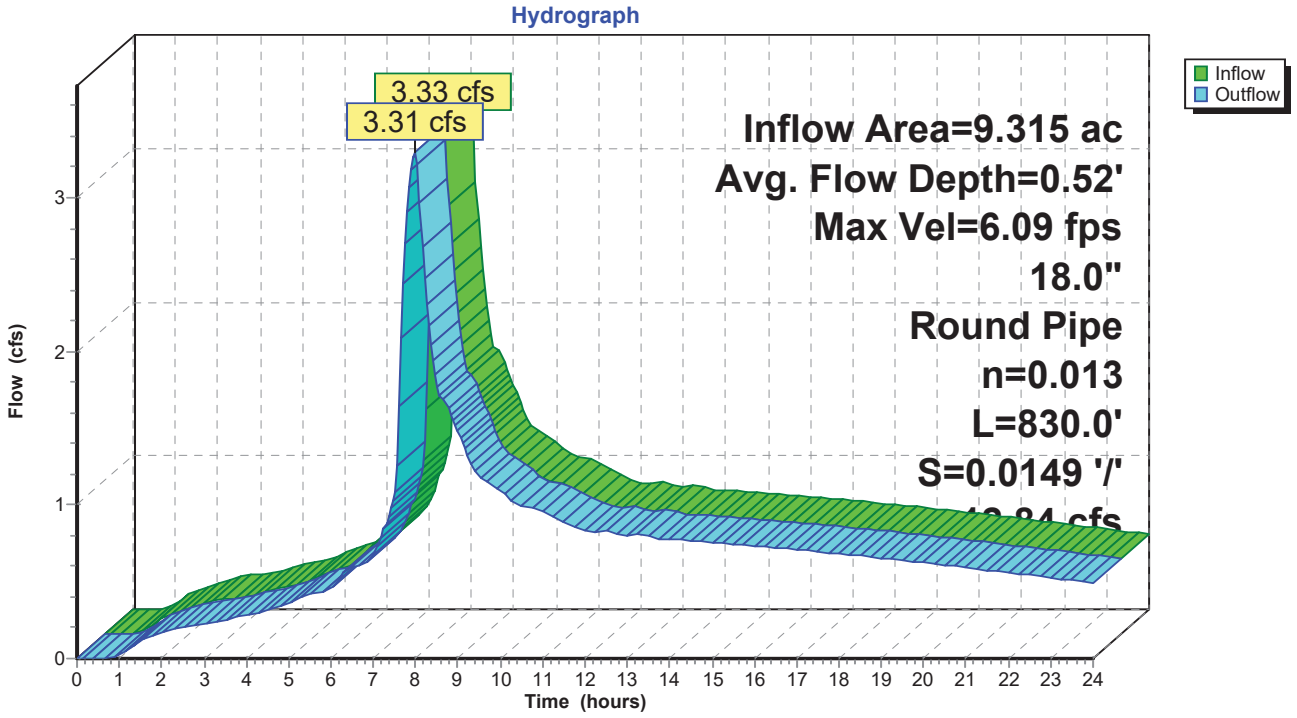
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.09 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 3.74 fps, Avg. Travel Time= 3.7 min

Peak Storage= 451 cf @ 7.99 hrs
Average Depth at Peak Storage= 0.52'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 12.84 cfs

18.0" Round Pipe
n= 0.013
Length= 830.0' Slope= 0.0149 '/'
Inlet Invert= 187.30', Outlet Invert= 174.90'



Reach 2R: Ex 18" ADS



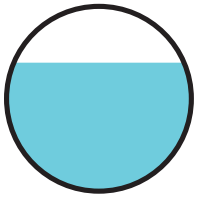
Summary for Reach 3R: 24" PVC

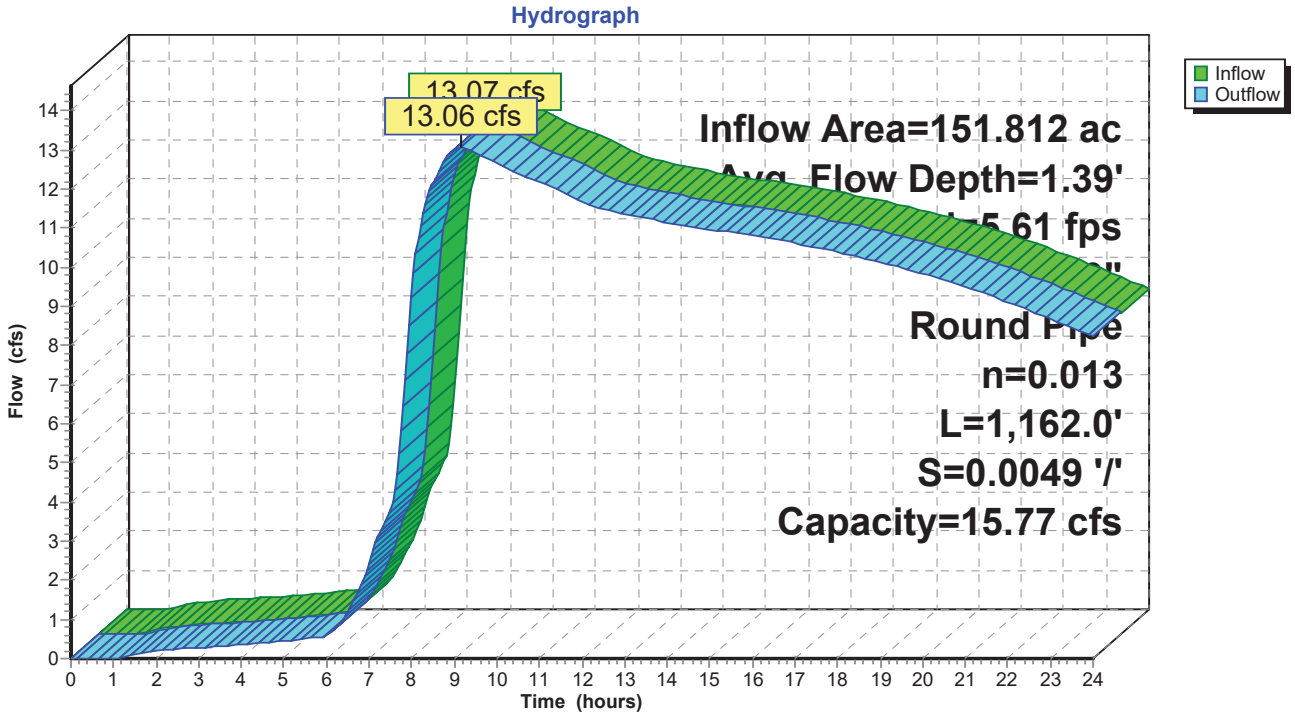
Inflow Area = 151.812 ac, 2.19% Impervious, Inflow Depth > 1.17" for 25-YEAR event
Inflow = 13.07 cfs @ 9.09 hrs, Volume= 14.858 af
Outflow = 13.06 cfs @ 9.14 hrs, Volume= 14.815 af, Atten= 0%, Lag= 3.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.61 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 4.43 fps, Avg. Travel Time= 4.4 min

Peak Storage= 2,705 cf @ 9.14 hrs
Average Depth at Peak Storage= 1.39'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 15.77 cfs

24.0" Round Pipe
n= 0.013 PVC, smooth interior
Length= 1,162.0' Slope= 0.0049 '/'
Inlet Invert= 170.54', Outlet Invert= 164.89'





Summary for Pond 1P: Existing Stormwater Facility

Inflow Area = 90.742 ac, 3.67% Impervious, Inflow Depth > 1.26" for 25-YEAR event
Inflow = 15.49 cfs @ 8.06 hrs, Volume= 9.544 af
Outflow = 6.89 cfs @ 11.83 hrs, Volume= 8.733 af, Atten= 56%, Lag= 226.1 min
Primary = 6.89 cfs @ 11.83 hrs, Volume= 8.733 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 173.58' @ 11.83 hrs Surf.Area= 142,242 sf Storage= 61,192 cf
Flood Elev= 174.50' Surf.Area= 258,975 sf Storage= 245,604 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 73.4 min (924.4 - 850.9)

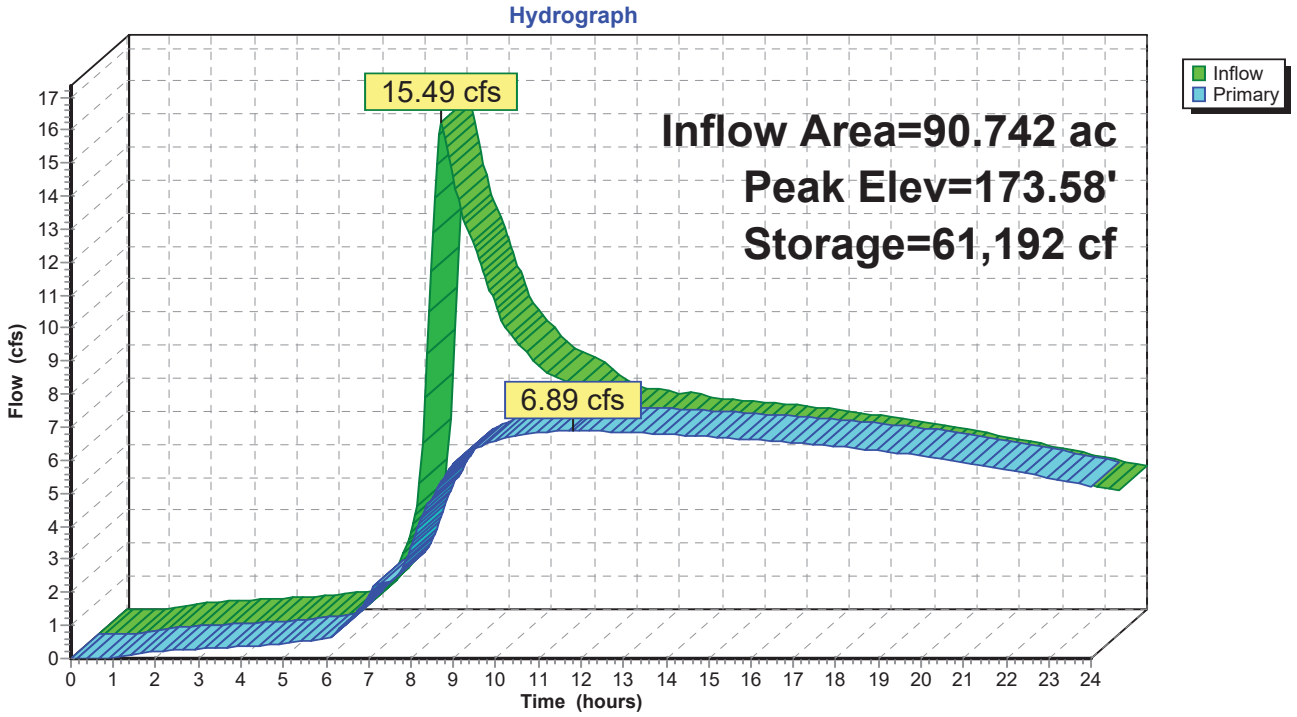
Volume	Invert	Avail.Storage	Storage Description
#1	173.00'	1,197,116 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
173.00	68,497	0	0
175.00	322,467	390,964	390,964
177.00	483,685	806,152	1,197,116

Device	Routing	Invert	Outlet Devices
#1	Primary	172.04'	**90.0 deg x 1.40' rise Sharp-Crested Vee/Trap Weir** Cv= 2.50 (C= 3.13)

Primary OutFlow Max=6.89 cfs @ 11.83 hrs HW=173.58' TW=171.83' (Dynamic Tailwater)
↑—**1=Sharp-Crested Vee/Trap Weir** (Orifice Controls 6.89 cfs @ 3.51 fps)

Pond 1P: Existing Stormwater Facility

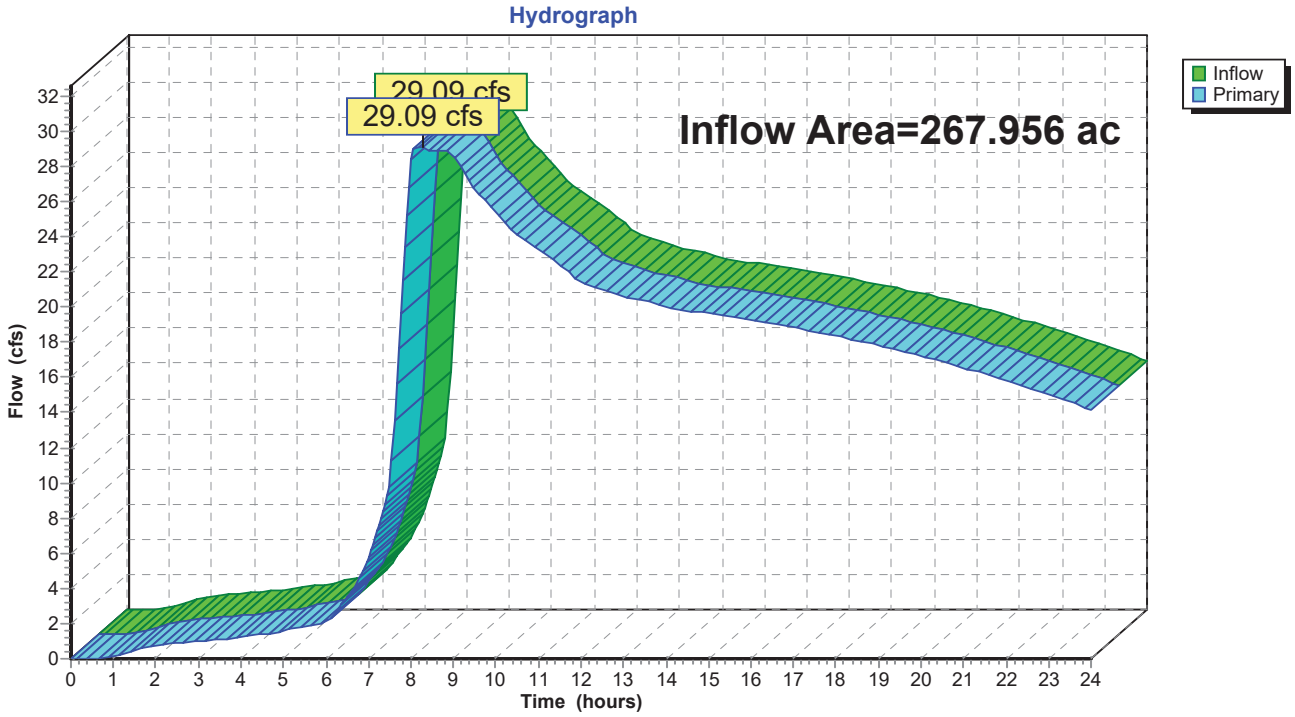


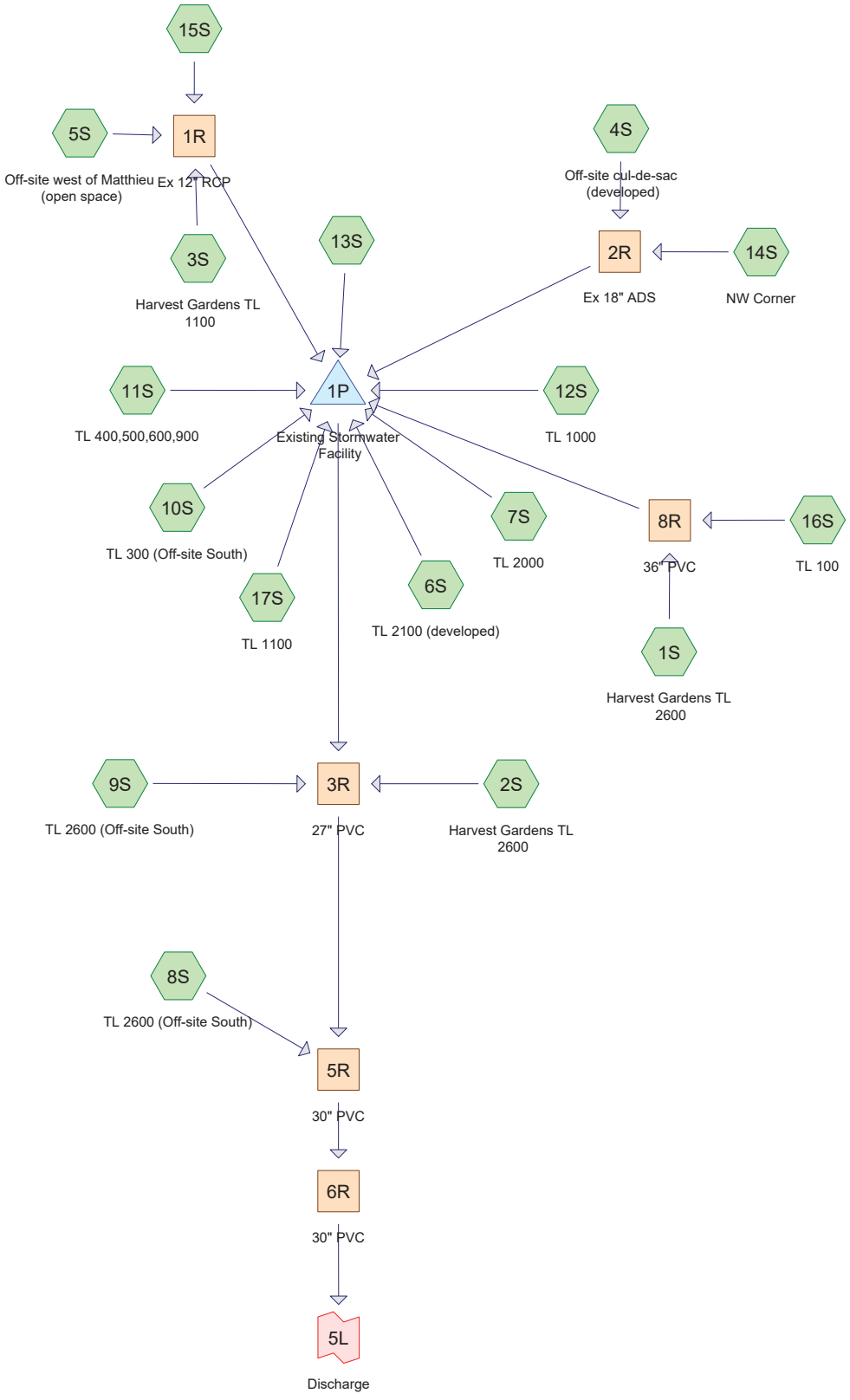
Summary for Link 5L: Discharge

Inflow Area = 267.956 ac, 4.26% Impervious, Inflow Depth > 1.27" for 25-YEAR event
Inflow = 29.09 cfs @ 8.27 hrs, Volume= 28.297 af
Primary = 29.09 cfs @ 8.27 hrs, Volume= 28.297 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 5L: Discharge





Subcat Reach Pond Link

Routing Diagram for 6732 Harvest Gardens Post-Developed
Prepared by AKS Engineering and Forestry, Printed 3/16/2020
HydroCAD® 10.00-22 s/n 01338 © 2018 HydroCAD Software Solutions LLC

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Harvest Gardens TL Runoff Area=1,891,057 sf 54.70% Impervious Runoff Depth>1.92"
Tc=5.0 min CN=74/98 Runoff=19.54 cfs 6.952 af

Subcatchment 2S: Harvest Gardens TL Runoff Area=369,349 sf 47.88% Impervious Runoff Depth>1.80"
Tc=5.0 min CN=74/98 Runoff=3.50 cfs 1.268 af

Subcatchment 3S: Harvest Gardens TL Runoff Area=406,655 sf 66.99% Impervious Runoff Depth>2.15"
Tc=5.0 min CN=74/98 Runoff=4.83 cfs 1.673 af

Subcatchment 4S: Off-site cul-de-sac Runoff Area=223,632 sf 50.68% Impervious Runoff Depth>1.85"
Tc=0.0 min CN=74/98 Runoff=2.24 cfs 0.792 af

Subcatchment 5S: Off-site west of Matthieu Runoff Area=59,593 sf 0.00% Impervious Runoff Depth>0.79"
Flow Length=415' Tc=30.0 min CN=72/0 Runoff=0.11 cfs 0.090 af

Subcatchment 6S: TL 2100 (developed) Runoff Area=519,405 sf 63.26% Impervious Runoff Depth>2.08"
Tc=5.0 min CN=74/98 Runoff=5.92 cfs 2.068 af

Subcatchment 7S: TL 2000 Runoff Area=146,139 sf 16.26% Impervious Runoff Depth>1.19"
Flow Length=520' Tc=29.9 min CN=74/98 Runoff=0.55 cfs 0.333 af

Subcatchment 8S: TL 2600 (Off-site Runoff Area=4,393,660 sf 0.00% Impervious Runoff Depth>0.89"
Flow Length=4,393' Tc=110.1 min CN=75/0 Runoff=6.69 cfs 7.440 af

Subcatchment 9S: TL 2600 (Off-site South) Runoff Area=381,740 sf 0.00% Impervious Runoff Depth>0.94"
Flow Length=1,006' Tc=31.8 min CN=75/0 Runoff=0.96 cfs 0.687 af

Subcatchment 10S: TL 300 (Off-site South) Runoff Area=677,221 sf 0.00% Impervious Runoff Depth>0.89"
Flow Length=828' Slope=0.0150 '/' Tc=25.5 min CN=74/0 Runoff=1.67 cfs 1.156 af

Subcatchment 11S: TL 400,500,600,900 Runoff Area=1,001,660 sf 0.00% Impervious Runoff Depth>0.88"
Flow Length=1,774' Tc=52.6 min CN=74/0 Runoff=1.85 cfs 1.677 af

Subcatchment 12S: TL 1000 Runoff Area=531,627 sf 0.00% Impervious Runoff Depth>0.79"
Flow Length=989' Tc=28.6 min CN=72/0 Runoff=0.98 cfs 0.805 af

Subcatchment 13S: Runoff Area=341,174 sf 9.28% Impervious Runoff Depth>0.98"
Flow Length=763' Tc=22.5 min CN=72/98 Runoff=1.02 cfs 0.637 af

Subcatchment 14S: NW Corner Runoff Area=182,135 sf 0.00% Impervious Runoff Depth>0.89"
Flow Length=601' Tc=31.0 min CN=74/0 Runoff=0.42 cfs 0.310 af

Subcatchment 15S: Runoff Area=221,408 sf 0.00% Impervious Runoff Depth>0.88"
Flow Length=1,173' Tc=37.5 min CN=74/0 Runoff=0.47 cfs 0.375 af

Subcatchment 16S: TL 100 Runoff Area=173,055 sf 0.00% Impervious Runoff Depth>0.90"
Flow Length=293' Tc=19.2 min CN=74/0 Runoff=0.48 cfs 0.297 af

Subcatchment 17S: TL 1100 Runoff Area=134,571 sf 0.00% Impervious Runoff Depth>0.90"
Flow Length=308' Tc=19.3 min CN=74/0 Runoff=0.37 cfs 0.231 af

Reach 1R: Ex 12" RCP Avg. Flow Depth=0.62' Max Vel=10.27 fps Inflow=5.27 cfs 2.138 af
12.0" Round Pipe n=0.013 L=45.7' S=0.0435 '/' Capacity=7.43 cfs Outflow=5.27 cfs 2.138 af

Reach 2R: Ex 18" ADS Avg. Flow Depth=0.45' Max Vel=5.65 fps Inflow=2.54 cfs 1.102 af
18.0" Round Pipe n=0.013 L=830.0' S=0.0149 '/' Capacity=12.84 cfs Outflow=2.54 cfs 1.099 af

Reach 3R: 27" PVC Avg. Flow Depth=1.19' Max Vel=5.63 fps Inflow=12.08 cfs 16.568 af
27.0" Round Pipe n=0.013 L=1,162.0' S=0.0050 '/' Capacity=21.90 cfs Outflow=11.98 cfs 16.520 af

Reach 5R: 30" PVC Avg. Flow Depth=1.42' Max Vel=6.21 fps Inflow=17.93 cfs 23.960 af
30.0" Round Pipe n=0.013 L=122.6' S=0.0050 '/' Capacity=28.93 cfs Outflow=17.93 cfs 23.954 af

Reach 6R: 30" PVC Avg. Flow Depth=1.41' Max Vel=6.27 fps Inflow=17.93 cfs 23.954 af
30.0" Round Pipe n=0.013 L=39.1' S=0.0051 '/' Capacity=29.34 cfs Outflow=17.93 cfs 23.951 af

Reach 8R: 36" PVC Avg. Flow Depth=1.35' Max Vel=6.45 fps Inflow=19.95 cfs 7.249 af
36.0" Round Pipe n=0.013 L=495.0' S=0.0051 '/' Capacity=47.78 cfs Outflow=19.94 cfs 7.241 af

Pond 1P: Existing Stormwater Facility Peak Elev=174.18' Storage=170,174 cf Inflow=39.41 cfs 17.385 af
Outflow=10.02 cfs 14.613 af

Link 5L: Discharge Inflow=17.93 cfs 23.951 af
Primary=17.93 cfs 23.951 af

Total Runoff Area = 267.541 ac Runoff Volume = 26.790 af Average Runoff Depth = 1.20"
83.00% Pervious = 222.065 ac 17.00% Impervious = 45.476 ac

Summary for Subcatchment 1S: Harvest Gardens TL 2600

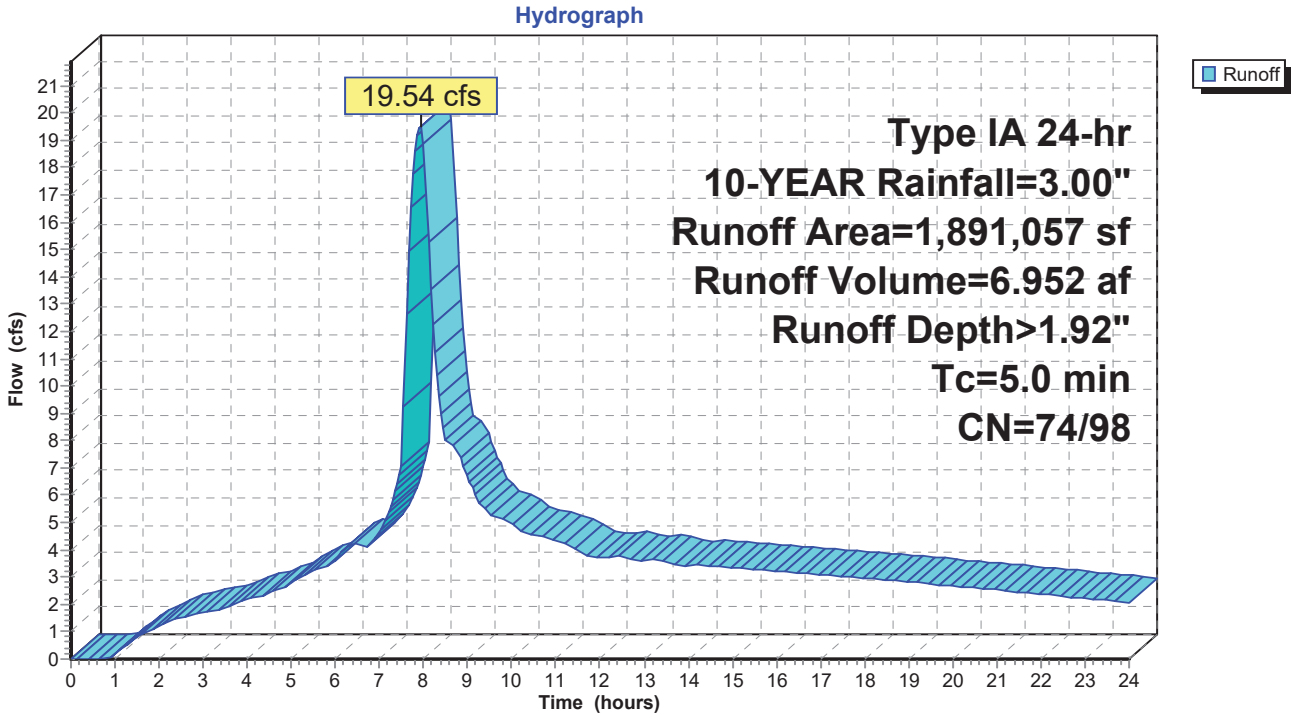
Runoff = 19.54 cfs @ 7.94 hrs, Volume= 6.952 af, Depth> 1.92"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

	Area (sf)	CN	Description
*	466,714	98	impervious, ROW, sidewalk, etc
*	567,600	98	impervious (215 lots @ 2400)
	856,743	74	>75% Grass cover, Good, HSG C
	1,891,057	87	Weighted Average
	856,743	74	45.30% Pervious Area
	1,034,314	98	54.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 1S: Harvest Gardens TL 2600



Summary for Subcatchment 2S: Harvest Gardens TL 2600

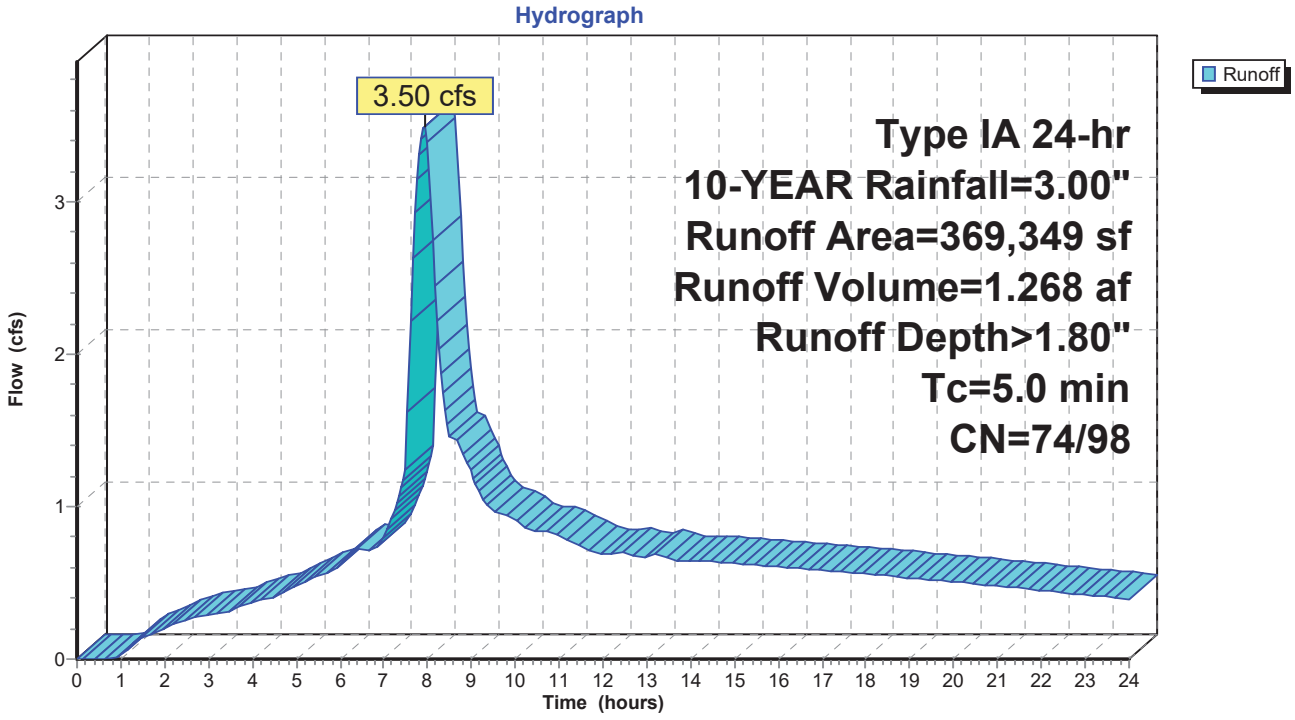
Runoff = 3.50 cfs @ 7.95 hrs, Volume= 1.268 af, Depth> 1.80"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

	Area (sf)	CN	Description
*	77,162	98	impervious, ROW, sidewalk, etc
*	99,688	98	impervious (39 lots @ 2400)
	192,499	74	>75% Grass cover, Good, HSG C
	369,349	85	Weighted Average
	192,499	74	52.12% Pervious Area
	176,850	98	47.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 2S: Harvest Gardens TL 2600



Summary for Subcatchment 3S: Harvest Gardens TL 1100

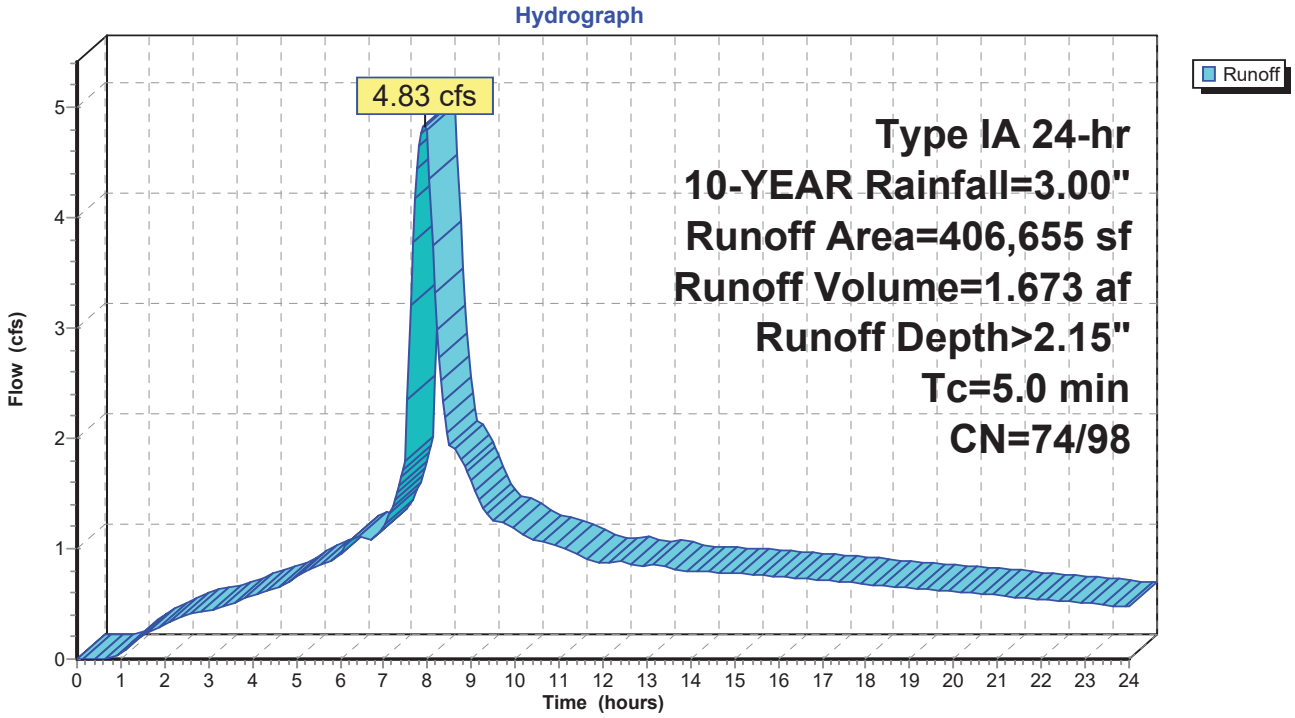
Runoff = 4.83 cfs @ 7.92 hrs, Volume= 1.673 af, Depth> 2.15"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

	Area (sf)	CN	Description
*	132,514	98	impervious, ROW, sidewalk, etc
*	139,920	98	impervious (53 lots @ 2640)
	134,221	74	>75% Grass cover, Good, HSG C
	406,655	90	Weighted Average
	134,221	74	33.01% Pervious Area
	272,434	98	66.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 3S: Harvest Gardens TL 1100



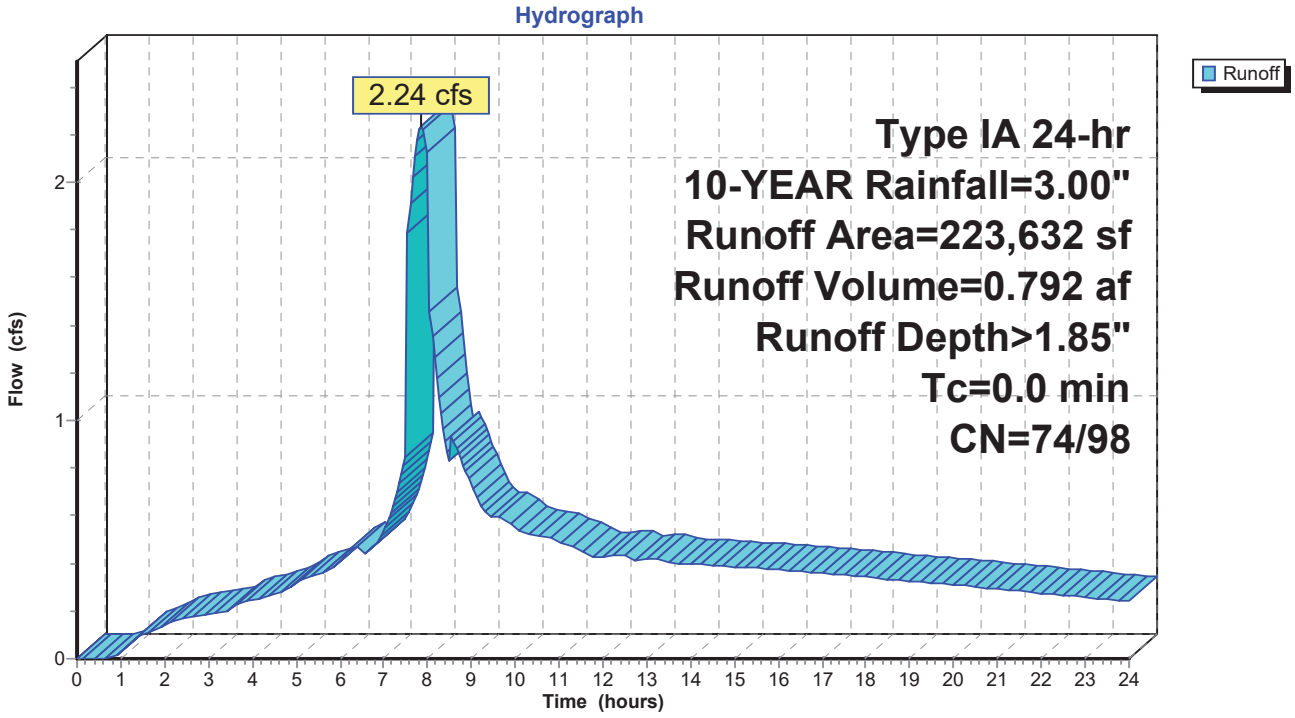
Summary for Subcatchment 4S: Off-site cul-de-sac (developed)

Runoff = 2.24 cfs @ 7.86 hrs, Volume= 0.792 af, Depth> 1.85"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

	Area (sf)	CN	Description
*	42,063	98	impervious, ROW, sidewalk, etc.
*	71,280	98	impervious (8 lots @ 2640)
	110,289	74	>75% Grass cover, Good, HSG C
	223,632	86	Weighted Average
	110,289	74	49.32% Pervious Area
	113,343	98	50.68% Impervious Area

Subcatchment 4S: Off-site cul-de-sac (developed)



Summary for Subcatchment 5S: Off-site west of Matthieu (open space)

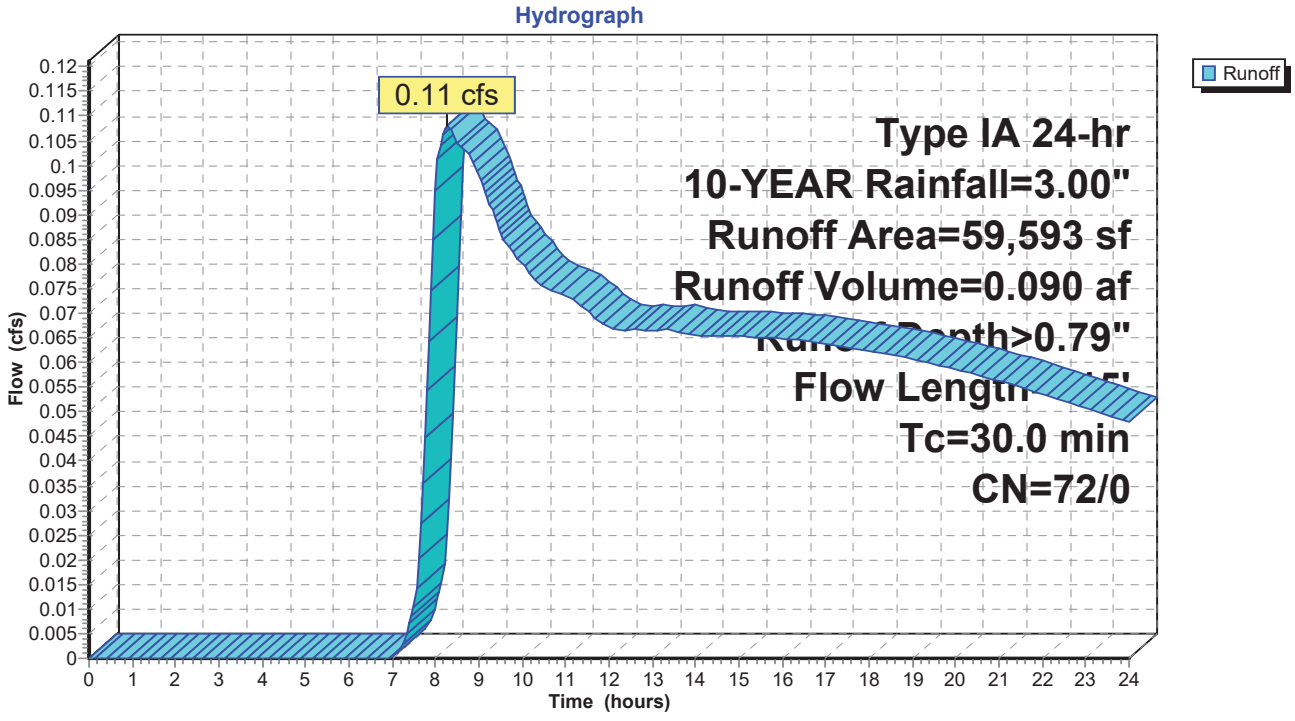
Runoff = 0.11 cfs @ 8.28 hrs, Volume= 0.090 af, Depth> 0.79"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

Area (sf)	CN	Description
59,593	72	Woods/grass comb., Good, HSG C
59,593	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.7	50	0.0040	0.05		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
12.3	365	0.0050	0.49		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
30.0	415	Total			

Subcatchment 5S: Off-site west of Matthieu (open space)



Summary for Subcatchment 6S: TL 2100 (developed)

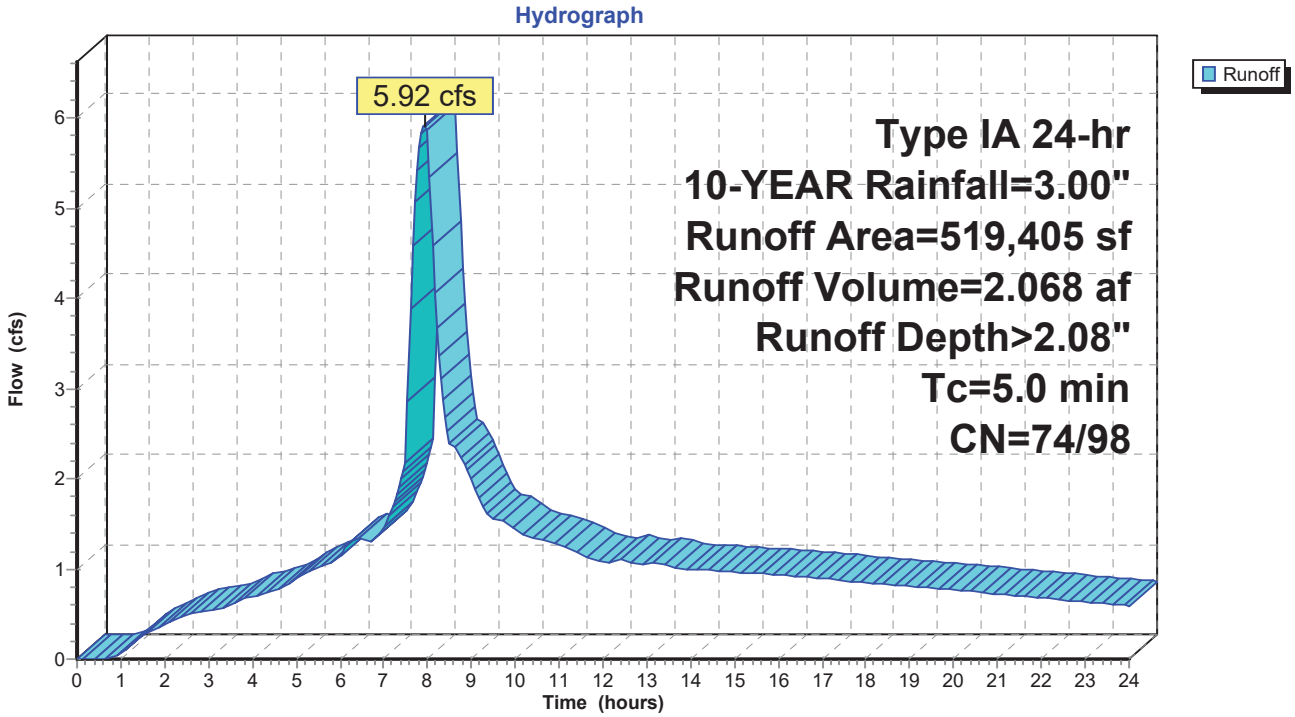
Runoff = 5.92 cfs @ 7.93 hrs, Volume= 2.068 af, Depth> 2.08"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

	Area (sf)	CN	Description
*	154,312	98	impervious, ROW, sidewalk, etc
*	174,240	98	Lots (66 @ 2640)
	190,853	74	>75% Grass cover, Good, HSG C
	519,405	89	Weighted Average
	190,853	74	36.74% Pervious Area
	328,552	98	63.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: TL 2100 (developed)



Summary for Subcatchment 7S: TL 2000

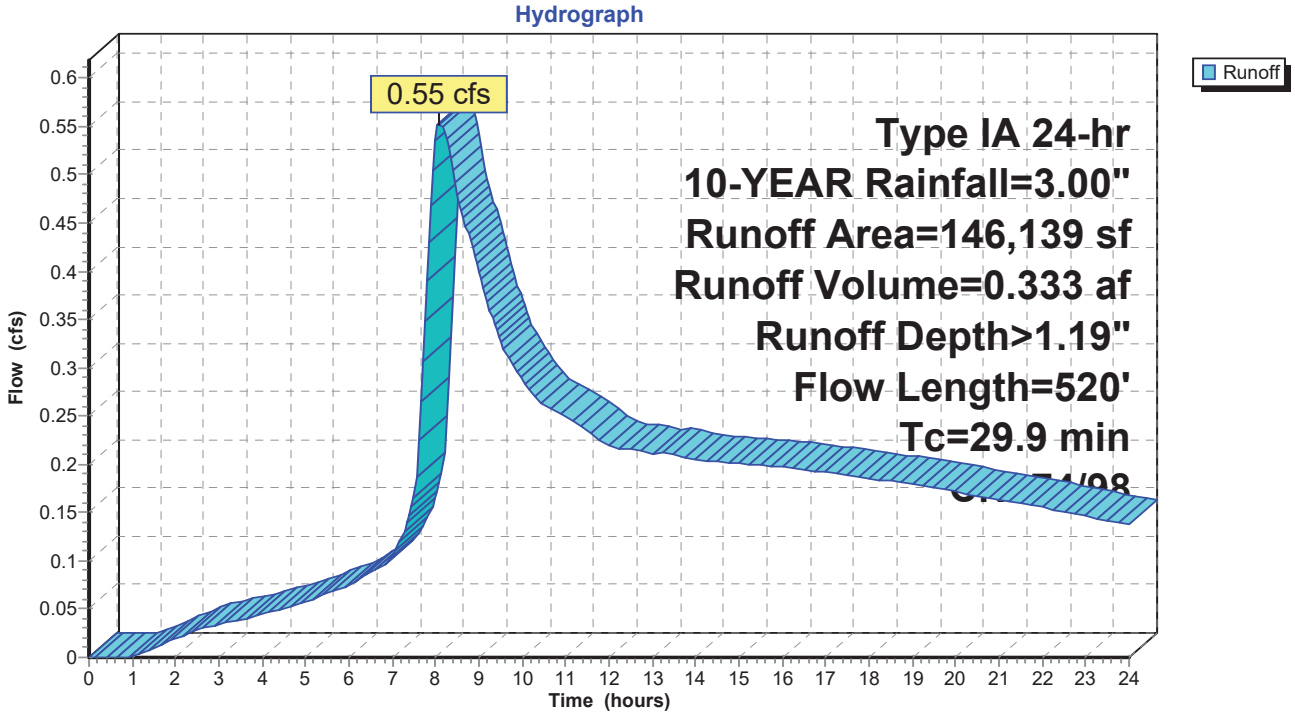
Runoff = 0.55 cfs @ 8.09 hrs, Volume= 0.333 af, Depth> 1.19"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

	Area (sf)	CN	Description
*	15,845	98	impervious, ROW, sidewalk, etc
*	7,920	98	Lots (3 @ 2640)
	122,374	74	>75% Grass cover, Good, HSG C
	146,139	78	Weighted Average
	122,374	74	83.74% Pervious Area
	23,765	98	16.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	50	0.0100	0.07		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
17.7	470	0.0040	0.44		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
29.9	520	Total			

Subcatchment 7S: TL 2000



Summary for Subcatchment 8S: TL 2600 (Off-site South)

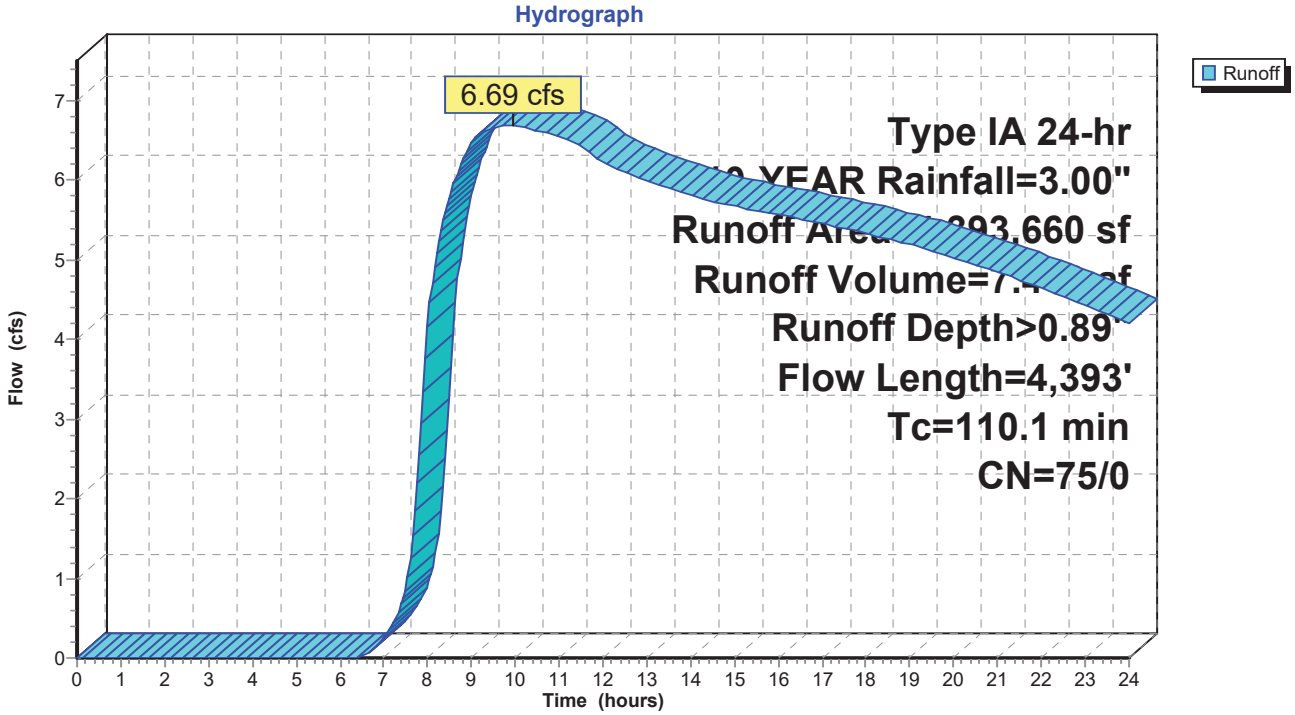
Runoff = 6.69 cfs @ 9.95 hrs, Volume= 7.440 af, Depth> 0.89"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

Area (sf)	CN	Description
3,824,683	74	Pasture/grassland/range, Good, HSG C
568,977	80	Pasture/grassland/range, Good, HSG D
4,393,660	75	Weighted Average
4,393,660	75	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.1	50	0.0050	0.05		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
15.7	510	0.0060	0.54		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
78.3	3,833	0.0500	0.82	0.82	**Channel Flow, channel** Area= 1.0 sf Perim= 50.0' r= 0.02' n= 0.030 Short grass
110.1	4,393	Total			

Subcatchment 8S: TL 2600 (Off-site South)



Summary for Subcatchment 9S: TL 2600 (Off-site South)

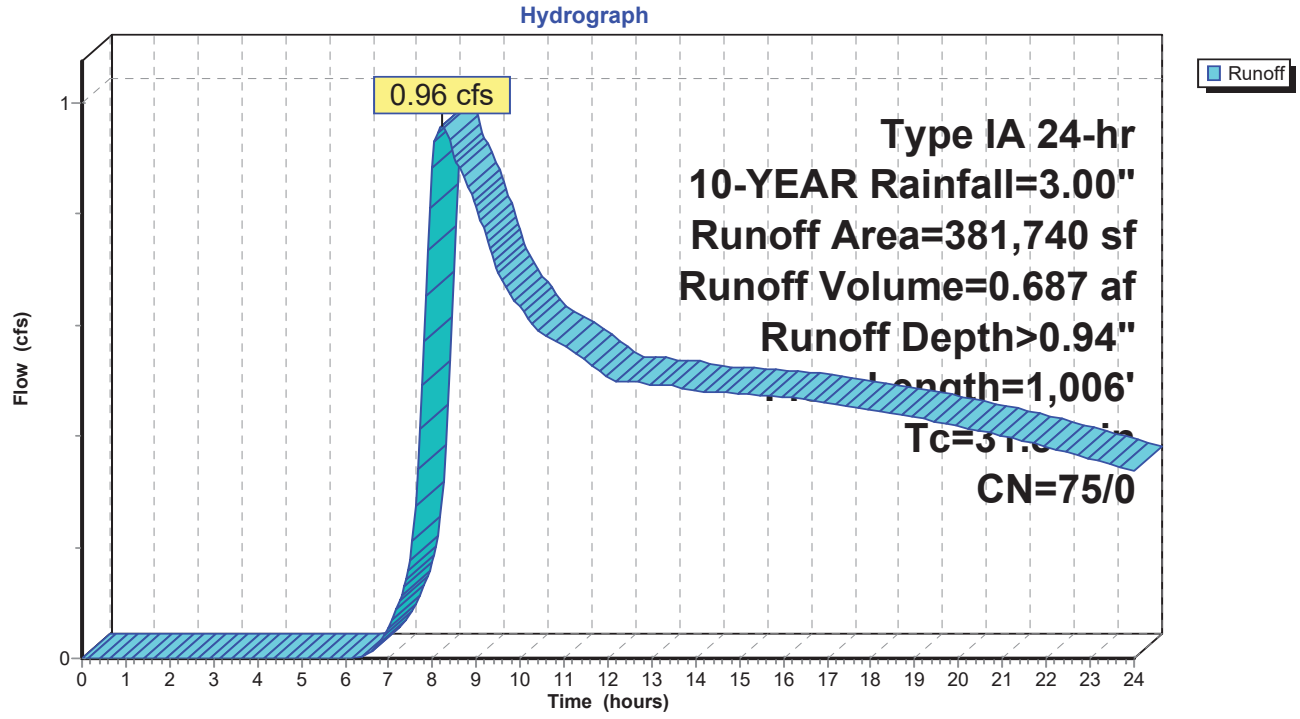
Runoff = 0.96 cfs @ 8.21 hrs, Volume= 0.687 af, Depth> 0.94"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

Area (sf)	CN	Description
322,671	74	Pasture/grassland/range, Good, HSG C
59,069	80	Pasture/grassland/range, Good, HSG D
381,740	75	Weighted Average
381,740	75	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	50	0.0130	0.08		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
20.8	956	0.0120	0.77		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
31.8	1,006	Total			

Subcatchment 9S: TL 2600 (Off-site South)



Summary for Subcatchment 10S: TL 300 (Off-site South)

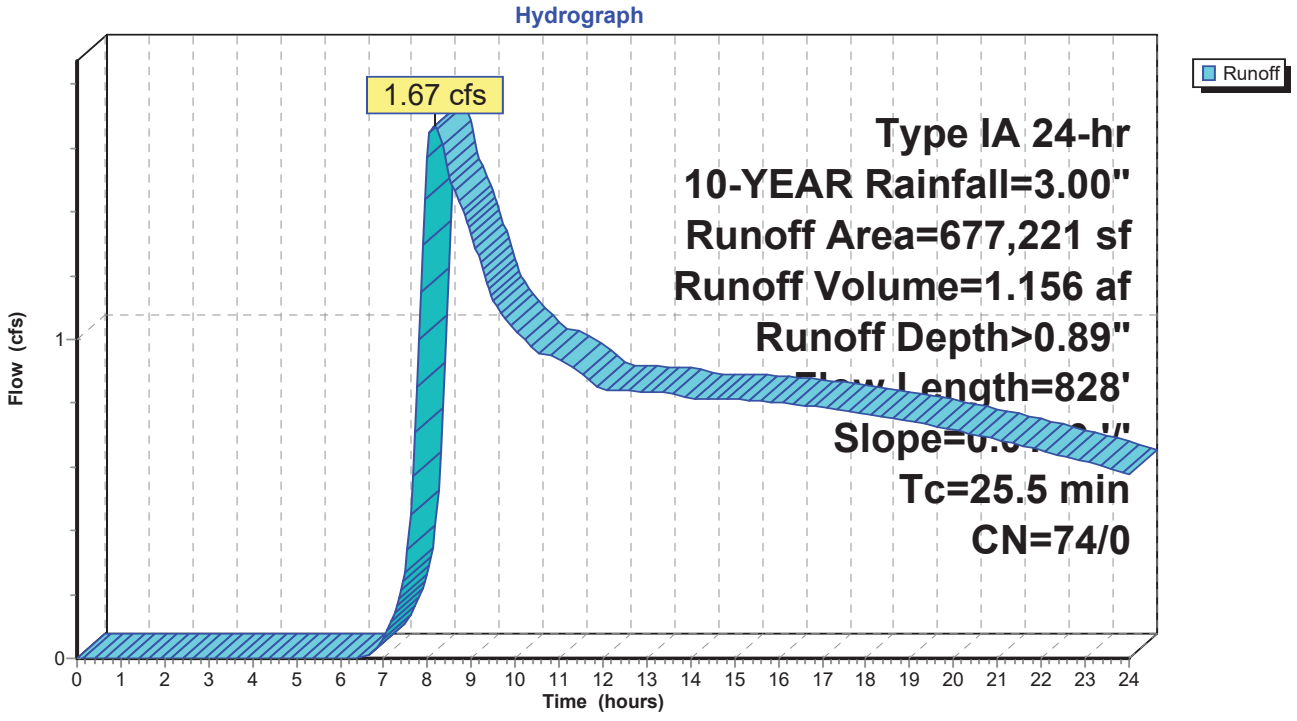
Runoff = 1.67 cfs @ 8.16 hrs, Volume= 1.156 af, Depth> 0.89"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

Area (sf)	CN	Description
677,221	74	Pasture/grassland/range, Good, HSG C
677,221	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	50	0.0150	0.08		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
15.1	778	0.0150	0.86		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
25.5	828	Total			

Subcatchment 10S: TL 300 (Off-site South)



Summary for Subcatchment 11S: TL 400,500,600,900

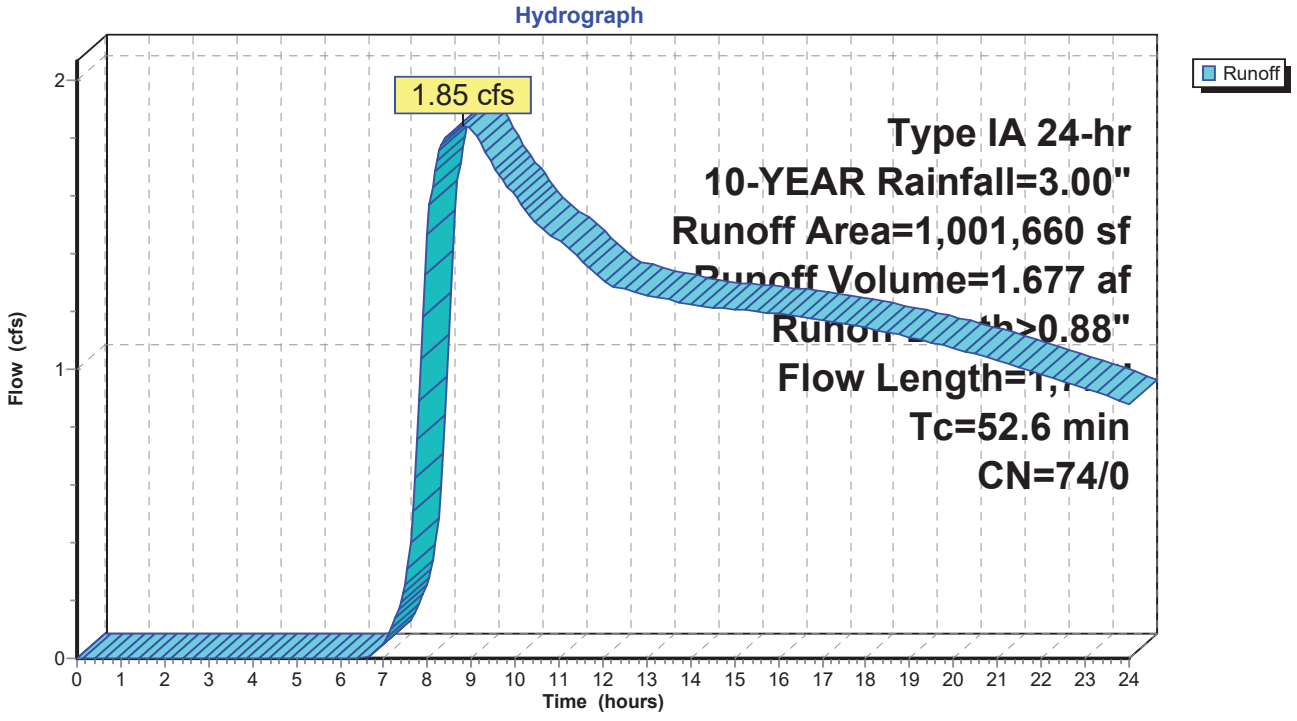
Runoff = 1.85 cfs @ 8.80 hrs, Volume= 1.677 af, Depth> 0.88"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

Area (sf)	CN	Description
1,001,660	74	Pasture/grassland/range, Good, HSG C
1,001,660	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0200	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
43.3	1,724	0.0090	0.66		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
52.6	1,774	Total			

Subcatchment 11S: TL 400,500,600,900



Summary for Subcatchment 12S: TL 1000

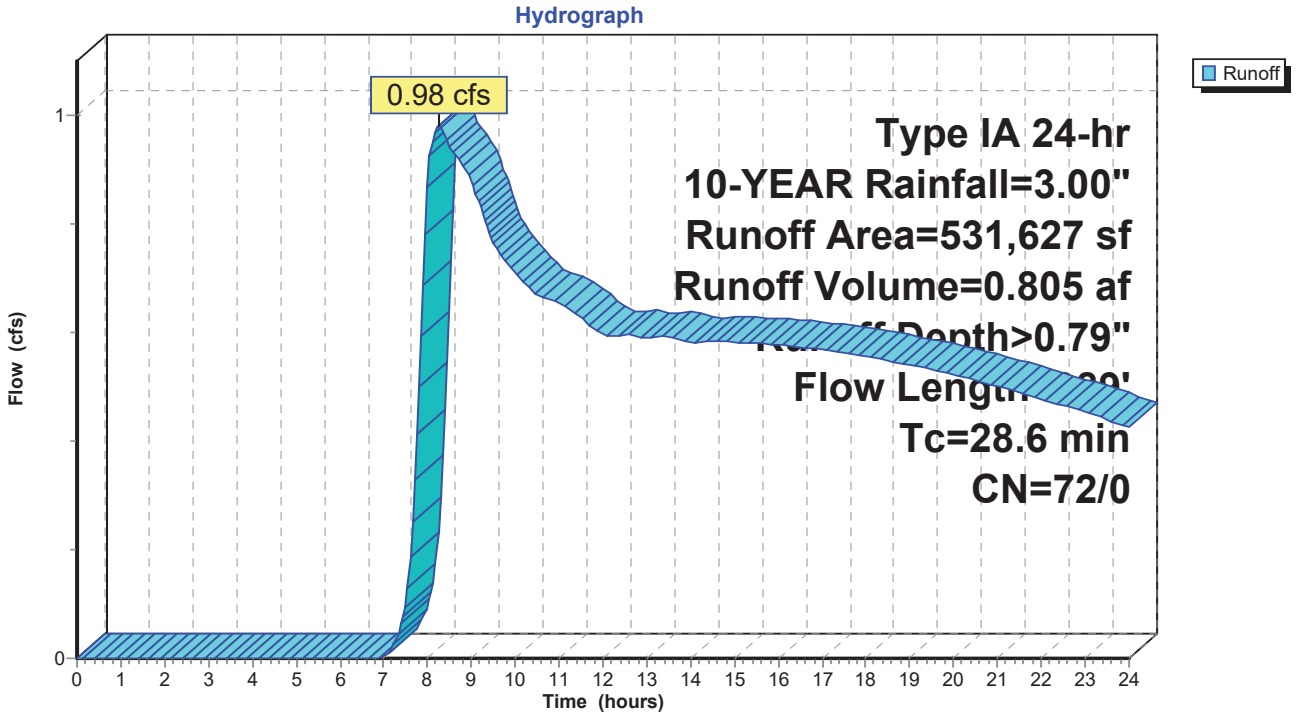
Runoff = 0.98 cfs @ 8.26 hrs, Volume= 0.805 af, Depth> 0.79"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

Area (sf)	CN	Description
531,627	72	Woods/grass comb., Good, HSG C
531,627	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	50	0.0180	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
18.9	939	0.0140	0.83		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
28.6	989	Total			

Subcatchment 12S: TL 1000



Summary for Subcatchment 13S:

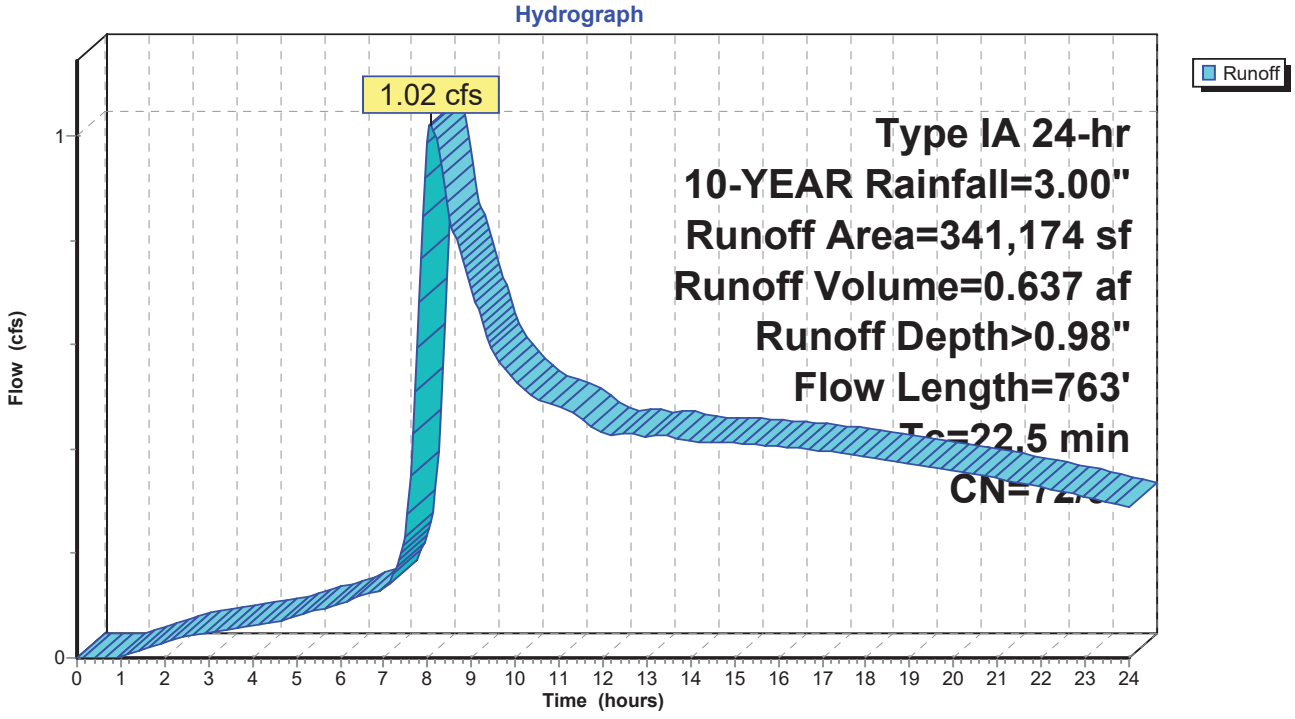
Runoff = 1.02 cfs @ 8.07 hrs, Volume= 0.637 af, Depth> 0.98"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

	Area (sf)	CN	Description
	309,516	72	Woods/grass comb., Good, HSG C
*	31,658	98	Impervious structures (4)
	341,174	74	Weighted Average
	309,516	72	90.72% Pervious Area
	31,658	98	9.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0240	0.10		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
13.9	713	0.0150	0.86		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
22.5	763	Total			

Subcatchment 13S:



Summary for Subcatchment 14S: NW Corner

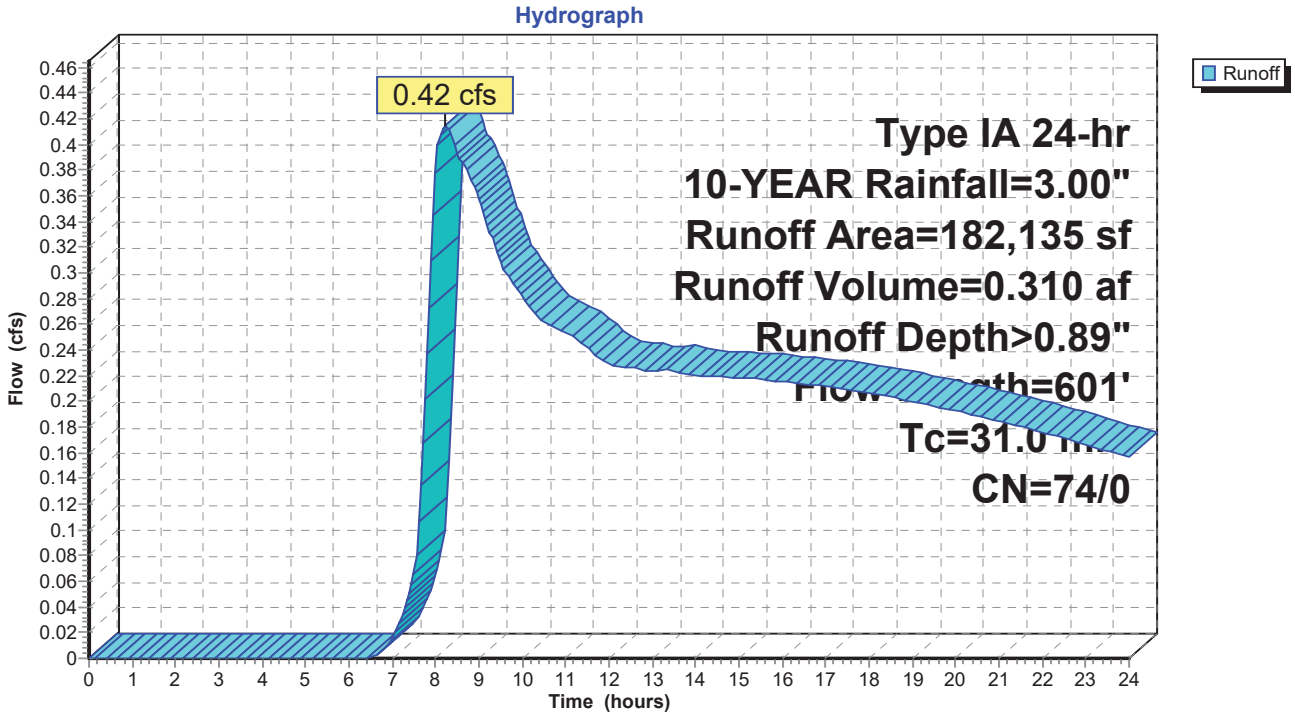
Runoff = 0.42 cfs @ 8.23 hrs, Volume= 0.310 af, Depth> 0.89"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

Area (sf)	CN	Description
182,135	74	>75% Grass cover, Good, HSG C
182,135	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	50	0.0070	0.06		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
16.9	551	0.0060	0.54		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
31.0	601	Total			

Subcatchment 14S: NW Corner



Summary for Subcatchment 15S:

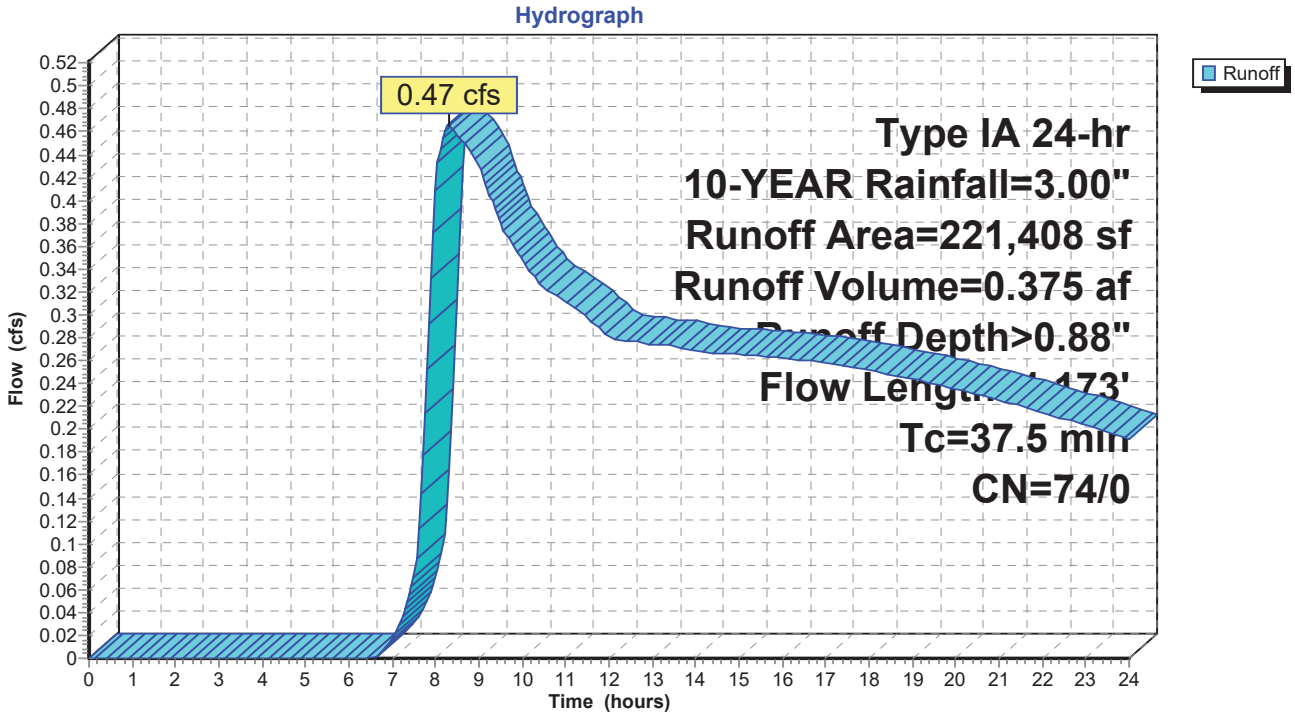
Runoff = 0.47 cfs @ 8.31 hrs, Volume= 0.375 af, Depth> 0.88"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

Area (sf)	CN	Description
221,408	74	Pasture/grassland/range, Good, HSG C
221,408	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0200	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
28.2	1,123	0.0090	0.66		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
37.5	1,173	Total			

Subcatchment 15S:



Summary for Subcatchment 16S: TL 100

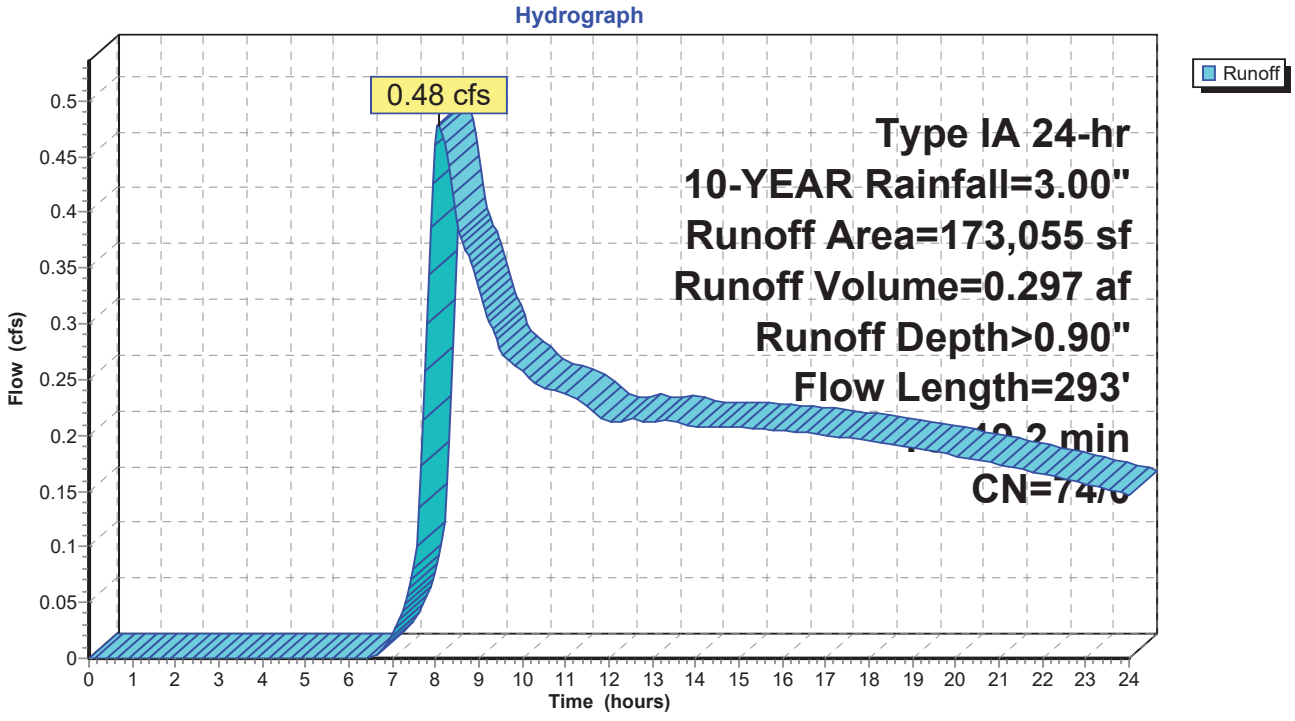
Runoff = 0.48 cfs @ 8.07 hrs, Volume= 0.297 af, Depth> 0.90"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

Area (sf)	CN	Description
173,055	74	Pasture/grassland/range, Good, HSG C
173,055	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	50	0.0130	0.08		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
8.2	243	0.0050	0.49		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
19.2	293	Total			

Subcatchment 16S: TL 100



Summary for Subcatchment 17S: TL 1100

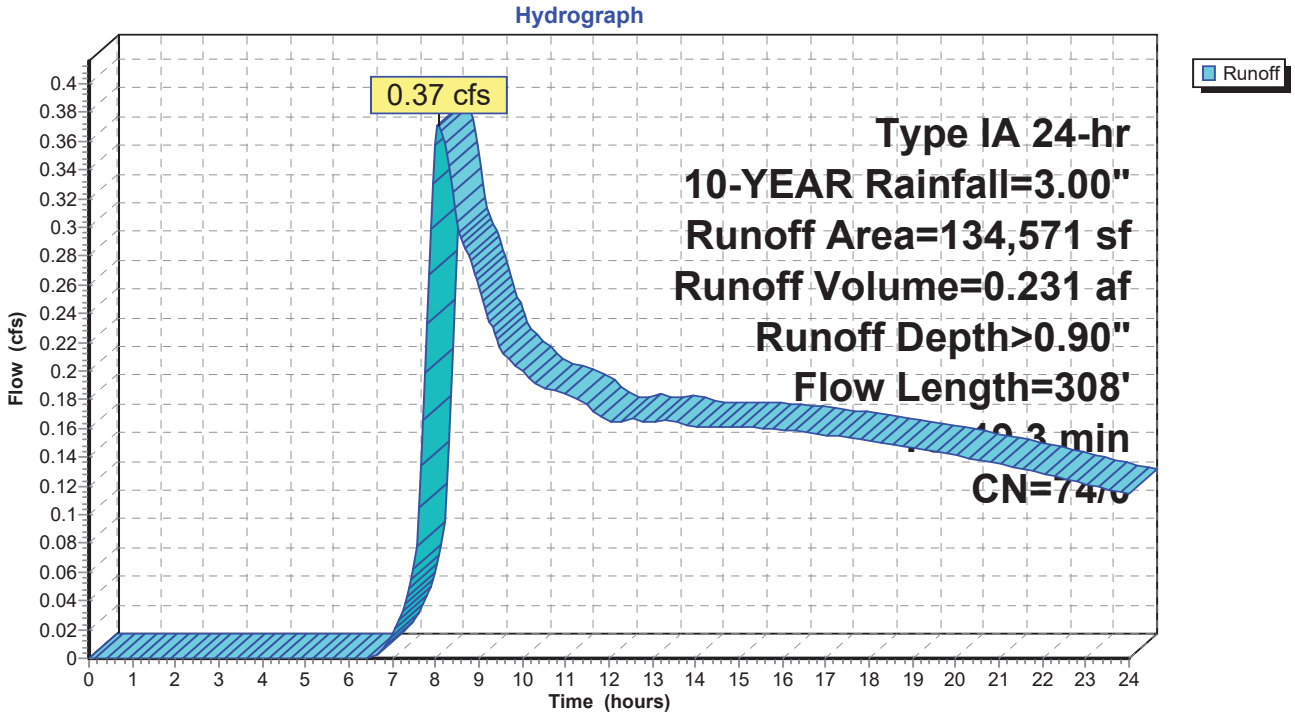
Runoff = 0.37 cfs @ 8.07 hrs, Volume= 0.231 af, Depth> 0.90"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-YEAR Rainfall=3.00"

Area (sf)	CN	Description
134,571	74	Pasture/grassland/range, Good, HSG C
134,571	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	50	0.0080	0.06		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
5.9	258	0.0110	0.73		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
19.3	308	Total			

Subcatchment 17S: TL 1100



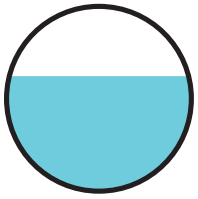
Summary for Reach 1R: Ex 12" RCP

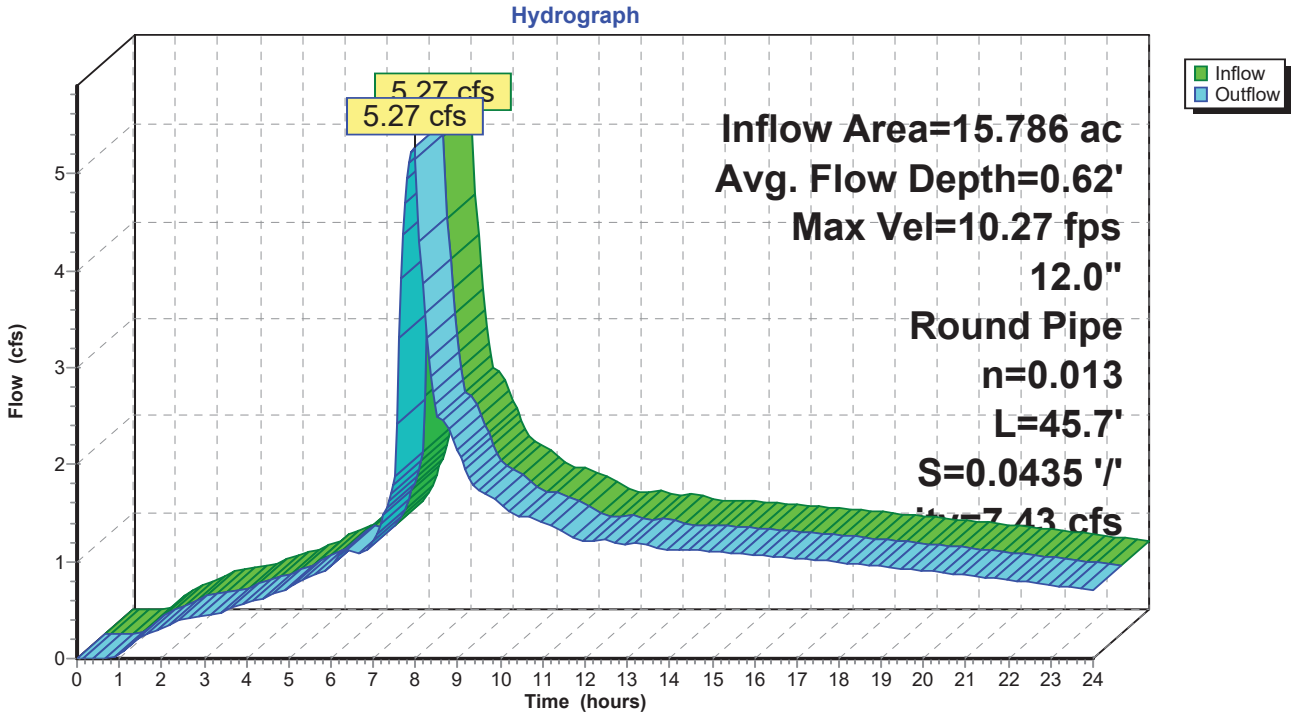
Inflow Area = 15.786 ac, 39.62% Impervious, Inflow Depth > 1.62" for 10-YEAR event
Inflow = 5.27 cfs @ 7.96 hrs, Volume= 2.138 af
Outflow = 5.27 cfs @ 7.96 hrs, Volume= 2.138 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 10.27 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 6.53 fps, Avg. Travel Time= 0.1 min

Peak Storage= 23 cf @ 7.96 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.43 cfs

12.0" Round Pipe
n= 0.013
Length= 45.7' Slope= 0.0435 '/'
Inlet Invert= 174.68', Outlet Invert= 172.69'





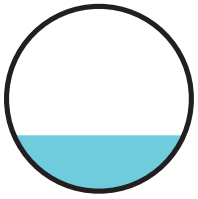
Summary for Reach 2R: Ex 18" ADS

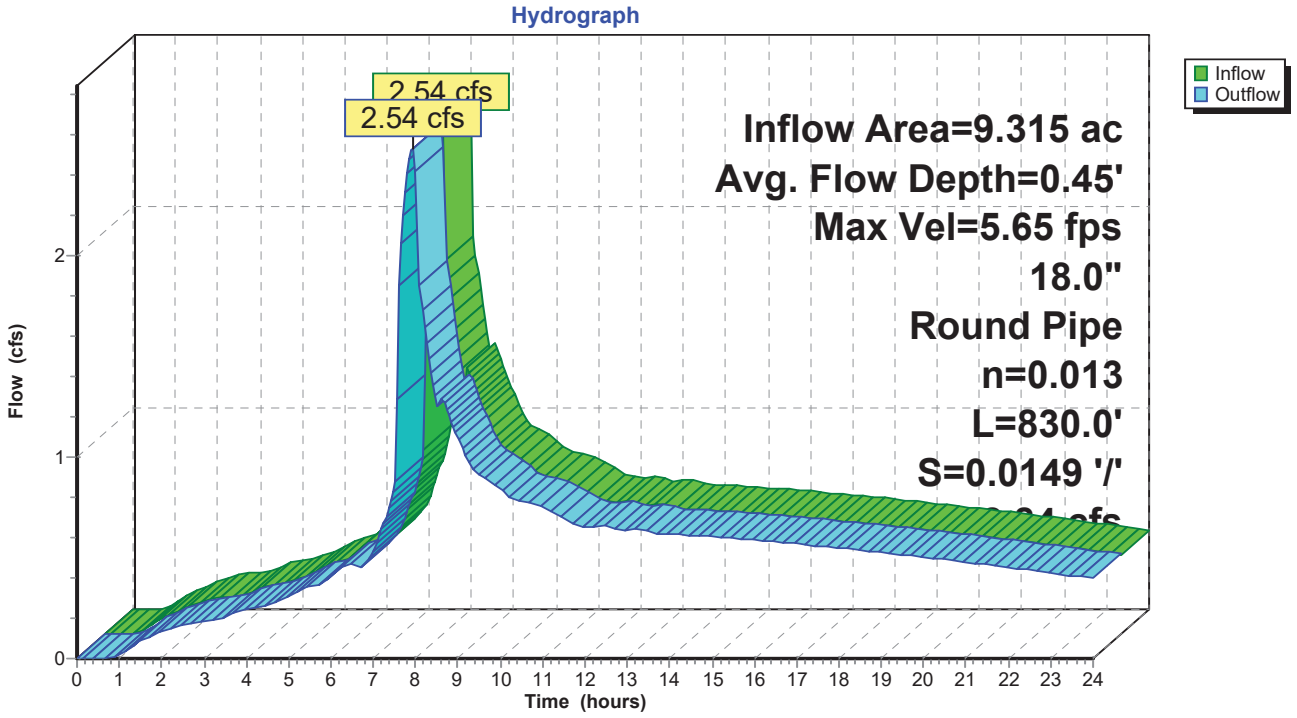
Inflow Area = 9.315 ac, 27.93% Impervious, Inflow Depth > 1.42" for 10-YEAR event
Inflow = 2.54 cfs @ 7.92 hrs, Volume= 1.102 af
Outflow = 2.54 cfs @ 7.95 hrs, Volume= 1.099 af, Atten= 0%, Lag= 1.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.65 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 3.50 fps, Avg. Travel Time= 3.9 min

Peak Storage= 372 cf @ 7.95 hrs
Average Depth at Peak Storage= 0.45'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 12.84 cfs

18.0" Round Pipe
n= 0.013
Length= 830.0' Slope= 0.0149 '/'
Inlet Invert= 187.30', Outlet Invert= 174.90'





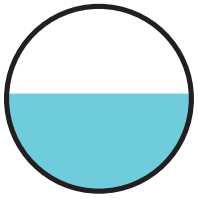
Summary for Reach 3R: 27" PVC

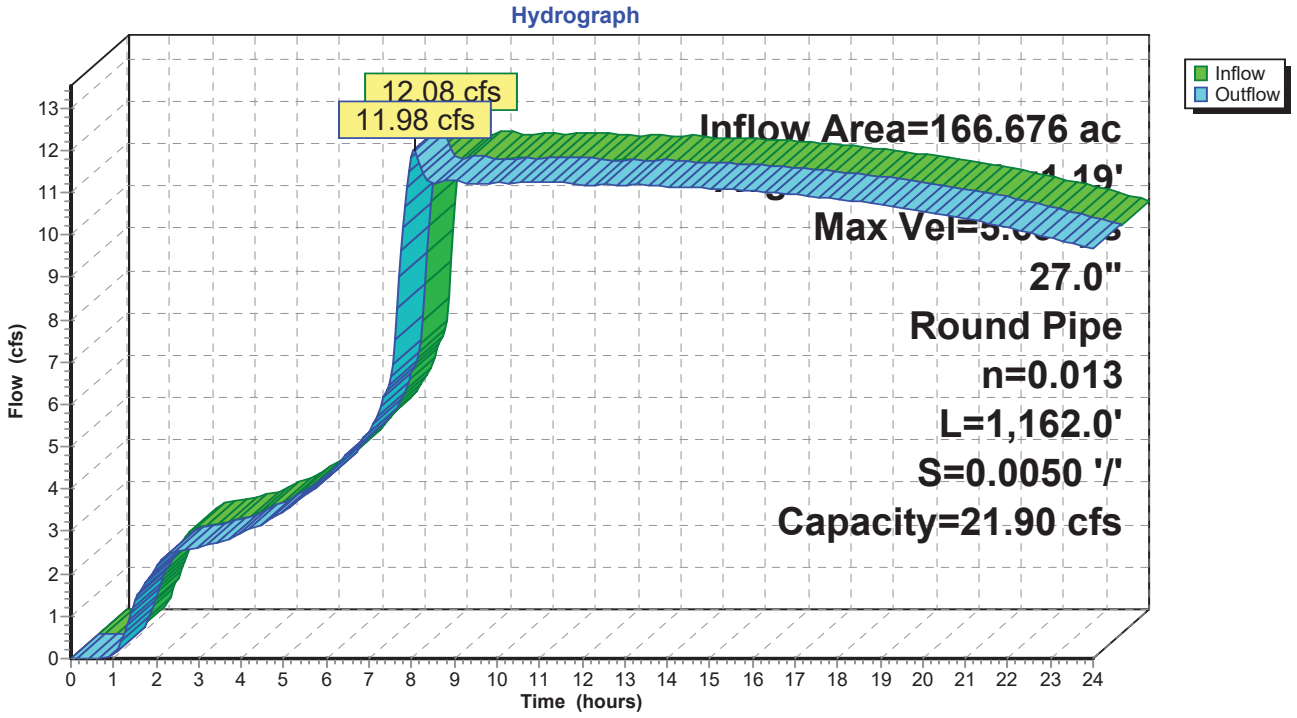
Inflow Area = 166.676 ac, 27.28% Impervious, Inflow Depth > 1.19" for 10-YEAR event
Inflow = 12.08 cfs @ 8.02 hrs, Volume= 16.568 af
Outflow = 11.98 cfs @ 8.06 hrs, Volume= 16.520 af, Atten= 1%, Lag= 2.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.63 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 4.98 fps, Avg. Travel Time= 3.9 min

Peak Storage= 2,472 cf @ 8.06 hrs
Average Depth at Peak Storage= 1.19'
Bank-Full Depth= 2.25' Flow Area= 4.0 sf, Capacity= 21.90 cfs

27.0" Round Pipe
n= 0.013 PVC, smooth interior
Length= 1,162.0' Slope= 0.0050 '/'
Inlet Invert= 169.14', Outlet Invert= 163.33'





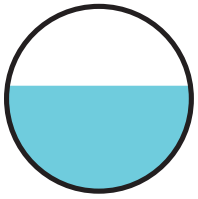
Summary for Reach 5R: 30" PVC

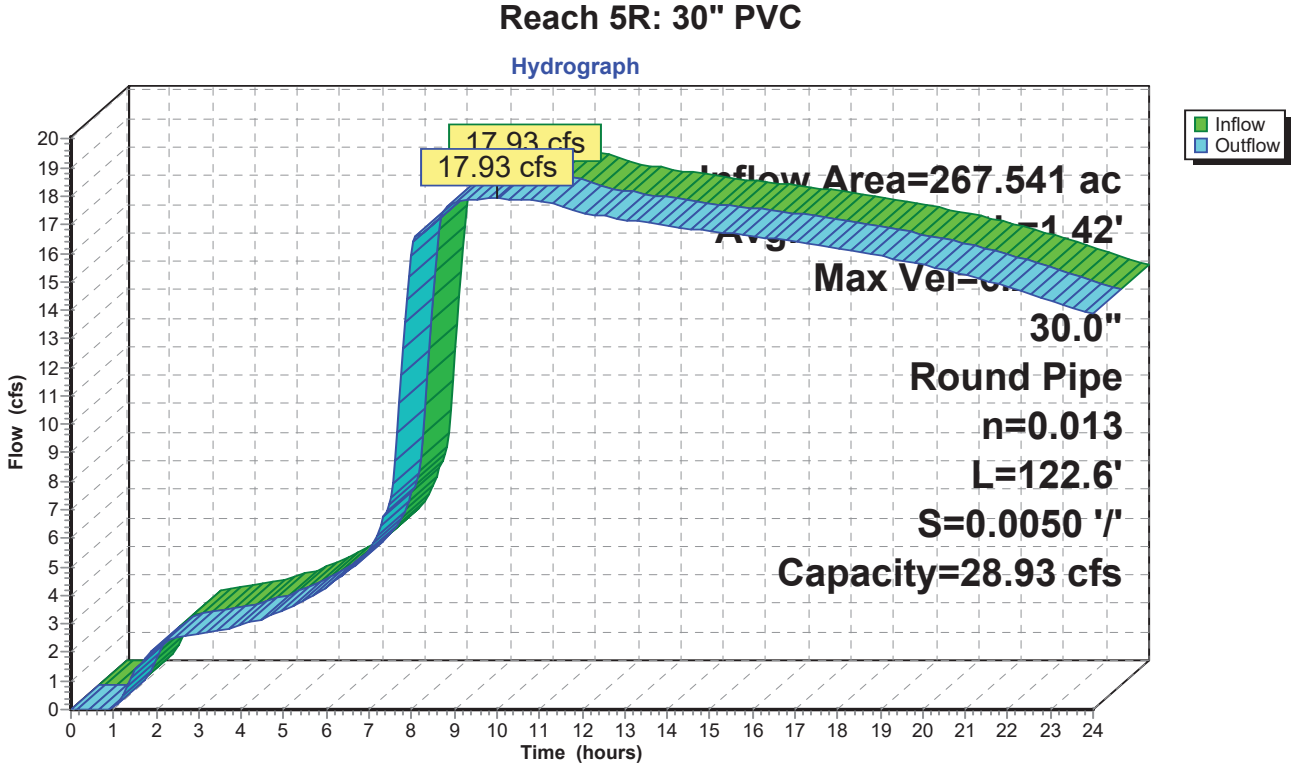
Inflow Area = 267.541 ac, 17.00% Impervious, Inflow Depth > 1.07" for 10-YEAR event
Inflow = 17.93 cfs @ 9.98 hrs, Volume= 23.960 af
Outflow = 17.93 cfs @ 9.98 hrs, Volume= 23.954 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.21 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 5.38 fps, Avg. Travel Time= 0.4 min

Peak Storage= 354 cf @ 9.98 hrs
Average Depth at Peak Storage= 1.42'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 28.93 cfs

30.0" Round Pipe
n= 0.013
Length= 122.6' Slope= 0.0050 '/'
Inlet Invert= 163.33', Outlet Invert= 162.72'





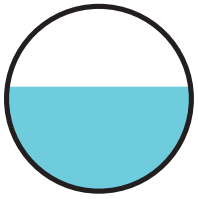
Summary for Reach 6R: 30" PVC

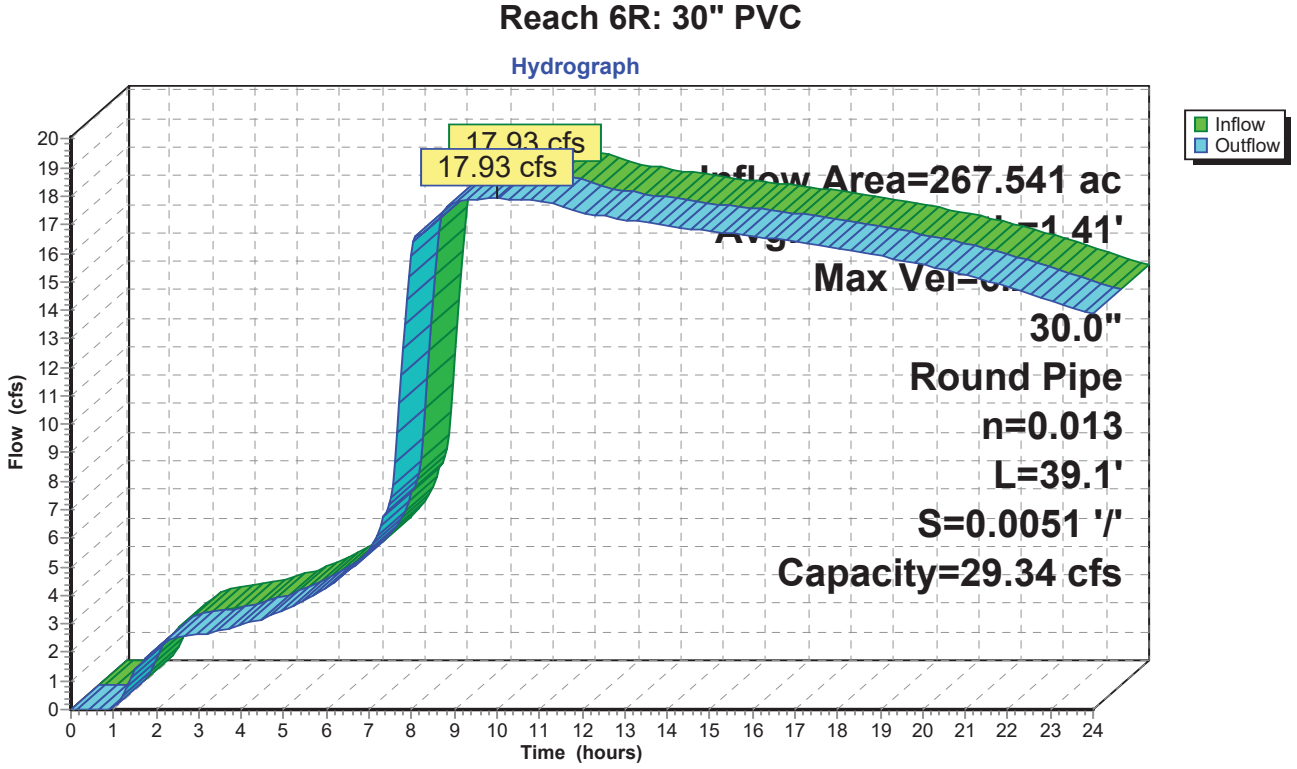
Inflow Area = 267.541 ac, 17.00% Impervious, Inflow Depth > 1.07" for 10-YEAR event
Inflow = 17.93 cfs @ 9.98 hrs, Volume= 23.954 af
Outflow = 17.93 cfs @ 9.98 hrs, Volume= 23.951 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.27 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 5.43 fps, Avg. Travel Time= 0.1 min

Peak Storage= 112 cf @ 9.98 hrs
Average Depth at Peak Storage= 1.41'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 29.34 cfs

30.0" Round Pipe
n= 0.013
Length= 39.1' Slope= 0.0051 '/'
Inlet Invert= 162.72', Outlet Invert= 162.52'





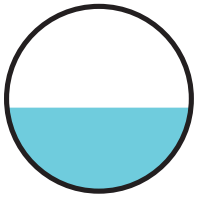
Summary for Reach 8R: 36" PVC

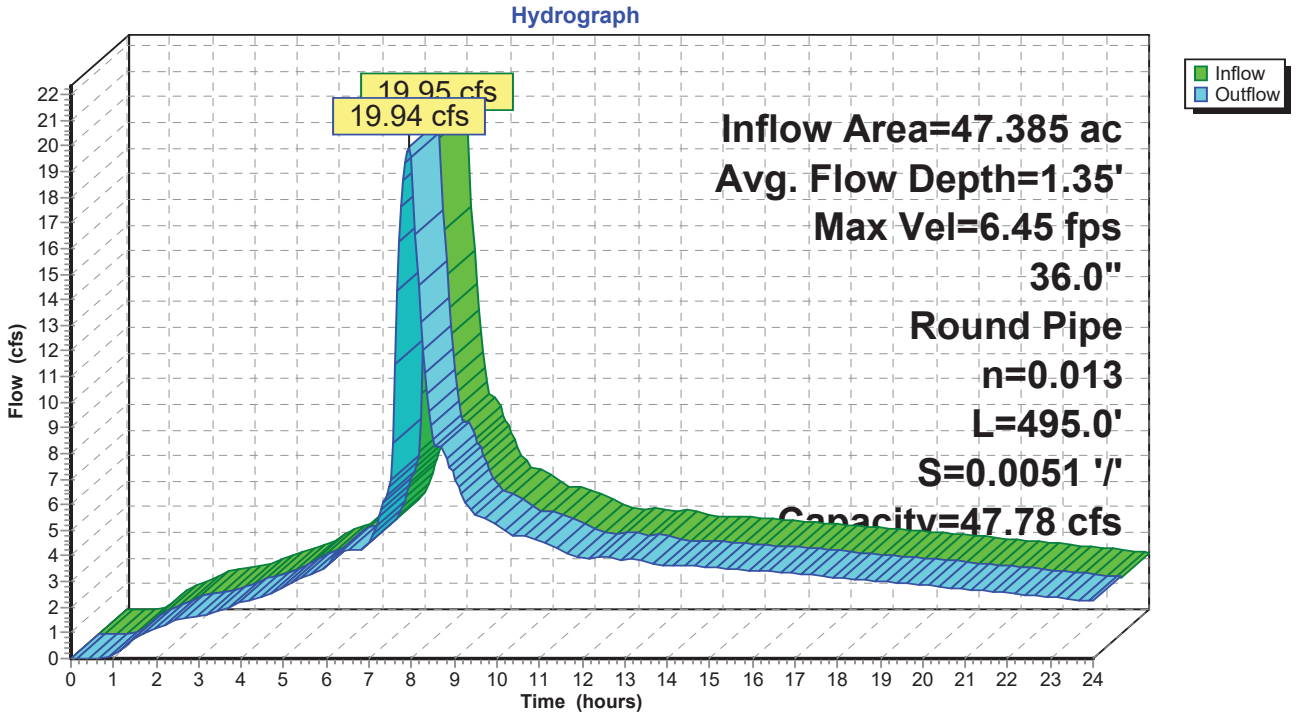
Inflow Area = 47.385 ac, 50.11% Impervious, Inflow Depth > 1.84" for 10-YEAR event
Inflow = 19.95 cfs @ 7.94 hrs, Volume= 7.249 af
Outflow = 19.94 cfs @ 7.96 hrs, Volume= 7.241 af, Atten= 0%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.45 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 3.86 fps, Avg. Travel Time= 2.1 min

Peak Storage= 1,529 cf @ 7.96 hrs
Average Depth at Peak Storage= 1.35'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 47.78 cfs

36.0" Round Pipe
n= 0.013 PVC, smooth interior
Length= 495.0' Slope= 0.0051 '/'
Inlet Invert= 172.10', Outlet Invert= 169.56'





Summary for Pond 1P: Existing Stormwater Facility

Inflow Area = 149.434 ac, 27.72% Impervious, Inflow Depth > 1.40" for 10-YEAR event
Inflow = 39.41 cfs @ 7.98 hrs, Volume= 17.385 af
Outflow = 10.02 cfs @ 13.54 hrs, Volume= 14.613 af, Atten= 75%, Lag= 333.7 min
Primary = 10.02 cfs @ 13.54 hrs, Volume= 14.613 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 174.18' @ 13.54 hrs Surf.Area= 218,886 sf Storage= 170,174 cf
Flood Elev= 174.50' Surf.Area= 258,975 sf Storage= 245,604 cf

Plug-Flow detention time= 212.8 min calculated for 14.613 af (84% of inflow)
Center-of-Mass det. time= 112.0 min (879.1 - 767.1)

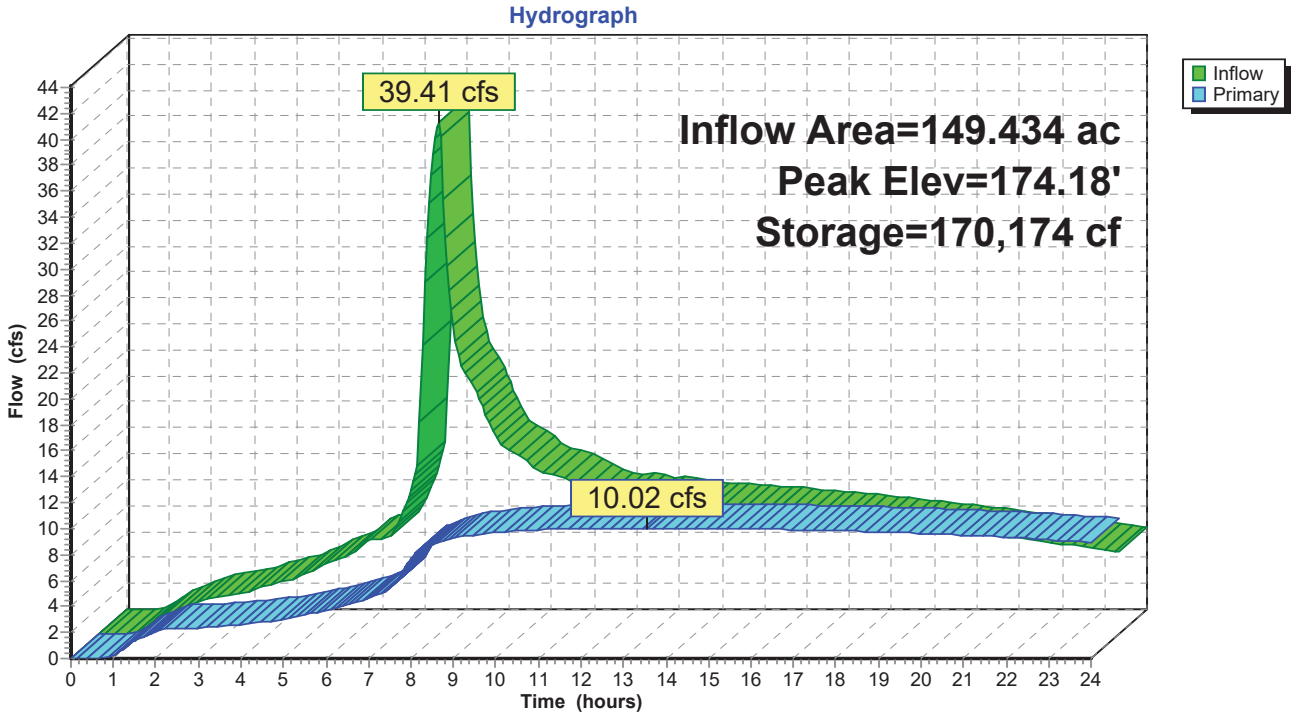
Volume	Invert	Avail.Storage	Storage Description
#1	173.00'	1,197,116 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
173.00	68,497	0	0
175.00	322,467	390,964	390,964
177.00	483,685	806,152	1,197,116

Device	Routing	Invert	Outlet Devices
#1	Primary	172.04'	**90.0 deg x 1.40' rise Sharp-Crested Vee/Trap Weir** Cv= 2.50 (C= 3.13)

Primary OutFlow Max=10.02 cfs @ 13.54 hrs HW=174.18' TW=170.28' (Dynamic Tailwater)
↑—**1=Sharp-Crested Vee/Trap Weir** (Orifice Controls 10.02 cfs @ 5.11 fps)

Pond 1P: Existing Stormwater Facility

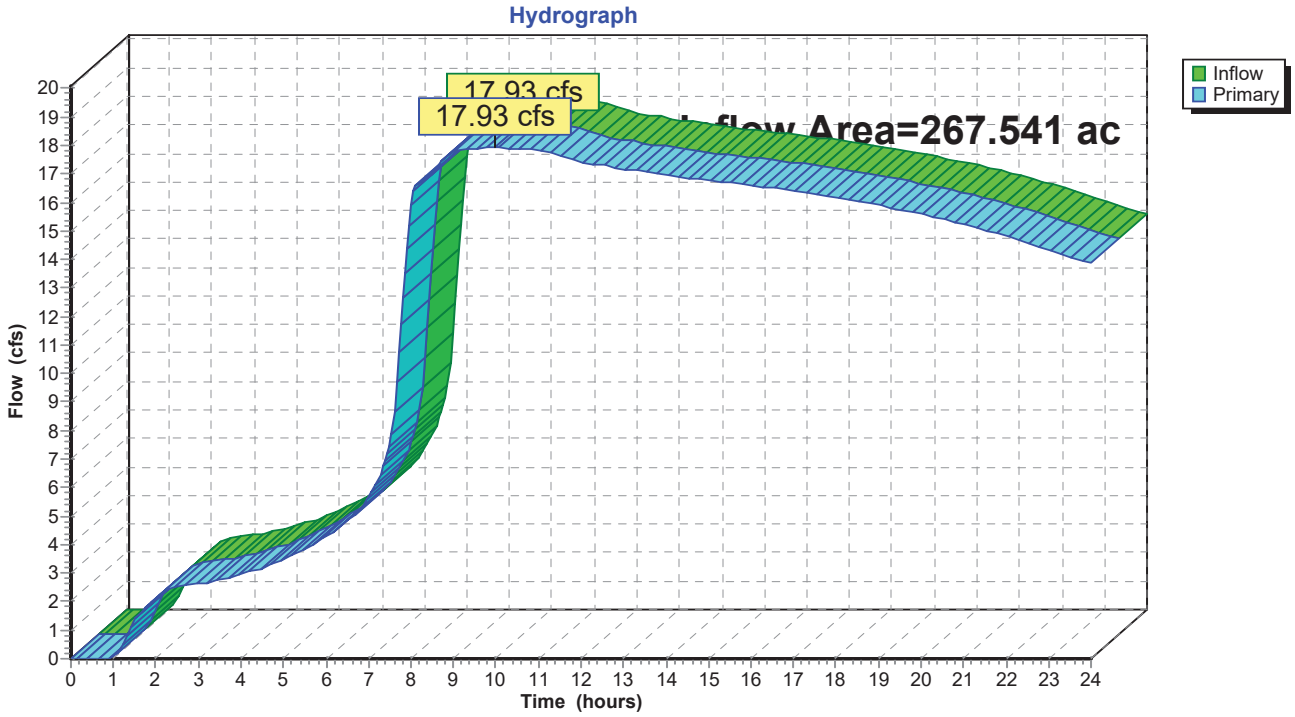


Summary for Link 5L: Discharge

Inflow Area = 267.541 ac, 17.00% Impervious, Inflow Depth > 1.07" for 10-YEAR event
Inflow = 17.93 cfs @ 9.98 hrs, Volume= 23.951 af
Primary = 17.93 cfs @ 9.98 hrs, Volume= 23.951 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 5L: Discharge



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Harvest Gardens TL Runoff Area=1,891,057 sf 54.70% Impervious Runoff Depth>2.34"
Tc=5.0 min CN=74/98 Runoff=24.07 cfs 8.479 af

Subcatchment 2S: Harvest Gardens TL Runoff Area=369,349 sf 47.88% Impervious Runoff Depth>2.21"
Tc=5.0 min CN=74/98 Runoff=4.37 cfs 1.558 af

Subcatchment 3S: Harvest Gardens TL Runoff Area=406,655 sf 66.99% Impervious Runoff Depth>2.59"
Tc=5.0 min CN=74/98 Runoff=5.84 cfs 2.017 af

Subcatchment 4S: Off-site cul-de-sac Runoff Area=223,632 sf 50.68% Impervious Runoff Depth>2.27"
Tc=0.0 min CN=74/98 Runoff=2.78 cfs 0.970 af

Subcatchment 5S: Off-site west of Matthieu Runoff Area=59,593 sf 0.00% Impervious Runoff Depth>1.10"
Flow Length=415' Tc=30.0 min CN=72/0 Runoff=0.18 cfs 0.125 af

Subcatchment 6S: TL 2100 (developed) Runoff Area=519,405 sf 63.26% Impervious Runoff Depth>2.52"
Tc=5.0 min CN=74/98 Runoff=7.20 cfs 2.501 af

Subcatchment 7S: TL 2000 Runoff Area=146,139 sf 16.26% Impervious Runoff Depth>1.54"
Flow Length=520' Tc=29.9 min CN=74/98 Runoff=0.77 cfs 0.432 af

Subcatchment 8S: TL 2600 (Off-site Runoff Area=4,393,660 sf 0.00% Impervious Runoff Depth>1.21"
Flow Length=4,393' Tc=110.1 min CN=75/0 Runoff=9.84 cfs 10.136 af

Subcatchment 9S: TL 2600 (Off-site South) Runoff Area=381,740 sf 0.00% Impervious Runoff Depth>1.28"
Flow Length=1,006' Tc=31.8 min CN=75/0 Runoff=1.47 cfs 0.932 af

Subcatchment 10S: TL 300 (Off-site South) Runoff Area=677,221 sf 0.00% Impervious Runoff Depth>1.22"
Flow Length=828' Slope=0.0150 '/' Tc=25.5 min CN=74/0 Runoff=2.62 cfs 1.581 af

Subcatchment 11S: TL 400,500,600,900 Runoff Area=1,001,660 sf 0.00% Impervious Runoff Depth>1.20"
Flow Length=1,774' Tc=52.6 min CN=74/0 Runoff=2.83 cfs 2.295 af

Subcatchment 12S: TL 1000 Runoff Area=531,627 sf 0.00% Impervious Runoff Depth>1.10"
Flow Length=989' Tc=28.6 min CN=72/0 Runoff=1.63 cfs 1.118 af

Subcatchment 13S: Runoff Area=341,174 sf 9.28% Impervious Runoff Depth>1.30"
Flow Length=763' Tc=22.5 min CN=72/98 Runoff=1.52 cfs 0.850 af

Subcatchment 14S: NW Corner Runoff Area=182,135 sf 0.00% Impervious Runoff Depth>1.22"
Flow Length=601' Tc=31.0 min CN=74/0 Runoff=0.65 cfs 0.424 af

Subcatchment 15S: Runoff Area=221,408 sf 0.00% Impervious Runoff Depth>1.21"
Flow Length=1,173' Tc=37.5 min CN=74/0 Runoff=0.73 cfs 0.513 af

Subcatchment 16S: TL 100 Runoff Area=173,055 sf 0.00% Impervious Runoff Depth>1.23"
Flow Length=293' Tc=19.2 min CN=74/0 Runoff=0.75 cfs 0.406 af

Subcatchment 17S: TL 1100 Runoff Area=134,571 sf 0.00% Impervious Runoff Depth>1.22"
Flow Length=308' Tc=19.3 min CN=74/0 Runoff=0.58 cfs 0.315 af

Reach 1R: Ex 12" RCP Avg. Flow Depth=0.73' Max Vel=10.69 fps Inflow=6.61 cfs 2.655 af
12.0" Round Pipe n=0.013 L=45.7' S=0.0435 '/' Capacity=7.43 cfs Outflow=6.61 cfs 2.655 af

Reach 2R: Ex 18" ADS Avg. Flow Depth=0.52' Max Vel=6.08 fps Inflow=3.28 cfs 1.393 af
18.0" Round Pipe n=0.013 L=830.0' S=0.0149 '/' Capacity=12.84 cfs Outflow=3.28 cfs 1.391 af

Reach 3R: 27" PVC Avg. Flow Depth=1.32' Max Vel=5.87 fps Inflow=14.39 cfs 19.448 af
27.0" Round Pipe n=0.013 L=1,162.0' S=0.0050 '/' Capacity=21.90 cfs Outflow=14.28 cfs 19.392 af

Reach 5R: 30" PVC Avg. Flow Depth=1.67' Max Vel=6.53 fps Inflow=22.82 cfs 29.528 af
30.0" Round Pipe n=0.013 L=122.6' S=0.0050 '/' Capacity=28.93 cfs Outflow=22.82 cfs 29.520 af

Reach 6R: 30" PVC Avg. Flow Depth=1.66' Max Vel=6.60 fps Inflow=22.82 cfs 29.520 af
30.0" Round Pipe n=0.013 L=39.1' S=0.0051 '/' Capacity=29.34 cfs Outflow=22.82 cfs 29.518 af

Reach 8R: 36" PVC Avg. Flow Depth=1.53' Max Vel=6.82 fps Inflow=24.74 cfs 8.884 af
36.0" Round Pipe n=0.013 L=495.0' S=0.0051 '/' Capacity=47.78 cfs Outflow=24.73 cfs 8.876 af

Pond 1P: Existing Stormwater Facility Peak Elev=174.56' Storage=262,552 cf Inflow=51.03 cfs 22.014 af
Outflow=11.53 cfs 16.957 af

Link 5L: Discharge Inflow=22.82 cfs 29.518 af
Primary=22.82 cfs 29.518 af

Total Runoff Area = 267.541 ac Runoff Volume = 34.652 af Average Runoff Depth = 1.55"
83.00% Pervious = 222.065 ac 17.00% Impervious = 45.476 ac

Summary for Subcatchment 1S: Harvest Gardens TL 2600

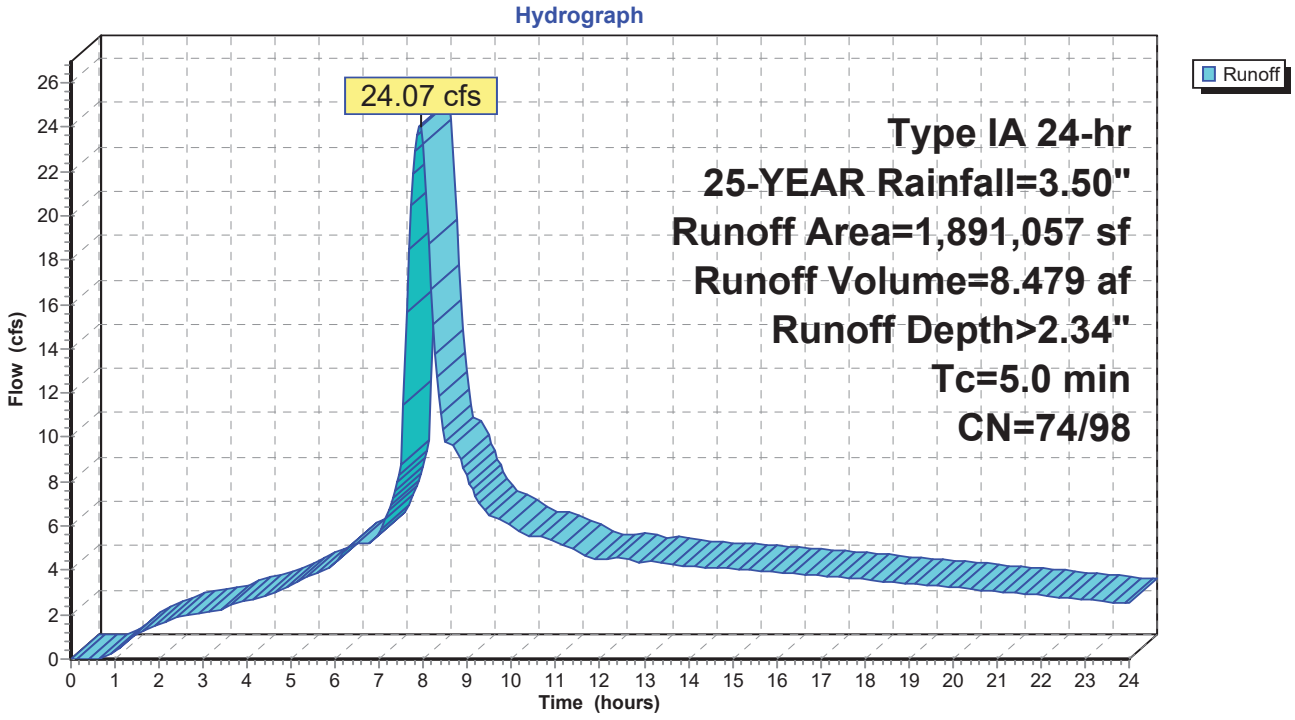
Runoff = 24.07 cfs @ 7.93 hrs, Volume= 8.479 af, Depth> 2.34"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

	Area (sf)	CN	Description
*	466,714	98	impervious, ROW, sidewalk, etc
*	567,600	98	impervious (215 lots @ 2400)
	856,743	74	>75% Grass cover, Good, HSG C
	1,891,057	87	Weighted Average
	856,743	74	45.30% Pervious Area
	1,034,314	98	54.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 1S: Harvest Gardens TL 2600



Summary for Subcatchment 2S: Harvest Gardens TL 2600

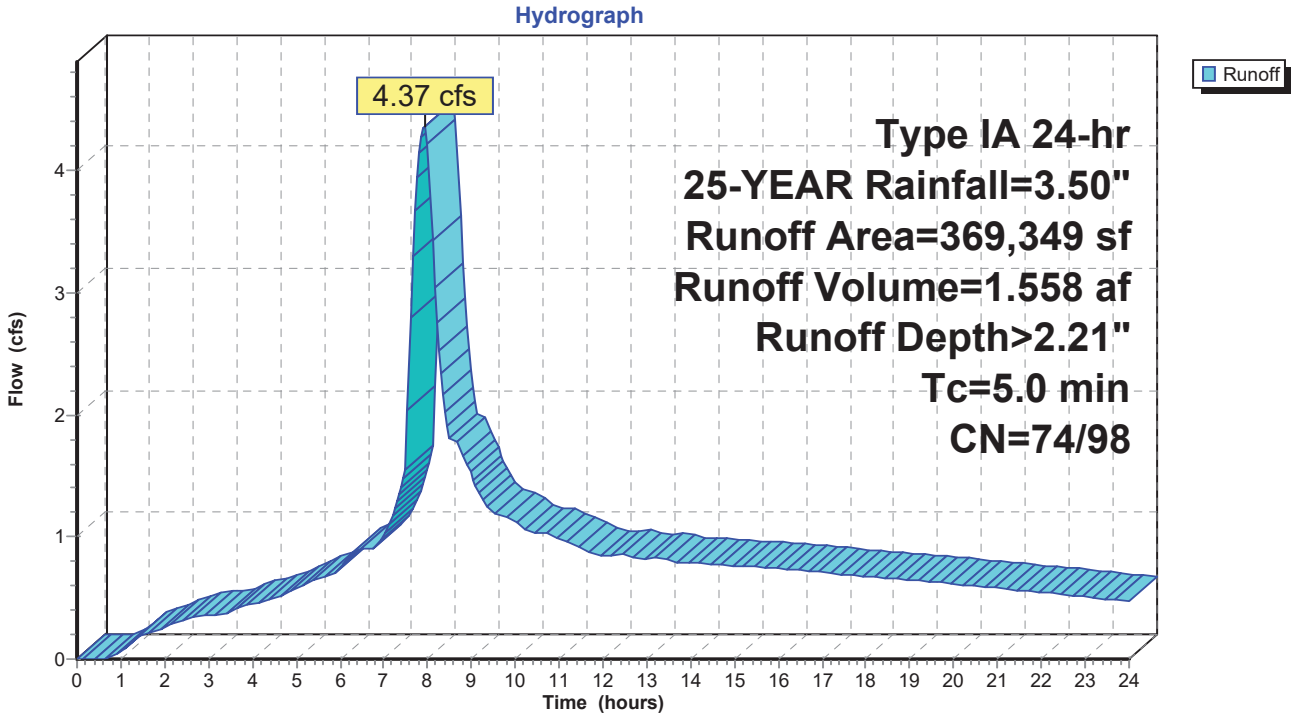
Runoff = 4.37 cfs @ 7.94 hrs, Volume= 1.558 af, Depth> 2.21"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

	Area (sf)	CN	Description
*	77,162	98	impervious, ROW, sidewalk, etc
*	99,688	98	impervious (39 lots @ 2400)
	192,499	74	>75% Grass cover, Good, HSG C
	369,349	85	Weighted Average
	192,499	74	52.12% Pervious Area
	176,850	98	47.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 2S: Harvest Gardens TL 2600



Summary for Subcatchment 3S: Harvest Gardens TL 1100

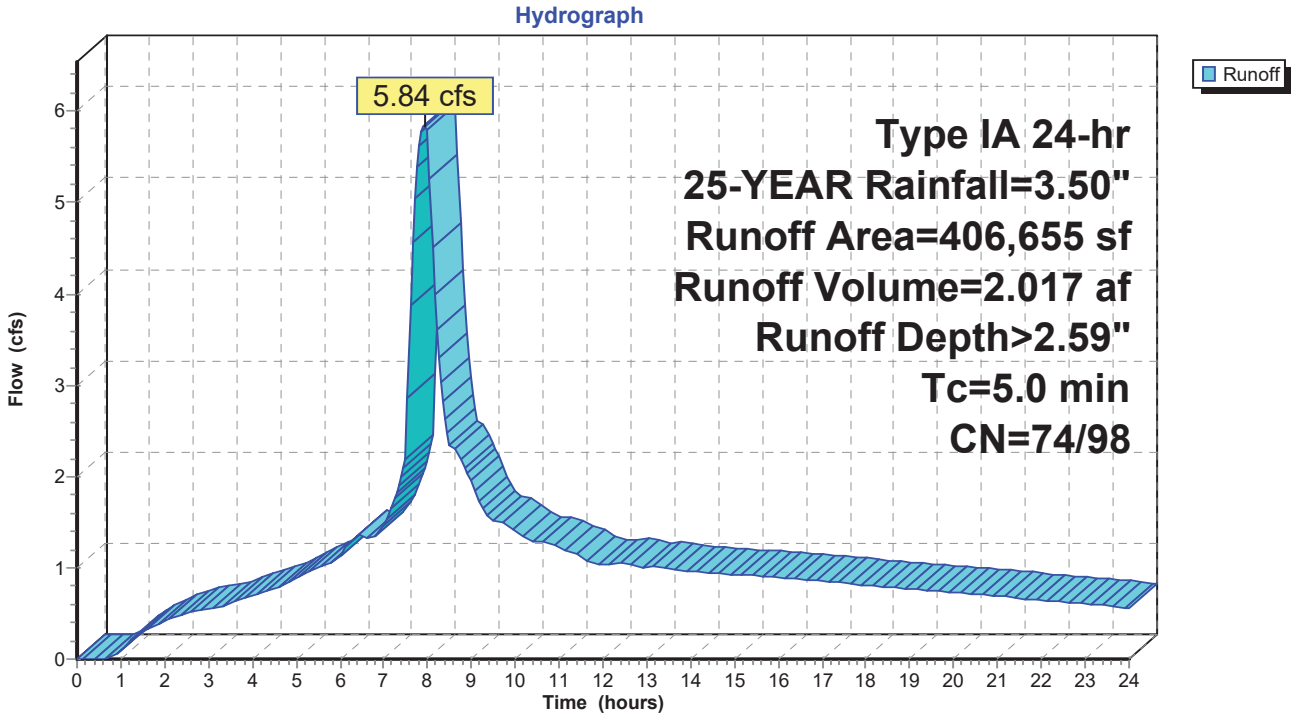
Runoff = 5.84 cfs @ 7.92 hrs, Volume= 2.017 af, Depth> 2.59"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

	Area (sf)	CN	Description
*	132,514	98	impervious, ROW, sidewalk, etc
*	139,920	98	impervious (53 lots @ 2640)
	134,221	74	>75% Grass cover, Good, HSG C
	406,655	90	Weighted Average
	134,221	74	33.01% Pervious Area
	272,434	98	66.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 3S: Harvest Gardens TL 1100



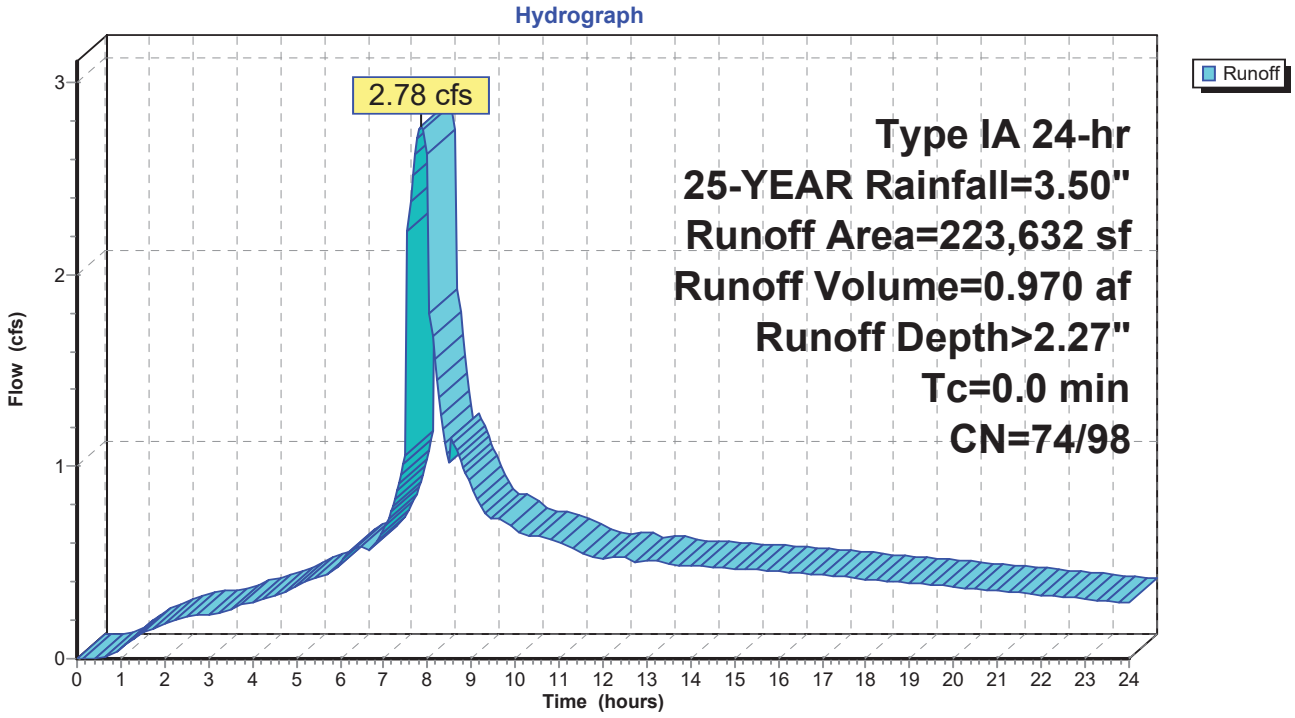
Summary for Subcatchment 4S: Off-site cul-de-sac (developed)

Runoff = 2.78 cfs @ 7.85 hrs, Volume= 0.970 af, Depth> 2.27"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

	Area (sf)	CN	Description
*	42,063	98	impervious, ROW, sidewalk, etc.
*	71,280	98	impervious (8 lots @ 2640)
	110,289	74	>75% Grass cover, Good, HSG C
	223,632	86	Weighted Average
	110,289	74	49.32% Pervious Area
	113,343	98	50.68% Impervious Area

Subcatchment 4S: Off-site cul-de-sac (developed)



Summary for Subcatchment 5S: Off-site west of Matthieu (open space)

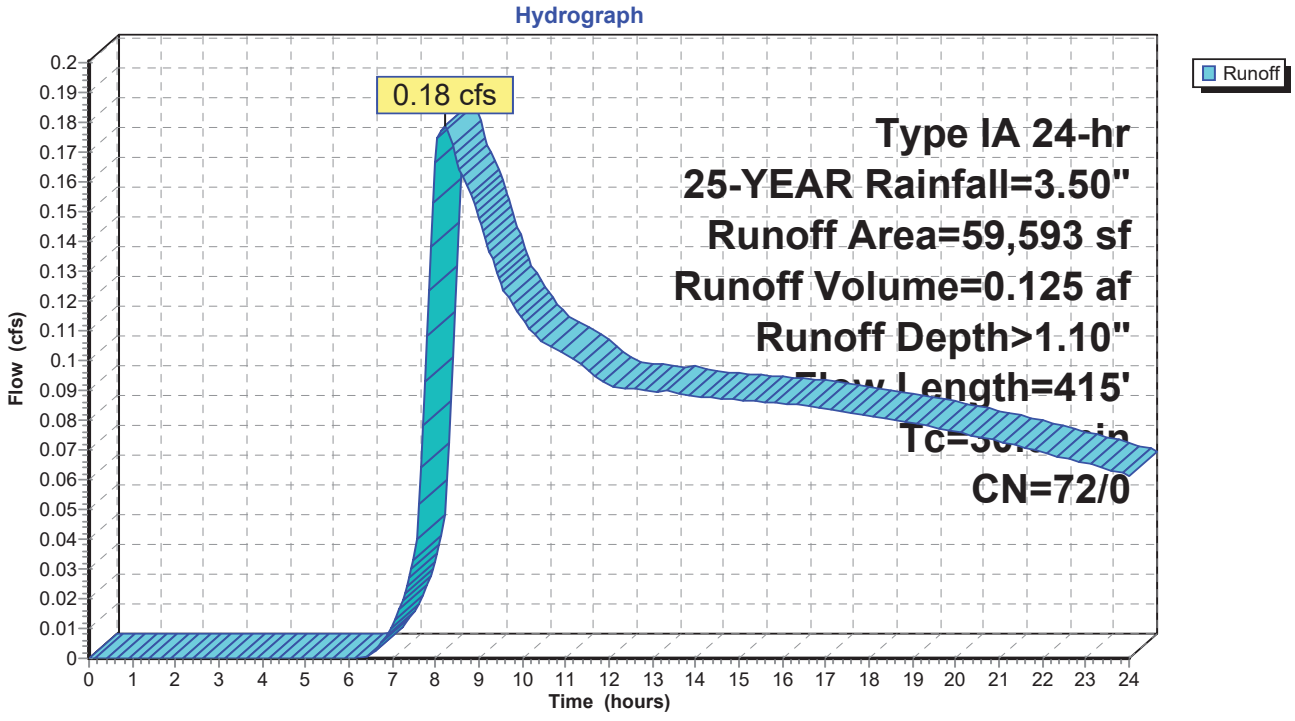
Runoff = 0.18 cfs @ 8.19 hrs, Volume= 0.125 af, Depth> 1.10"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

Area (sf)	CN	Description
59,593	72	Woods/grass comb., Good, HSG C
59,593	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.7	50	0.0040	0.05		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
12.3	365	0.0050	0.49		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
30.0	415	Total			

Subcatchment 5S: Off-site west of Matthieu (open space)



Summary for Subcatchment 6S: TL 2100 (developed)

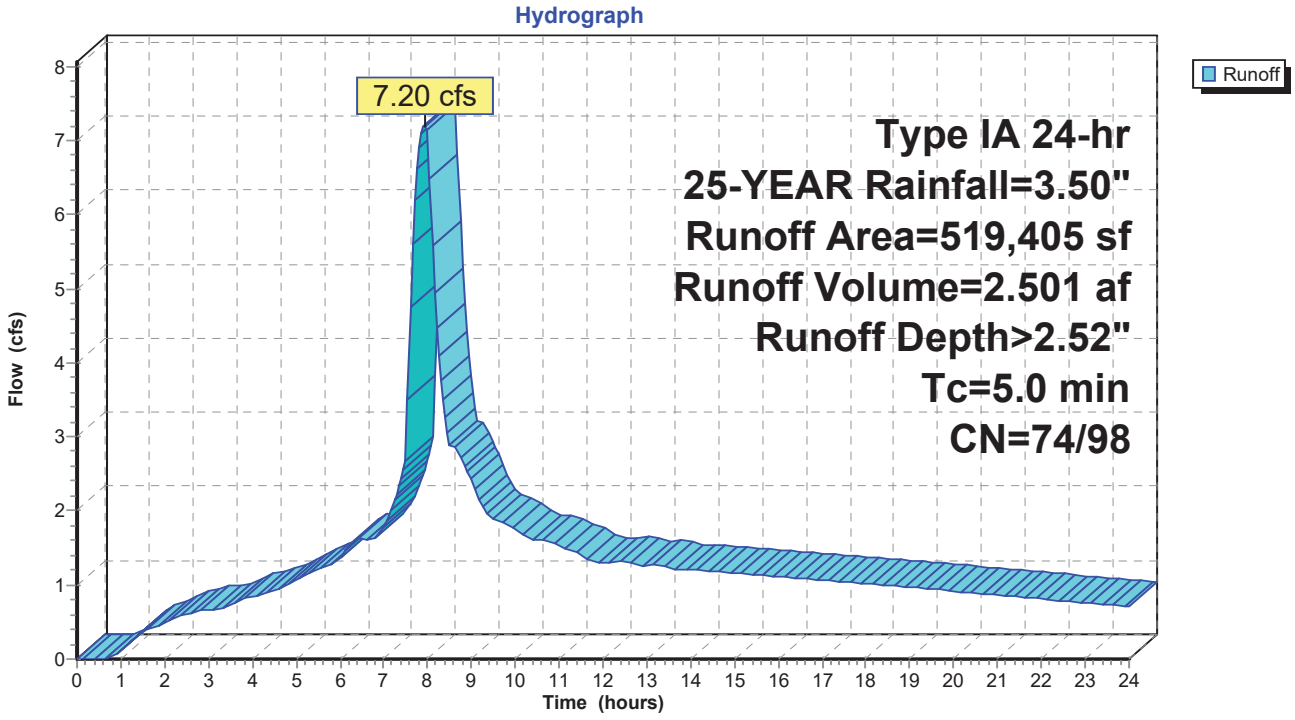
Runoff = 7.20 cfs @ 7.92 hrs, Volume= 2.501 af, Depth> 2.52"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

	Area (sf)	CN	Description
*	154,312	98	impervious, ROW, sidewalk, etc
*	174,240	98	Lots (66 @ 2640)
	190,853	74	>75% Grass cover, Good, HSG C
	519,405	89	Weighted Average
	190,853	74	36.74% Pervious Area
	328,552	98	63.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: TL 2100 (developed)



Summary for Subcatchment 7S: TL 2000

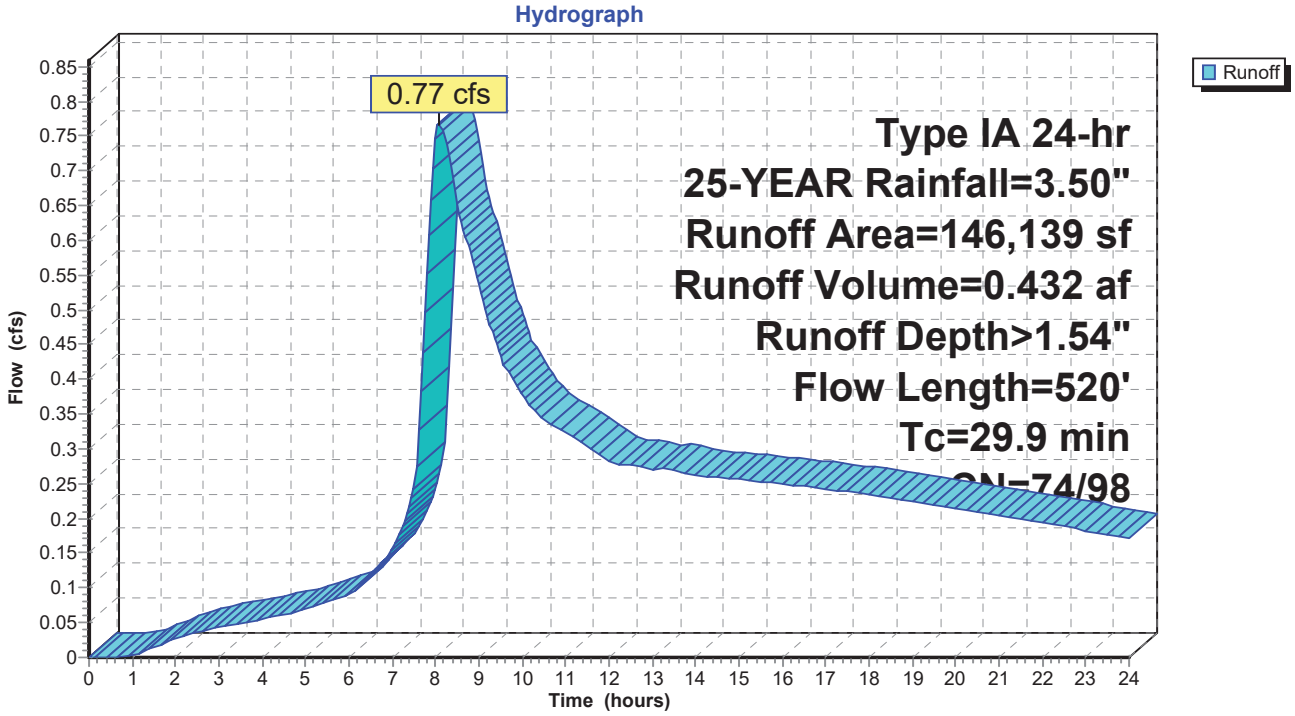
Runoff = 0.77 cfs @ 8.07 hrs, Volume= 0.432 af, Depth> 1.54"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

	Area (sf)	CN	Description
*	15,845	98	impervious, ROW, sidewalk, etc
*	7,920	98	Lots (3 @ 2640)
	122,374	74	>75% Grass cover, Good, HSG C
	146,139	78	Weighted Average
	122,374	74	83.74% Pervious Area
	23,765	98	16.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	50	0.0100	0.07		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
17.7	470	0.0040	0.44		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
29.9	520	Total			

Subcatchment 7S: TL 2000



Summary for Subcatchment 8S: TL 2600 (Off-site South)

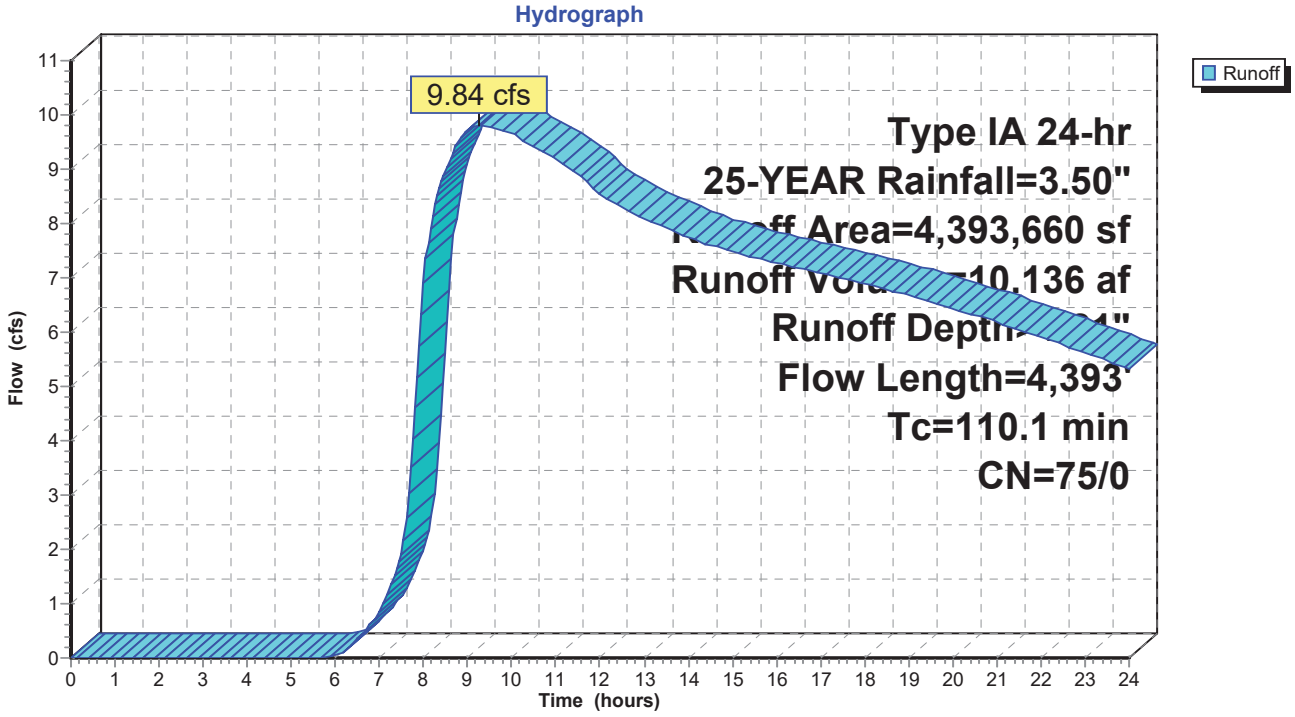
Runoff = 9.84 cfs @ 9.25 hrs, Volume= 10.136 af, Depth> 1.21"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

Area (sf)	CN	Description
3,824,683	74	Pasture/grassland/range, Good, HSG C
568,977	80	Pasture/grassland/range, Good, HSG D
4,393,660	75	Weighted Average
4,393,660	75	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.1	50	0.0050	0.05		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
15.7	510	0.0060	0.54		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
78.3	3,833	0.0500	0.82	0.82	**Channel Flow, channel** Area= 1.0 sf Perim= 50.0' r= 0.02' n= 0.030 Short grass
110.1	4,393	Total			

Subcatchment 8S: TL 2600 (Off-site South)



Summary for Subcatchment 9S: TL 2600 (Off-site South)

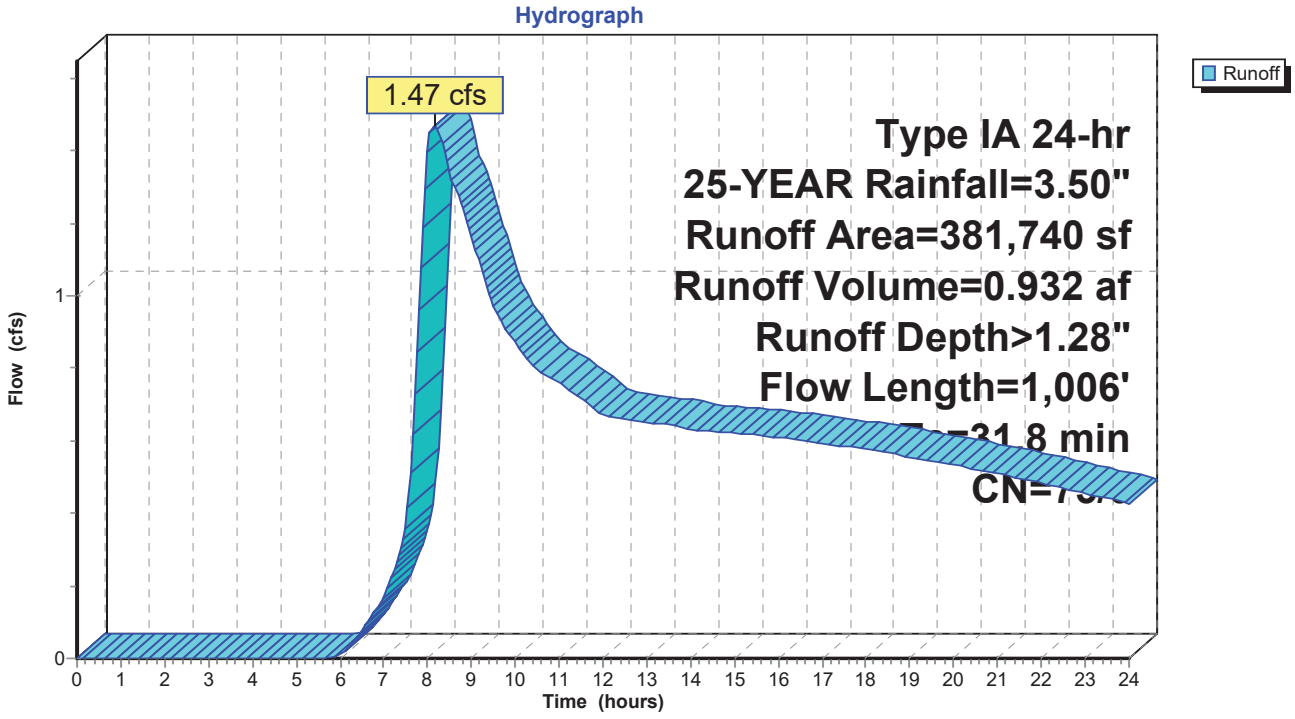
Runoff = 1.47 cfs @ 8.16 hrs, Volume= 0.932 af, Depth> 1.28"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

Area (sf)	CN	Description
322,671	74	Pasture/grassland/range, Good, HSG C
59,069	80	Pasture/grassland/range, Good, HSG D
381,740	75	Weighted Average
381,740	75	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	50	0.0130	0.08		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
20.8	956	0.0120	0.77		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
31.8	1,006	Total			

Subcatchment 9S: TL 2600 (Off-site South)



Summary for Subcatchment 10S: TL 300 (Off-site South)

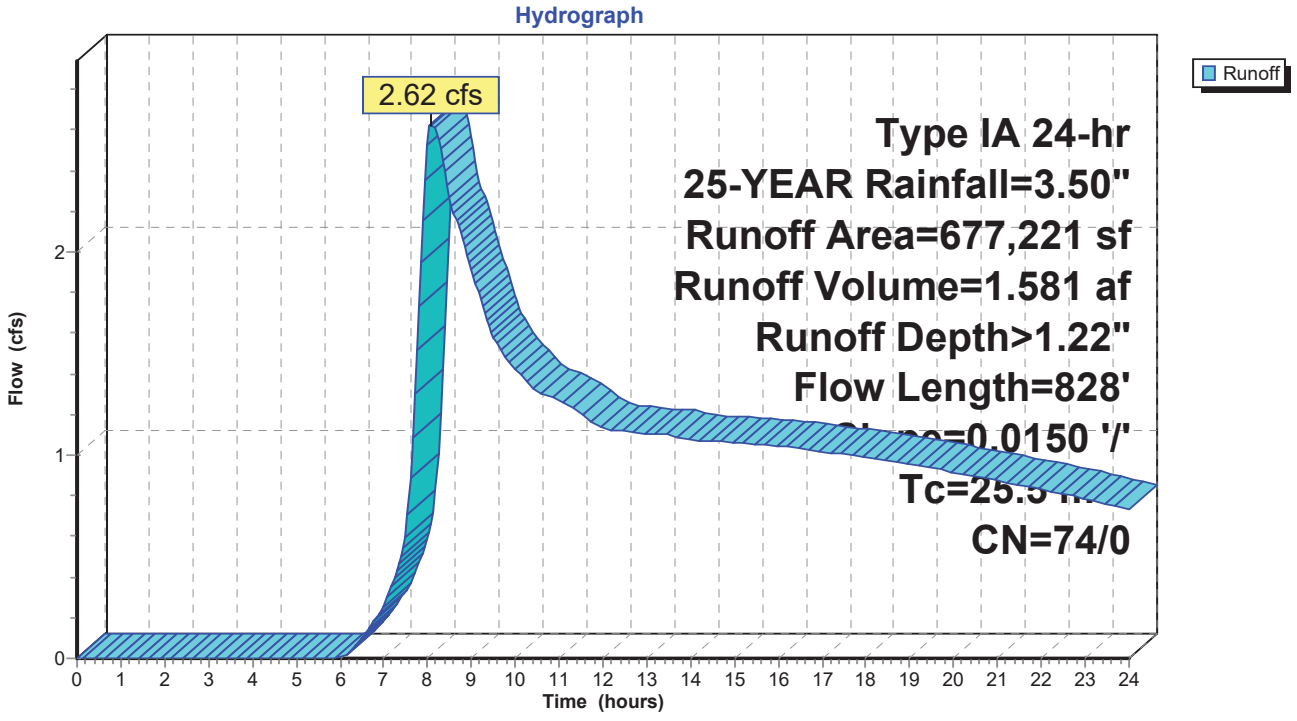
Runoff = 2.62 cfs @ 8.09 hrs, Volume= 1.581 af, Depth> 1.22"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

Area (sf)	CN	Description
677,221	74	Pasture/grassland/range, Good, HSG C
677,221	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	50	0.0150	0.08		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
15.1	778	0.0150	0.86		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
25.5	828	Total			

Subcatchment 10S: TL 300 (Off-site South)



Summary for Subcatchment 11S: TL 400,500,600,900

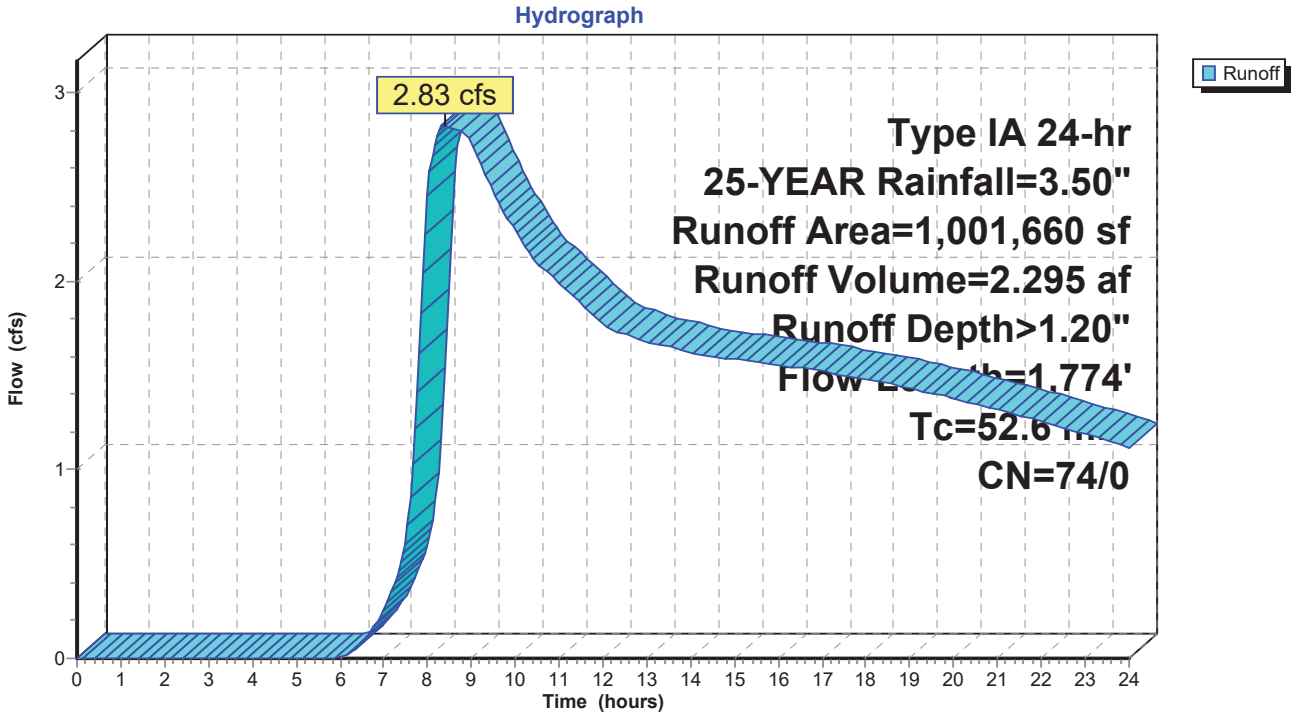
Runoff = 2.83 cfs @ 8.38 hrs, Volume= 2.295 af, Depth> 1.20"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

Area (sf)	CN	Description
1,001,660	74	Pasture/grassland/range, Good, HSG C
1,001,660	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0200	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
43.3	1,724	0.0090	0.66		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
52.6	1,774	Total			

Subcatchment 11S: TL 400,500,600,900



Summary for Subcatchment 12S: TL 1000

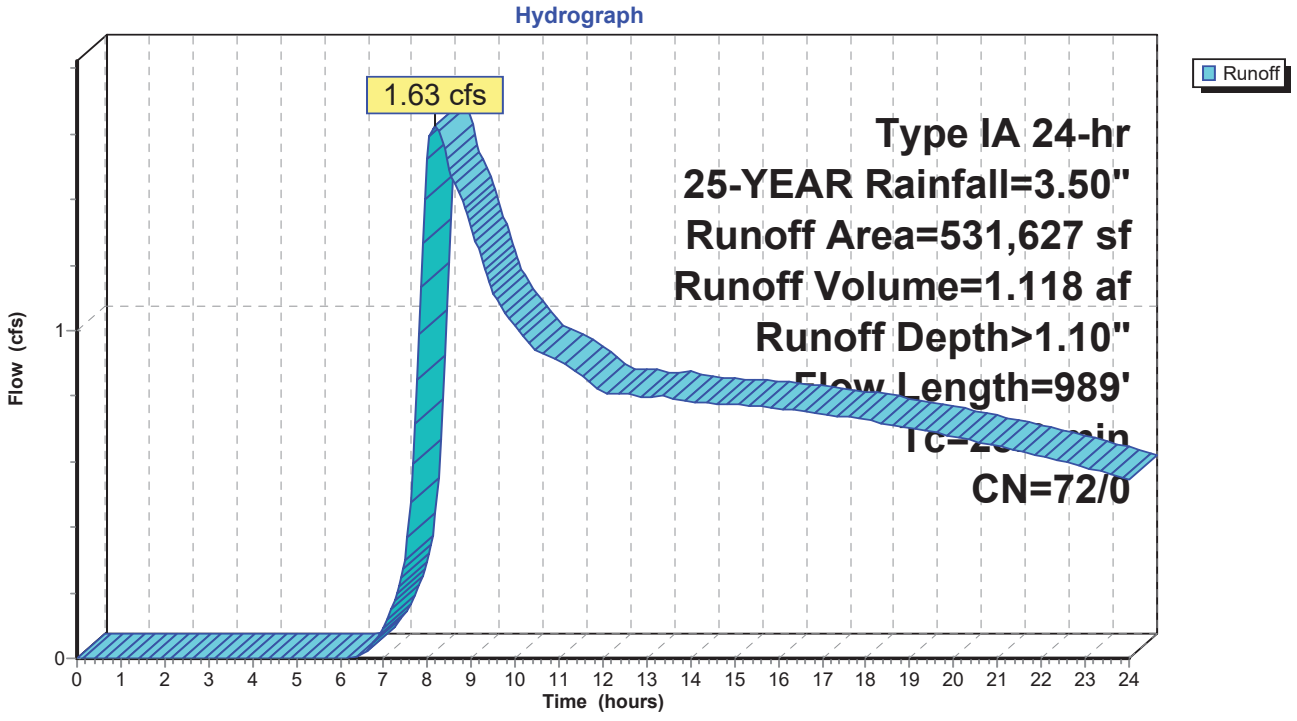
Runoff = 1.63 cfs @ 8.17 hrs, Volume= 1.118 af, Depth> 1.10"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

Area (sf)	CN	Description
531,627	72	Woods/grass comb., Good, HSG C
531,627	72	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	50	0.0180	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
18.9	939	0.0140	0.83		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
28.6	989	Total			

Subcatchment 12S: TL 1000



Summary for Subcatchment 13S:

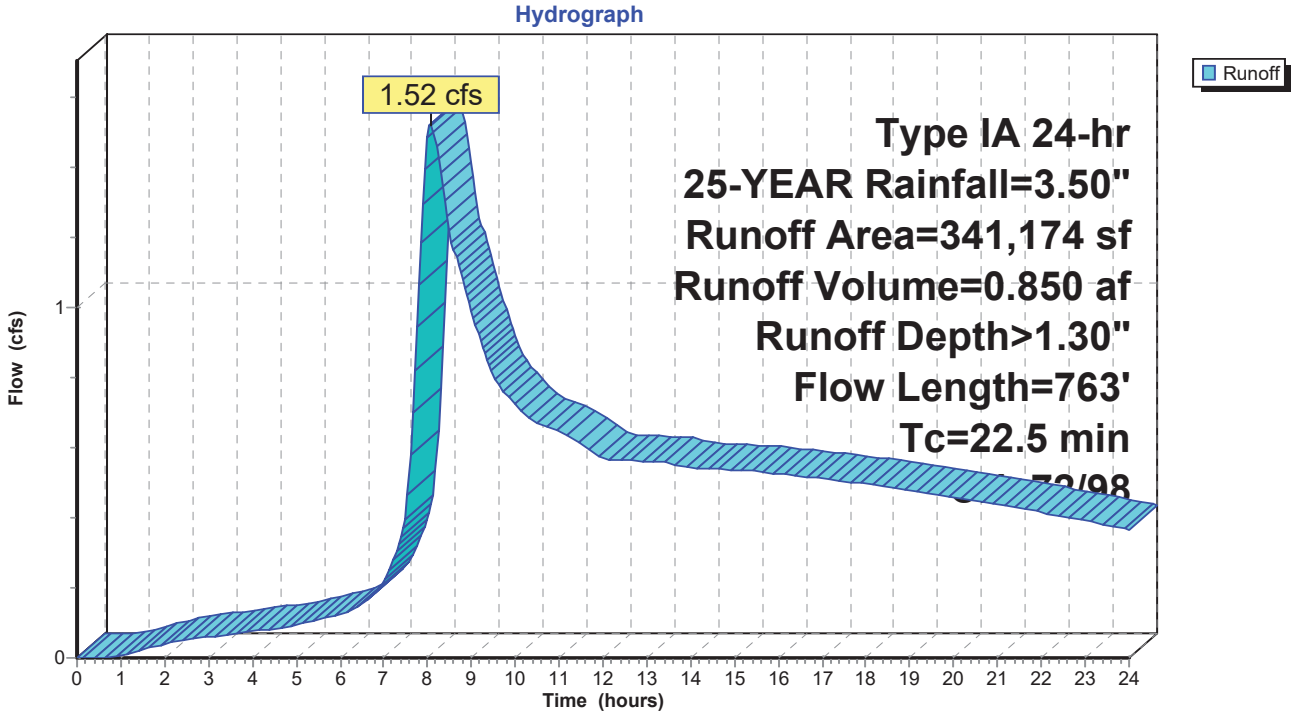
Runoff = 1.52 cfs @ 8.06 hrs, Volume= 0.850 af, Depth> 1.30"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

	Area (sf)	CN	Description
	309,516	72	Woods/grass comb., Good, HSG C
*	31,658	98	Impervious structures (4)
	341,174	74	Weighted Average
	309,516	72	90.72% Pervious Area
	31,658	98	9.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	50	0.0240	0.10		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
13.9	713	0.0150	0.86		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
22.5	763	Total			

Subcatchment 13S:



Summary for Subcatchment 14S: NW Corner

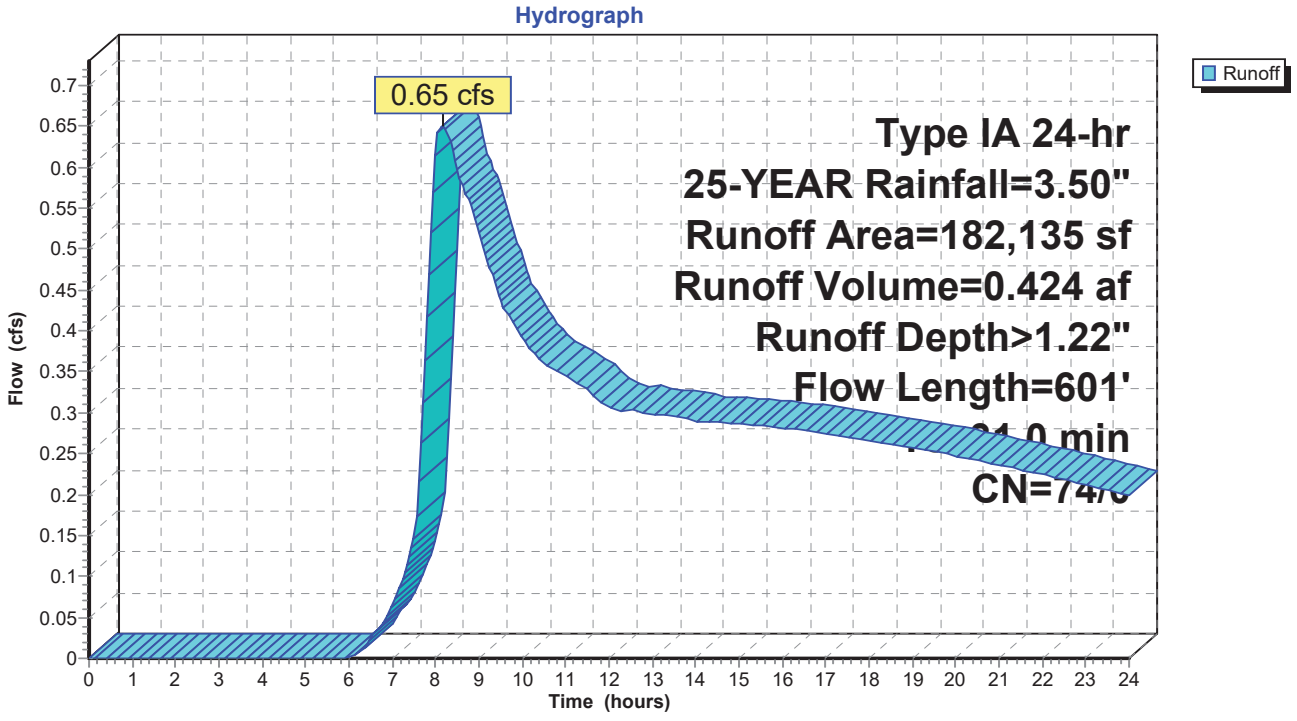
Runoff = 0.65 cfs @ 8.16 hrs, Volume= 0.424 af, Depth> 1.22"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

Area (sf)	CN	Description
182,135	74	>75% Grass cover, Good, HSG C
182,135	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	50	0.0070	0.06		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
16.9	551	0.0060	0.54		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
31.0	601	Total			

Subcatchment 14S: NW Corner



Summary for Subcatchment 15S:

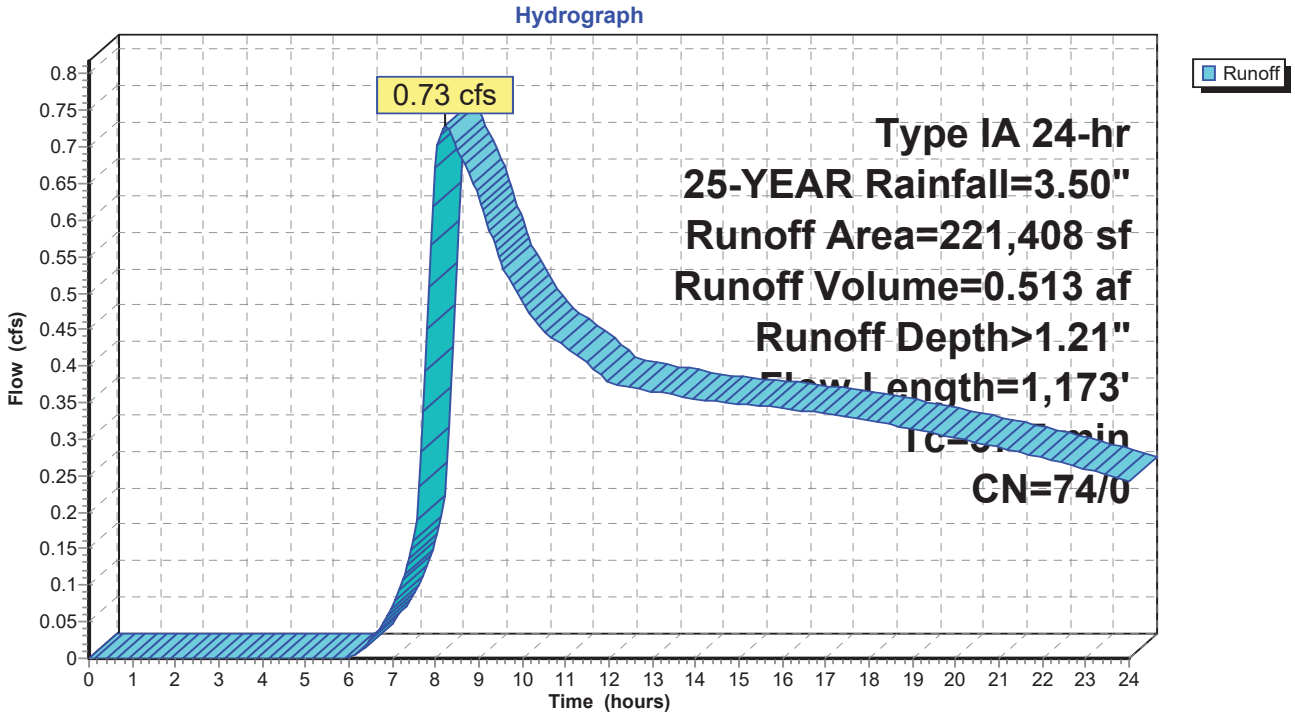
Runoff = 0.73 cfs @ 8.24 hrs, Volume= 0.513 af, Depth> 1.21"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

Area (sf)	CN	Description
221,408	74	Pasture/grassland/range, Good, HSG C
221,408	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0200	0.09		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
28.2	1,123	0.0090	0.66		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
37.5	1,173	Total			

Subcatchment 15S:



Summary for Subcatchment 16S: TL 100

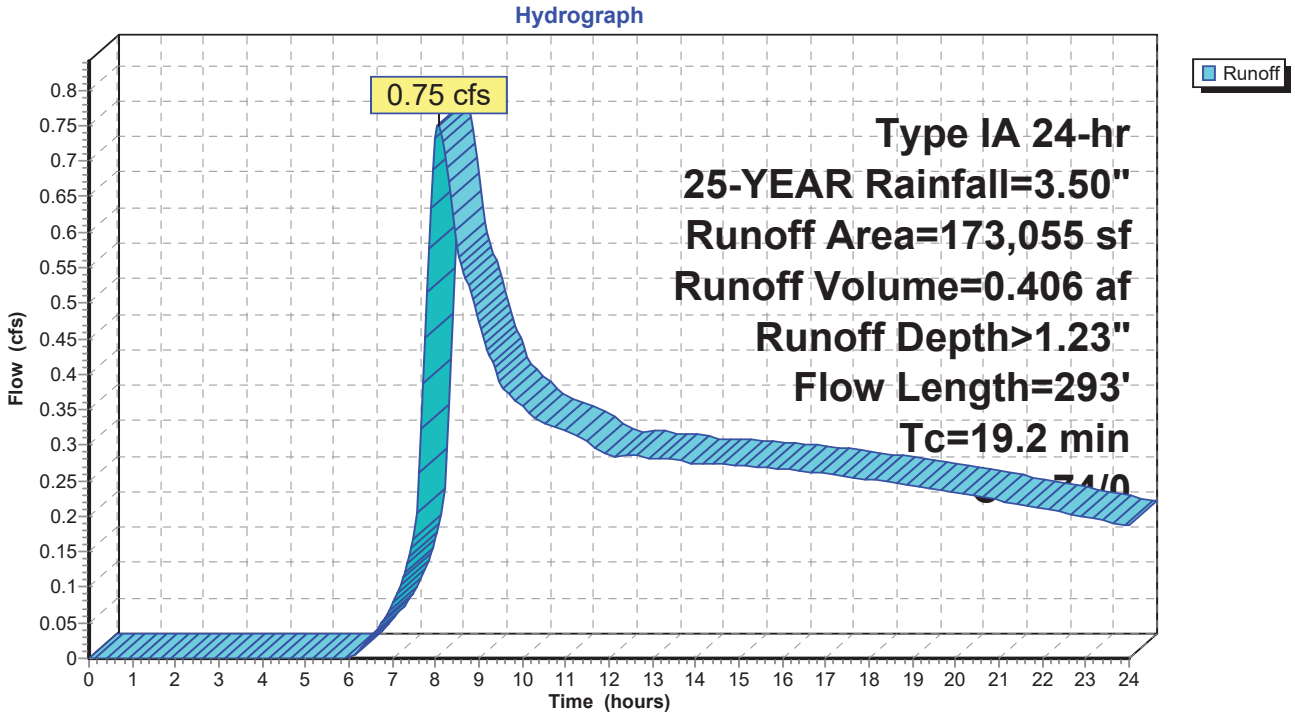
Runoff = 0.75 cfs @ 8.06 hrs, Volume= 0.406 af, Depth> 1.23"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

Area (sf)	CN	Description
173,055	74	Pasture/grassland/range, Good, HSG C
173,055	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	50	0.0130	0.08		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
8.2	243	0.0050	0.49		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
19.2	293	Total			

Subcatchment 16S: TL 100



Summary for Subcatchment 17S: TL 1100

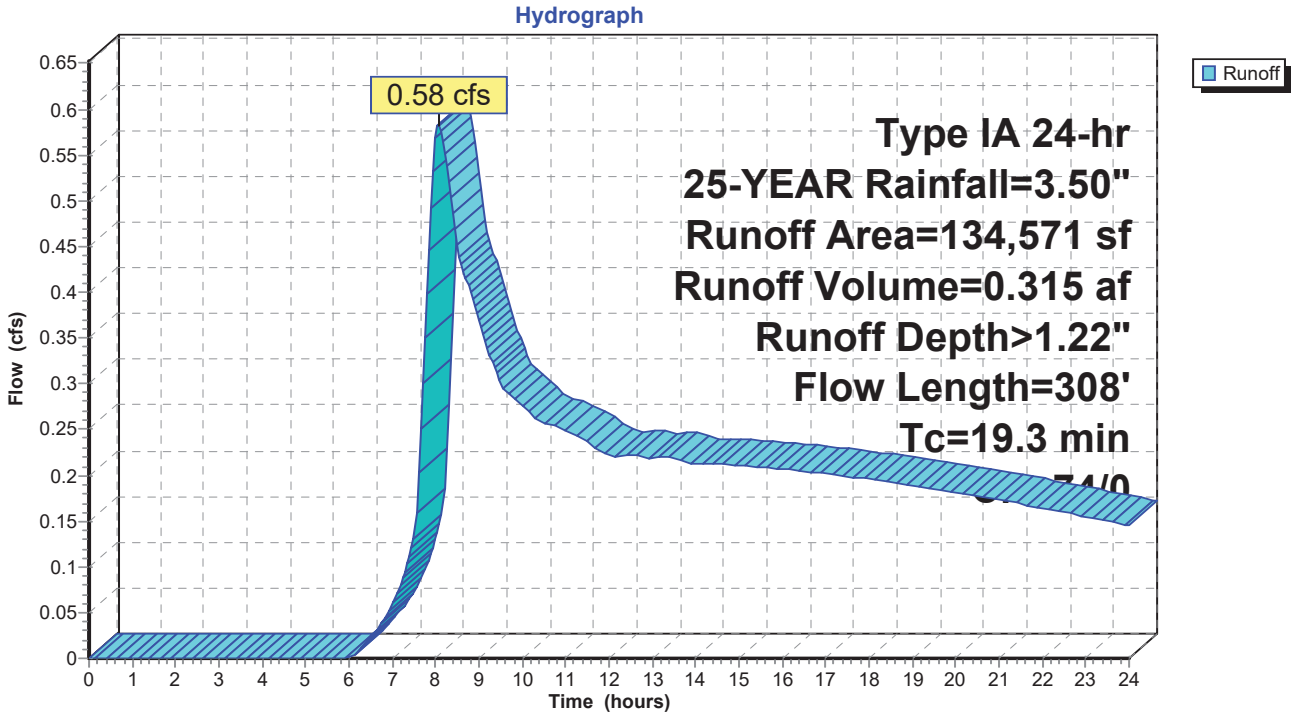
Runoff = 0.58 cfs @ 8.06 hrs, Volume= 0.315 af, Depth> 1.22"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25-YEAR Rainfall=3.50"

Area (sf)	CN	Description
134,571	74	Pasture/grassland/range, Good, HSG C
134,571	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	50	0.0080	0.06		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 2.50"
5.9	258	0.0110	0.73		**Shallow Concentrated Flow, shallow** Short Grass Pasture Kv= 7.0 fps
19.3	308	Total			

Subcatchment 17S: TL 1100



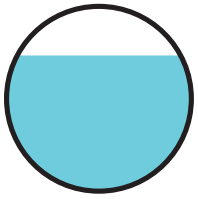
Summary for Reach 1R: Ex 12" RCP

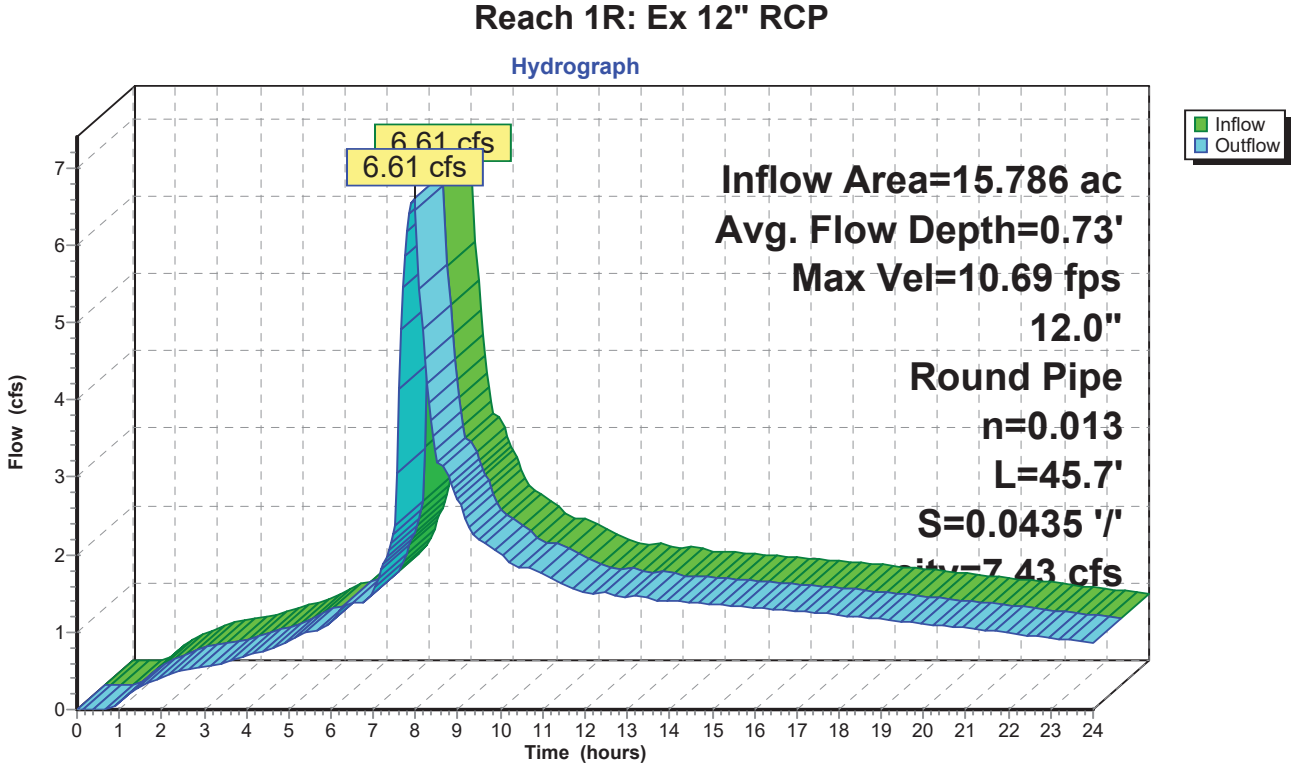
Inflow Area = 15.786 ac, 39.62% Impervious, Inflow Depth > 2.02" for 25-YEAR event
Inflow = 6.61 cfs @ 7.97 hrs, Volume= 2.655 af
Outflow = 6.61 cfs @ 7.97 hrs, Volume= 2.655 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 10.69 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 6.92 fps, Avg. Travel Time= 0.1 min

Peak Storage= 28 cf @ 7.97 hrs
Average Depth at Peak Storage= 0.73'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.43 cfs

12.0" Round Pipe
n= 0.013
Length= 45.7' Slope= 0.0435 '/'
Inlet Invert= 174.68', Outlet Invert= 172.69'





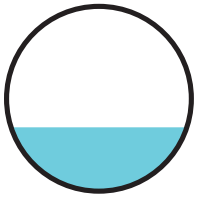
Summary for Reach 2R: Ex 18" ADS

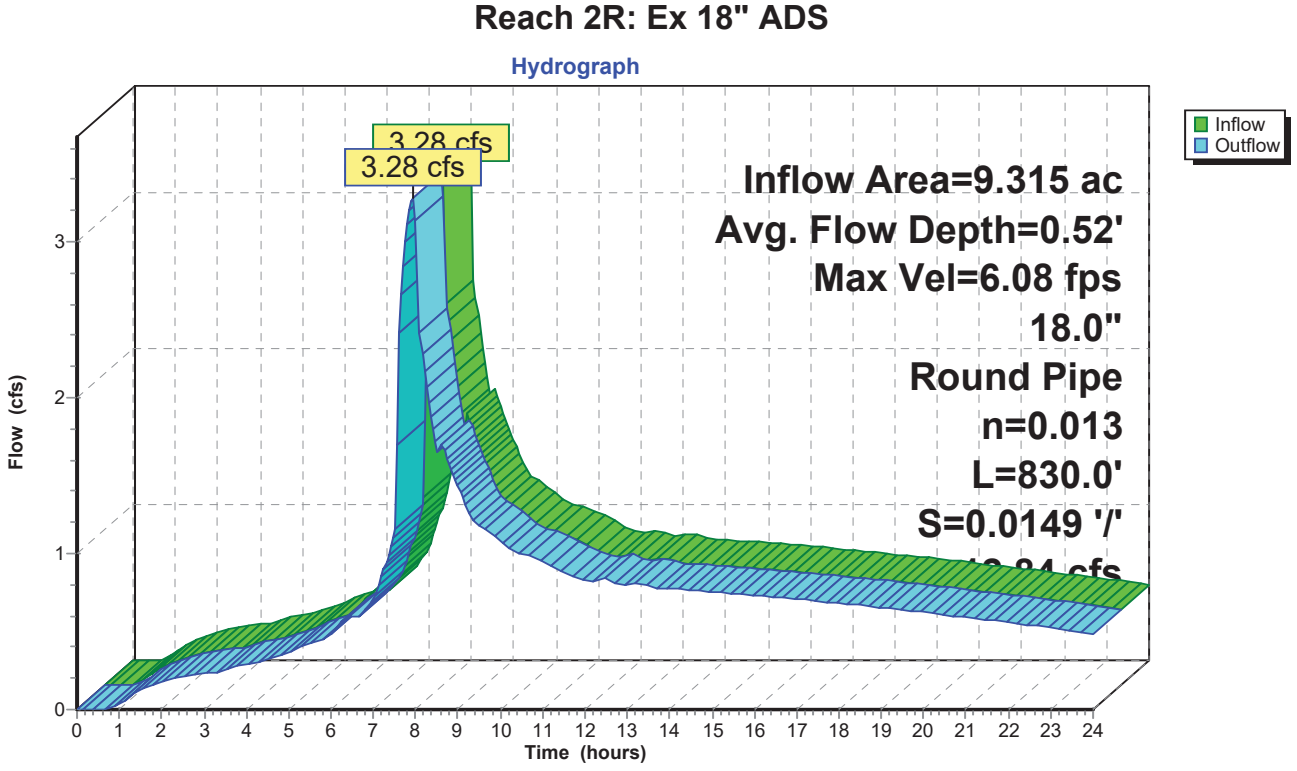
Inflow Area = 9.315 ac, 27.93% Impervious, Inflow Depth > 1.80" for 25-YEAR event
Inflow = 3.28 cfs @ 7.95 hrs, Volume= 1.393 af
Outflow = 3.28 cfs @ 7.95 hrs, Volume= 1.391 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.08 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 3.74 fps, Avg. Travel Time= 3.7 min

Peak Storage= 448 cf @ 7.95 hrs
Average Depth at Peak Storage= 0.52'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 12.84 cfs

18.0" Round Pipe
n= 0.013
Length= 830.0' Slope= 0.0149 '/'
Inlet Invert= 187.30', Outlet Invert= 174.90'





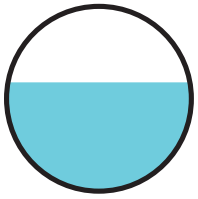
Summary for Reach 3R: 27" PVC

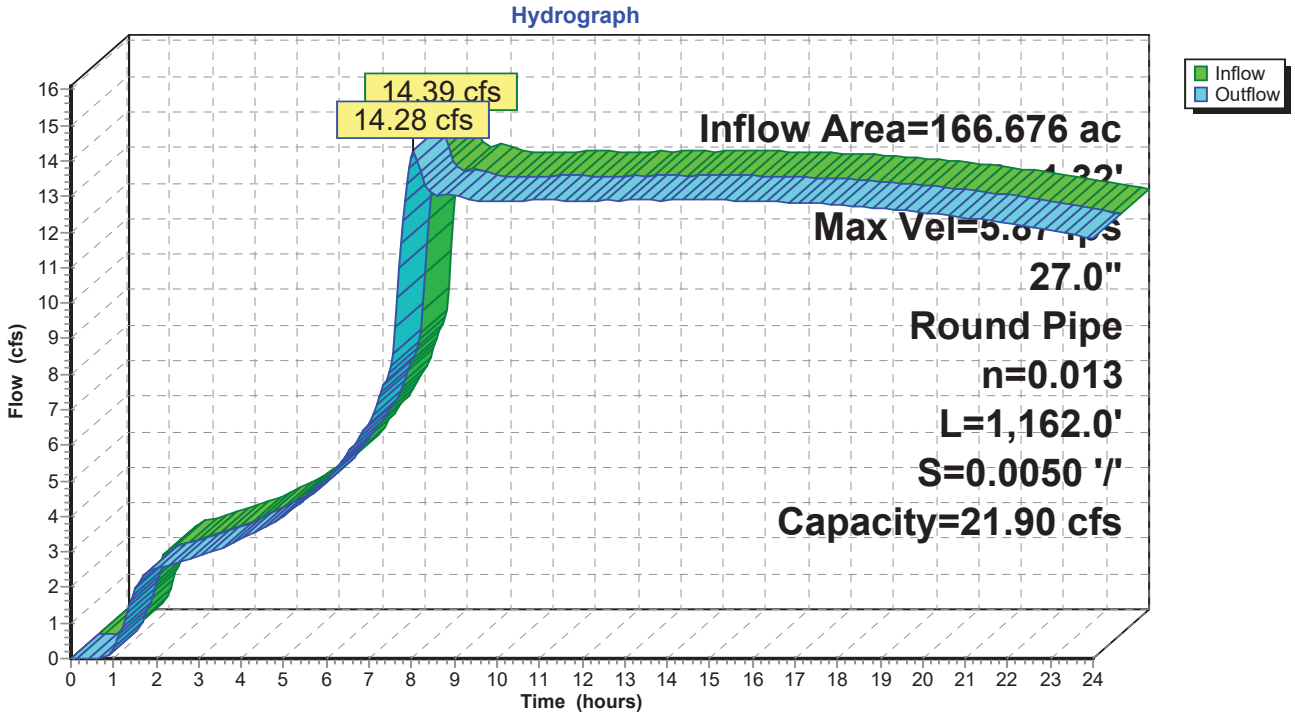
Inflow Area = 166.676 ac, 27.28% Impervious, Inflow Depth > 1.40" for 25-YEAR event
Inflow = 14.39 cfs @ 8.01 hrs, Volume= 19.448 af
Outflow = 14.28 cfs @ 8.05 hrs, Volume= 19.392 af, Atten= 1%, Lag= 2.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.87 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 5.17 fps, Avg. Travel Time= 3.7 min

Peak Storage= 2,827 cf @ 8.05 hrs
Average Depth at Peak Storage= 1.32'
Bank-Full Depth= 2.25' Flow Area= 4.0 sf, Capacity= 21.90 cfs

27.0" Round Pipe
n= 0.013 PVC, smooth interior
Length= 1,162.0' Slope= 0.0050 '/'
Inlet Invert= 169.14', Outlet Invert= 163.33'





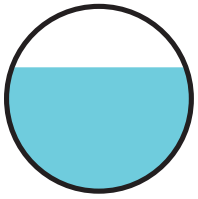
Summary for Reach 5R: 30" PVC

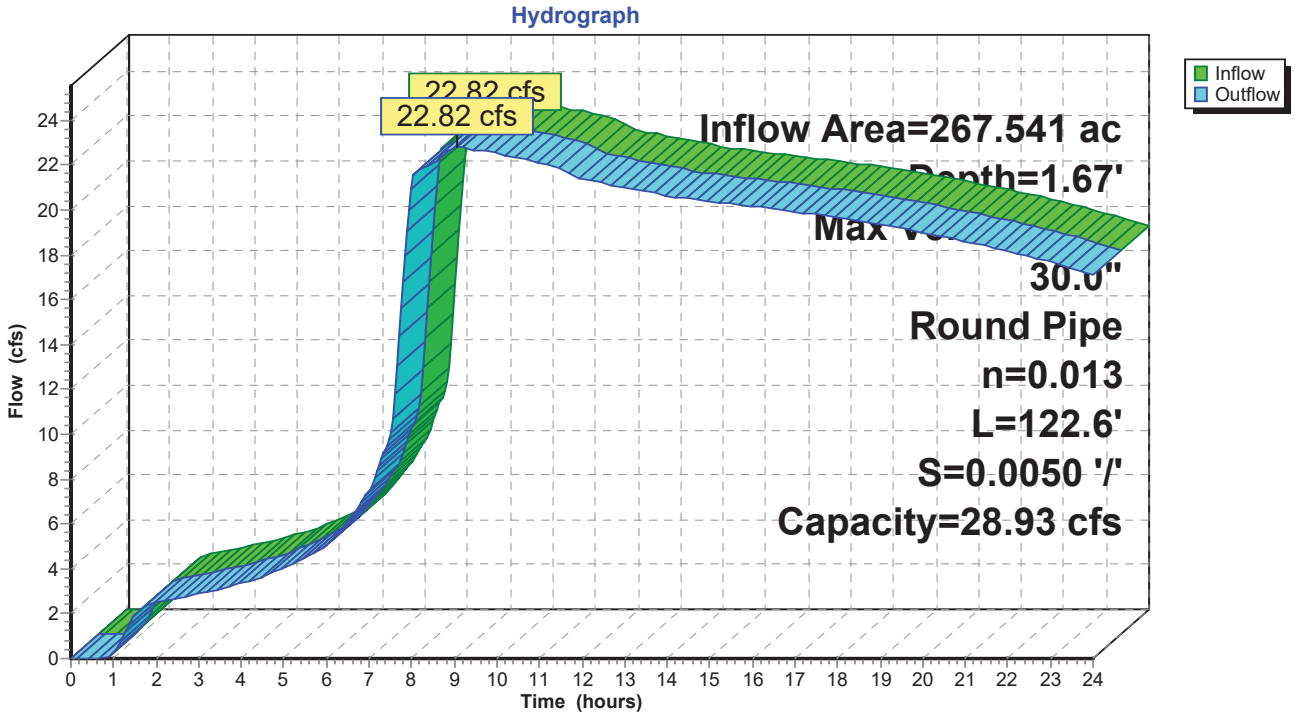
Inflow Area = 267.541 ac, 17.00% Impervious, Inflow Depth > 1.32" for 25-YEAR event
Inflow = 22.82 cfs @ 9.06 hrs, Volume= 29.528 af
Outflow = 22.82 cfs @ 9.07 hrs, Volume= 29.520 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.53 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 5.62 fps, Avg. Travel Time= 0.4 min

Peak Storage= 428 cf @ 9.07 hrs
Average Depth at Peak Storage= 1.67'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 28.93 cfs

30.0" Round Pipe
n= 0.013
Length= 122.6' Slope= 0.0050 '/'
Inlet Invert= 163.33', Outlet Invert= 162.72'





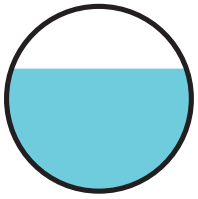
Summary for Reach 6R: 30" PVC

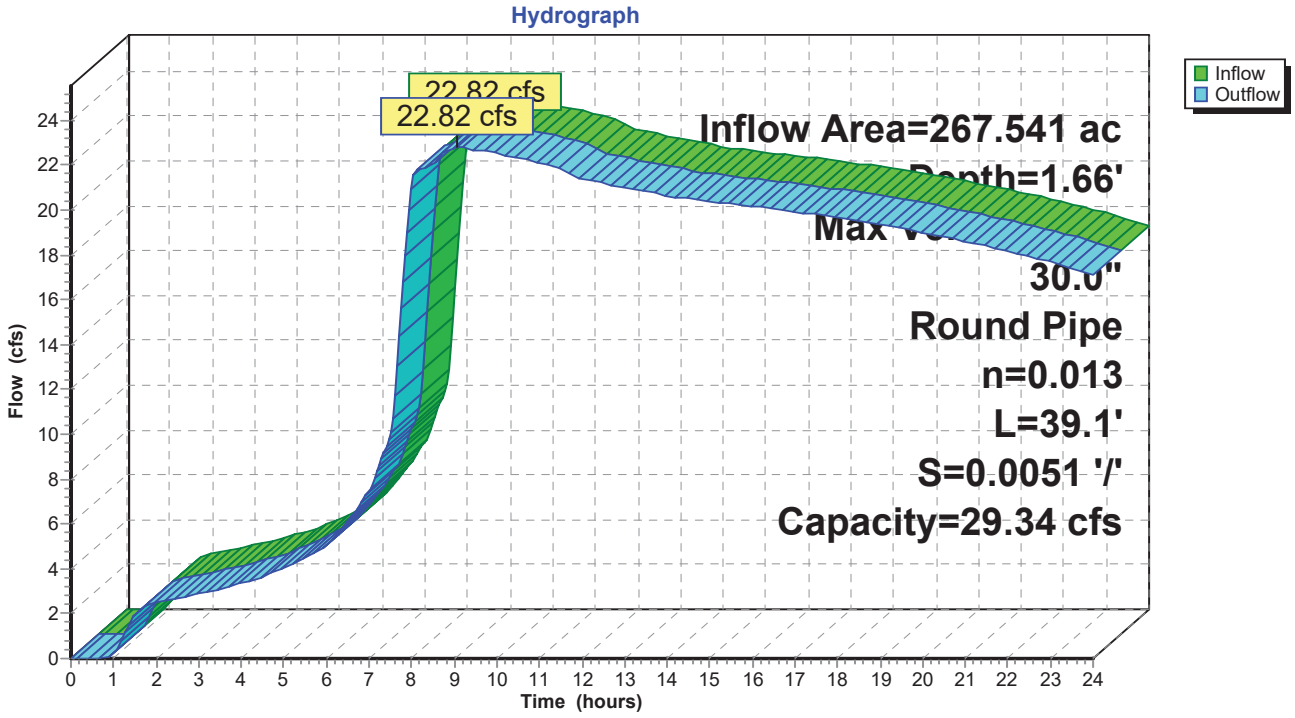
Inflow Area = 267.541 ac, 17.00% Impervious, Inflow Depth > 1.32" for 25-YEAR event
Inflow = 22.82 cfs @ 9.07 hrs, Volume= 29.520 af
Outflow = 22.82 cfs @ 9.07 hrs, Volume= 29.518 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.60 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 5.69 fps, Avg. Travel Time= 0.1 min

Peak Storage= 135 cf @ 9.07 hrs
Average Depth at Peak Storage= 1.66'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 29.34 cfs

30.0" Round Pipe
n= 0.013
Length= 39.1' Slope= 0.0051 '/'
Inlet Invert= 162.72', Outlet Invert= 162.52'





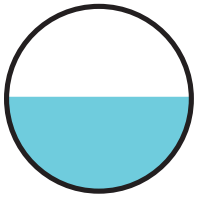
Summary for Reach 8R: 36" PVC

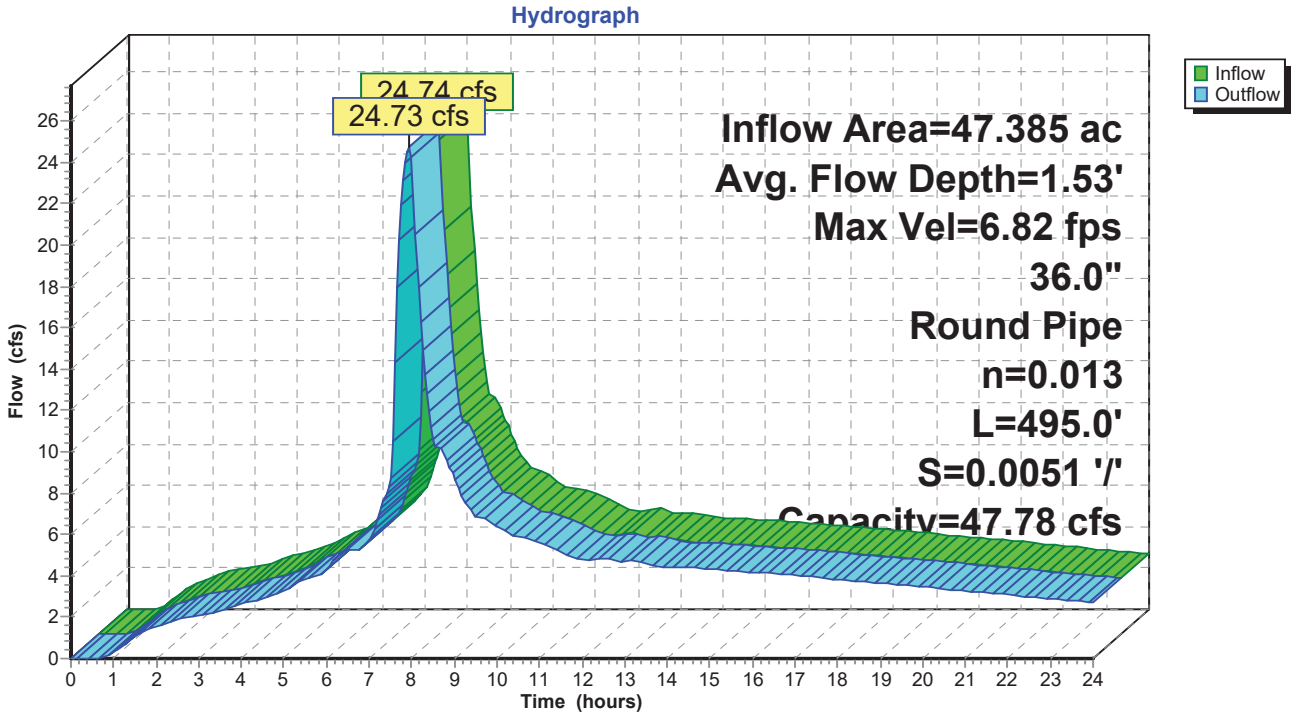
Inflow Area = 47.385 ac, 50.11% Impervious, Inflow Depth > 2.25" for 25-YEAR event
Inflow = 24.74 cfs @ 7.94 hrs, Volume= 8.884 af
Outflow = 24.73 cfs @ 7.96 hrs, Volume= 8.876 af, Atten= 0%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.82 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 4.09 fps, Avg. Travel Time= 2.0 min

Peak Storage= 1,795 cf @ 7.96 hrs
Average Depth at Peak Storage= 1.53'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 47.78 cfs

36.0" Round Pipe
n= 0.013 PVC, smooth interior
Length= 495.0' Slope= 0.0051 '/'
Inlet Invert= 172.10', Outlet Invert= 169.56'





Summary for Pond 1P: Existing Stormwater Facility

Inflow Area = 149.434 ac, 27.72% Impervious, Inflow Depth > 1.77" for 25-YEAR event
Inflow = 51.03 cfs @ 7.98 hrs, Volume= 22.014 af
Outflow = 11.53 cfs @ 16.43 hrs, Volume= 16.957 af, Atten= 77%, Lag= 506.6 min
Primary = 11.53 cfs @ 16.43 hrs, Volume= 16.957 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 174.56' @ 16.43 hrs Surf.Area= 267,156 sf Storage= 262,552 cf
Flood Elev= 174.50' Surf.Area= 258,975 sf Storage= 245,604 cf

Plug-Flow detention time= 263.6 min calculated for 16.922 af (77% of inflow)
Center-of-Mass det. time= 122.3 min (885.0 - 762.7)

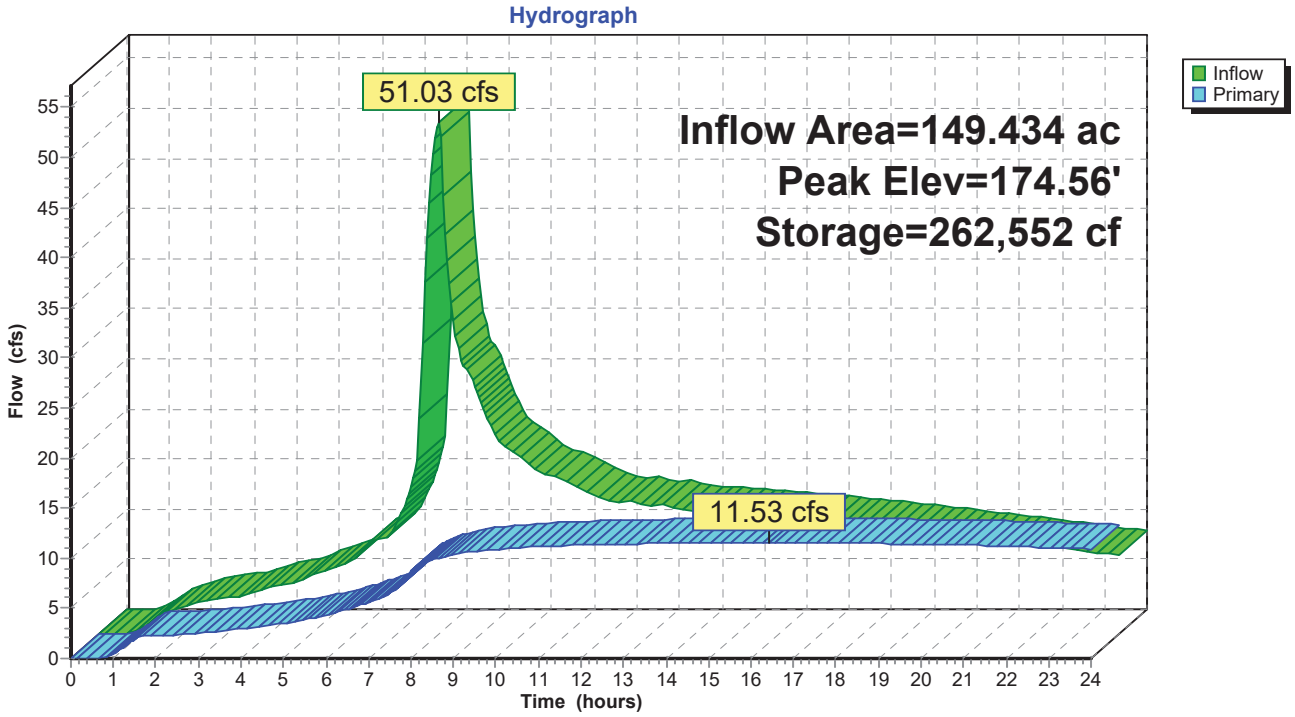
Volume	Invert	Avail.Storage	Storage Description
#1	173.00'	1,197,116 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
173.00	68,497	0	0
175.00	322,467	390,964	390,964
177.00	483,685	806,152	1,197,116

Device	Routing	Invert	Outlet Devices
#1	Primary	172.04'	**90.0 deg x 1.40' rise Sharp-Crested Vee/Trap Weir** Cv= 2.50 (C= 3.13)

Primary OutFlow Max=11.53 cfs @ 16.43 hrs HW=174.56' TW=170.38' (Dynamic Tailwater)
↑—**1=Sharp-Crested Vee/Trap Weir** (Orifice Controls 11.53 cfs @ 5.88 fps)

Pond 1P: Existing Stormwater Facility



Summary for Link 5L: Discharge

Inflow Area = 267.541 ac, 17.00% Impervious, Inflow Depth > 1.32" for 25-YEAR event
Inflow = 22.82 cfs @ 9.07 hrs, Volume= 29.518 af
Primary = 22.82 cfs @ 9.07 hrs, Volume= 29.518 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 5L: Discharge

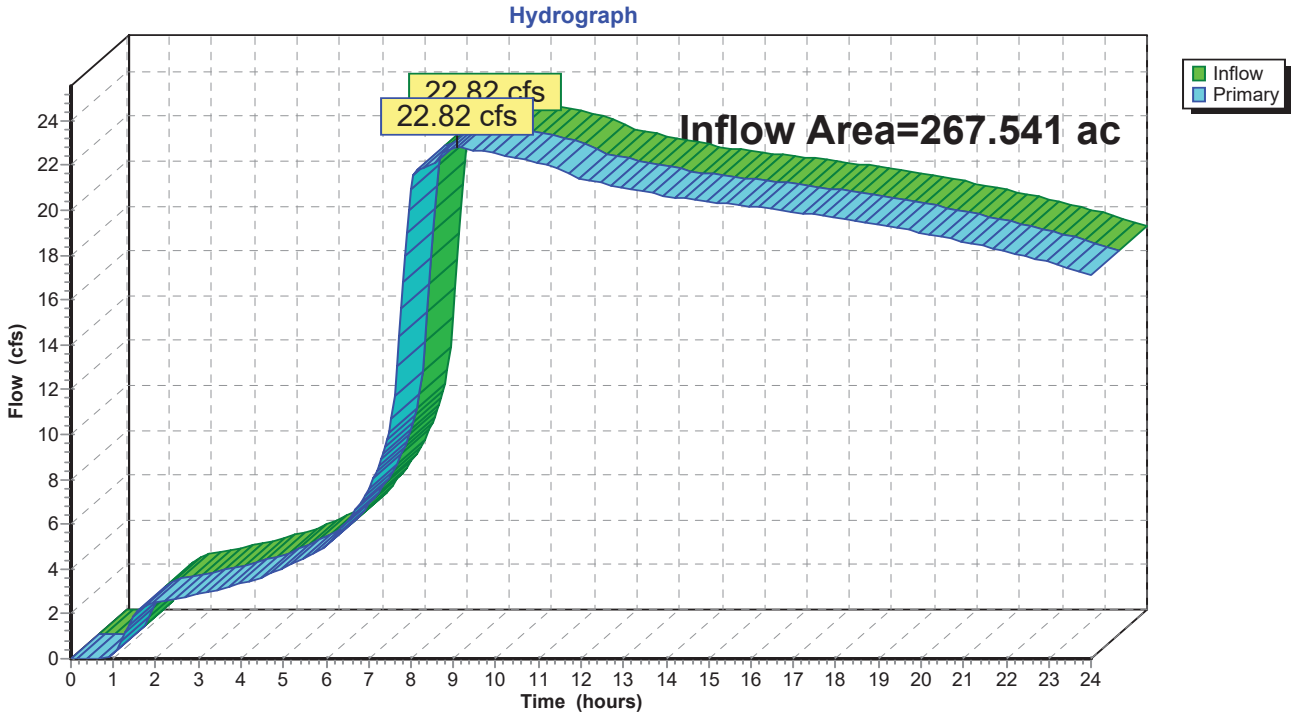


Table 2-2a Runoff curve numbers for urban areas [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type and hydrologic condition	Average percent impervious area [2/]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3/]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4/]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation) [5/]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

1 Average runoff condition, and $I_a = 0.2S$.

2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

3 CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

4 Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

5 Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Table 2-2b Runoff curve numbers for cultivated agricultural lands [1/]

Cover description			Curve numbers for hydrologic soil group			
Cover type	Treatment [2/]	Hydrologic condition [3/]	A	B	C	D
Fallow	Bare soil	—	77	86	91	94
	Crop residue cover (CR)	Poor	76	85	90	93
		Good	74	83	88	90
Row crops	Straight row (SR)	Poor	72	81	88	91
		Good	67	78	85	89
	SR + CR	Poor	71	80	87	90
		Good	64	75	82	85
	Contoured (C)	Poor	70	79	84	88
		Good	65	75	82	86
	C + CR	Poor	69	78	83	87
		Good	64	74	81	85
	Contoured & terraced (C&T)	Poor	66	74	80	82
		Good	62	71	78	81
	C&T+ CR	Poor	65	73	79	81
		Good	61	70	77	80
Small grain	SR	Poor	65	76	84	88
		Good	63	75	83	87
	SR + CR	Poor	64	75	83	86
		Good	60	72	80	84
	C	Poor	63	74	82	85
		Good	61	73	81	84
	C + CR	Poor	62	73	81	84
		Good	60	72	80	83
	C&T	Poor	61	72	79	82
		Good	59	70	78	81
	C&T+ CR	Poor	60	71	78	81
		Good	58	69	77	80
Close-seeded or broadcast legumes or rotation meadow	SR	Poor	66	77	85	89
		Good	58	72	81	85
	C	Poor	64	75	83	85
		Good	55	69	78	83
	C&T	Poor	63	73	80	83
		Good	51	67	76	80

[1] Average runoff condition, and I_a=0.2S

[2] Crop residue cover applies only if residue is on at least 5% of the surface throughout the year.

[3] Hydraulic condition is based on combination factors that affect infiltration and runoff, including (a) density and canopy of vegetative areas, (b) amount of year-round cover, (c) amount of grass or close-seeded legumes, (d) percent of residue cover on the land surface (good ≥ 20%), and (e) degree of surface roughness.

Poor: Factors impair infiltration and tend to increase runoff.

Good: Factors encourage average and better than average infiltration and tend to decrease runoff.

Table 2-2c Runoff curve numbers for other agricultural lands [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition	A	B	C	D
Pasture, grassland, or range—continuous forage for grazing. [2/]	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. [3/]	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30 [4/]	48	65	73
Woods—grass combination (orchard or tree farm). [5/]	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods. [6/]	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 [4/]	55	70	77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

1 Average runoff condition, and $I_a = 0.2S$.

2 *Poor:* <50%) ground cover or heavily grazed with no mulch.
Fair: 50 to 75% ground cover and not heavily grazed.
Good: > 75% ground cover and lightly or only occasionally grazed.

3 *Poor*: <50% ground cover.
Fair: 50 to 75% ground cover.
Good: >75% ground cover.

4 Actual curve number is less than 30; use CN = 30 for runoff computations.

5 CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.

6 *Poor:* Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.
Fair: Woods are grazed but not burned, and some forest litter covers the soil.
Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

Table 2-2d Runoff curve numbers for arid and semiarid rangelands [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition [2/]	A [3/]	B	C	D
Herbaceous—mixture of grass, weeds, and low-growing brush, with brush the minor element.	Poor		80	87	93
	Fair		71	81	89
	Good		62	74	85
Oak-aspen—mountain brush mixture of oak brush, aspen, mountain mahogany, bitter brush, maple, and other brush.	Poor		66	74	79
	Fair		48	57	63
	Good		30	41	48
Pinyon-juniper—pinyon, juniper, or both; grass understory.	Poor		75	85	89
	Fair		58	73	80
	Good		41	61	71
Sagebrush with grass understory.	Poor		67	80	85
	Fair		51	63	70
	Good		35	47	55
Desert shrub—major plants include saltbush, greasewood, creosotebush, blackbrush, bursage, palo verde, mesquite, and cactus.	Poor	63	77	85	88
	Fair	55	72	81	86
	Good	49	68	79	84

1 Average runoff condition, and I_a, = 0.2S. For range in humid regions, use table 2-2c.
2 Poor: <30% ground cover (litter, grass, and brush overstory).
Fair: 30 to 70% ground cover.
Good: > 70% ground cover.
3 Curve numbers for group A have been developed only for desert shrub.

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Marion County Area, Oregon

March 16, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:12,500 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 150 300 600 900

Feet
0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Marion County Area, Oregon
Survey Area Data: Version 16, Sep 10, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 19, 2015—Sep 13, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Am	Amity silt loam	65.8	12.0%
Co	Concord silt loam	38.2	7.0%
Da	Dayton silt loam	34.5	6.3%
PITS	Pits	16.5	3.0%
Wc	Wapato silty clay loam	4.2	0.8%
WuA	Woodburn silt loam, 0 to 3 percent slopes	390.0	71.0%
Totals for Area of Interest		**549.2**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Marion County Area, Oregon

Am—Amity silt loam

Map Unit Setting

National map unit symbol: 24ns
Elevation: 120 to 350 feet
Mean annual precipitation: 40 to 45 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 190 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Amity and similar soils: 85 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Amity

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear, convex
Across-slope shape: Linear
Parent material: Mixed silty alluvium

Typical profile

H1 - 0 to 24 inches: silt loam
H2 - 24 to 37 inches: silty clay loam
H3 - 37 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Forage suitability group: Somewhat Poorly Drained (G002XY005OR)
Hydric soil rating: No

Minor Components

Concord

Percent of map unit: 5 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave

Across-slope shape: Concave
Hydric soil rating: Yes

Co—Concord silt loam

Map Unit Setting

National map unit symbol: 24p2
Elevation: 120 to 350 feet
Mean annual precipitation: 40 to 45 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 190 to 210 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Concord and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Concord

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Mixed mineralogy alluvium

Typical profile

H1 - 0 to 15 inches: silt loam
H2 - 15 to 29 inches: silty clay
H3 - 29 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water storage in profile: High (about 11.4 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Forage suitability group: Poorly Drained (G002XY006OR)
Hydric soil rating: Yes

Minor Components

Dayton

Percent of map unit: 10 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Da—Dayton silt loam

Map Unit Setting

National map unit symbol: 24p4
Elevation: 120 to 350 feet
Mean annual precipitation: 40 to 45 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 190 to 210 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Dayton and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dayton

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Mixed alluvium with some loess in the upper layers

Typical profile

H1 - 0 to 13 inches: silt loam
H2 - 13 to 46 inches: clay
H3 - 46 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 12 to 24 inches to abrupt textural change
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): 4w
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: D
Forage suitability group: Poorly Drained (G002XY006OR)
Hydric soil rating: Yes

Minor Components

Concord

Percent of map unit: 5 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

PITS—Pits

Map Unit Composition

Pits: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pits

Properties and qualities

Slope: 0 to 90 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Wc—Wapato silty clay loam

Map Unit Setting

National map unit symbol: 24rw
Elevation: 100 to 650 feet
Mean annual precipitation: 40 to 45 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 200 to 210 days
Farmland classification: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Wapato and similar soils: 90 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wapato

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Concave, linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Typical profile

H1 - 0 to 16 inches: silty clay loam
H2 - 16 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Available water storage in profile: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Forage suitability group: Poorly Drained (G002XY006OR)
Hydric soil rating: Yes

WuA—Woodburn silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 24s3
Elevation: 150 to 350 feet
Mean annual precipitation: 40 to 45 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 200 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Woodburn and similar soils: 85 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodburn

Setting

Landform: Terraces
Landform position (three-dimensional): Tread

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty alluvium and mixed mineralogy loess

Typical profile

H1 - 0 to 17 inches: silt loam
H2 - 17 to 32 inches: silty clay loam
H3 - 32 to 68 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 25 to 32 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Forage suitability group: Moderately Well Drained < 15% Slopes (G002XY004OR)
Hydric soil rating: No

Minor Components

Aquolls, somewhat poorly drained

Percent of map unit: 1 percent
Landform: Terraces
Hydric soil rating: Yes

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Exhibit I: Preliminary Traffic Impact Study

lancaster mobley

321 SW 4th Ave., Suite 400
Portland, OR 97204
503.248.0313
lancastermobley.com

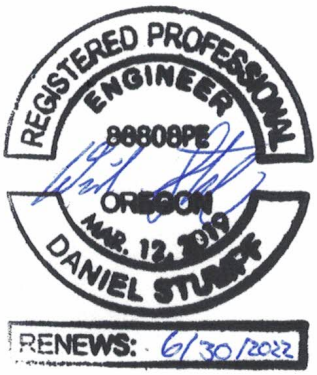
Memorandum

To: **GK Machine**

From: **Daniel Stumpf, PE**

Date: **May 28, 2020**

Subject: **Harvest Gardens Subdivision**
Transportation Impact Study Addendum



Introduction

This memorandum is written as an addendum to the original *Harvest Gardens Subdivision Transportation Impact Study* (TIS), dated March 11th, 2020. City of Donald and Marion County staff have requested additional left-turn lane warrant analyses at the intersection of Huckleberry Lane NE at Donald Road NE as well as the proposed "Street 4" intersection along Donald Road NE. Additionally, an evaluation of access spacing between the proposed "Street 2" and Huckleberry Lane NE intersections along Donald Road NE was requested. Accordingly, this addendum evaluates these two items for future year 2029 buildout conditions.

Left-Turn Lane Warrants

The original TIS analyzed the impacts of the proposed development, assuming two access intersections along Donald Road NE rather than three access intersections (i.e. the intersections of "Street 1", "Street 2", and "Street 4" along Donald Road NE). Therefore, in order to evaluate left-turn lane warrants at the requested intersections, trips distribution and assignment at the site access intersections as well as at the Huckleberry Lane NE intersection was re-evaluated.

To evaluate left-turn lane warrants under year 2029 buildout conditions, an estimate of future traffic volumes assuming full buildout of the site is necessary. Utilizing similar methodologies for volume growth and trip generation/distribution as detailed in the TIS, traffic counts at the intersection of Huckleberry Lane NE at Donald Road NE (collected on Thursday, February 15th, 2018, from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM) were projected to year 2029 buildout conditions. The distribution of trips along access roadways will vary slightly compared to the distribution presented in the TIS since the number of accesses analyzed along Donald Road NE has changed. Therefore, the following distribution of trips was utilized:

- Approximately 49 percent of site trips will utilize "Street 1" to access the site;
- Approximately 49 percent of site trips will utilize "Street 2" to access the site; and
- Approximately 2 percent of site trips will utilize "Street 4" to access the site.

It should be noted that this change in trip assignment will only impact the study intersections along the site frontage with Donald Road NE. Additionally, since the number of access intersections is increasing, fewer site trips will impact either the "Street 1" or "Street 2" intersections than were previously studied in the TIS. Therefore, the level of service (LOS) and capacity analysis presented in the TIS will provide a more conservative assessment of trip impacts and operation at the "Street 1" and "Street 2" access intersections. Since the "Street 4" access intersection will serve significantly fewer trips than the other two access intersections, it is expected that the "Street 4" intersection will operate with lower delays and congestion compared to the other two access intersections. Accordingly, no further operational analysis of these intersections is necessary.

Figures presenting the existing, background, and buildout volumes at the access intersections and Huckleberry Lane intersection during the morning and evening peak hours are included as an attachment to this addendum.

Left-turn lane warrants were re-evaluated for the site access intersections and the Huckleberry Lane NE intersection along Donald Road NE. A left-turn refuge is primarily a safety consideration for the major street, removing left-turning vehicles from the through traffic stream. The warrants used were developed from the *National Cooperative Highway Research Project's* (NCHRP) *Report 457*. These warrants are evaluated based on the number of left-turning vehicles, the number of advancing and opposing vehicles, the number of lanes, and the roadway travel speed.

Based on the updated analysis, left-turn lane warrants are not projected to be met at any of the aforementioned study intersections under any of the analysis scenarios. Accordingly, no new turn lanes are necessary or recommended.

Functional Classification

Marion County's Rural Transportation System Plan (TSP) classifies Donald Road as a Minor Collector along its entire length, including though the City of Donald. A Minor Collector is described in Table 5-1 of the County TSP as follows[1]:

- *Spaced at intervals to collect traffic from local roads and bring all developed areas within a reasonable distance of a collector road; and*
- *Provide service to any remaining smaller communities and traffic generators; and*
- *Link locally important traffic generators with their local constituents.*

This is certainly consistent with the function of Donald Road, which provides service to smaller communities and provides a link to local traffic generators such as the North Marion schools to the east, and higher-classification roads such as Ehlen Road/Yergen Road to the west.

Table 5-1 describes higher classification roadways such as Major Collectors and Arterials as serving larger towns, being higher importance intra-county corridors, or in the case of Arterials, linking cities, larger towns, and providing interstate and inter-county service. Nearly all the Arterials in the TSP are state highways.

[1] *Marion County Rural Transportation System Plan*, Rural Road Functional Classification Characteristics, Table 5-1 on page 5-2

City of Donald Classification

Similarly, the text of the Donald Comprehensive Plan describes Donald Road as a Collector, although the figure titled "Transportation Plan" labels Donald Road as an Arterial. There is other language in the Comprehensive Plan that co-mingles the labels of Arterial and Collector. However, it is important to note the context of the discussion. The City has essentially two types of roadways, which are listed as Arterials and Residential Streets. Because Donald Road serves a higher function than a local neighborhood streets, it is labelled with the higher classification. The important distinction is that this does not imply that it functions as an Arterial in the same context as a facility that Marion County considers an Arterial. It is simply a higher functional classification than a local Residential Street.

Traffic Volumes and Actual Operation

The TIS and this addendum show that the traffic volumes on Donald Road along the site frontage will be less than 4,000 vehicles per day and the current average daily traffic (ADT) is significantly lower. These volumes are well within what a Collector roadway is intended to serve, particularly within a more definitive classification system such as that used by Marion County.

Traffic volumes in this range are certainly higher than what a local Residential Street as considered by the City's Comprehensive Plan is intended to carry, so the City's higher classification is appropriate, but it is important not to equate Donald Road with what the County would consider an Arterial. The amount of traffic on Donald Road illustrates this disparity and reinforces the most appropriate classification as a Minor Collector.

Access Spacing

Regarding access spacing between the "Street 2" intersection and the Huckleberry Lane NE intersection, the proposed access will be located 100.5 feet east of Huckleberry Lane NE, measured centerline to centerline. Access spacing standards are commonly tied to functional classification. The City of Donald does not have a spacing standard, but Marion County, who is expected to retain jurisdiction of the street, has spacing standards in Table 10-2 of the TSP. The spacing standard between intersections along a Minor Collectors, including private accesses, is 100 feet. As such, the spacing standard is satisfied.

Again, it is *not* recommended that Donald Road be considered an Arterial and then evaluated against County standards for an Arterial roadway. The appropriate functional classification for Donald Road is a Minor Collector, consistent with the designation applied by Marion County.

Block Length Standard

According to the City of Donald's development code, section *2.307.04 Additional Design Standards for Subdivisions*:

> *Standards for Blocks. Blocks should not exceed 600 feet in length between street lines, except blocks adjacent to arterial streets, or unless the previous adjacent development pattern or topographical conditions justify a variation. The recommended minimum distance between intersections on arterial streets is 1,800 feet.*

These block length standards require a maximum block length of 600 feet, unless on an Arterial whereby a block length of 1,800 feet is recommended. The City code does not say the 1,800-foot block length standard shall be required, whereby the construction of "Street 2" at its planned location is acceptable if demonstrated to operate safely and efficiently.

Left Turn Queuing & Operation Along Donald Road

From an operation and safety standpoint, both "Street 2" and Huckleberry Lane NE are located in a manner where major-street left-turning vehicles will not conflict with each other nor will potential queues associated with these left turns extend toward each other (i.e. no "left-turn binding" will occur along Donald Road NE due to concurrent major-street left-turning vehicles). To further demonstrate these left-turn vehicle queues will not impede other turning movements at these or any of the other site access intersections, a queuing analysis was performed for the three access intersections and the Huckleberry Lane NE intersection along Donald Road NE. The queue lengths were projected based on the results of a Synchro/SimTraffic analysis, with the reported values based on the 95th percentile queue length. The 95th percentile queue is a statistical measurement which indicates there is a 5 percent chance that the queue may exceed this length during the analysis period; however, given this is a probability, the 95th percentile queue length may theoretically never be met or observed in the field.

Based on the queuing analysis, none of the projected 95th percentile major-street left-turn queues are expected to extend back to or impede turning movements at adjacent intersections along Donald Road NE. Accordingly, the two offset intersections are expected to operate safely and efficiently with regard to intersection spacing.

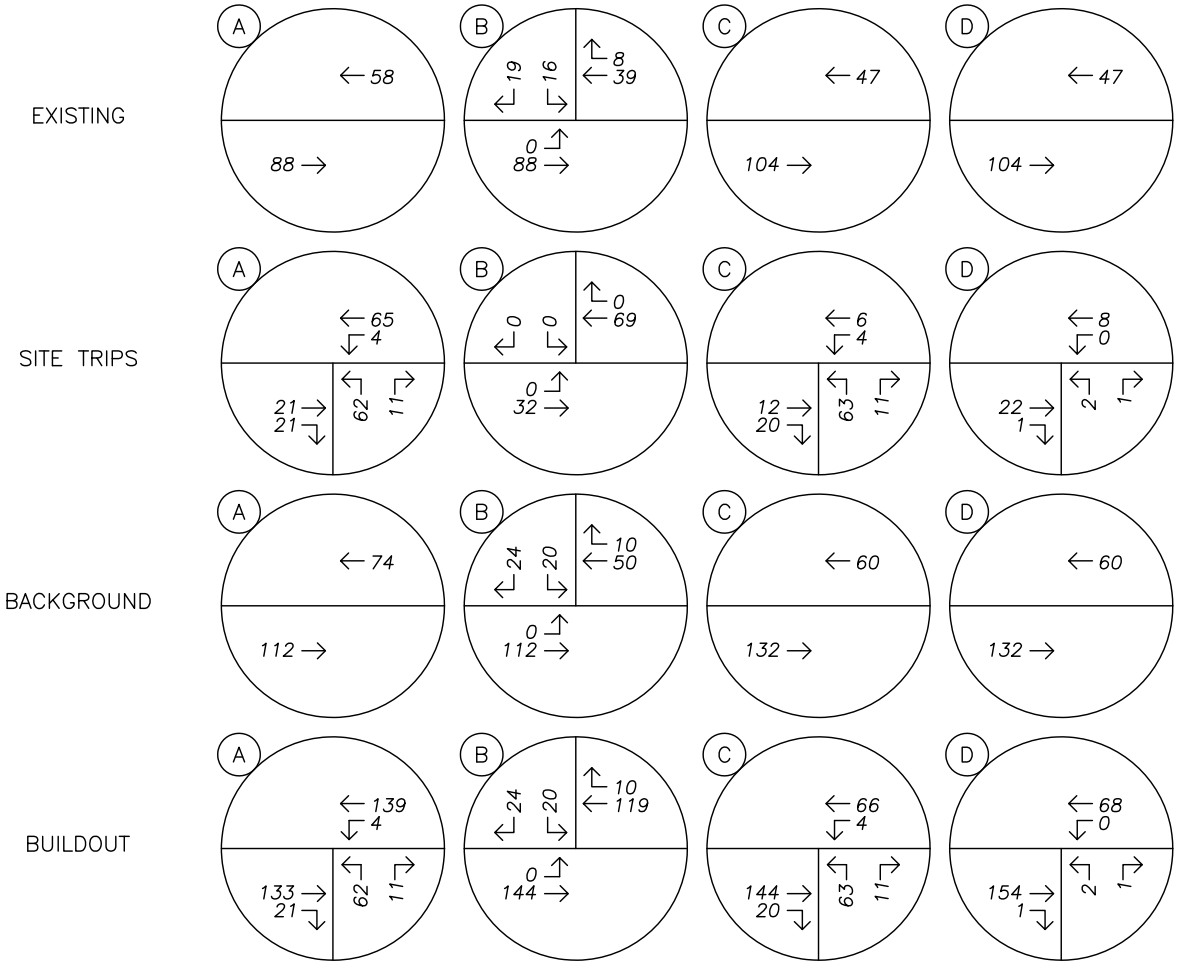
The major-street left-turn movements and projected 95th percentile queue lengths are presented visually in Figure C, which is included as an attachment to this memorandum. Detailed queuing analysis worksheets are also included within the attachments.

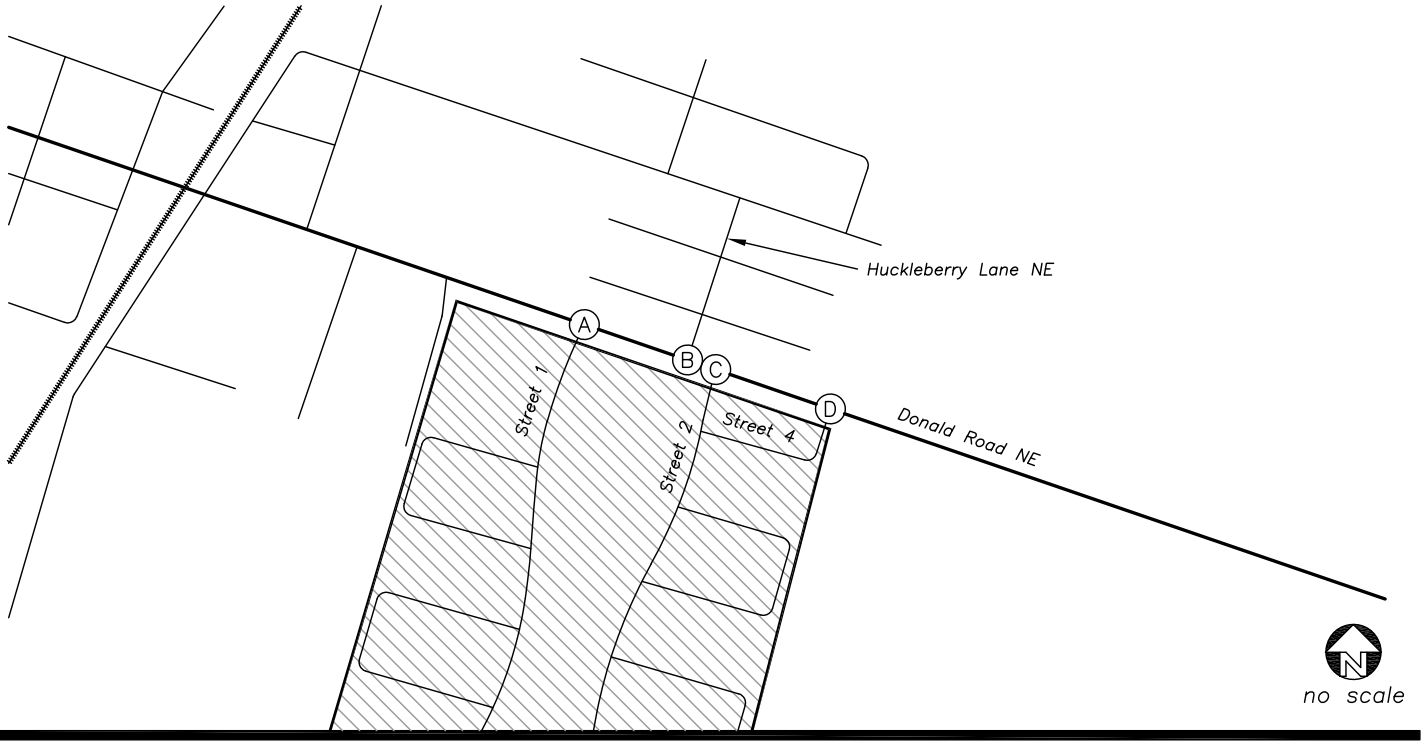
Conclusions

As demonstrated in this addendum, the following findings are made:

1. Left-turn lane warrants are not projected to be met at any of the access intersections along Donald Road nor at the intersection of Huckleberry Lane at Donald Road under any of the analysis scenarios. Accordingly, no new turn lanes are necessary or recommended.
2. Considering the guidance and standards from the City and the County, as well as the traffic volumes on the roadway, the appropriate functional classification for Donald Road is a Minor Collector, consistent with the designation applied by Marion County.
3. Based on this functional classification, access spacing standards along Donald Road are satisfied.
4. Regardless of the functional classification and access spacing standard applied to the roadway, the operation of left turns into and out of existing and proposed intersections along the site frontage on Donald Road are expected to operate safely and efficiently.

If you have any questions regarding the preparation of this scoping memorandum, please don't hesitate to contact us.



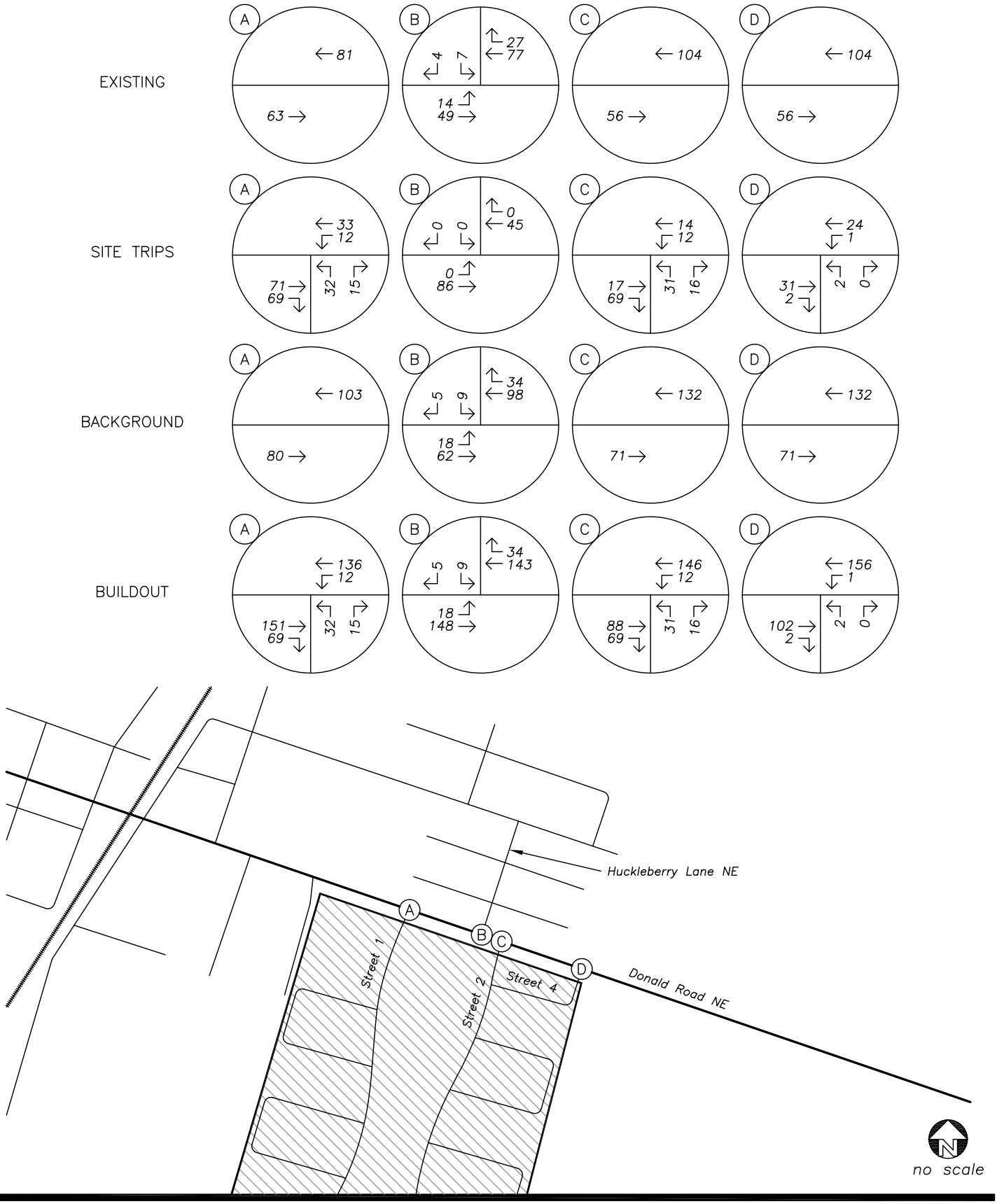


lancaster mobley

TRAFFIC VOLUMES

Existing, 2029 Background, and 2029 Buildout Conditions
AM Peak Hour

Figure A



lancaster mobley

TRAFFIC VOLUMES

Existing, 2029 Background, and 2029 Buildout Conditions
PM Peak Hour

Figure B

17 FT (PM Peak Hour)

18 FT (PM Peak Hour)

17 FT (PM Peak Hour)

4 FT (PM Peak Hour)

Google Earth

200 ft

N

TURNING DIAGRAM & LEFT-TURN QUEUE LENGTHS

95th Percentile Queue Length

AM and PM Peak Hours - Longest Peak Hour Queue Depicted

Harvest Gardens Subdivision

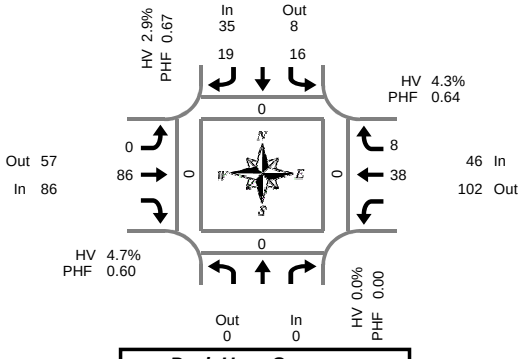
5/18/2020

Figure C

lancaster mobley

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Huckleberry Ln NE & Donald Rd NE

Thursday, February 15, 2018
7:00 AM to 9:00 AM

Peak Hour Summary
7:10 AM to 8:10 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total	Pedestrians Crosswalk			
				Bikes	L		R	Bikes	L	T		Bikes		T	R	Bikes		North	South	East	West
7:00 AM				0	2		1	0	0	4		0		1	1	0	9	0	0	0	0
7:05 AM				0	2		0	0	0	4		0		0	0	0	6	0	0	0	0
7:10 AM				0	1		4	0	0	6		0		3	0	0	14	0	0	0	0
7:15 AM				0	1		2	0	0	2		0		0	0	0	5	0	0	0	0
7:20 AM				0	2		2	0	0	5		0		4	0	0	13	0	0	0	0
7:25 AM				0	0		2	0	0	5		0		4	0	0	11	0	0	0	0
7:30 AM				0	1		2	0	0	6		0		5	0	0	14	0	0	0	0
7:35 AM				0	2		2	0	0	9		0		5	0	0	18	0	0	0	0
7:40 AM				0	1		2	0	0	10		0		0	1	0	14	0	0	0	0
7:45 AM				0	5		1	0	0	12		0		2	2	0	22	0	0	0	0
7:50 AM				0	1		0	0	0	14		0		2	0	0	17	0	0	0	0
7:55 AM				0	1		1	0	0	8		0		6	2	0	18	0	0	0	0
8:00 AM				0	0		0	0	0	3		0		5	0	0	8	0	0	0	0
8:05 AM				0	1		1	0	0	6		0		2	3	0	13	0	0	0	0
8:10 AM				0	0		0	0	0	1		0		4	1	0	6	0	0	0	0
8:15 AM				0	0		1	0	0	1		0		1	0	0	3	0	0	0	0
8:20 AM				0	0		0	0	0	2		0		3	1	0	6	0	0	0	0
8:25 AM				0	2		0	0	0	5		0		2	0	0	9	0	0	0	0
8:30 AM				0	1		1	0	0	2		0		2	0	0	6	0	0	0	0
8:35 AM				0	2		2	0	0	4		0		1	0	0	9	0	0	0	0
8:40 AM				0	1		3	0	0	4		0		2	2	0	12	0	0	0	0
8:45 AM				0	1		0	0	0	5		0		2	1	0	9	0	0	0	0
8:50 AM				0	0		2	0	0	6		0		2	1	0	11	0	0	0	0
8:55 AM				0	3		0	0	0	1		0		2	1	0	7	0	0	0	0
Total Survey				0	30		29	0	0	125		0		60	16	0	260	0	0	0	0

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total	Pedestrians Crosswalk			
				Bikes	L		R	Bikes	L	T		Bikes		T	R	Bikes		North	South	East	West
7:00 AM				0	5		5	0	0	14		0		4	1	0	29	0	0	0	0
7:15 AM				0	3		6	0	0	12		0		8	0	0	29	0	0	0	0
7:30 AM				0	4		6	0	0	25		0		10	1	0	46	0	0	0	0
7:45 AM				0	7		2	0	0	34		0		10	4	0	57	0	0	0	0
8:00 AM				0	1		1	0	0	10		0		11	4	0	27	0	0	0	0
8:15 AM				0	2		1	0	0	8		0		6	1	0	18	0	0	0	0
8:30 AM				0	4		6	0	0	10		0		5	2	0	27	0	0	0	0
8:45 AM				0	4		2	0	0	12		0		6	3	0	27	0	0	0	0
Total Survey				0	30		29	0	0	125		0		60	16	0	260	0	0	0	0

Peak Hour Summary
7:10 AM to 8:10 AM

By Approach	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	0	0	0	0	35	8	43	0	86	57	143	0	46	102	148	0	167	0	0	0	0
%HV	0.0%				2.9%				4.7%				4.3%				4.2%				
PHF	0.00				0.67				0.60				0.64				0.73				

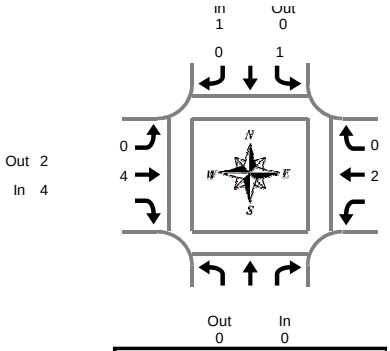
By Movement	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Total
				Total	L		R	Total	L	T		Total		T	R	Total	
Volume				0	16		19	35	0	86		86		38	8	46	167
%HV	NA	NA	NA	0.0%	6.3%	NA	0.0%	2.9%	0.0%	4.7%	NA	4.7%	NA	5.3%	0.0%	4.3%	4.2%
PHF				0.00	0.50		0.59	0.67	0.00	0.60		0.60		0.68	0.40	0.64	0.73

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total	Pedestrians Crosswalk			
				Bikes	L		R	Bikes	L	T		Bikes		T	R	Bikes		North	South	East	West
7:00 AM				0	19		19	0	0	85		0		32	6	0	161	0	0	0	0
7:15 AM				0	15		15	0	0	81		0		39	9	0	159	0	0	0	0
7:30 AM				0	14		10	0	0	77		0		37	10	0	148	0	0	0	0
7:45 AM				0	14		10	0	0	62		0		32	11	0	129	0	0	0	0
8:00 AM				0	11		10	0	0	40		0		28	10	0	99	0	0	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Huckleberry Ln NE & Donald Rd NE

Thursday, February 15, 2018
7:00 AM to 9:00 AM

Peak Hour Summary
7:10 AM to 8:10 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
7:00 AM				0	0		0	0	0	0		0		0	0	0	0
7:05 AM				0	0		0	0	0	0		0		0	0	0	0
7:10 AM				0	0		0	0	0	0		0		0	0	0	0
7:15 AM				0	0		0	0	0	0		0		0	0	0	0
7:20 AM				0	0		0	0	0	0		0		0	0	0	0
7:25 AM				0	0		0	0	0	0		0		0	0	0	0
7:30 AM				0	1		0	1	0	2		2		0	0	0	3
7:35 AM				0	0		0	0	0	0		0		1	0	1	1
7:40 AM				0	0		0	0	0	1		1		0	0	0	1
7:45 AM				0	0		0	0	0	0		0		1	0	1	1
7:50 AM				0	0		0	0	0	0		0		0	0	0	0
7:55 AM				0	0		0	0	0	0		0		0	0	0	0
8:00 AM				0	0		0	0	0	0		0		0	0	0	0
8:05 AM				0	0		0	0	0	1		1		0	0	0	1
8:10 AM				0	0		0	0	0	0		0		0	0	0	0
8:15 AM				0	0		0	0	0	1		1		0	0	0	1
8:20 AM				0	0		0	0	0	0		0		0	0	0	0
8:25 AM				0	1		0	1	0	0		0		0	0	0	1
8:30 AM				0	0		0	0	0	1		1		0	0	0	1
8:35 AM				0	1		0	1	0	2		2		0	0	0	3
8:40 AM				0	0		0	0	0	0		0		0	0	0	0
8:45 AM				0	0		0	0	0	0		0		0	0	0	0
8:50 AM				0	0		0	0	0	0		0		0	0	0	0
8:55 AM				0	0		0	0	0	0		0		0	0	0	0
Total Survey				0	3		0	3	0	8		8		2	0	2	13

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
7:00 AM				0	0		0	0	0	0		0		0	0	0	0
7:15 AM				0	0		0	0	0	0		0		0	0	0	0
7:30 AM				0	1		0	1	0	3		3		1	0	1	5
7:45 AM				0	0		0	0	0	0		0		1	0	1	1
8:00 AM				0	0		0	0	0	1		1		0	0	0	1
8:15 AM				0	1		0	1	0	1		1		0	0	0	2
8:30 AM				0	1		0	1	0	3		3		0	0	0	4
8:45 AM				0	0		0	0	0	0		0		0	0	0	0
Total Survey				0	3		0	3	0	8		8		2	0	2	13

Heavy Vehicle Peak Hour Summary
7:10 AM to 8:10 AM

By Approach	Northbound Huckleberry Ln NE			Southbound Huckleberry Ln NE			Eastbound Donald Rd NE			Westbound Donald Rd NE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	1	0	1	4	2	6	2	5	7	7
PHF	0.00			0.25			0.33			0.25			0.35

By Movement	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Total
				Total	L		R	Total	L	T		Total		T	R	Total	
Volume				0	1		0	1	0	4		4		2	0	2	7
PHF				0.00	0.25		0.00	0.25	0.00	0.33		0.33		0.25	0.00	0.25	0.35

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

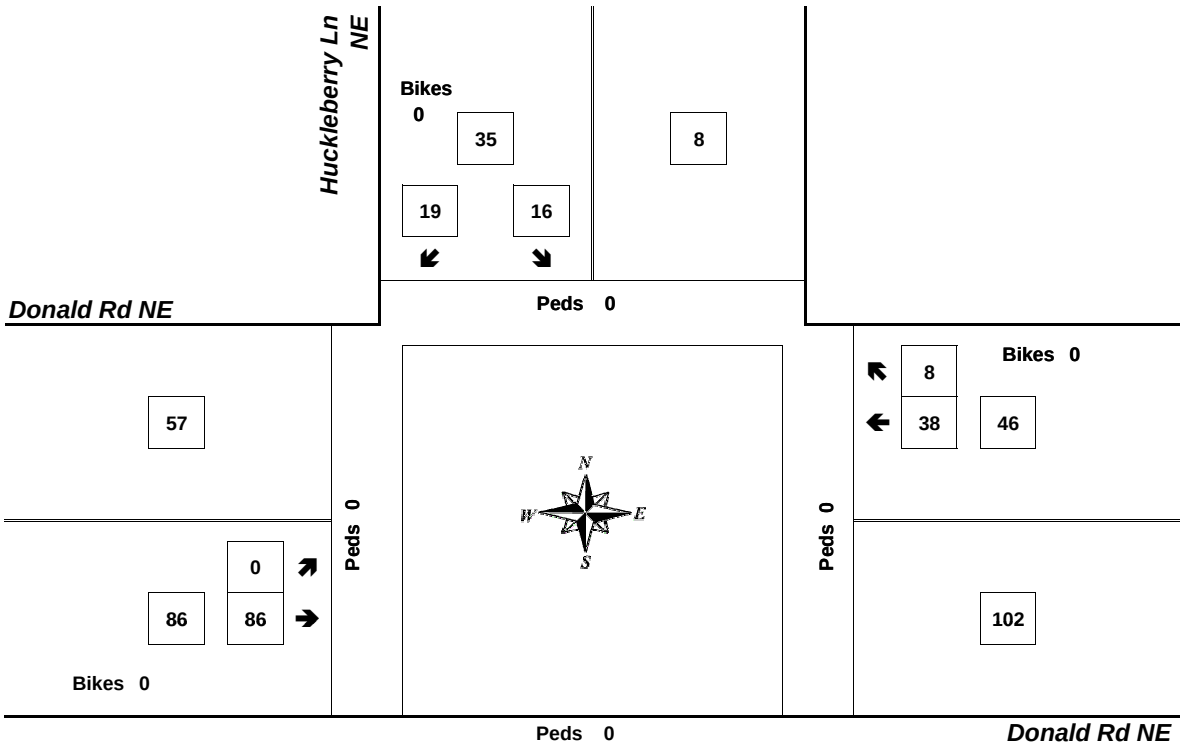
Interval Start Time	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
7:00 AM				0	1		0	1	0	3		3		2	0	2	6
7:15 AM				0	1		0	1	0	4		4		2	0	2	7
7:30 AM				0	2		0	2	0	5		5		2	0	2	9
7:45 AM				0	2		0	2	0	5		5		1	0	1	8
8:00 AM				0	2		0	2	0	5		5		0	0	0	7

Peak Hour Summary

Clay Carney
(503) 833-2740

Huckleberry Ln NE & Donald Rd NE

7:10 AM to 8:10 AM
Thursday, February 15, 2018

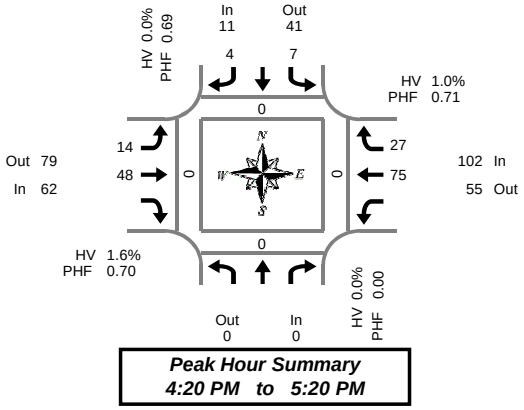


Approach	PHF	HV%	Volume
EB	0.60	4.7%	86
WB	0.64	4.3%	46
NB	0.00	0.0%	0
SB	0.67	2.9%	35
Intersection	0.73	4.2%	167

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:20 PM to 5:20 PM

Huckleberry Ln NE & Donald Rd NE

Thursday, February 15, 2018
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total	Pedestrians Crosswalk			
				Bikes	L		R	Bikes	L	T		Bikes		T	R	Bikes		North	South	East	West
4:00 PM				0	0		0	0	1	2		0		6	2	0	11	0	0	0	0
4:05 PM				0	1		1	0	0	5		0		7	0	0	14	0	0	0	0
4:10 PM				0	0		1	0	2	4		0		4	0	0	11	0	0	0	0
4:15 PM				0	0		0	0	0	5		0		2	1	0	8	0	0	0	0
4:20 PM				0	1		1	0	0	4		0		10	2	0	18	0	0	0	0
4:25 PM				0	0		0	0	0	7		0		11	3	0	21	0	0	0	0
4:30 PM				0	0		0	0	1	5		0		7	3	0	16	0	0	0	0
4:35 PM				0	0		0	0	2	7		0		7	3	0	19	0	0	0	0
4:40 PM				0	2		0	0	2	4		0		3	2	0	13	0	0	0	0
4:45 PM				0	0		1	0	0	2		0		4	1	0	8	0	0	0	0
4:50 PM				0	0		1	0	2	4		0		5	1	0	13	0	0	0	0
4:55 PM				0	0		1	0	0	2		0		4	5	0	12	0	0	0	0
5:00 PM				0	1		0	0	1	3		0		8	3	0	16	0	0	0	0
5:05 PM				0	0		0	0	2	3		0		6	1	0	12	0	0	0	0
5:10 PM				0	1		0	0	1	4		0		4	2	0	12	0	0	0	0
5:15 PM				0	2		0	0	3	3		0		6	1	0	15	0	0	0	0
5:20 PM				0	0		0	0	0	3		0		3	2	0	8	0	0	0	0
5:25 PM				0	0		0	0	1	5		0		3	0	0	9	0	0	0	0
5:30 PM				0	1		0	0	1	6		0		4	1	0	13	0	0	0	0
5:35 PM				0	0		0	0	0	2		0		4	2	0	8	0	0	0	0
5:40 PM				0	1		0	0	3	4		0		5	2	0	15	0	0	0	0
5:45 PM				0	1		0	0	2	11		0		0	1	0	15	0	0	0	0
5:50 PM				0	1		0	0	1	1		0		2	0	0	5	0	0	0	0
5:55 PM				0	0		0	0	3	1		0		4	3	0	11	0	0	0	0
Total Survey				0	12		6	0	28	97		0		119	41	0	303	0	0	0	0

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total	Pedestrians Crosswalk			
				Bikes	L		R	Bikes	L	T		Bikes		T	R	Bikes		North	South	East	West
4:00 PM				0	1		2	0	3	11		0		17	2	0	36	0	0	0	0
4:15 PM				0	1		1	0	0	16		0		23	6	0	47	0	0	0	0
4:30 PM				0	2		0	0	5	16		0		17	8	0	48	0	0	0	0
4:45 PM				0	0		3	0	2	8		0		13	7	0	33	0	0	0	0
5:00 PM				0	2		0	0	4	10		0		18	6	0	40	0	0	0	0
5:15 PM				0	2		0	0	4	11		0		12	3	0	32	0	0	0	0
5:30 PM				0	2		0	0	4	12		0		13	5	0	36	0	0	0	0
5:45 PM				0	2		0	0	6	13		0		6	4	0	31	0	0	0	0
Total Survey				0	12		6	0	28	97		0		119	41	0	303	0	0	0	0

Peak Hour Summary
4:20 PM to 5:20 PM

By Approach	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	0	0	0	0	11	41	52	0	62	79	141	0	102	55	157	0	175	0	0	0	0
%HV	0.0%				0.0%				1.6%				1.0%				1.1%				
PHF	0.00				0.69				0.70				0.71				0.78				

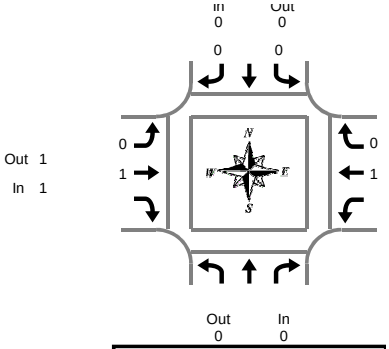
By Movement	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Total
				Total	L		R	Total	L	T		Total		T	R	Total	
Volume				0	7		4	11	14	48		62		75	27	102	175
%HV	NA	NA	NA	0.0%	0.0%	NA	0.0%	0.0%	0.0%	2.1%	NA	1.6%	NA	1.3%	0.0%	1.0%	1.1%
PHF				0.00	0.58		0.33	0.69	0.58	0.63		0.70		0.67	0.75	0.71	0.78

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total	Pedestrians Crosswalk			
				Bikes	L		R	Bikes	L	T		Bikes		T	R	Bikes		North	South	East	West
4:00 PM				0	4		6	0	10	51		0		70	23	0	164	0	0	0	0
4:15 PM				0	5		4	0	11	50		0		71	27	0	168	0	0	0	0
4:30 PM				0	6		3	0	15	45		0		60	24	0	153	0	0	0	0
4:45 PM				0	6		3	0	14	41		0		56	21	0	141	0	0	0	0
5:00 PM				0	8		0	0	18	46		0		49	18	0	139	0	0	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Huckleberry Ln NE & Donald Rd NE

Thursday, February 15, 2018
4:00 PM to 6:00 PM

Peak Hour Summary
4:20 PM to 5:20 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
4:00 PM				0	0		0	0	0	0		0		1	0	1	1
4:05 PM				0	0		0	0	0	2		2		1	0	1	3
4:10 PM				0	0		0	0	0	0		0		0	0	0	0
4:15 PM				0	0		0	0	0	0		0		0	0	0	0
4:20 PM				0	0		0	0	0	0		0		0	0	0	0
4:25 PM				0	0		0	0	0	0		0		0	0	0	0
4:30 PM				0	0		0	0	0	0		0		0	0	0	0
4:35 PM				0	0		0	0	0	0		0		1	0	1	1
4:40 PM				0	0		0	0	0	0		0		0	0	0	0
4:45 PM				0	0		0	0	0	0		0		0	0	0	0
4:50 PM				0	0		0	0	0	0		0		0	0	0	0
4:55 PM				0	0		0	0	0	0		0		0	0	0	0
5:00 PM				0	0		0	0	0	0		0		0	0	0	0
5:05 PM				0	0		0	0	0	1		1		0	0	0	1
5:10 PM				0	0		0	0	0	0		0		0	0	0	0
5:15 PM				0	0		0	0	0	0		0		0	0	0	0
5:20 PM				0	0		0	0	0	0		0		0	0	0	0
5:25 PM				0	0		0	0	0	0		0		0	0	0	0
5:30 PM				0	0		0	0	0	0		0		0	0	0	0
5:35 PM				0	0		0	0	0	1		1		0	0	0	1
5:40 PM				0	0		0	0	0	0		0		0	0	0	0
5:45 PM				0	0		0	0	0	0		0		0	0	0	0
5:50 PM				0	0		0	0	0	0		0		0	0	0	0
5:55 PM				0	0		0	0	0	0		0		0	0	0	0
Total Survey				0	0		0	0	0	4		4		3	0	3	7

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
4:00 PM				0	0		0	0	0	2		2		2	0	2	4
4:15 PM				0	0		0	0	0	0		0		0	0	0	0
4:30 PM				0	0		0	0	0	0		0		1	0	1	1
4:45 PM				0	0		0	0	0	0		0		0	0	0	0
5:00 PM				0	0		0	0	0	1		1		0	0	0	1
5:15 PM				0	0		0	0	0	0		0		0	0	0	0
5:30 PM				0	0		0	0	0	1		1		0	0	0	1
5:45 PM				0	0		0	0	0	0		0		0	0	0	0
Total Survey				0	0		0	0	0	4		4		3	0	3	7

Heavy Vehicle Peak Hour Summary
4:20 PM to 5:20 PM

By Approach	Northbound Huckleberry Ln NE			Southbound Huckleberry Ln NE			Eastbound Donald Rd NE			Westbound Donald Rd NE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	0	0	1	1	2	1	1	2	2
PHF	0.00			0.00			0.25			0.25			0.50

By Movement	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Total
				Total	L		R	Total	L	T		Total		T	R	Total	
Volume				0	0		0	0	0	1		1		1	0	1	2
PHF				0.00	0.00		0.00	0.00	0.00	0.25		0.25		0.25	0.00	0.25	0.50

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

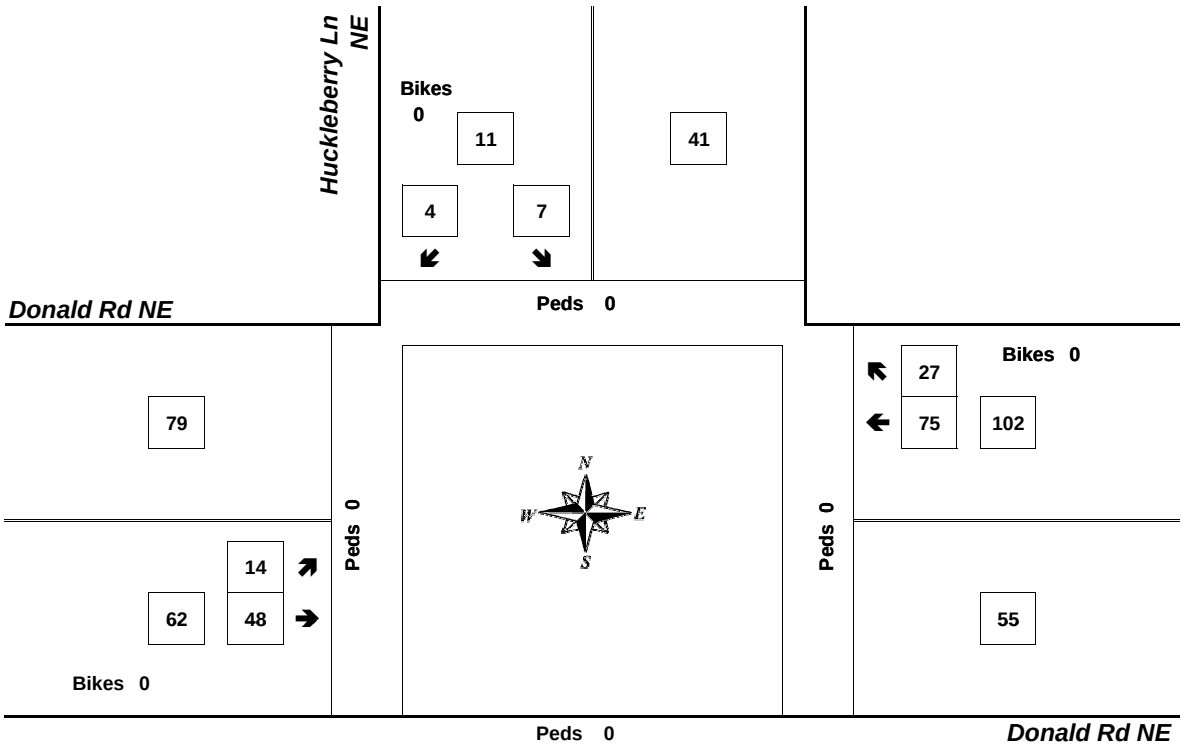
Interval Start Time	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
4:00 PM				0	0		0	0	0	2		2		3	0	3	5
4:15 PM				0	0		0	0	0	1		1		1	0	1	2
4:30 PM				0	0		0	0	0	1		1		1	0	1	2
4:45 PM				0	0		0	0	0	2		2		0	0	0	2
5:00 PM				0	0		0	0	0	2		2		0	0	0	2

Peak Hour Summary

Clay Carney
(503) 833-2740

Huckleberry Ln NE & Donald Rd NE

4:20 PM to 5:20 PM
Thursday, February 15, 2018



Approach	PHF	HV%	Volume
EB	0.70	1.6%	62
WB	0.71	1.0%	102
NB	0.00	0.0%	0
SB	0.69	0.0%	11
Intersection	0.78	1.1%	175

Count Period: 4:00 PM to 6:00 PM

Left-Turn Lane Warrant Analysis

Project: Harvest Gardens Subdivision
Intersection: A. Street 1 at Donald Road NE
Date: 5/28/2020
Scenario: 2029 Buildout Conditions - AM Peak Hour (WB)

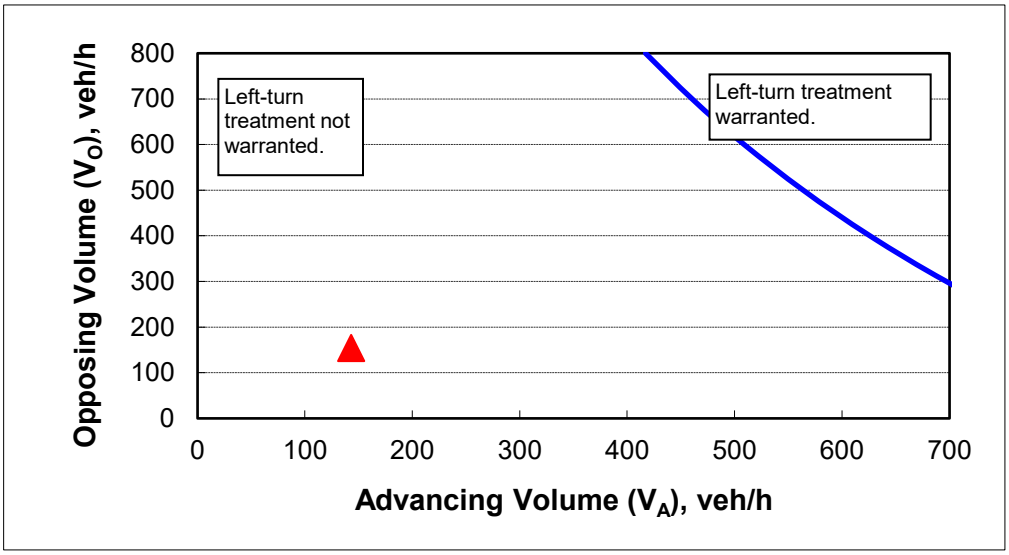
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	3%
Advancing volume (V_A), veh/h:	143
Opposing volume (V_O), veh/h:	154

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	821
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: Harvest Gardens Subdivision
Intersection: A. Street 1 at Donald Road NE
Date: 5/28/2020
Scenario: 2029 Buildout Conditions - PM Peak Hour (WB)

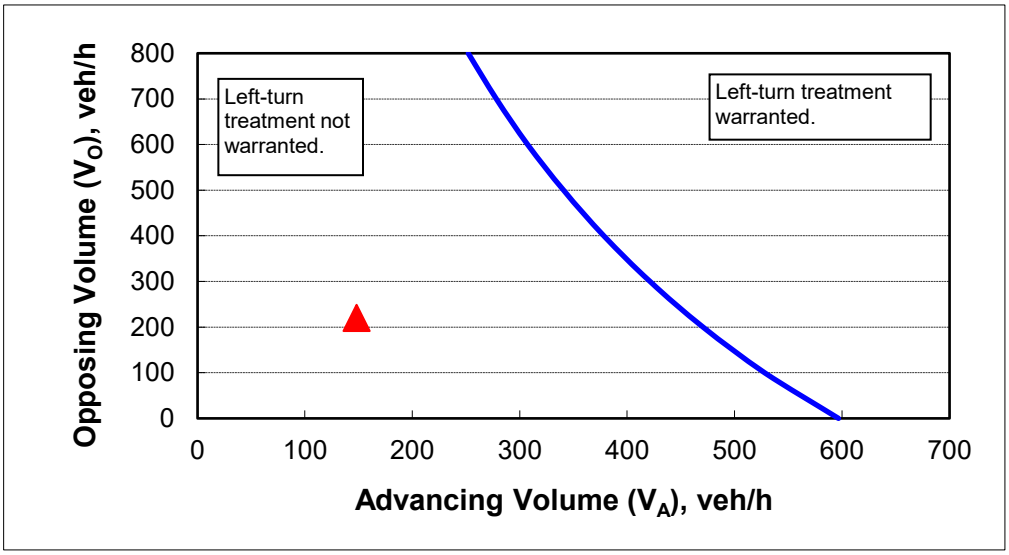
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	8%
Advancing volume (V_A), veh/h:	148
Opposing volume (V_O), veh/h:	220

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	460
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: Harvest Gardens Subdivision
Intersection: B. Huckleberry Lane NE at Donald Road NE
Date: 5/28/2020
Scenario: 2029 Buildout Conditions - AM Peak Hour (EB)

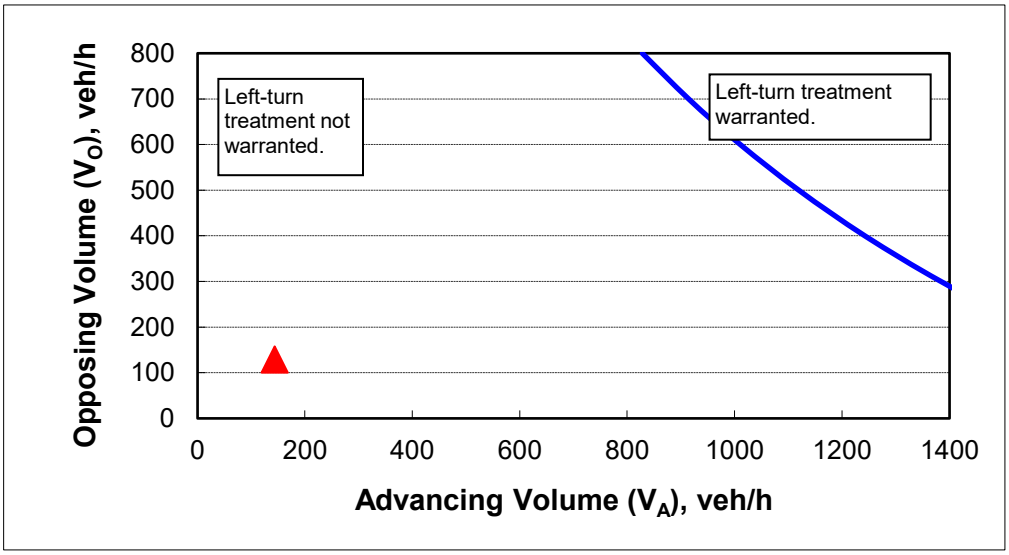
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	1%
Advancing volume (V_A), veh/h:	144
Opposing volume (V_O), veh/h:	129

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1678
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: Harvest Gardens Subdivision
Intersection: B. Huckleberry Lane NE at Donald Road NE
Date: 5/28/2020
Scenario: 2029 Buildout Conditions - PM Peak Hour (EB)

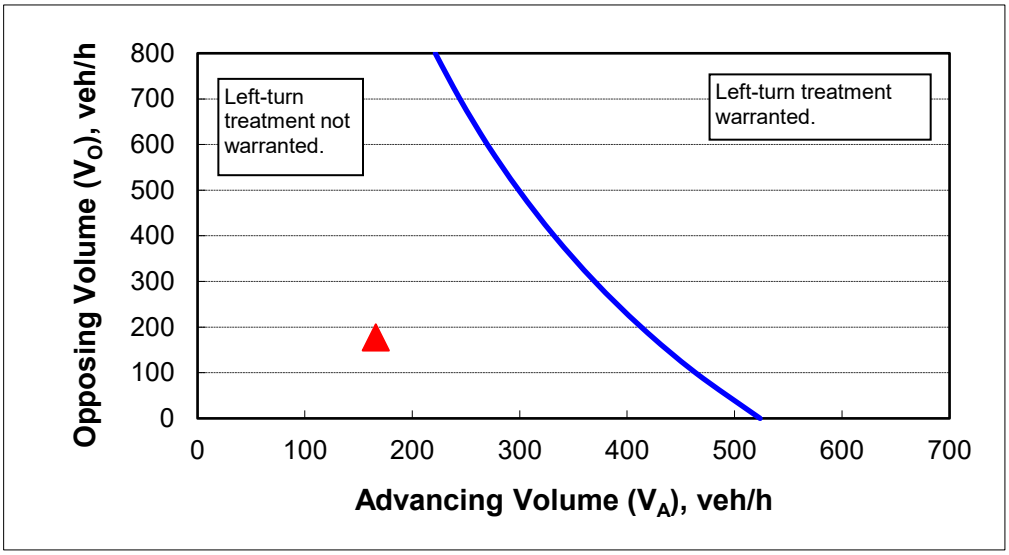
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	11%
Advancing volume (V_A), veh/h:	166
Opposing volume (V_O), veh/h:	177

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	424
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: Harvest Gardens Subdivision
Intersection: C. Street 2 at Donald Road NE
Date: 5/28/2020
Scenario: 2029 Buildout Conditions - AM Peak Hour (WB)

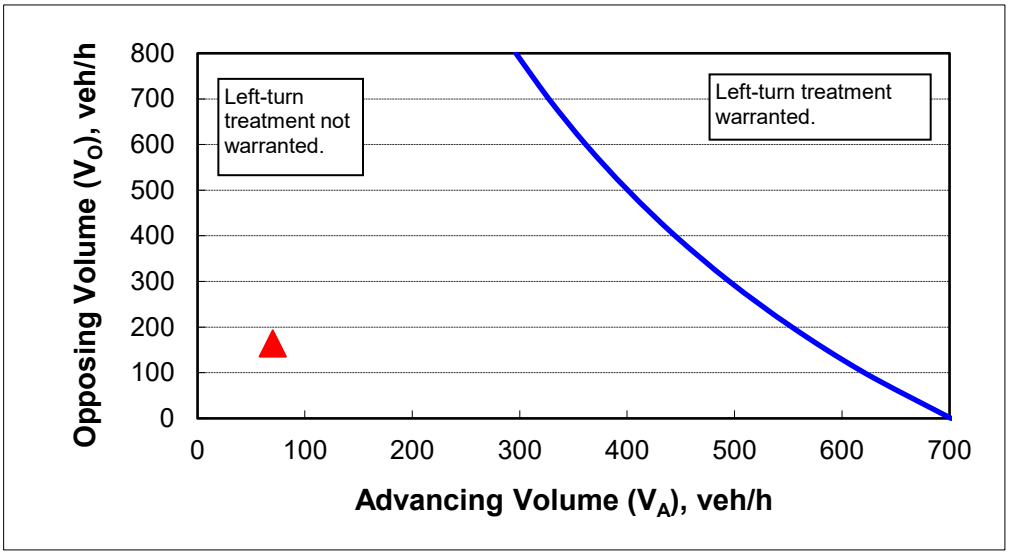
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	6%
Advancing volume (V_A), veh/h:	70
Opposing volume (V_O), veh/h:	164

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	577
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: Harvest Gardens Subdivision
Intersection: C. Street 2 at Donald Road NE
Date: 5/28/2020
Scenario: 2029 Buildout Conditions - PM Peak Hour (WB)

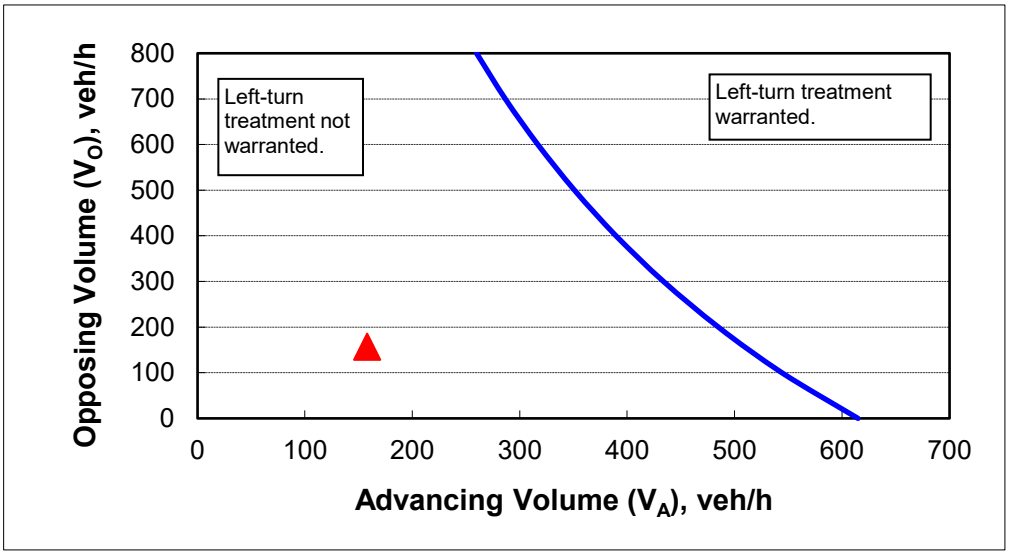
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	8%
Advancing volume (V_A), veh/h:	158
Opposing volume (V_O), veh/h:	157

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	509
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: Harvest Gardens Subdivision
Intersection: D. Street 4 at Donald Road NE
Date: 5/28/2020
Scenario: 2029 Buildout Conditions - AM Peak Hour (WB)

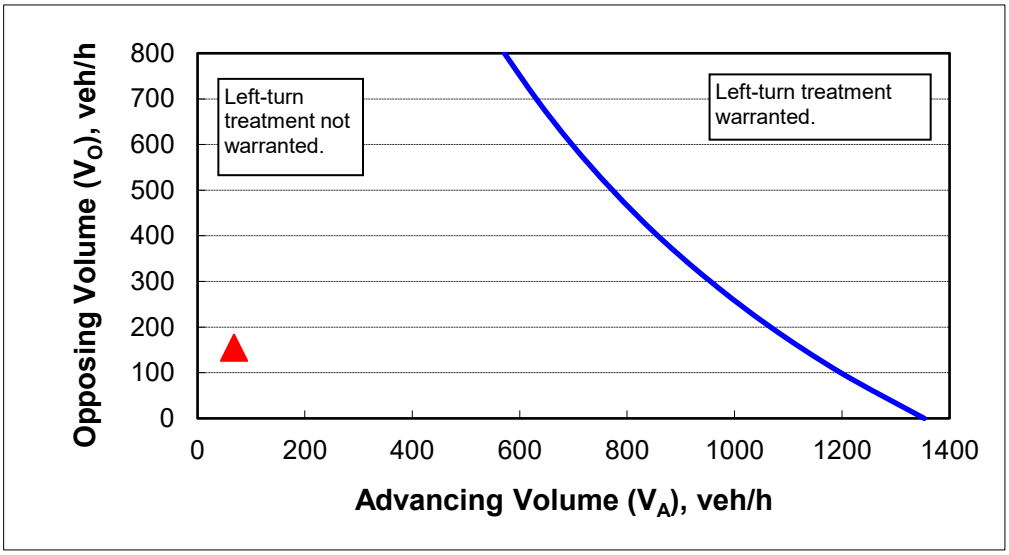
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	1%
Advancing volume (V_A), veh/h:	68
Opposing volume (V_O), veh/h:	155

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1123
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: Harvest Gardens Subdivision
Intersection: D. Street 4 at Donald Road NE
Date: 5/28/2020
Scenario: 2029 Buildout Conditions - PM Peak Hour (WB)

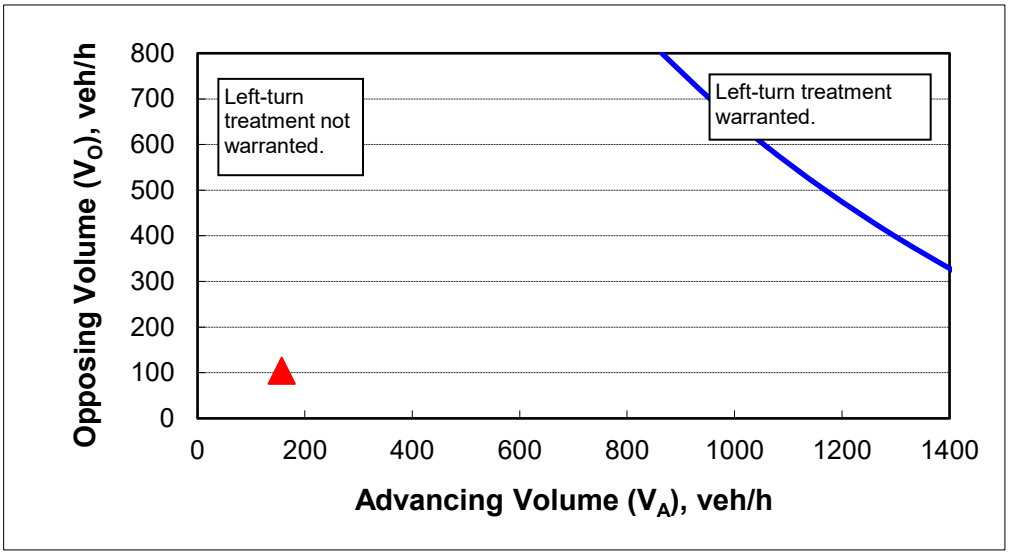
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	1%
Advancing volume (V_A), veh/h:	157
Opposing volume (V_O), veh/h:	104

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1804
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Intersection: 1: Street 1 & Donald Road NE

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	13	65
Average Queue (ft)	0	31
95th Queue (ft)	7	54
Link Distance (ft)	312	344
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Donald Road NE & Huckleberry Lane NE

Movement	WB	SB
Directions Served	TR	LR
Maximum Queue (ft)	14	58
Average Queue (ft)	0	25
95th Queue (ft)	8	51
Link Distance (ft)	50	491
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Street 2 & Donald Road NE

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	10	56
Average Queue (ft)	1	31
95th Queue (ft)	7	51
Link Distance (ft)	310	319
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Street 4 & Donald Road NE

Movement	NB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	3
95th Queue (ft)	18
Link Distance (ft)	333
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 0

Intersection: 1: Street 1 & Donald Road NE

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	31	54
Average Queue (ft)	3	26
95th Queue (ft)	17	49
Link Distance (ft)	312	344
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Donald Road NE & Huckleberry Lane NE

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	32	1	38
Average Queue (ft)	3	0	12
95th Queue (ft)	18	0	37
Link Distance (ft)	312	50	491
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Street 2 & Donald Road NE

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	1	31	50
Average Queue (ft)	0	3	25
95th Queue (ft)	2	17	48
Link Distance (ft)	50	310	319
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Street 4 & Donald Road NE

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	3	29
Average Queue (ft)	0	2
95th Queue (ft)	4	16
Link Distance (ft)	199	333
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

lancaster mobley

321 SW 4th Ave., Suite 400
Portland, OR 97204
503.248.0313
lancastermobley.com

REGISTERED PROFESSIONAL ENGINEER
54653PE
OREGON
JULY 9, 2001
TODD E. MOBLEY
RENEWS: 12/31/2020

Memorandum

To: **GK Machine**

From: **Todd E. Mobley, PE**

Date: **May 21, 2020**

Subject: **Harvest Gardens Subdivision**
Shared Street Configuration

Introduction

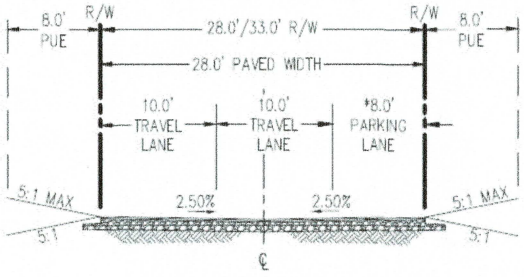
This memorandum is written in response to comments received from the City of Donald and the City's consulting engineer regarding the potential requirement for sidewalks on low-volume local streets within the project. Specifically, Streets 4 through 10 are proposed to be constructed to the "L3" standard shown in Figure 1 below.

Shared Street Operation

The proposed Harvest Gardens project is planned and designed to be a unique, agriculture-centric community. Part of that aesthetic is a non-standard approach to some of the street configurations. Streets 4 through 10 are essentially loop streets that serve only the homes that front them. By design, they are low-speed, low-volume streets. These low volumes and low speeds allow the streets to operate safely as shared facilities. Cars are still allowed on the streets, but the design is intended to make a driver feel like a guest on the street. Delineating dedicated space for people walking, people biking, and people driving leads to a higher comfort level for people driving, resulting in higher speeds and less attentiveness. For quiet residential streets such as Streets 4 through 10, this is not the desired operation.

This shared street concept is commonly used throughout the world and is becoming more popular in America and the northwest. This treatment is well researched and documented as an appropriate treatment for low-volume residential streets. The *Urban Street Design Guide*, published by NACTO[1], is perhaps the most comprehensive and widely accepted design manual that details the use of shared streets.

Figure 1: Proposed Shared Street Cross Section



L3
LOCAL – PARKING ONE SIDE
TYPICAL SECTION
SCALE 1" = 10'

STREET 4
STREET 5
STREET 6
STREET 7
STREET 8
STREET 9
STREET 10

[1] *Urban Street Design Guide*, published in 2013 by the National Association of City Transportation Officials (NACTO)

Recommended Design Features

The *Urban Street Design Guide* provides guidance on shared street design elements to ensure operation of the street as intended, stating, "Cities should aim to maintain low speeds and volumes on these streets, reinforcing their shared nature through materials and targeted design enhancements."

Some of these design features include the following. These are direct quotes from the manual.

- *Drainage channels should be provided either at the center of the street or along the flush curb, depending on underground utilities and other existing conditions.*
- *A shared street sign should be used at the entrance to a shared street. In some cases, a modified YIELD TO PEDESTRIANS sign (MUTCD 2B-2) may be added to reinforce the conversion in early stages.*
- *Shared streets should generally be designed to operate intuitively as shared spaces without the need of signage. Signage serves to educate the public in the early stages of a conversion. Residential shared street signage often depicts children playing to make motorists aware that they are entering a low speed area.*
- *Provide tactile warning strips at the entrance to all shared spaces. Warning strips should alert drivers and pedestrians.*

Figure 2: Shared Street Example from NACTO (Urban Street Design Guide)

The proposed street configuration does have drainage that sheds to the centerline. It is recommended that additional design considerations such as signage and entrance treatments be considered rather than adding sidewalks.

Conclusions

The proposed L3 street section for Streets 4 through 10 within Harvest Gardens were designed intentionally to be unique, low speed and low volume residential shared streets. Rather than imposing a condition of approval to require sidewalks, it is recommended that additional design treatments such as those described above be incorporate to allow the street to operate as intended.

If you have any questions regarding the preparation of this scoping memorandum, please don't hesitate to contact us.

Harvest Gardens Subdivision

Transportation Impact Study

Donald, Oregon

Date:
March 11, 2020

Prepared for:
GK Machine

Prepared by:
Terrington Smith, EI
Daniel Stumpf, PE
Todd Mobley, PE

LANCASTER
ENGINEERING

321 SW 4th Ave., Suite 400 | Portland, OR 97204 | 503.248.0313 | lancasterengineering.com

Table of Contents

Table of Figures

Table of Tables

Executive Summary

1. The proposed Harvest Gardens Subdivision is a residential development that will include the construction of 297 single-family homes on approximately 62 acres of land recently brought into the City of Donald's urban growth boundary.
2. The trip generation calculations show that the proposed development is projected to generate 220 site trips during the morning peak hour, 294 site trips during the evening peak hour, and 2,804 site trips during a typical weekday.
3. The following intersections are projected to operate in excess of their applicable jurisdictional standards:
   - Ehlen Road NE at Butteville Road NE during the evening peak hour under year 2029 buildout conditions;
   - I-5 southbound ramps at Ehlen Road NE for all analysis scenarios except under existing conditions during the morning peak hour; and
   - I-5 northbound ramps at Ehlen Road NE for all analysis scenarios

   Per the Marion County Rural Transportation System Plan (TSP), the County is currently considering a traffic signal at the intersection of Ehlen Road NE at Butteville Road NE. Either potential mitigation is projected to improve intersection operation to acceptable levels. Regarding the intersections of Ehlen Road NE at the I-5 ramps, ODOT's IAMP and interchange reconstruction project is currently under development and will address both immediate and long-term mitigation necessary to improve operation at the interchange. With implementation of the IAMP and subsequent reconstruction of the Aurora-Donald interchange, sufficient capacity to serve future projected traffic volumes will be provided.
4. All other study intersections are currently operating acceptably per their respective jurisdictional standards and are projected to continue operating acceptably through the 2034 planning horizon.
5. The intersection of Ehlen Road NE at Butteville Road NE and the I-5 ramp intersections along Ehlen Road NE are currently operating with crash rates above 1.00 CMEV. However, planned improvements at the aforementioned study intersections are expected to improve safety. No other significant trends or crash patterns were identified at any of the other study intersections that were indicative of safety concerns.
6. Left-turn lane warrants are not projected to be met under any of the analysis scenarios for either of the site access intersections along Donald Road/Main Street NE.
7. Preliminary traffic signal warrants are projected to be met for the intersections of Ehlen Road NE at Butteville Road NE and Ehlen Road NE at Bents Court NE (with the realignment of Bents Road NE) under year 2029 buildout conditions. Traffic signal warrants are not projected to be met for any of the other study intersections.

8. Following implementation of the above suggested operational and safety mitigations, the proposed Harvest Gardens Subdivision is not projected to degrade the performance of any other existing or planned transportation facility below acceptable City of Donald, Marion County, or ODOT standards. In addition, the proposal will not impact or alter the functional classification of any existing or planned facility and does not include a change to any functional classification standards. Accordingly, the Transportation Planning Rule is satisfied.

Introduction

The proposed Harvest Gardens Subdivision is a residential development that will include the construction of 297 single-family homes on approximately 62 acres of land recently brought into the City of Donald's urban growth boundary. The intent of the proposed project is to support the expected increase in the city's population, from approximately 985 residents in 2018 to 2,085 residents in 2029. The project site is located near the southeastern edge of city limits.

The purpose of this report is to determine whether the transportation system within the vicinity of the site is capable of safely and efficiently supporting the existing and proposed uses and to determine any mitigation that may be necessary to do so. Detailed information on traffic counts, trip generation calculations, safety analyses, and level of service calculations is included in the appendix to this report.

Project and Location Description

The proposed Harvest Gardens Subdivision will be located south of Donald Road/Main Street NE and east of Matthieu Street NE. As part of the proposed development, the site will be annexed into the City of Donald and subsequently subdivided. The surrounding area is predominately developed for agriculture with the exception of a mix of residential, light industrial, and smaller commercial uses to the northwest.

Based on correspondence with City of Donald and Marion County staff, the following intersections were selected for analysis of projected morning and evening peak hour traffic impacts:

1. Proposed east access at Donald Road/Main Street NE;
2. Proposed west access at Donald Road/Main Street NE;
3. Butteville Road NE at Donald Road/Main Street NE;
4. Ehlen Road NE at Butteville Road NE;
5. Ehlen Road NE at Bents Court NE;
6. Ehlen Road NE at Bents Road NE;
7. I-5 southbound ramps at Ehlen Road NE; and
8. I-5 northbound ramps at Ehlen Road NE;

Vicinity Streets

The proposed development is expected to predominantly impact seven roadways near the site. Table 1 provides a description of each of the vicinity roadways.

Table 1: Study Roadway Characteristics

Street Name	Jurisdiction	Functional Classification	Speed (mph)	Curbs & Sidewalks	On-Street Parking	Bicycle Lanes
Interstate 5	ODOT	Interstate	65	N	N	N
Ehlen Road NE	Marion County	Principal Arterial	35 near I-5, 45-55 elsewhere	N	N	N
Butteville Road NE	Marion County	Major Collector	55 near Ehlen Road, 40 in City Limits, 25 in residential areas	N	N	N
Donald Road NE (Main Street NE)	Marion County	Minor Collector	25, 45 east of 11101 Main Street NE	Intermittent	Intermittent	N
Bents Road NE	Marion County	Minor Collector	55	N	N	N
Bents Court NE	Marion County	Local Roadway	20	Y	N	N

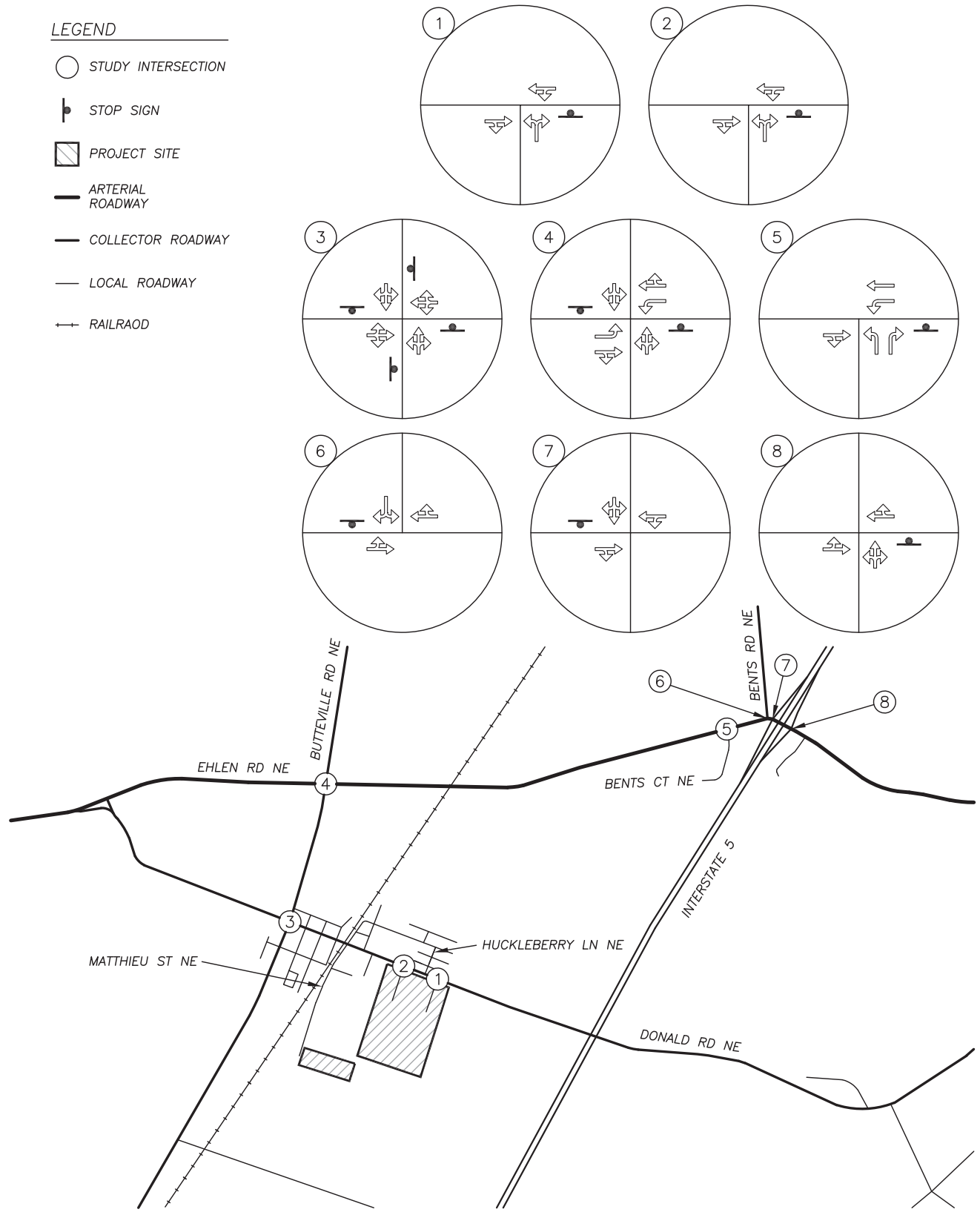
Study Intersections

A majority of site trips generated by the proposed development are expected to impact six existing, nearby intersections of significance. A summarized description of these intersections is provided in Table 2.

Table 2: Study Intersection Characteristics

	Intersection	Jurisdiction	Control Type
3	Butteville Road NE at Donald Road/Main Street NE	Marion County	Stop Control (All Approaches)
4	Ehlen Road NE at Butteville Road NE	Marion County	Stop Control (NB & SB Approaches)
5	Ehlen Road NE at Bents Court NE	Marion County	Stop Control (NB Approach)
6	Ehlen Road NE at Bents Road NE	Marion County	Stop Control (SB Approach)
7	Ehlen Road NE at I-5 Southbound Ramps	ODOT	Stop Control (SB Approach)
8	Ehlen Road NE at I-5 Northbound Ramps	ODOT	Stop Control (NB Approach)

Figure 1 on page 4 shows a vicinity map displaying the project site, vicinity streets, and intersection configurations.



VICINITY MAP

no scale

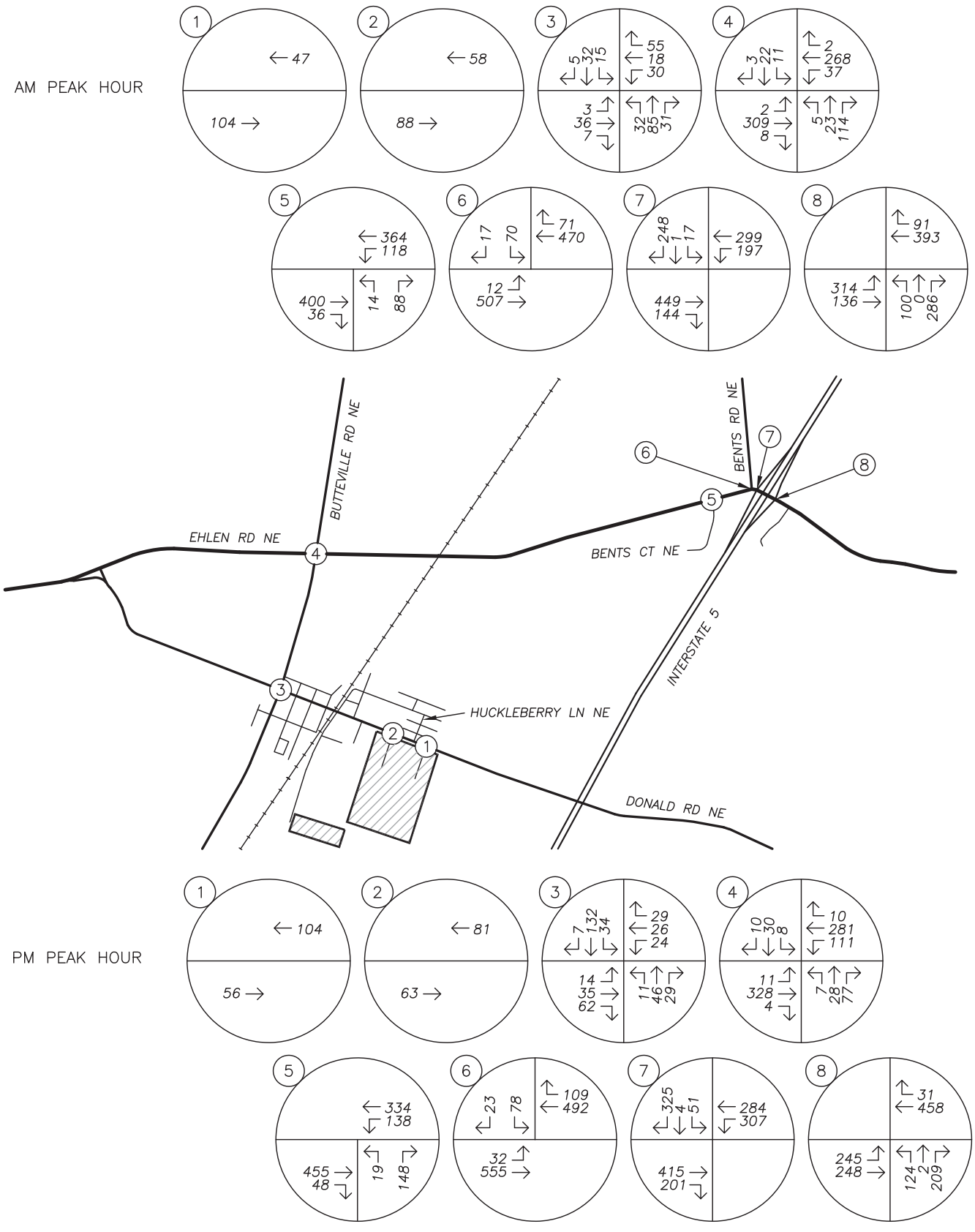
FIGURE 1

Traffic Counts

Traffic counts were conducted at five of the study intersections on Thursday, February 15, 2018, from 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m. At the intersection of Ehlen Road NE at Bents Court NE, traffic counts were conducted on Tuesday, February 27, 2018, from 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m. Counts were collected by a third-party company. Individual vehicle, pedestrian, and bicycle movements were counted at each intersection. Data from each intersection's morning and evening peak hours were used. Detailed count summaries are provided in the appendix.

As assumed by Marion County staff, to reflect existing year 2019 traffic conditions the collected count data was increased utilizing an assumed compounded growth rate of 2.4 percent per year over a period of one year. Details regarding the use of a 2.4 percent per year growth rate are provided within the *Background Conditions* section of his report.

Figure 2 on page 6 shows existing morning and evening peak hour traffic volumes at each of the study intersections.



TRAFFIC VOLUMES
Existing Conditions
AM & PM Peak Hours

no scale

FIGURE 2

Site Trips

Trip Generation

The proposed Harvest Gardens Subdivision will predominately include the construction of residential uses within approximately 62 acres of recently annexed land.

To estimate the number of trips that will be generated by the proposed development, trip rates from the *Trip Generation Manual* [1] were used. The *Trip Generation Manual* contains trip generation rates based on data from site observations across the United States. Separate rates are provided in the manual for the morning peak hour, evening peak hour, and an entire weekday, all of which were used to calculate trip generation in this report. Data and trip rates corresponding to land use code 210, *Single-Family Detached Housing*, were used to estimate the proposed development's trip generation based on the number of dwelling units.

The trip generation calculations show that the proposed development is projected to generate 220 site trips during the morning peak hour, 294 site trips during the evening peak hour, and 2,804 site trips during a typical weekday. Trip generation estimates are summarized in Table 3. Detailed trip generation calculations are included in the appendix to this report.

Table 3: Trip Generation Summary

Land Use Code	ITE Code	Size	Morning Peak Hour			Evening Peak Hour			Weekday Total
			In	Out	Total	In	Out	Total	
Single Family Homes	210	297 units	55	165	220	185	109	294	2,804

Access Locations

The proposed development will take access to the greater transportation system via two locations along the south side of Donald Road/Main Street NE and one location along the east side of Matthieu Street NE.

The project site is divided between a northern section, where trips generated in this area will utilize accesses along Donald Road/Main Street NE, and a southwestern section, where trips generated in this area will utilize the access along Matthieu Street NE. The proposed development does not include an internal street connection between the northern section and southwestern section, but a connection will eventually be made upon future development in the area.

[1] Institute of Transportation Engineers (ITE), *TRIP GENERATION MANUAL*, 10th Edition, 2017.

For the purposes of this report, it was assumed that 90 percent of trips generated by the proposed development will utilize the access intersections along Donald Road/Main Street NE while the remaining 10 percent will utilize access intersections along Matthieu Street NE.

Trip Distribution

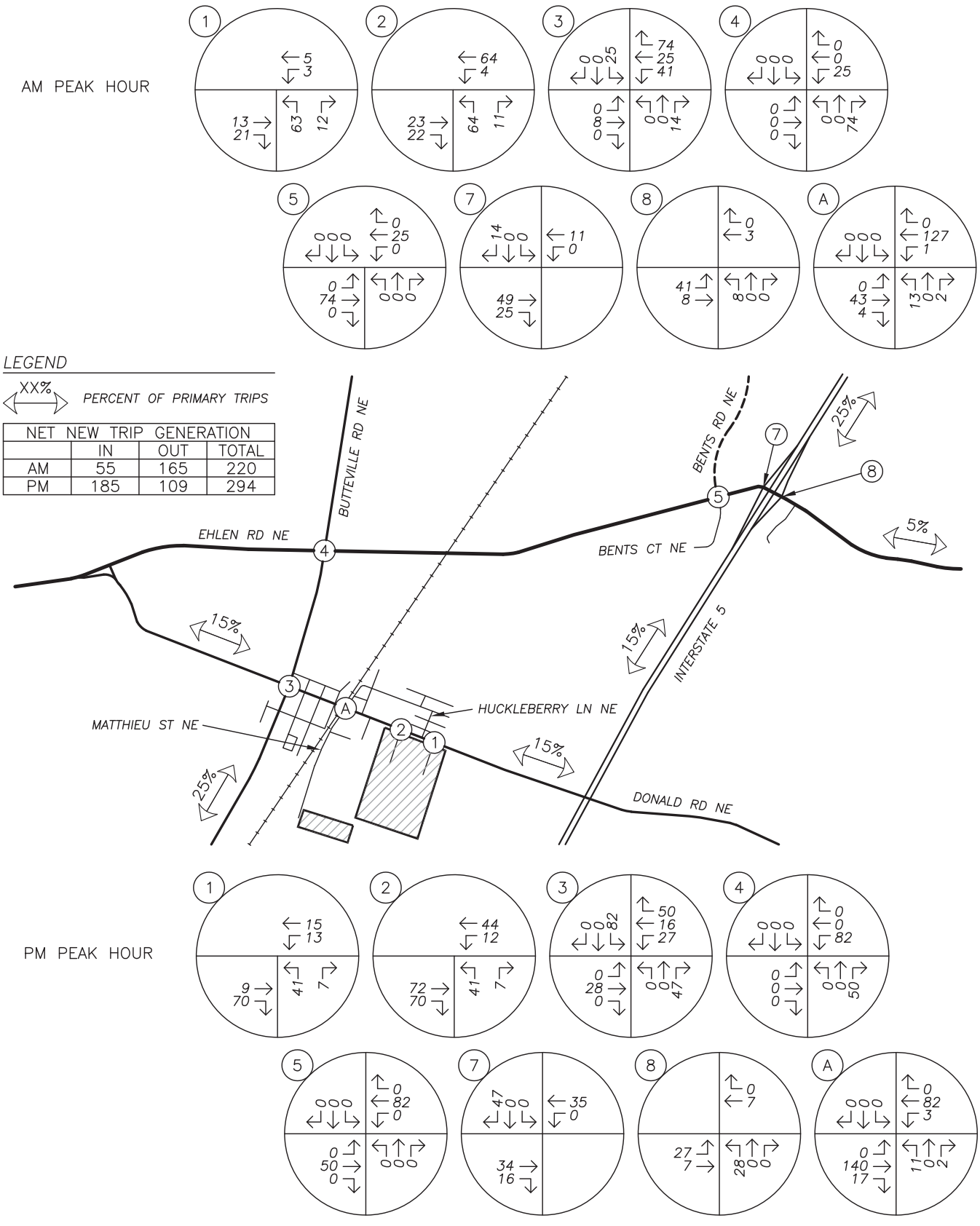
The directional distribution of site trips to and from the project site was estimated based on likely trip destinations, locations of major transportation facilities in the site vicinity, and existing travel patterns at the study area intersections.

The following trip distribution was estimated and used for analysis:

- Approximately 15 percent of site trips will travel to/from the west along Donald Road/Main Street NE
- Approximately 15 percent of site trips will travel to/from the east along Donald Road/Main Street NE
- Approximately 25 percent of site trips will travel to/from the south along Butteville Road NE
- Approximately 15 percent of site trips will travel to/from the south along I-5 (via Ehlen Road NE)
- Approximately 25 percent of site trips will travel to/from the north along I-5 (via Ehlen Road NE
- Approximately 5 percent of site trips will travel to/from the east along Ehlen Road NE

It is estimated that a nominal percentage of site trips will travel to/from the north along Butteville Road NE, as the roadway does not lead to any significant day-to-day transportation facilities or destinations. It is also estimated that a nominal percentage of site trips will travel along Bents Road NE or Bents Court NE. It was assumed that trips to and from the west of the project site will use Donald Road/Main Street NE rather than Ehlen Road NE, since Donald Road/Main Street NE provides a more direct connection to the intersection of Donald Road NE at Ehlen Road NE/Yergen Road NE.

The trip distribution and assignment for the site trips generated during the morning and evening peak hours site trips is shown in Figure 3 on page 9.



TRAFFIC VOLUMES
Site Trip Distribution & Analysis
AM & PM Peak Hours

no scale

FIGURE 3

Future Traffic Volumes

Background Conditions

To provide analysis of the impact of the proposed development on the nearby transportation facilities, an estimate of future traffic volumes is required. In collaboration with the City of Donald, the Mid-Willamette Valley Council of Governments (MWVCOG), and Marion County, a compounded growth rate of 2.4 percent per year was applied to the measured existing traffic volumes to approximate year 2029 background conditions. The growth rate was determined by averaging compounded growth rates between Marion County's 2011 traffic counts and 2032 traffic volume projections from the Rural Transportation System Plan (TSP).

The realignment of Bents Road NE to comprise a north leg of the intersection of Ehlen Road NE at Bents Court NE, and subsequent signalization of the resulting intersection, has been identified as a needed improvement in the Marion County Rural TSP,[2] and as an issue in ODOT's Aurora-Donald Interchange Area Management Plan (IAMP).[3] It is expected that the realignment of Bents Road NE will be completed before year 2029; therefore, analysis of this intersection with the planned improvement in place was conducted.

Figure 4 on page 11 shows the projected year 2029 background traffic volumes at the study intersections during the morning and evening peak hours, with the future realignment of Bents Road NE implemented.

Buildout Conditions

Peak hour trips calculated to be generated by the proposed development, as described in the *Site Trips* section, were added to the projected year 2029 background traffic volumes to obtain the expected 2029 site buildout volumes. Figure 5 on page 12 shows the projected year 2029 peak hour buildout traffic volumes at the study intersections during the morning and evening peak hours.

Year 2034 Planning Horizon

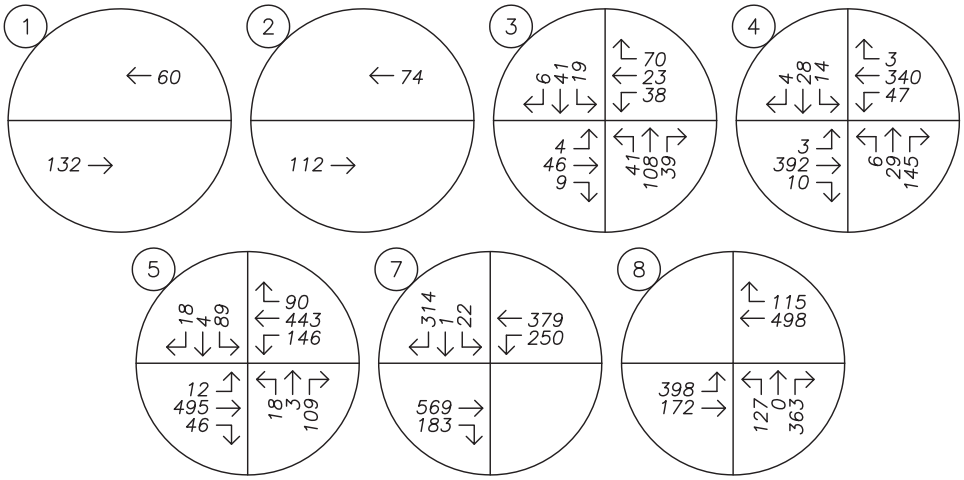
To determine long-term traffic conditions with buildout of the proposed development, an additional analysis scenario analyzing the 2034 planning horizon was conducted. To determine the 2034 planning year volumes, volume data was referenced from the *City of Donald UGB Expansion Transportation Impact Study* (TIS), dated April 19, 2018. Figure 6 on page 13 shows the projected year 2034 planning horizon traffic volumes at the study intersections for the morning and evening peak hours.

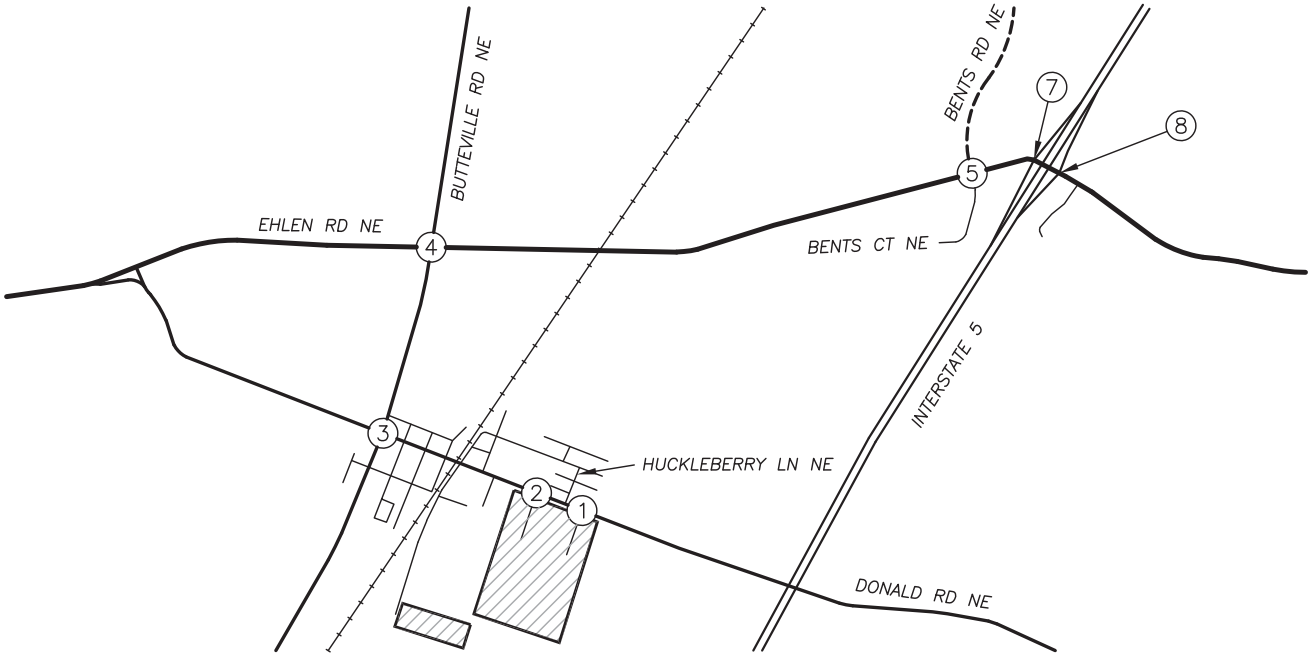
---

[2] Marion County, *Marion County Rural Transportation System Plan 2005 Update*, Chapter 8: Roadway System Needs and Recommended Improvements, 2005. http://www.co.marion.or.us/PW/Engineering/rtsp/Documents/chapter8roadwaysystemimprovements.pdf.

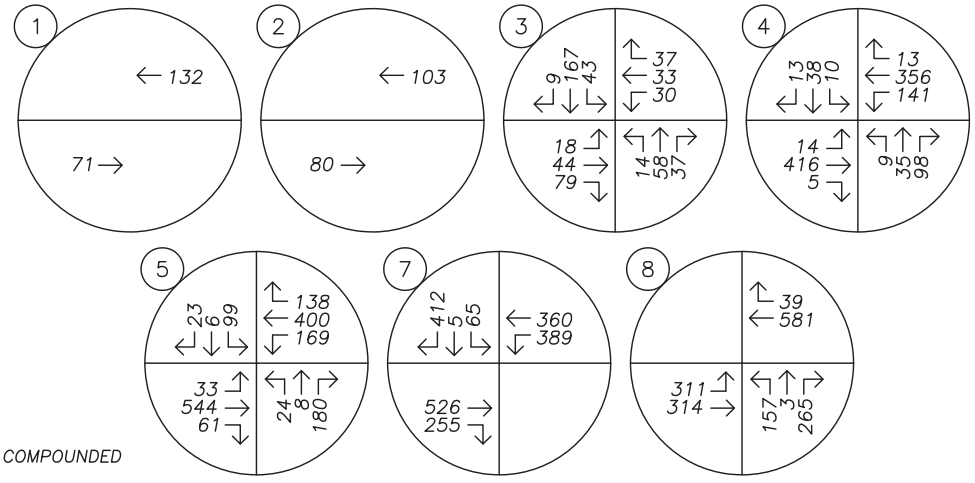
[3] ODOT, *I-5 at Aurora-Donald Interchange Project, Phase 1*, 2018. http://www.oregon.gov/odot/projects/pages/project-details.aspx?project=19062.

AM PEAK HOUR





PM PEAK HOUR



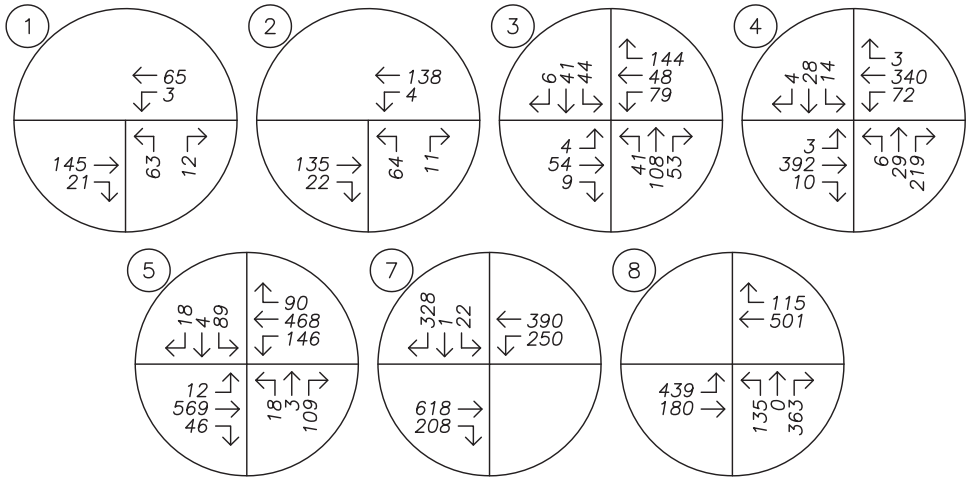
GROWTH RATE: 2.4 PERCENT PER YEAR COMPOUNDED

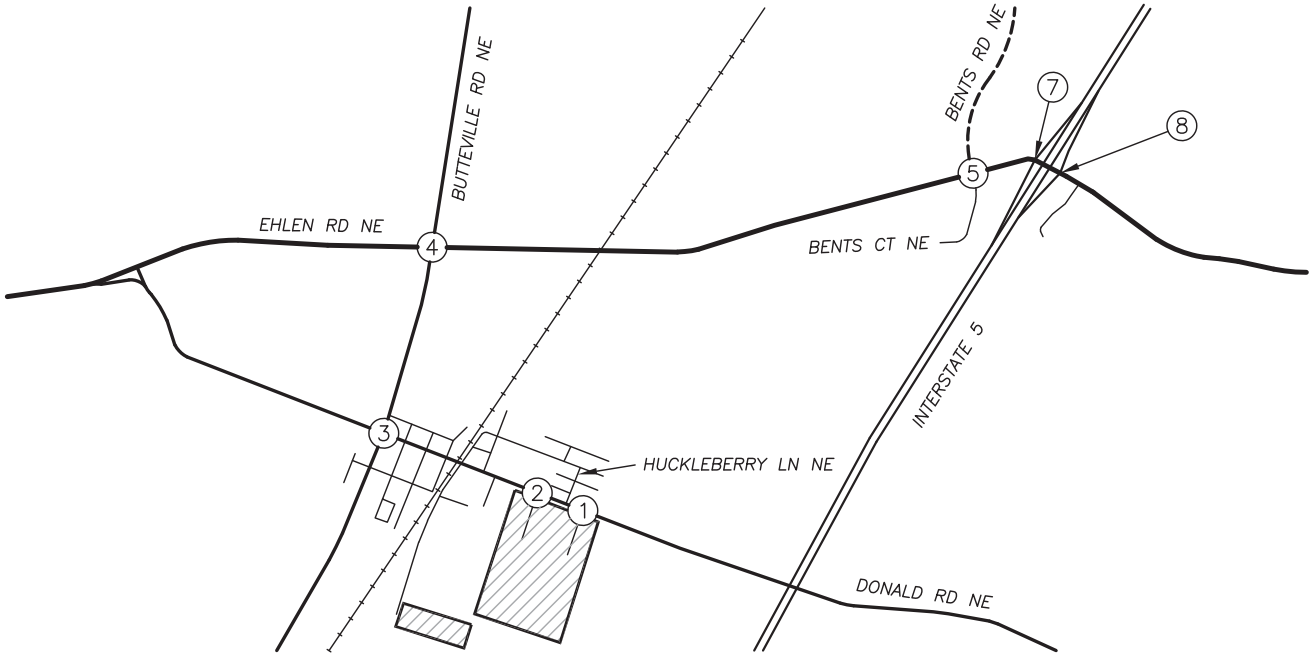
TRAFFIC VOLUMES
Year 2029 Background Conditions
AM & PM Peak Hours

no scale

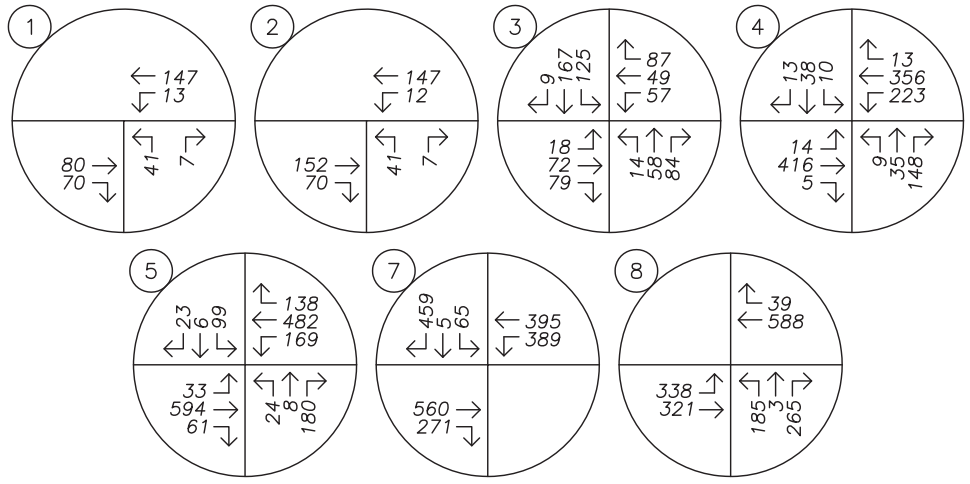
FIGURE 4

AM PEAK HOUR





PM PEAK HOUR

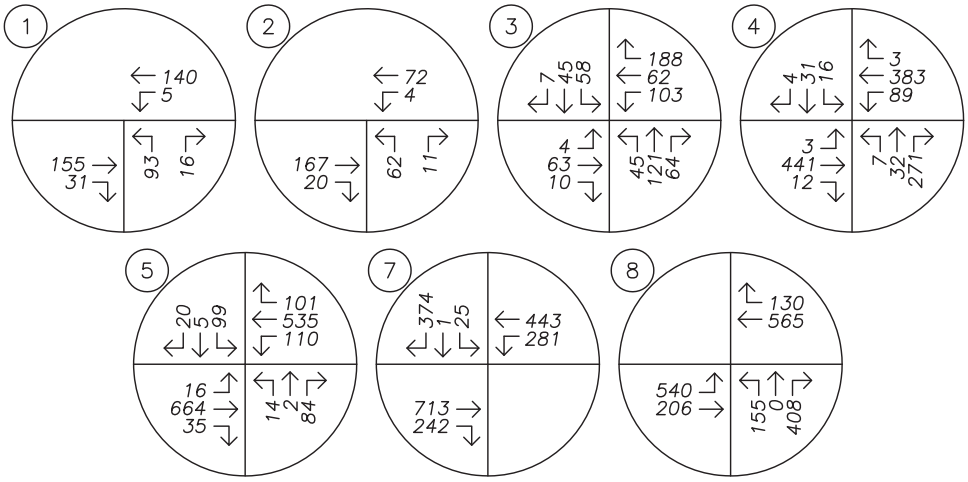


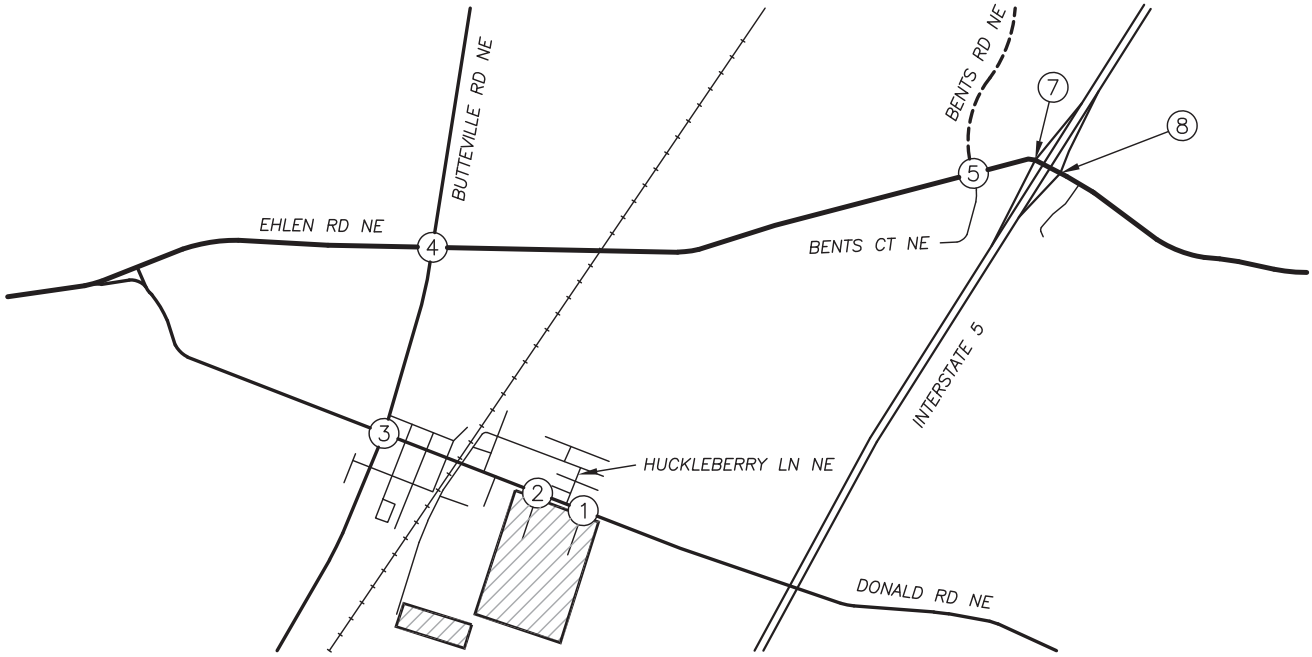
TRAFFIC VOLUMES
Year 2029 Buildout Conditions
AM & PM Peak Hours

no scale

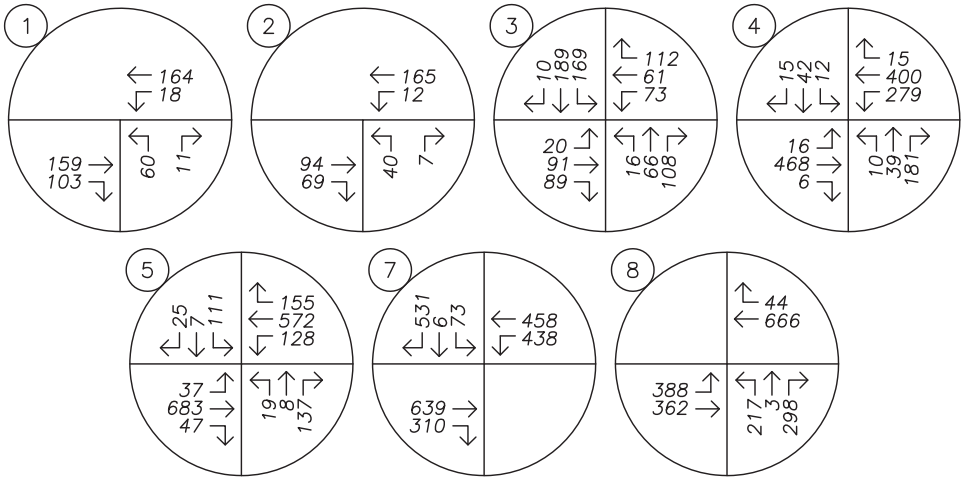
FIGURE 5

AM PEAK HOUR





PM PEAK HOUR



TRAFFIC VOLUMES
Year 2034 Planning Horizon
AM & PM Peak Hours

no scale

FIGURE 6

PAGE 13

Operational Analysis

Intersection Capacity Analysis

A capacity analysis was conducted for each of the study intersections per the signalized and unsignalized intersection analysis methodologies in the *Highway Capacity Manual* (HCM)[4]. The level of service (LOS) of an intersection can range from LOS A, which indicates very little or no delay experienced by vehicles, to LOS F, which indicates a high degree of congestion and delay. The volume-to-capacity (v/c) ratio is a measure that compares the traffic volumes (demand) against the available capacity of an intersection.

Marion County requires that signalized and all-way stop-controlled intersections operate at LOS D or better, with individual movements operating at LOS E or better, and with a v/c ratio no greater than 0.85. Other unsignalized intersections must operate at LOS E or better; however, LOS F may be allowed if the movement serves relatively low volumes (at the discretion of County staff) and if there is no indication of a safety issue.[5]

In addition, the I-5 ramp intersections along Ehlen Road NE are under the jurisdiction of ODOT and must operate according to the standards established in the Oregon Highway Plan[6] (OHP). Per the OHP, interchange ramp terminals are required to operate with a v/c ratio of 0.85 or less.

The v/c, delay, and LOS results of the capacity analysis for morning and evening peak hours are shown in Table 4. Detailed calculations as well as tables showing the relationship between delay and LOS are included in the appendix to this report.

[4] Transportation Research Board, *Highway Capacity Manual*, 6th Edition, 2016.

[5] Marion County, *Traffic Impact Analysis Requirements*, 2015. http://www.co.marion.or.us/PW/Engineering/Pages/analysis.aspx.

[6] Oregon Department of Transportation, *Oregon Highway Plan: Including amendments November 1999 through May 2015*, 2015.

Table 4: Intersection Capacity Analysis Summary

	Morning Peak Hour			Evening Peak Hour		
	LOS	Delay (s)	v/c	LOS	Delay (s)	v/c
1 East Access at Donald Road/Main Street NE						
2029 Buildout Conditions	B	11	0.15	B	11	0.10
2034 Planning Horizon	B	13	0.24	B	13	0.17
2 West Access at Donald Road/Main Street NE						
2029 Buildout Conditions	B	12	0.16	B	12	0.11
2034 Planning Horizon	B	11	0.15	B	11	0.09
3 Butteville Road NE at Donald Road/Main Street NE						
2019 Existing Conditions	A	8	-	A	9	-
2029 Background Conditions	A	9	-	A	10	-
2029 Buildout Conditions	B	11	-	B	14	-
2034 Planning Horizon	B	12	-	C	24	-
4 Ehlen Road NE at Butteville Road NE						
2019 Existing Conditions	C	18	0.26	C	22	0.27
2029 Background Conditions	D	25	0.39	E	36	0.45
2029 Buildout Conditions	D	32	0.53	**F**	63	0.66
2034 Planning Horizon	F	55	0.71	**F**	>120	**>1.00**
5 Ehlen Road NE at Bents Court NE						
2019 Existing Conditions	D	30	0.19	D	29	0.30
2029 Background Conditions*	B	19	0.74	B	20	0.74
2029 Buildout Conditions*	C	26	0.80	C	31	0.78
2034 Planning Horizon	C	26	0.83	C	33	0.84
6 Ehlen Road NE at Bents Road NE						
2019 Existing Conditions	D	34	0.42	E	38	0.49

* Intersection converted from three to four legs (i.e. Bents Road is re-aligned to intersection).

Italic results indicate highest approach v/c ratio reported.

BOLDED results indicate operation above acceptable jurisdictional standards.

Table 4: Intersection Capacity Analysis Summary (Continued)

	Morning Peak Hour			Evening Peak Hour		
	LOS	Delay (s)	v/c	LOS	Delay (s)	v/c
7 I-5 SB Ramps at Ehlen Road NE						
2019 Existing Conditions	C	19	0.52	F	>120	**>1.00**
2029 Background Conditions	F	58	0.90	F	>120	**>1.00**
2029 Buildout Conditions	F	83	**>1.00**	F	>120	**>1.00**
2034 Planning Horizon	F	>120	**>1.00**	F	>120	**>1.00**
8 I-5 NB Ramps at Ehlen Road NE						
2019 Existing Conditions	F	>120	**>1.00**	F	>120	**>1.00**
2029 Background Conditions	F	>120	**>1.00**	F	>120	**>1.00**
2029 Buildout Conditions	F	>120	**>1.00**	F	>120	**>1.00**
2034 Planning Horizon	F	>120	**>1.00**	F	>120	**>1.00**

BOLDED results indicate operation above acceptable jurisdictional standards.

Based on the results of the operational analysis, the following intersections are projected to operate in excess of their applicable jurisdictional standards:

4. Ehlen Road NE at Butteville Road NE during the evening peak hour under year 2029 buildout conditions;
7. I-5 southbound ramps at Ehlen Road NE for all analysis scenarios except under existing conditions during the morning peak hour; and
8. I-5 northbound ramps at Ehlen Road NE for all analysis scenarios.

Further inspection of potential mitigation at these intersections is discussed within the following *Mitigation Analysis* section.

All other study intersections are currently operating acceptably per their respective jurisdictional standards and are projected to continue operating acceptably through the 2029 buildout year of the site as well as the 2034 planning horizon. No operational mitigation is necessary or recommended at these intersections.

Mitigation Analysis

The intersection of Ehlen Road NE at Butteville Road NE is projected to operate in excess of County LOS standards during the evening peak hour in year 2029 buildout conditions as well as by the 2034 planning horizon. Based on correspondence with County staff, the intersection is under consideration for reconstruction as a roundabout or installation of a traffic signal. Currently, the Marion County Rural Transportation System Plan (TSP) indicates the intersection is planned for signalization.[7]

Based on preliminary conversations with Marion County staff, a proportional share contribution is planned to be required to help fund planned improvements, including the intersection of the Ehlen Road NE at Butteville Road NE.

Analyses were conducted with a traffic signal installed and with the intersection reconstructed as a single-lane roundabout under year 2029 buildout conditions as well as the 2034 planning horizon. Results are shown in Table 5. With either a traffic signal or a roundabout, the intersection is projected to operate acceptably through the planning horizon, with or without the addition of site trips related to the proposed development.

Table 5: Mitigation Analysis Summary

	Morning Peak Hour			Evening Peak Hour		
	LOS	Delay (s)	v/c	LOS	Delay (s)	v/c
4 Ehlen Road NE at Butteville Road NE						
2029 Buildout Conditions	D	32	0.53	**F**	63	0.66
2029 Mitigated Conditions (Signalized)	A	8	0.48	A	8	0.48
2029 Mitigated Conditions (Roundabout)	A	8	0.40	A	9	0.51
2034 Mitigated Conditions (Signalized)	A	9	0.53	A	8	0.58
2034 Mitigated Conditions (Roundabout)	A	9	0.46	B	11	0.60

BOLDED results indicate operation above acceptable jurisdictional standards.

The intersections of Ehlen Road NE at the I-5 ramps currently do not meet County or State operational standards. ODOT's IAMP for the interchange is currently under development and will address both immediate and long-term improvements to the interchange.[8] The I-5: Aurora-Donald Intersection Project, Phase 1 project alternative is considering the reconstruction of the existing interchange as a Diverging Diamond Interchange (DDI). Phase 1 of the DDI project will include relocating Bents Road NE,

[7] Marion County, *Marion County Rural Transportation System Plan 2005 Update*, Chapter 8: Roadway System Needs and Recommended Improvements, 2005. https://www.co.marion.or.us/PW/Engineering/rtsp. [8] ODOT, *I-5 at Aurora-Donald Interchange Project, Phase 1*, 2018. http://www.oregon.gov/odot/projects/pages/project-details.aspx?project=19062.

[8] ODOT, *I-5 at Aurora-Donald Interchange Project, Phase 1*, 2018. http://www.oregon.gov/odot/projects/pages/project-details.aspx?project=19062.

constructing a new I-5 bridge and exit ramps, widen Ehlen Road NE, and install traffic signals at the ramp intersections with Ehlen Road NE. The current schedule for Phase 1 includes completing a design by 2020, purchasing right-of-way between 2020 and 2021, and begin construction by 2022 where construction will occur over a half-year timeframe. Phase 1 of the project is currently funded (estimated project cost is $18 million), where the project was originally funded at $3.4 million while the Keep Oregon Moving transportation funding package, HB 2017, allocated just under $25 million for a total of $28.3 million. It is assumed that with implementation of the planned mitigation and subsequent reconstruction of the Aurora-Donald interchange, sufficient capacity to serve future projected traffic volumes will be provided.

Railroad Crossing

A railroad divides the City of Donald, with a single rail crossing on Main Street NE immediately west of Matthieu Street NE. The current crossing offers a high level of crossing protection with flashers and gates that are activated in advance of the crossing. The proposed development is located east of the railroad tracks and the existing crossing is sufficient to accommodate the proposed development without any upgrade of the crossing treatment.

The *Intersection Capacity Analysis* section above does not indicate the need for an additional railroad crossing, strictly from a capacity standpoint. Based on conversations with ODOT Rail, it would very difficult to obtain approval for an additional at-grade crossing since both ODOT Rail and the railroad company itself are very resistant to new at-grade crossings. There is a crossing located approximately 0.65 miles south of the Donald Road/Main Street NE crossing. This crossing would not serve the project area and is also a private crossing. Upgrading the private crossing to a public crossing would effectively be akin to establishing a new public crossing.

Most new crossings are required to be grade separated, with the street going either over or under the railroad. A new crossing in Donald would require grade separation and would be prohibitively expensive. For these reasons, a new rail crossing is not proposed.

Safety Analysis

Crash Data Analysis

Using data obtained from ODOT's Crash Analysis and Reporting Unit, a review of the most recent available five years of crash history (January 2013 to December 2017) at the study intersections was performed. The crash data was evaluated based on the number of crashes, the type of collisions, the severity of the collisions, and the resulting crash rate for the intersection. Crash rates provide the ability to compare safety risks at different intersections by accounting for both the number of crashes that have occurred during the study period and the number of vehicles that typically travel through the intersection. Crash rates were calculated using the common assumption that traffic counted during the evening peak period represents approximately 10 percent of the annual average daily traffic (AADT) at the intersection. Crash rates in excess of 1.0 crashes per million entering vehicles (CMEV) may be indicative of design deficiencies and therefore require a need for further investigation and possible mitigation.

With regard to crash severity, ODOT classifies crashes in the following categories:

- Property Damage Only (PDO);
- Possible Injury – Complaint of Pain (Injury C);
- Non-Incapacitating Injury (Injury B);
- Incapacitating Injury – Bleeding, Broken Bones (Injury A); and
- Fatality or Fatal Injury.

The I-5 ramp intersections along Ehlen Road NE are ODOT facilities which adhere to the crash analysis methodologies within ODOT's APM. According to *Exhibit 4-1: Intersection Crash Rates per MEV by Land Type and Traffic Control* of the APM, intersections which experience crash rates in excess of 90th percentile crash rates should be "flagged for further analysis". For four-legged, stop-controlled intersections in rural settings (i.e. intersections outside City limits), the 90th percentile rate is 1.080 CMEV.

For the purposes of conducting the crash data analysis, the intersection of Ehlen Road NE at Bents Road NE and the I-5 southbound ramps at Ehlen Road NE were treated as a single intersection.

Table 6 provides a summary of crash types while Table 7 summarizes crash severities and rates for each of the study intersections. Crash data is included in the technical appendix to this report.

Table 6: Crash Type Summary

	Intersection	Crash Type							Total Crashes
		Rear End	Turn	Angle	Side Swipe	Fixed Object	Ped/ Bike	Other	
3	Butteville Road NE at Donald Road/Main Street NE	0	0	0	0	0	0	0	0
4	Ehlen Road NE at Butteville Road NE	0	3	15	0	3	0	0	21
5	Ehlen Road NE at Bents Court NE	0	1	0	0	0	0	0	1
6	Ehlen Road NE at Bents Road NE	28	37	8	0	2	0	0	75
7	I-5 SB Ramps at Ehlen Road NE								
8	I-5 NB Ramps at Ehlen Road NE	14	13	1	0	1	0	1	30

Table 7: Crash Severity and Rate Summary

	Intersection	Crash Severity						Total Crashes	AADT	Crash Rate
		PDO	C	B	A	Fatal	Unknown			
3	Butteville Rd NE at Donald Rd/Main St NE	0	0	0	0	0	0	0	4,490	0.00
4	Ehlen Road NE at Butteville Road NE	3	8	7	1	2	0	21	9,050	**1.27**
5	Ehlen Road NE at Bents Court NE	1	0	0	0	0	0	1	11,420	0.05
6	Ehlen Road NE at Bents Road NE	36	25	13	1	0	0	75	16,880	**2.43**
7	I-5 SB Ramps at Ehlen Road NE									
8	I-5 NB Ramps at Ehlen Road NE	16	11	3	0	0	0	30	13,170	**1.25**

BOLDED text indicates a crash rate in excess of either 1.0 CMEV or the 90th Percentile CMEV per ODOT's APM.

Based on a review of the crash data, there were three intersections with high crash rates above 1.00 CMEV. Furthermore, there were four crashes which resulted in injuries consistent with *Injury A* classification or

resulted in a fatality. An in-depth analysis of these intersections and crashes is detailed in the following sections.

Ehlen Road NE at Butteville Road NE

The intersection of Ehlen Road NE at Butteville Road NE had three crashes which were classified as *Injury A* or resulted in a person sustaining fatal injuries.

One crash that was classified as *Injury A* occurred when the driver of a northbound, left-turning passenger car failed to yield right-of-way to an eastbound passenger car. The driver of the northbound vehicle sustained injuries consistent with *Injury A* classification while the driver of the eastbound vehicle sustained no injuries.

Two of the crashes at the intersection resulted in a fatality over the five-year analysis period. One of these crashes occurred on Saturday, April 30th, 2016 at 7:00 PM and involved one westbound passenger vehicle (with two occupants) and one northbound passenger vehicle (with two occupants). Driving conditions at the time of the collision were during dusk with clear weather and dry roadways. The crash occurred when the driver of the northbound vehicle disregarded traffic controls and collided with the westbound vehicle which then overturned after the initial collision. The drivers of both vehicles sustained injuries consistent with *Injury A* classification while the passenger of the westbound vehicle sustained injuries consistent with *Injury B* classification. The passenger of the northbound vehicle sustained fatal injuries.

The second crash which resulted in a fatality occurred on Sunday, July 24th, 2016 at 3:00 PM and involved one westbound passenger vehicle (with two occupants) and one northbound passenger vehicle (with two occupants). Driving conditions at the time of the collision were during the day with clear weather and dry roadways. The crash occurred when the driver of the northbound vehicle disregarded traffic controls and collided with the westbound vehicle which then overturned after the initial collision. The passenger of the northbound vehicle sustained fatal injuries while all other persons involved sustained injuries consistent with *Injury A* classification.

In addition, the intersection had a calculated crash rate above 1.00 CMEV. A significant majority of these collisions were angle-type crashes (approximately 71.4 percent of the collisions) and involved either a northbound or southbound vehicle failing to yield right-of-way to an eastbound/westbound vehicle. The City of Donald and Marion County have acknowledged the intersection is a high crash/severity intersection and have suggested potential future mitigation, such as signalization or reconstructing the intersection as a roundabout. Converting the intersection to a roundabout will encourage slower travel speeds, reduce the severity of future collisions, and is expected to reduce the overall number of crashes which may occur at the intersection.

As of 2017, safety mitigation including the addition of rumble strips to the center lines of both Ehlen Road NE and Butteville Road NE have been constructed. Funds had been allocated by ODOT's Highway Safety Improvement Program for this mitigation as well as the installation of advanced warning signs with motion-detection flashing yellow lights. At the time of writing, the advance warning signs have yet to be installed at the intersection, though funding is currently available.

I-5 NB & SB Ramps at Ehlen Road NE

The I-5 southbound ramp intersection at Ehlen Road NE had one crash which was classified as *Injury A*. The crash occurred when the driver of a passenger car was following too closely and rear-ended another vehicle. After the initial collision, three other vehicles were damaged and some of their occupants injured. All but two people involved in the collision were injured, where one person sustained injuries consistent with *Injury A* classification while the remainder sustained injuries consistent with *Injury C* classification.

Both of the I-5 ramp intersections had calculated crash rates above 1.00 CMEV. A significant majority of the crashes were either turning-movement collisions or rear-end collisions. Based on the current and projected operation of the intersections, as described in the *Intersection Capacity Analysis* section, both intersections are operating well above capacity which may be the main contributing factor to the high number of reported crashes. Provided ODOT's IAMP for the interchange is implemented and the interchange reconstructed, it is assumed that the overall number of crashes at both ramp intersections will decrease.

Analysis Conclusions

Based on a review of the most recent five years of available crash data, the intersection of Ehlen Road NE at Butteville Road NE and the I-5 ramp intersections along Ehlen Road NE are currently operating with crash rates above 1.00 CMEV. However, planned improvements at the aforementioned study intersections are expected to improve safety. No other significant trends or crash patterns were identified at any of the other study intersections that were indicative of safety concerns. Accordingly, no other safety mitigation is recommended per the crash data analysis.

Warrants Analysis

Left-turn lane warrants were evaluated for the westbound approaches of the site access intersections along Donald Road/Main Street NE. A left-turn refuge is primarily a safety consideration for the major street, removing left-turning vehicles from the through traffic stream. The warrants used were developed from the National Cooperative Highway Research Project's (NCHRP) Report 457. These warrants are evaluated based on the number of left-turning vehicles, the number of advancing and opposing vehicles, the number of lanes, and the roadway travel speed.

Left-turn lane warrants are not projected to be met under any of the analysis scenarios for either of the site access intersections along Donald Road/Main Street NE.

Preliminary traffic signal warrants were evaluated for the following study intersections: Butteville Road NE at Donald Road/Main Street NE, Ehlen Road NE at Butteville Road NE, and the future intersection of Ehlen Road NE at Bents Road/Bents Court NE. Signal warrant analysis was conducted 70 percent of standard traffic signal warrants due to the location of the intersections in a community with a population less than 10,000, and with right-turn volumes on the minor-street approach reduced by 25 percent.

Traffic signal warrants were not projected to be met for the intersection of Butteville Road NE at Donald Road/Main Street NE in any of the analysis scenarios.

For the intersection of Ehlen Road NE at Butteville Road NE, traffic signal warrants are projected to be met under year 2029 buildout conditions. As stated previously, however, County officials are also considering a signal or roundabout at this intersection for safety reasons.

Traffic signal warrants were also evaluated for the intersection of Ehlen Road NE at Bents Court NE, assuming the realignment of Bents Road NE to comprise a northern leg of this intersection has already occurred. Preliminary signal warrants are projected to be met under year 2029 buildout conditions. As mentioned previously, a signal is under consideration for this intersection, along with the realignment of Bents Road NE.

Transportation Planning Rule

The Transportation Planning Rule (TPR) is in place to ensure that the transportation system is capable of supporting possible increases in traffic intensity that could result from changes to adopted plans and land-use regulations. It should be noted the TPR was not addressed during the initial urban growth boundary expansion for the project site. The applicable elements of the TPR are each quoted directly in italics below, with responses following.

660-012-0060

(1) If an amendment to a functional plan, an acknowledged comprehensive plan, or a land use regulation (including a zoning map) would significantly affect an existing or planned transportation facility, then the local government must put in place measures as provided in section (2) of this rule, unless the amendment is allowed under section (3), (9) or (10) of this rule. A plan or land use regulation amendment significantly affects a transportation facility if it would:

(a) Change the functional classification of an existing or planned transportation facility (exclusive of correction of map errors in an adopted plan);

(b) Change standards implementing a functional classification system; or

(c) Result in any of the effects listed in paragraphs (A) through (C) of this subsection based on projected conditions measured at the end of the planning period identified in the adopted TSP. As part of evaluating projected conditions, the amount of traffic projected to be generated within the area of the amendment may be reduced if the amendment includes an enforceable, ongoing requirement that would demonstrably limit traffic generation, including, but not limited to, transportation demand management. This reduction may diminish or completely eliminate the significant effect of the amendment.

(A) Types or levels of travel or access that are inconsistent with the functional classification of an existing or planned transportation facility;

(B) Degrade the performance of an existing or planned transportation facility such that it would not meet the performance standards identified in the TSP or comprehensive plan; or

(C) Degrade the performance of an existing or planned transportation facility that is otherwise projected to not meet the performance standards identified in the TSP or comprehensive plan.

Based on the analysis findings in the report, subsections (a) and (b) are not triggered since the proposed subdivision will not impact or alter the functional classification of any existing or planned facility and the proposal does not include a change to any functional classification standards.

Regarding subsection (c), three of the study intersections are currently or projected to operate in excess of acceptable levels of operation per their respective jurisdictional standards. However, these intersections may be reasonably mitigated via planned City/County/ODOT transportation projects or through those suggested within the *Mitigation Analysis* section of this report.

With mitigative measures in place, the proposed development will not degrade the performance of any existing or planned transportation facility below acceptable City, County, or ODOT standards. Accordingly, the Transportation Planning Rule may be satisfied if mitigations are addressed upon development of the site.

Conclusions

The following intersections are projected to operate in excess of their applicable jurisdictional standards:

- Ehlen Road NE at Butteville Road NE during the evening peak hour under year 2029 buildout conditions;
- I-5 southbound ramps at Ehlen Road NE for all analysis scenarios except under existing conditions during the morning peak hour; and
- I-5 northbound ramps at Ehlen Road NE for all analysis scenarios

Per the Marion County Rural Transportation System Plan (TSP), the County is currently considering a roundabout or a traffic signal at the intersection of Ehlen Road NE at Butteville Road NE. Either potential mitigation is projected to improve intersection operation to acceptable levels. Regarding the intersections of Ehlen Road NE at the I-5 ramps, ODOT's IAMP for the interchange is currently under development and will address both immediate and long-term mitigation necessary to improve operation at the interchange. With implementation of the IAMP and subsequent reconstruction of the Aurora-Donald interchange, sufficient capacity to serve future projected traffic volumes will be provided.

All other study intersections are currently operating acceptably per their respective jurisdictional standards and are projected to continue operating acceptably through the 2034 planning horizon.

The intersection of Ehlen Road NE at Butteville Road NE and the I-5 ramp intersections along Ehlen Road NE are currently operating with crash rates above 1.00 CMEV. However, planned improvements at the aforementioned study intersections are expected to improve safety. No other significant trends or crash patterns were identified at any of the other study intersections that were indicative of safety concerns.

Left-turn lane warrants are not projected to be met under any of the analysis scenarios for either of the site access intersections along Donald Road/Main Street NE.

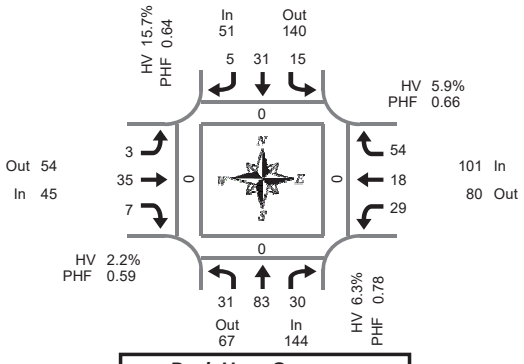
Preliminary traffic signal warrants are projected to be met for the intersections of Ehlen Road NE at Butteville Road NE and Ehlen Road NE at Bents Court NE (with the realignment of Bents Road NE) under year 2029 buildout conditions. Traffic signal warrants are not projected to be met for any of the other study intersections.

Following implementation of the above suggested operational and safety mitigations, the proposed Harvest Gardens Subdivision is not projected to degrade the performance of any other existing or planned transportation facility below acceptable City of Donald, Marion County, or ODOT standards. In addition, the proposal will not impact or alter the functional classification of any existing or planned facility and does not include a change to any functional classification standards. Accordingly, the Transportation Planning Rule is satisfied.

Appendix

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
7:10 AM to 8:10 AM

Butteville Rd NE & Donald Rd NE

Thursday, February 15, 2018
7:00 AM to 9:00 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	1	7	2	0	1	0	0	0	0	1	0	0	1	0	3	0	16	0	0	0	0
7:05 AM	0	4	2	0	1	5	2	0	0	3	1	0	0	1	3	0	22	0	0	0	0
7:10 AM	2	8	2	0	1	3	0	0	0	1	0	0	5	1	5	0	28	0	0	0	0
7:15 AM	5	5	3	0	0	2	0	0	0	2	1	0	3	2	4	0	27	0	0	0	0
7:20 AM	4	1	4	0	1	1	1	0	1	4	2	0	4	2	6	0	31	0	0	0	0
7:25 AM	1	9	2	0	1	4	0	0	0	2	2	0	4	1	5	0	31	0	0	0	0
7:30 AM	3	6	6	0	2	3	0	0	0	1	0	0	2	5	9	0	37	0	0	0	0
7:35 AM	1	4	1	0	1	1	0	0	1	0	0	0	3	2	4	0	18	0	0	0	0
7:40 AM	8	9	2	0	1	2	0	0	0	3	0	0	1	1	5	0	32	0	0	0	0
7:45 AM	3	6	5	0	2	5	3	0	0	8	0	0	0	1	2	0	35	0	0	0	0
7:50 AM	2	8	3	0	2	5	0	0	0	6	1	0	3	0	5	0	35	0	0	0	0
7:55 AM	1	6	1	0	2	1	0	0	1	2	1	0	0	2	4	0	21	0	0	0	0
8:00 AM	1	11	0	0	1	1	1	0	0	2	0	0	4	0	1	0	22	0	0	0	0
8:05 AM	0	10	1	0	1	3	0	0	0	4	0	0	0	1	4	0	24	0	0	0	0
8:10 AM	1	1	1	0	2	5	2	0	1	1	1	0	2	2	1	0	20	0	0	0	0
8:15 AM	0	2	1	0	0	4	0	0	1	1	3	0	3	1	3	0	19	0	0	0	0
8:20 AM	0	5	5	0	0	1	1	0	0	2	1	0	2	2	0	0	19	0	0	0	0
8:25 AM	2	5	2	0	1	5	0	0	1	1	0	0	1	0	5	0	23	0	0	0	0
8:30 AM	0	4	0	0	2	0	1	0	0	1	1	0	2	0	2	0	13	0	0	0	0
8:35 AM	1	3	0	0	1	2	0	0	0	4	1	0	2	1	1	0	16	0	0	0	0
8:40 AM	1	6	1	0	1	2	0	0	0	2	1	0	1	1	4	0	20	0	0	0	0
8:45 AM	0	2	0	0	3	5	0	0	1	1	0	0	0	1	2	0	15	0	0	0	0
8:50 AM	1	1	3	0	1	1	0	0	0	1	0	0	0	2	4	0	14	0	1	0	0
8:55 AM	0	2	2	0	1	3	2	0	1	2	1	0	1	1	1	0	17	0	0	0	0
Total Survey	38	125	49	0	29	64	13	0	8	55	17	0	44	30	83	0	555	0	1	0	0

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	3	19	6	0	3	8	2	0	0	5	1	0	6	2	11	0	66	0	0	0	0
7:15 AM	10	15	9	0	2	7	1	0	1	8	5	0	11	5	15	0	89	0	0	0	0
7:30 AM	12	19	9	0	4	6	0	0	1	4	0	0	6	8	18	0	87	0	0	0	0
7:45 AM	6	20	9	0	6	11	3	0	1	16	2	0	3	3	11	0	91	0	0	0	0
8:00 AM	2	22	2	0	4	9	3	0	1	7	1	0	6	3	6	0	66	0	0	0	0
8:15 AM	2	12	8	0	1	10	1	0	2	4	4	0	6	3	8	0	61	0	0	0	0
8:30 AM	2	13	1	0	4	4	1	0	0	7	3	0	5	2	7	0	49	0	0	0	0
8:45 AM	1	5	5	0	5	9	2	0	2	4	1	0	1	4	7	0	46	0	1	0	0
Total Survey	38	125	49	0	29	64	13	0	8	55	17	0	44	30	83	0	555	0	1	0	0

Peak Hour Summary
7:10 AM to 8:10 AM

By Approach	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	144	67	211	0	51	140	191	0	45	54	99	0	101	80	181	0	341	0	0	0	0
%HV	6.3%				15.7%				2.2%				5.9%				7.0%				
PHF	0.78				0.64				0.59				0.66				0.84				

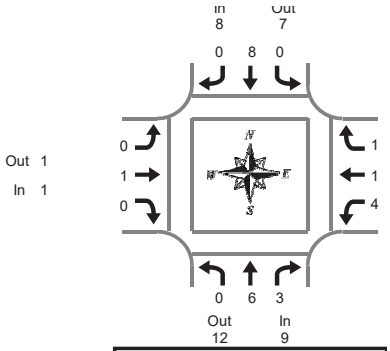
By Movement	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	31	83	30	144	15	31	5	51	3	35	7	45	29	18	54	101	341
%HV	0.0%	7.2%	10.0%	6.3%	0.0%	25.8%	0.0%	15.7%	0.0%	2.9%	0.0%	2.2%	13.8%	5.6%	1.9%	5.9%	7.0%
PHF	0.60	0.77	0.63	0.78	0.63	0.65	0.42	0.64	0.75	0.51	0.35	0.59	0.60	0.56	0.68	0.66	0.84

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	31	73	33	0	15	32	6	0	3	33	8	0	26	18	55	0	333	0	0	0	0
7:15 AM	30	76	29	0	16	33	7	0	4	35	8	0	26	19	50	0	333	0	0	0	0
7:30 AM	22	73	28	0	15	36	7	0	5	31	7	0	21	17	43	0	305	0	0	0	0
7:45 AM	12	67	20	0	15	34	8	0	4	34	10	0	20	11	32	0	267	0	0	0	0
8:00 AM	7	52	16	0	14	32	7	0	5	22	9	0	18	12	28	0	222	0	1	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Butteville Rd NE & Donald Rd NE

Thursday, February 15, 2018
7:00 AM to 9:00 AM

Peak Hour Summary
7:10 AM to 8:10 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:10 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
7:20 AM	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	2
7:25 AM	0	0	1	1	0	2	0	2	0	0	0	0	2	0	0	2	5
7:30 AM	0	1	1	2	0	1	0	1	0	0	0	0	0	0	0	0	3
7:35 AM	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2
7:40 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
7:50 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
7:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
8:00 AM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
8:05 AM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
8:10 AM	0	0	1	1	0	1	0	1	0	0	0	0	0	0	1	1	3
8:15 AM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	2
8:20 AM	0	1	2	3	0	0	1	1	0	0	0	0	0	0	0	0	4
8:25 AM	0	0	1	1	0	3	0	3	0	0	0	0	1	0	0	1	5
8:30 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:35 AM	0	0	0	0	0	1	0	1	0	1	0	1	0	0	0	0	2
8:40 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
8:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:55 AM	0	0	0	0	0	1	0	1	0	1	0	1	0	0	0	0	2
Total Survey	1	8	8	17	0	16	1	17	0	3	0	3	5	1	3	9	46

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	1	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
7:15 AM	0	1	2	3	0	2	0	2	0	0	0	0	3	0	0	3	8
7:30 AM	0	3	1	4	0	1	0	1	0	0	0	0	1	0	0	1	6
7:45 AM	0	0	0	0	0	3	0	3	0	0	0	0	0	1	1	2	5
8:00 AM	0	2	1	3	0	2	0	2	0	1	0	1	0	0	1	1	7
8:15 AM	0	1	4	5	0	3	1	4	0	0	0	0	1	0	1	2	11
8:30 AM	0	1	0	1	0	2	0	2	0	1	0	1	0	0	0	0	4
8:45 AM	0	0	0	0	0	2	0	2	0	1	0	1	0	0	0	0	3
Total Survey	1	8	8	17	0	16	1	17	0	3	0	3	5	1	3	9	46

Heavy Vehicle Peak Hour Summary
7:10 AM to 8:10 AM

By Approach	Northbound Butteville Rd NE			Southbound Butteville Rd NE			Eastbound Donald Rd NE			Westbound Donald Rd NE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	9	12	21	8	7	15	1	1	2	6	4	10	24
PHF	0.45			0.67			0.25			0.50			0.60

By Movement	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	6	3	9	0	8	0	8	0	1	0	1	4	1	1	6	24
PHF	0.00	0.50	0.25	0.45	0.00	0.67	0.00	0.67	0.00	0.25	0.00	0.25	0.33	0.25	0.25	0.50	0.60

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

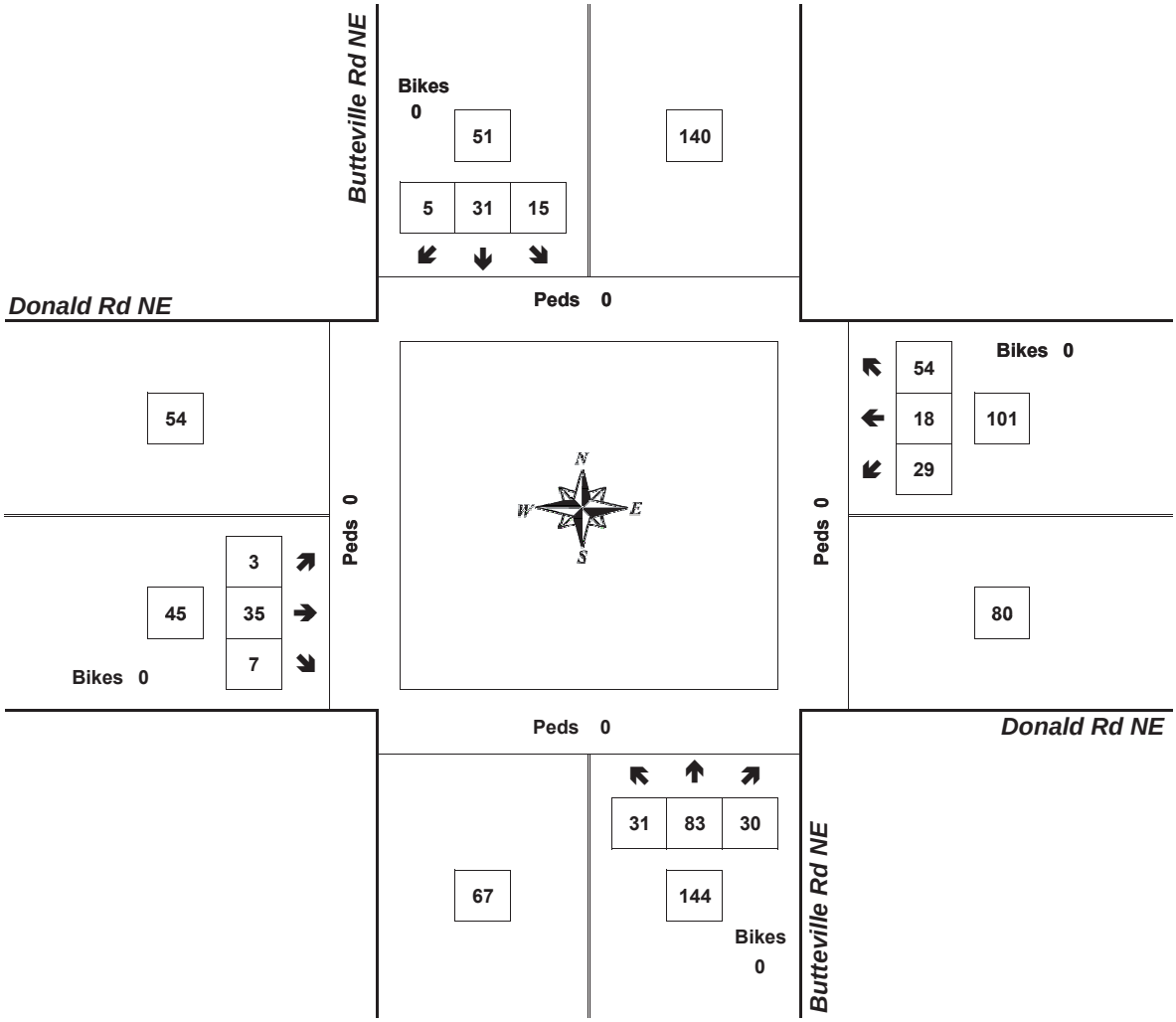
Interval Start Time	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	1	4	3	8	0	7	0	7	0	0	0	0	4	1	1	6	21
7:15 AM	0	6	4	10	0	8	0	8	0	1	0	1	4	1	2	7	26
7:30 AM	0	6	6	12	0	9	1	10	0	1	0	1	2	1	3	6	29
7:45 AM	0	4	5	9	0	10	1	11	0	2	0	2	1	1	3	5	27
8:00 AM	0	4	5	9	0	9	1	10	0	3	0	3	1	0	2	3	25

Peak Hour Summary

Clay Carney
(503) 833-2740

Butteville Rd NE & Donald Rd NE

7:10 AM to 8:10 AM
Thursday, February 15, 2018

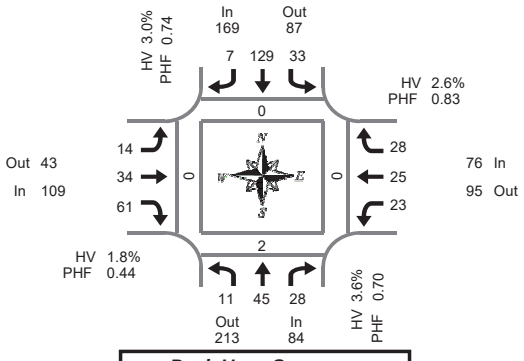


Approach	PHF	HV%	Volume
EB	0.59	2.2%	45
WB	0.66	5.9%	101
NB	0.78	6.3%	144
SB	0.64	15.7%	51
Intersection	0.84	7.0%	341

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Butteville Rd NE & Donald Rd NE

Thursday, February 15, 2018
4:00 PM to 6:00 PM

Peak Hour Summary
4:20 PM to 5:20 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	5	2	2	0	2	7	1	0	0	3	2	0	2	7	3	0	36	0	0	0	0
4:05 PM	0	6	1	0	2	7	0	0	0	2	5	0	2	6	0	0	31	0	0	0	0
4:10 PM	1	3	2	0	1	9	0	0	1	2	1	0	2	3	1	0	26	0	0	0	0
4:15 PM	2	6	2	1	2	5	1	0	1	5	3	0	1	1	5	0	34	0	0	0	0
4:20 PM	2	5	3	0	2	12	1	0	0	5	3	0	0	4	8	0	45	0	0	0	0
4:25 PM	1	6	1	0	4	5	1	1	1	1	2	0	3	2	1	0	28	0	0	0	0
4:30 PM	0	4	5	0	1	11	0	0	6	7	12	0	3	1	1	1	51	0	2	0	0
4:35 PM	2	5	6	0	3	8	1	0	3	5	11	0	1	3	1	0	49	0	0	0	0
4:40 PM	0	3	3	0	2	5	0	0	3	1	14	0	1	4	2	0	38	0	0	0	0
4:45 PM	0	1	1	0	2	9	0	0	0	1	4	0	5	0	0	0	23	0	0	0	0
4:50 PM	1	3	4	0	5	5	0	0	0	2	7	0	1	1	5	0	34	0	0	0	0
4:55 PM	1	4	0	0	1	18	0	0	1	1	3	0	1	1	3	0	34	0	0	0	0
5:00 PM	2	1	1	0	5	18	2	1	0	1	1	0	4	2	2	0	39	0	0	0	0
5:05 PM	0	2	2	0	2	10	1	0	0	3	1	0	3	2	2	0	28	0	0	0	0
5:10 PM	1	4	0	0	4	15	0	0	0	4	1	0	0	3	1	0	33	0	0	0	0
5:15 PM	1	7	2	0	2	13	1	0	0	3	2	0	1	2	2	0	36	0	0	0	0
5:20 PM	0	1	2	0	5	5	0	0	1	0	0	0	1	2	1	0	18	0	0	0	0
5:25 PM	1	3	1	0	5	4	0	0	0	1	3	0	2	2	5	0	27	0	0	0	0
5:30 PM	0	2	0	0	5	9	0	0	0	2	2	0	2	0	3	0	25	0	1	1	0
5:35 PM	0	1	2	0	1	10	0	0	0	1	0	0	0	2	1	0	18	0	0	0	0
5:40 PM	0	5	1	0	4	7	0	0	0	5	1	0	1	0	2	0	26	0	0	0	0
5:45 PM	1	2	1	0	4	8	1	0	0	3	1	0	2	1	0	0	24	0	0	0	0
5:50 PM	0	5	3	0	3	7	0	0	0	0	0	0	2	0	1	0	21	0	0	0	0
5:55 PM	0	0	2	0	2	8	0	0	0	1	0	0	1	3	3	0	20	0	1	0	0
Total Survey	21	81	47	1	69	215	10	2	17	59	79	0	41	52	53	1	744	0	4	1	0

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	6	11	5	0	5	23	1	0	1	7	8	0	6	16	4	0	93	0	0	0	0
4:15 PM	5	17	6	1	8	22	3	1	2	11	8	0	4	7	14	0	107	0	0	0	0
4:30 PM	2	12	14	0	6	24	1	0	12	13	37	0	5	8	4	1	138	0	2	0	0
4:45 PM	2	8	5	0	8	32	0	0	1	4	14	0	7	2	8	0	91	0	0	0	0
5:00 PM	3	7	3	0	11	43	3	1	0	8	3	0	7	7	5	0	100	0	0	0	0
5:15 PM	2	11	5	0	12	22	1	0	1	4	5	0	4	6	8	0	81	0	0	0	0
5:30 PM	0	8	3	0	10	26	0	0	0	8	3	0	3	2	6	0	69	0	1	1	0
5:45 PM	1	7	6	0	9	23	1	0	0	4	1	0	5	4	4	0	65	0	1	0	0
Total Survey	21	81	47	1	69	215	10	2	17	59	79	0	41	52	53	1	744	0	4	1	0

Peak Hour Summary
4:20 PM to 5:20 PM

By Approach	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	84	213	297	0	169	87	256	2	109	43	152	0	76	95	171	1	438	0	2	0	0
%HV	3.6%				3.0%				1.8%				2.6%				2.7%				
PHF	0.70				0.74				0.44				0.83				0.79				

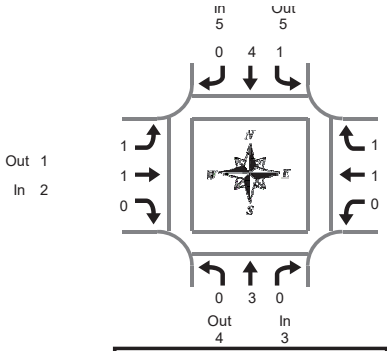
By Movement	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	11	45	28	84	33	129	7	169	14	34	61	109	23	25	28	76	438
%HV	0.0%	6.7%	0.0%	3.6%	3.0%	3.1%	0.0%	3.0%	7.1%	2.9%	0.0%	1.8%	0.0%	4.0%	3.6%	2.6%	2.7%
PHF	0.69	0.75	0.50	0.70	0.75	0.70	0.58	0.74	0.29	0.65	0.41	0.44	0.72	0.78	0.70	0.83	0.79

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	15	48	30	1	27	101	5	1	16	35	67	0	22	33	30	1	429	0	2	0	0
4:15 PM	12	44	28	1	33	121	7	2	15	36	62	0	23	24	31	1	436	0	2	0	0
4:30 PM	9	38	27	0	37	121	5	1	14	29	59	0	23	23	25	1	410	0	2	0	0
4:45 PM	7	34	16	0	41	123	4	1	2	24	25	0	21	17	27	0	341	0	1	1	0
5:00 PM	6	33	17	0	42	114	5	1	1	24	12	0	19	19	23	0	315	0	2	1	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Butteville Rd NE & Donald Rd NE

Thursday, February 15, 2018
4:00 PM to 6:00 PM

Peak Hour Summary
4:20 PM to 5:20 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	1	1	0	1	0	1	0	0	0	0	1	0	0	1	3
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:10 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0	0	2
4:20 PM	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0	3
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
4:40 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:55 PM	0	0	0	0	0	1	0	1	1	0	0	1	0	1	0	1	3
5:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
5:05 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
5:10 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:25 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	2
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:40 PM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
5:45 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	7	1	8	2	8	1	11	2	1	0	3	1	1	1	3	25

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	1	1	0	2	0	2	0	0	0	0	1	0	0	1	4
4:15 PM	0	1	0	1	0	2	1	3	1	0	0	1	0	0	0	0	5
4:30 PM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	1	1	3
4:45 PM	0	0	0	0	0	1	0	1	1	0	0	1	0	1	0	1	3
5:00 PM	0	0	0	0	1	1	0	2	0	1	0	1	0	0	0	0	3
5:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	2	0	2	1	1	0	2	0	0	0	0	0	0	0	0	4
5:45 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
Total Survey	0	7	1	8	2	8	1	11	2	1	0	3	1	1	1	3	25

Heavy Vehicle Peak Hour Summary
4:20 PM to 5:20 PM

By Approach	Northbound Butteville Rd NE			Southbound Butteville Rd NE			Eastbound Donald Rd NE			Westbound Donald Rd NE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	3	4	7	5	5	10	2	1	3	2	2	4	12
PHF	0.38			0.63			0.25			0.50			0.60

By Movement	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	3	0	3	1	4	0	5	1	1	0	2	0	1	1	2	12
PHF	0.00	0.38	0.00	0.38	0.25	0.50	0.00	0.63	0.25	0.25	0.00	0.25	0.00	0.25	0.25	0.50	0.60

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

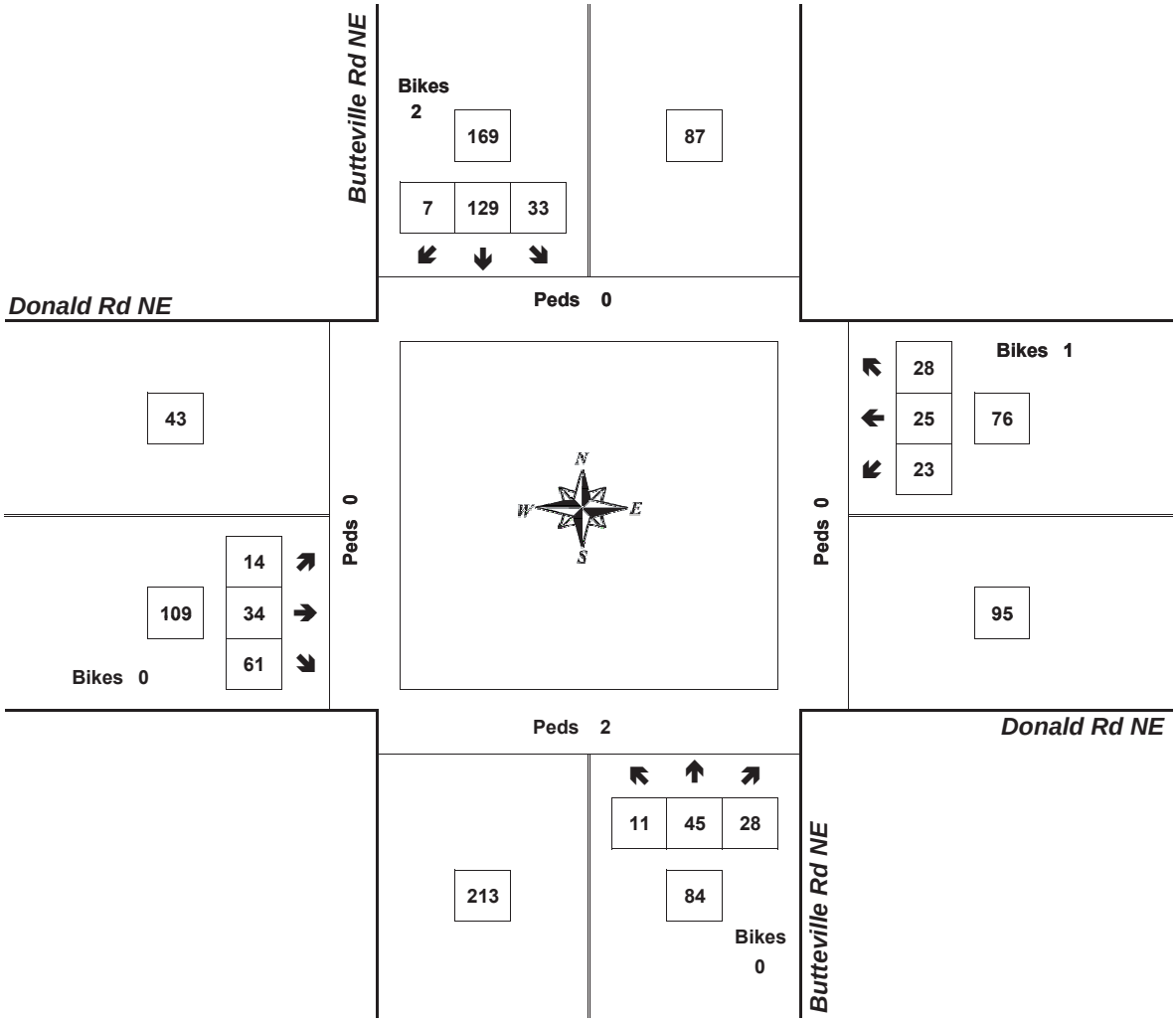
Interval Start Time	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	3	1	4	0	5	1	6	2	0	0	2	1	1	1	3	15
4:15 PM	0	3	0	3	1	4	1	6	2	1	0	3	0	1	1	2	14
4:30 PM	0	3	0	3	1	2	0	3	1	1	0	2	0	1	1	2	10
4:45 PM	0	3	0	3	2	3	0	5	1	1	0	2	0	1	0	1	11
5:00 PM	0	4	0	4	2	3	0	5	0	1	0	1	0	0	0	0	10

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Butteville Rd NE & Donald Rd NE

4:20 PM to 5:20 PM
Thursday, February 15, 2018

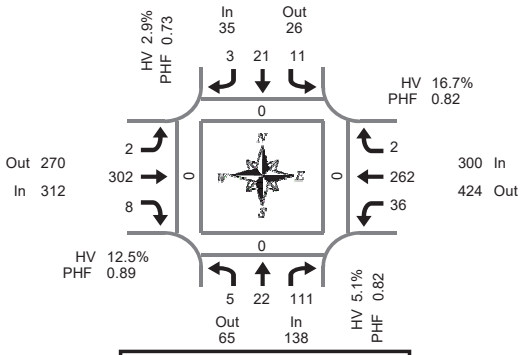


Approach	PHF	HV%	Volume
EB	0.44	1.8%	109
WB	0.83	2.6%	76
NB	0.70	3.6%	84
SB	0.74	3.0%	169
Intersection	0.79	2.7%	438

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Butteville Rd NE & Ehlen Rd NE

Thursday, February 15, 2018
7:00 AM to 9:00 AM

Peak Hour Summary
7:00 AM to 8:00 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	1	4	16	0	0	1	0	0	1	33	1	0	0	17	0	0	74	0	0	0	0
7:05 AM	1	1	9	0	1	4	0	0	0	25	1	0	5	17	0	0	64	0	0	0	0
7:10 AM	1	1	8	0	0	0	0	0	0	27	0	0	4	22	0	0	63	0	0	0	0
7:15 AM	0	2	9	0	3	1	1	0	0	25	0	0	0	24	0	0	65	0	0	0	0
7:20 AM	0	2	3	0	0	3	0	0	0	25	0	0	1	26	1	0	61	0	0	0	0
7:25 AM	0	0	12	0	2	0	0	0	0	24	2	0	4	22	1	0	67	0	0	0	0
7:30 AM	0	3	10	0	2	1	1	0	0	26	0	0	1	24	0	0	68	0	0	0	0
7:35 AM	0	1	14	0	2	3	1	0	0	27	1	0	1	18	0	0	68	0	0	0	0
7:40 AM	1	3	7	0	0	2	0	0	0	15	1	0	2	18	0	0	49	0	0	0	0
7:45 AM	0	0	9	0	0	2	0	0	1	24	0	0	6	24	0	0	66	0	0	0	0
7:50 AM	0	2	5	0	0	2	0	0	0	21	0	0	8	22	0	0	60	0	0	0	0
7:55 AM	1	3	9	0	1	2	0	0	0	30	2	0	4	28	0	0	80	0	0	0	0
8:00 AM	0	5	9	0	0	2	0	0	1	25	0	0	5	20	0	0	67	0	0	0	0
8:05 AM	0	3	11	0	1	2	0	0	0	19	0	0	3	30	0	0	69	0	0	0	0
8:10 AM	0	2	6	0	1	3	0	0	0	21	0	0	4	21	0	0	58	0	0	0	0
8:15 AM	0	0	4	0	0	2	0	0	1	12	0	0	5	25	0	0	49	0	0	0	0
8:20 AM	0	0	4	0	0	1	1	0	0	25	0	0	3	10	0	0	44	0	0	0	0
8:25 AM	0	0	7	0	0	2	0	0	1	24	3	0	4	18	0	0	59	0	0	0	0
8:30 AM	0	2	11	0	2	1	0	0	0	16	0	0	3	30	0	0	65	0	0	0	0
8:35 AM	0	1	4	0	0	0	0	0	0	21	0	0	3	14	0	0	43	0	0	0	0
8:40 AM	1	1	5	0	1	2	1	0	0	21	0	0	4	12	0	0	48	0	0	0	0
8:45 AM	0	1	6	0	1	3	0	0	1	25	1	0	4	19	0	0	61	0	0	0	0
8:50 AM	0	1	7	0	0	2	1	0	1	22	1	0	4	16	1	0	56	0	0	0	0
8:55 AM	0	0	5	0	0	3	0	0	0	20	0	0	9	14	0	0	51	0	0	0	0
Total Survey	6	38	190	0	17	44	6	0	7	553	13	0	87	491	3	0	1,455	0	0	0	0

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	3	6	33	0	1	5	0	0	1	85	2	0	9	56	0	0	201	0	0	0	0
7:15 AM	0	4	24	0	5	4	1	0	0	74	2	0	5	72	2	0	193	0	0	0	0
7:30 AM	1	7	31	0	4	6	2	0	0	68	2	0	4	60	0	0	185	0	0	0	0
7:45 AM	1	5	23	0	1	6	0	0	1	75	2	0	18	74	0	0	206	0	0	0	0
8:00 AM	0	10	26	0	2	7	0	0	1	65	0	0	12	71	0	0	194	0	0	0	0
8:15 AM	0	0	15	0	0	5	1	0	2	61	3	0	12	53	0	0	152	0	0	0	0
8:30 AM	1	4	20	0	3	3	1	0	0	58	0	0	10	56	0	0	156	0	0	0	0
8:45 AM	0	2	18	0	1	8	1	0	2	67	2	0	17	49	1	0	168	0	0	0	0
Total Survey	6	38	190	0	17	44	6	0	7	553	13	0	87	491	3	0	1,455	0	0	0	0

Peak Hour Summary
7:00 AM to 8:00 AM

By Approach	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	138	65	203	0	35	26	61	0	312	270	582	0	300	424	724	0	785	0	0	0	0
%HV	5.1%				2.9%				12.5%				16.7%				12.4%				
PHF	0.82				0.73				0.89				0.82				0.95				

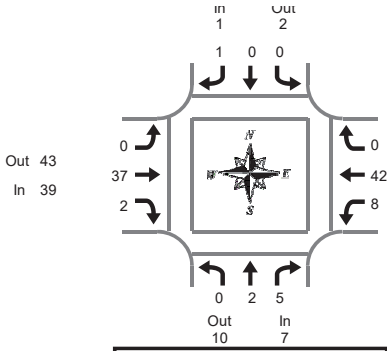
By Movement	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	5	22	111	138	11	21	3	35	2	302	8	312	36	262	2	300	785
%HV	0.0%	9.1%	4.5%	5.1%	0.0%	0.0%	33.3%	2.9%	0.0%	12.3%	25.0%	12.5%	22.2%	16.0%	0.0%	16.7%	12.4%
PHF	0.42	0.79	0.77	0.82	0.46	0.75	0.38	0.73	0.50	0.89	0.67	0.89	0.50	0.89	0.25	0.82	0.95

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	5	22	111	0	11	21	3	0	2	302	8	0	36	262	2	0	785	0	0	0	0
7:15 AM	2	26	104	0	12	23	3	0	2	282	6	0	39	277	2	0	778	0	0	0	0
7:30 AM	2	22	95	0	7	24	3	0	4	269	7	0	46	258	0	0	737	0	0	0	0
7:45 AM	2	19	84	0	6	21	2	0	4	259	5	0	52	254	0	0	708	0	0	0	0
8:00 AM	1	16	79	0	6	23	3	0	5	251	5	0	51	229	1	0	670	0	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Butteville Rd NE & Ehlen Rd NE

Thursday, February 15, 2018
7:00 AM to 9:00 AM

Peak Hour Summary
7:00 AM to 8:00 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	1	0	1	0	0	0	0	0	3	0	3	0	6	0	6	10
7:05 AM	0	0	0	0	0	0	0	0	0	6	0	6	1	4	0	5	11
7:10 AM	0	0	0	0	0	0	0	0	0	6	0	6	1	2	0	3	9
7:15 AM	0	0	1	1	0	0	1	1	0	4	0	4	0	4	0	4	10
7:20 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	3
7:25 AM	0	0	0	0	0	0	0	0	0	4	1	5	1	2	0	3	8
7:30 AM	0	0	0	0	0	0	0	0	0	5	0	5	1	7	0	8	13
7:35 AM	0	0	3	3	0	0	0	0	0	1	0	1	0	2	0	2	6
7:40 AM	0	1	0	1	0	0	0	0	0	1	0	1	0	4	0	4	6
7:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	1	4	0	5	6
7:50 AM	0	0	1	1	0	0	0	0	0	0	0	0	3	3	0	6	7
7:55 AM	0	0	0	0	0	0	0	0	0	5	1	6	0	2	0	2	8
8:00 AM	0	1	1	2	0	0	0	0	0	3	0	3	0	6	0	6	11
8:05 AM	0	0	1	1	0	0	0	0	0	5	0	5	1	7	0	8	14
8:10 AM	0	1	0	1	0	1	0	1	0	3	0	3	0	8	0	8	13
8:15 AM	0	0	1	1	0	0	0	0	0	2	0	2	0	6	0	6	9
8:20 AM	0	0	1	1	0	0	1	1	0	4	0	4	1	1	0	2	8
8:25 AM	0	0	0	0	0	2	0	2	0	5	1	6	0	1	0	1	9
8:30 AM	0	0	2	2	0	0	0	0	0	1	0	1	0	7	0	7	10
8:35 AM	0	0	0	0	0	0	0	0	0	5	0	5	1	4	0	5	10
8:40 AM	0	0	0	0	0	0	1	1	0	2	0	2	3	4	0	7	10
8:45 AM	0	0	0	0	0	0	0	0	0	3	0	3	0	2	0	2	5
8:50 AM	0	0	1	1	0	0	0	0	0	7	0	7	0	3	0	3	11
8:55 AM	0	0	0	0	0	2	0	2	0	5	0	5	1	4	0	5	12
Total Survey	0	4	12	16	0	5	3	8	0	82	3	85	15	95	0	110	219

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	1	0	1	0	0	0	0	0	15	0	15	2	12	0	14	30
7:15 AM	0	0	1	1	0	0	1	1	0	9	1	10	1	8	0	9	21
7:30 AM	0	1	3	4	0	0	0	0	0	7	0	7	1	13	0	14	25
7:45 AM	0	0	1	1	0	0	0	0	0	6	1	7	4	9	0	13	21
8:00 AM	0	2	2	4	0	1	0	1	0	11	0	11	1	21	0	22	38
8:15 AM	0	0	2	2	0	2	1	3	0	11	1	12	1	8	0	9	26
8:30 AM	0	0	2	2	0	0	1	1	0	8	0	8	4	15	0	19	30
8:45 AM	0	0	1	1	0	2	0	2	0	15	0	15	1	9	0	10	28
Total Survey	0	4	12	16	0	5	3	8	0	82	3	85	15	95	0	110	219

Heavy Vehicle Peak Hour Summary
7:00 AM to 8:00 AM

By Approach	Northbound Butteville Rd NE			Southbound Butteville Rd NE			Eastbound Ehlen Rd NE			Westbound Ehlen Rd NE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	7	10	17	1	2	3	39	43	82	50	42	92	97
PHF	0.44			0.25			0.61			0.83			0.81

By Movement	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	2	5	7	0	0	1	1	0	37	2	39	8	42	0	50	97
PHF	0.00	0.50	0.42	0.44	0.00	0.00	0.25	0.25	0.00	0.58	0.50	0.61	0.50	0.81	0.00	0.83	0.81

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

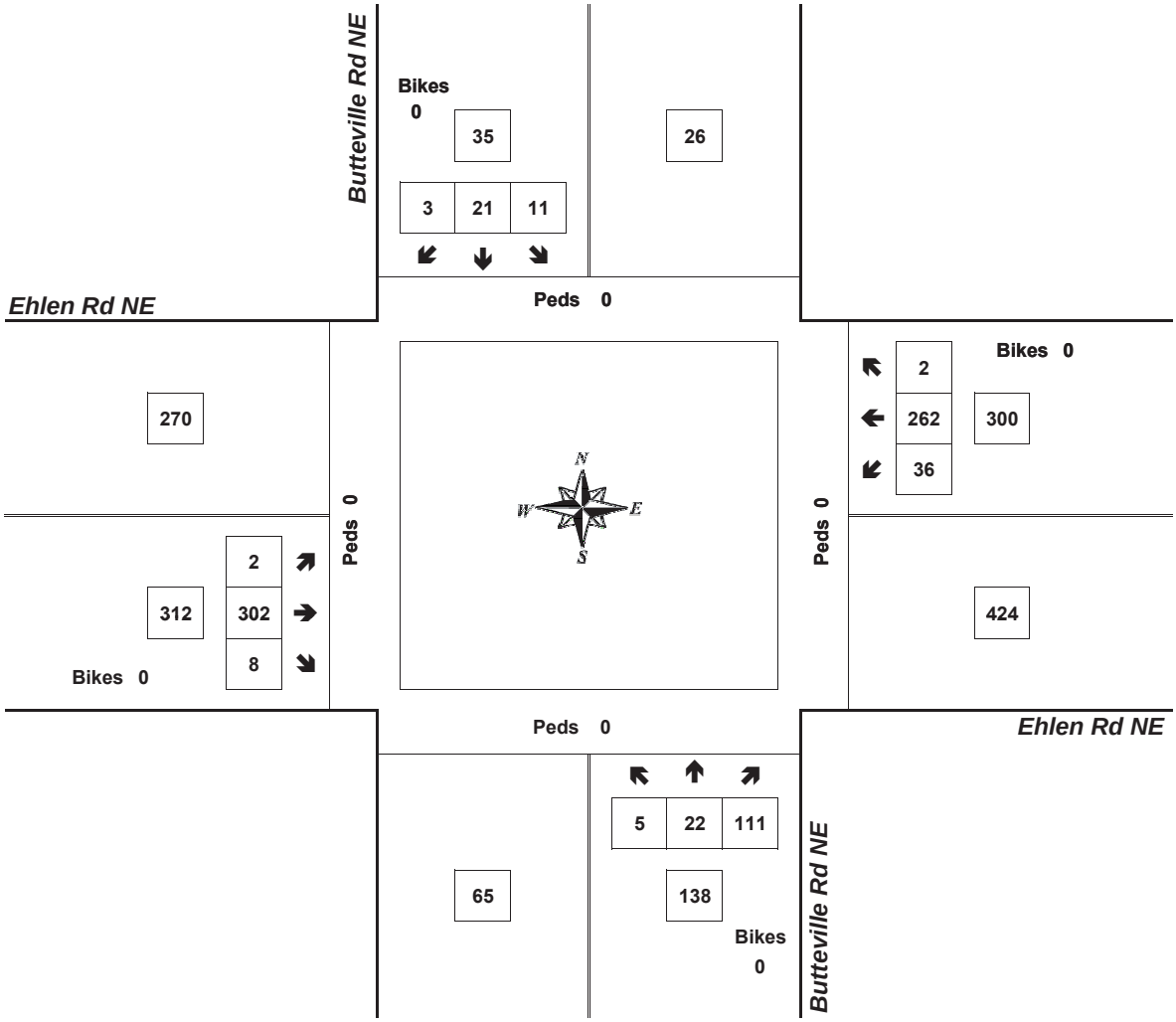
Interval Start Time	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	2	5	7	0	0	1	1	0	37	2	39	8	42	0	50	97
7:15 AM	0	3	7	10	0	1	1	2	0	33	2	35	7	51	0	58	105
7:30 AM	0	3	8	11	0	3	1	4	0	35	2	37	7	51	0	58	110
7:45 AM	0	2	7	9	0	3	2	5	0	36	2	38	10	53	0	63	115
8:00 AM	0	2	7	9	0	5	2	7	0	45	1	46	7	53	0	60	122

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Butteville Rd NE & Ehlen Rd NE

7:00 AM to 8:00 AM
Thursday, February 15, 2018

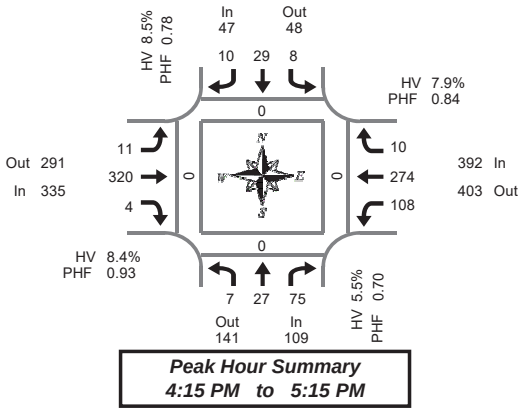


Approach	PHF	HV%	Volume
EB	0.89	12.5%	312
WB	0.82	16.7%	300
NB	0.82	5.1%	138
SB	0.73	2.9%	35
Intersection	0.95	12.4%	785

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:15 PM to 5:15 PM

Butteville Rd NE & Ehlen Rd NE

Thursday, February 15, 2018
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	1	2	7	0	0	2	1	0	0	23	0	0	9	20	2	0	67	0	0	0	0
4:05 PM	1	1	5	0	0	2	0	0	1	25	1	0	10	17	2	0	65	0	0	0	0
4:10 PM	0	1	3	0	1	4	0	0	0	28	0	0	7	25	1	0	70	0	0	0	0
4:15 PM	0	1	5	0	0	3	0	0	0	36	0	0	3	25	0	0	73	0	0	0	0
4:20 PM	3	3	10	1	1	5	1	0	2	18	0	0	9	14	0	0	66	0	0	0	0
4:25 PM	0	5	7	0	1	0	2	0	1	29	2	0	9	20	1	0	77	0	0	0	0
4:30 PM	0	3	8	0	0	1	2	0	1	25	0	0	11	14	1	0	66	0	0	0	0
4:35 PM	0	0	10	0	1	1	1	0	2	28	0	0	10	23	0	0	76	0	0	0	0
4:40 PM	2	2	7	0	3	4	1	0	0	25	0	0	4	20	1	0	69	0	0	0	0
4:45 PM	0	3	3	0	0	0	1	0	1	34	0	0	10	22	4	0	78	0	0	0	0
4:50 PM	1	1	3	0	0	2	1	0	0	18	0	0	9	31	2	0	68	0	0	0	0
4:55 PM	0	7	4	0	0	1	0	0	2	27	2	0	12	27	0	0	82	0	0	0	0
5:00 PM	0	1	7	0	0	6	1	1	0	30	0	0	10	21	1	0	77	0	0	0	0
5:05 PM	1	1	4	0	1	2	0	0	2	26	0	0	3	27	0	0	67	0	0	0	0
5:10 PM	0	0	7	0	1	4	0	0	0	24	0	0	18	30	0	0	84	0	0	0	0
5:15 PM	0	4	3	1	4	1	0	0	1	32	0	0	13	15	0	0	73	0	0	0	0
5:20 PM	0	2	2	0	0	4	0	0	2	21	1	0	8	19	0	0	59	0	0	0	0
5:25 PM	1	1	4	0	0	3	0	0	1	25	0	0	8	28	0	0	71	0	0	0	0
5:30 PM	1	2	5	0	0	3	0	0	0	13	0	0	9	26	1	0	60	0	0	0	0
5:35 PM	0	1	1	0	2	3	0	0	1	26	0	0	9	23	1	0	67	0	0	0	0
5:40 PM	0	1	7	0	0	2	0	0	0	24	0	0	7	27	1	0	69	0	0	0	0
5:45 PM	1	2	3	0	0	2	0	0	0	23	0	0	10	15	0	0	56	0	0	0	0
5:50 PM	0	0	3	0	0	1	1	0	0	23	1	0	9	17	1	0	56	0	0	0	0
5:55 PM	0	2	2	0	1	1	0	0	0	23	0	0	10	19	0	0	58	0	0	0	0
Total Survey	12	46	120	2	16	57	12	1	17	606	7	0	217	525	19	0	1,654	0	0	0	0

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	2	4	15	0	1	8	1	0	1	76	1	0	26	62	5	0	202	0	0	0	0
4:15 PM	3	9	22	1	2	8	3	0	3	83	2	0	21	59	1	0	216	0	0	0	0
4:30 PM	2	5	25	0	4	6	4	0	3	78	0	0	25	57	2	0	211	0	0	0	0
4:45 PM	1	11	10	0	0	3	2	0	3	79	2	0	31	80	6	0	228	0	0	0	0
5:00 PM	1	2	18	0	2	12	1	1	2	80	0	0	31	78	1	0	228	0	0	0	0
5:15 PM	1	7	9	1	4	8	0	0	4	78	1	0	29	62	0	0	203	0	0	0	0
5:30 PM	1	4	13	0	2	8	0	0	1	63	0	0	25	76	3	0	196	0	0	0	0
5:45 PM	1	4	8	0	1	4	1	0	0	69	1	0	29	51	1	0	170	0	0	0	0
Total Survey	12	46	120	2	16	57	12	1	17	606	7	0	217	525	19	0	1,654	0	0	0	0

Peak Hour Summary
4:15 PM to 5:15 PM

By Approach	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	109	141	250	1	47	48	95	1	335	291	626	0	392	403	795	0	883	0	0	0	0
%HV	5.5%				8.5%				8.4%				7.9%				7.8%				
PHF	0.70				0.78				0.93				0.84				0.97				

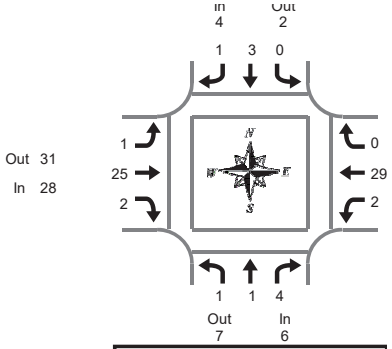
By Movement	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	7	27	75	109	8	29	10	47	11	320	4	335	108	274	10	392	883
%HV	14.3%	3.7%	5.3%	5.5%	0.0%	10.3%	10.0%	8.5%	9.1%	7.8%	50.0%	8.4%	1.9%	10.6%	0.0%	7.9%	7.8%
PHF	0.58	0.61	0.75	0.70	0.50	0.60	0.50	0.78	0.69	0.92	0.50	0.93	0.87	0.86	0.36	0.84	0.97

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	8	29	72	1	7	25	10	0	10	316	5	0	103	258	14	0	857	0	0	0	0
4:15 PM	7	27	75	1	8	29	10	1	11	320	4	0	108	274	10	0	883	0	0	0	0
4:30 PM	5	25	62	1	10	29	7	1	12	315	3	0	116	277	9	0	870	0	0	0	0
4:45 PM	4	24	50	1	8	31	3	1	10	300	3	0	116	296	10	0	855	0	0	0	0
5:00 PM	4	17	48	1	9	32	2	1	7	290	2	0	114	267	5	0	797	0	0	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
4:15 PM to 5:15 PM

Butteville Rd NE & Ehlen Rd NE

Thursday, February 15, 2018
4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	1	1	0	0	0	0	0	1	0	1	1	1	0	2	4
4:05 PM	0	0	0	0	0	0	0	0	1	5	0	6	2	1	1	4	10
4:10 PM	0	0	0	0	0	1	0	1	0	2	0	2	0	1	0	1	4
4:15 PM	0	0	0	0	0	1	0	1	0	6	0	6	0	1	0	1	8
4:20 PM	1	0	1	2	0	1	0	1	0	1	0	1	0	1	0	1	5
4:25 PM	0	0	0	0	0	0	0	0	0	2	0	2	1	2	0	3	5
4:30 PM	0	0	1	1	0	0	1	1	0	1	0	1	0	2	0	2	5
4:35 PM	0	0	1	1	0	0	0	0	0	3	0	3	0	4	0	4	8
4:40 PM	0	0	1	1	0	0	0	0	0	1	0	1	0	2	0	2	4
4:45 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	2	0	2	4
4:50 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	5	0	5	6
4:55 PM	0	1	0	1	0	0	0	0	0	0	2	2	0	5	0	5	8
5:00 PM	0	0	0	0	0	1	0	1	0	4	0	4	0	1	0	1	6
5:05 PM	0	0	0	0	0	0	0	0	1	3	0	4	0	2	0	2	6
5:10 PM	0	0	0	0	0	0	0	0	0	1	0	1	1	2	0	3	4
5:15 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	1	0	1	3
5:20 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
5:25 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
5:40 PM	0	0	1	1	0	0	0	0	0	1	0	1	0	0	0	0	2
5:45 PM	0	1	0	1	0	0	0	0	0	5	0	5	1	2	0	3	9
5:50 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:55 PM	0	0	0	0	0	0	0	0	0	6	0	6	0	2	0	2	8
Total Survey	1	2	8	11	0	4	1	5	2	48	2	52	6	38	1	45	113

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	1	1	0	1	0	1	1	8	0	9	3	3	1	7	18
4:15 PM	1	0	1	2	0	2	0	2	0	9	0	9	1	4	0	5	18
4:30 PM	0	0	3	3	0	0	1	1	0	5	0	5	0	8	0	8	17
4:45 PM	0	1	0	1	0	0	0	0	0	3	2	5	0	12	0	12	18
5:00 PM	0	0	0	0	0	1	0	1	1	8	0	9	1	5	0	6	16
5:15 PM	0	0	1	1	0	0	0	0	0	3	0	3	0	1	0	1	5
5:30 PM	0	0	1	1	0	0	0	0	0	1	0	1	0	1	0	1	3
5:45 PM	0	1	1	2	0	0	0	0	0	11	0	11	1	4	0	5	18
Total Survey	1	2	8	11	0	4	1	5	2	48	2	52	6	38	1	45	113

Heavy Vehicle Peak Hour Summary
4:15 PM to 5:15 PM

By Approach	Northbound Butteville Rd NE			Southbound Butteville Rd NE			Eastbound Ehlen Rd NE			Westbound Ehlen Rd NE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	6	7	13	4	2	6	28	31	59	31	29	60	69
PHF	0.50			0.50			0.70			0.65			0.86

By Movement	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	1	4	6	0	3	1	4	1	25	2	28	2	29	0	31	69
PHF	0.25	0.25	0.33	0.50	0.00	0.38	0.25	0.50	0.25	0.69	0.25	0.70	0.50	0.60	0.00	0.65	0.86

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

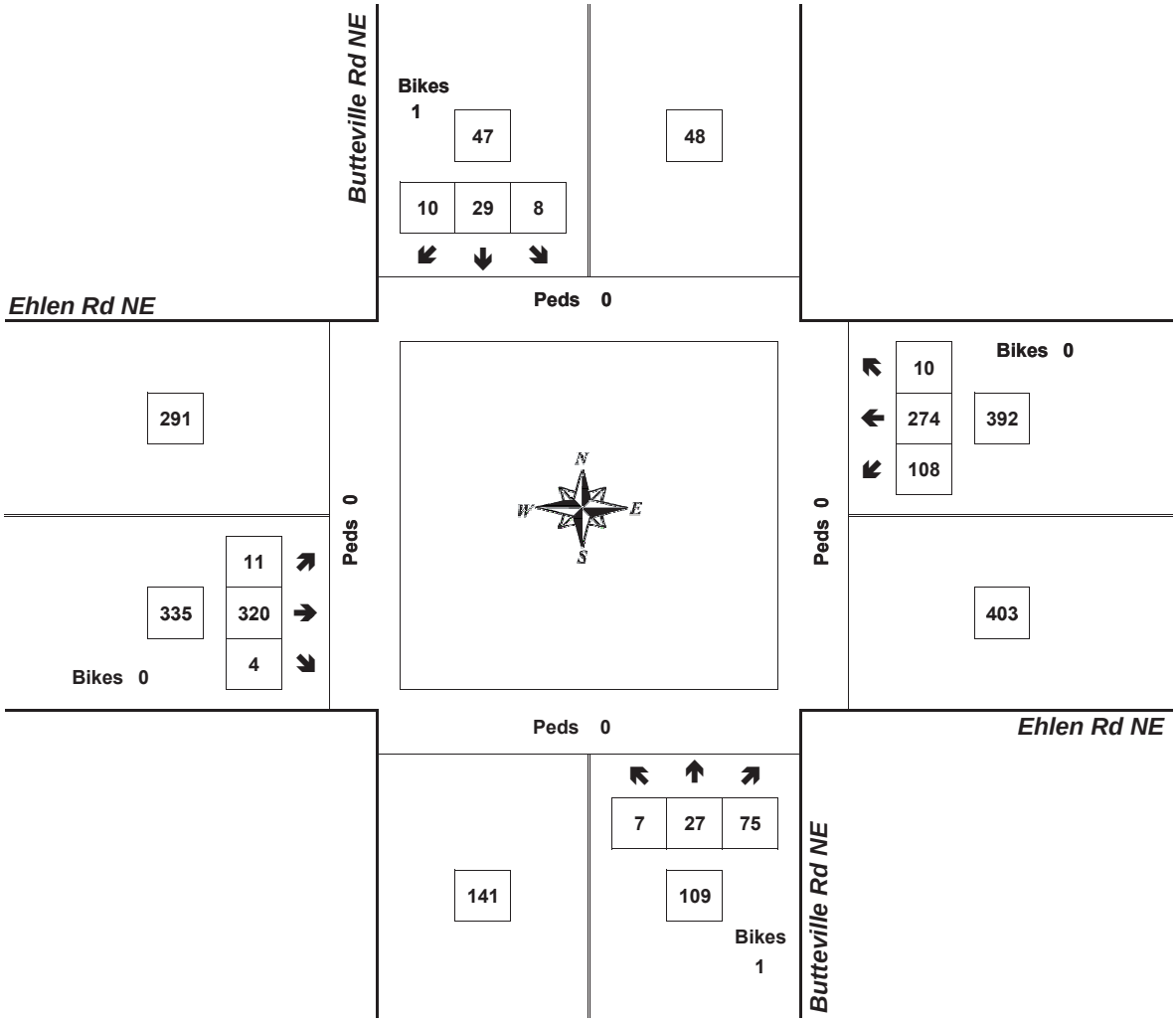
Interval Start Time	Northbound Butteville Rd NE				Southbound Butteville Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	1	1	5	7	0	3	1	4	1	25	2	28	4	27	1	32	71
4:15 PM	1	1	4	6	0	3	1	4	1	25	2	28	2	29	0	31	69
4:30 PM	0	1	4	5	0	1	1	2	1	19	2	22	1	26	0	27	56
4:45 PM	0	1	2	3	0	1	0	1	1	15	2	18	1	19	0	20	42
5:00 PM	0	1	3	4	0	1	0	1	1	23	0	24	2	11	0	13	42

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Butteville Rd NE & Ehlen Rd NE

4:15 PM to 5:15 PM
Thursday, February 15, 2018

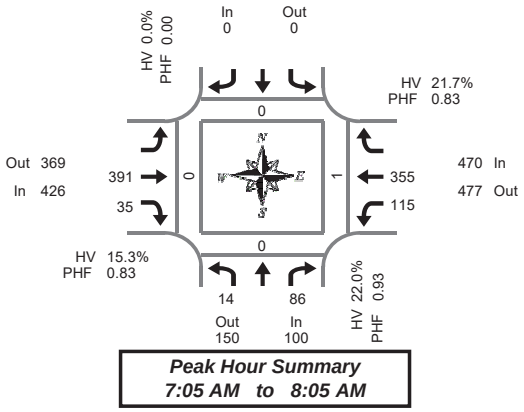


Approach	PHF	HV%	Volume
EB	0.93	8.4%	335
WB	0.84	7.9%	392
NB	0.70	5.5%	109
SB	0.78	8.5%	47
Intersection	0.97	7.8%	883

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
7:05 AM to 8:05 AM

Bents Ct NE & Ehlen Rd NE

Tuesday, February 27, 2018
7:00 AM to 9:00 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Bents Ct NE				Southbound Bents Ct NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes	T	R	Bikes	L	T		Bikes			North	South	East	West
7:00 AM	3		5	0				0	13	5	0	10	29		0	65		0	0	0	0
7:05 AM	1		7	0				0	31	4	0	7	21		0	71		0	0	0	0
7:10 AM	1		11	0				0	35	4	0	3	31		0	85		0	0	0	0
7:15 AM	1		5	0				0	40	1	0	6	27		0	80		0	0	0	0
7:20 AM	1		5	0				0	22	0	0	14	39		0	81		0	0	0	0
7:25 AM	3		6	0				0	35	5	0	8	24		0	81		0	0	0	0
7:30 AM	3		8	0				0	38	1	0	12	28		0	90		0	0	1	0
7:35 AM	0		3	0				0	42	7	0	9	26		0	87		0	0	0	0
7:40 AM	0		10	0				0	26	3	0	15	33		0	87		0	0	0	0
7:45 AM	1		11	0				0	37	1	0	9	37		0	96		0	0	0	0
7:50 AM	0		5	0				0	30	2	0	17	31		0	85		0	0	0	0
7:55 AM	1		5	0				0	33	4	0	11	32		0	86		0	0	0	0
8:00 AM	2		10	0				0	22	3	0	4	26		0	67		0	0	0	0
8:05 AM	1		12	0				0	28	2	0	8	19		0	70		0	0	0	0
8:10 AM	0		6	0				0	37	0	0	12	17		0	72		0	0	0	0
8:15 AM	2		14	0				0	23	4	0	12	21		0	76		0	0	0	0
8:20 AM	3		8	0				0	24	0	0	9	18		0	62		0	0	0	0
8:25 AM	0		6	0				0	37	3	0	8	29		0	83		0	0	0	0
8:30 AM	2		7	0				0	22	6	0	13	24		0	74		0	0	0	0
8:35 AM	0		9	0				0	29	5	0	11	21		0	75		0	0	0	0
8:40 AM	4		6	0				0	21	2	0	17	22		0	72		0	0	0	0
8:45 AM	0		12	0				0	35	1	0	15	25		0	88		0	0	0	0
8:50 AM	1		7	0				0	25	5	0	15	25		0	78		0	0	0	0
8:55 AM	1		9	0				0	30	3	0	12	17		0	72		0	0	0	0
Total Survey	31		187	0				0	715	71	0	257	622		0	1,883		0	0	1	0

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Bents Ct NE				Southbound Bents Ct NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes	T	R	Bikes	L	T		Bikes			North	South	East	West
7:00 AM	5		23	0				0	79	13	0	20	81		0	221		0	0	0	0
7:15 AM	5		16	0				0	97	6	0	28	90		0	242		0	0	0	0
7:30 AM	3		21	0				0	106	11	0	36	87		0	264		0	0	1	0
7:45 AM	2		21	0				0	100	7	0	37	100		0	267		0	0	0	0
8:00 AM	3		28	0				0	87	5	0	24	62		0	209		0	0	0	0
8:15 AM	5		28	0				0	84	7	0	29	68		0	221		0	0	0	0
8:30 AM	6		22	0				0	72	13	0	41	67		0	221		0	0	0	0
8:45 AM	2		28	0				0	90	9	0	42	67		0	238		0	0	0	0
Total Survey	31		187	0				0	715	71	0	257	622		0	1,883		0	0	1	0

Peak Hour Summary
7:05 AM to 8:05 AM

By Approach	Northbound Bents Ct NE				Southbound Bents Ct NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	100	150	250	0	0	0	0	0	426	369	795	0	470	477	947	0	996	0	0	1	0
%HV	22.0%				0.0%				15.3%				21.7%				19.0%				
PHF	0.93				0.00				0.83				0.83				0.92				

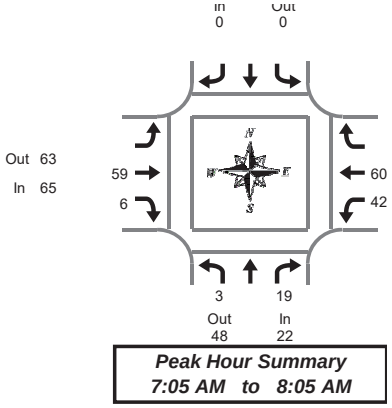
By Movement	Northbound Bents Ct NE				Southbound Bents Ct NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	14		86	100				0		391	35	426	115	355		470	996
%HV	21.4%	NA	22.1%	22.0%	NA	NA	NA	0.0%	NA	15.1%	17.1%	15.3%	36.5%	16.9%	NA	21.7%	19.0%
PHF	0.50		0.83	0.93				0.00		0.85	0.67	0.83	0.70	0.88		0.83	0.92

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Bents Ct NE				Southbound Bents Ct NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes	T	R	Bikes	L	T		Bikes			North	South	East	West
7:00 AM	15		81	0				0	382	37	0	121	358		0	994		0	0	1	0
7:15 AM	13		86	0				0	390	29	0	125	339		0	982		0	0	1	0
7:30 AM	13		98	0				0	377	30	0	126	317		0	961		0	0	1	0
7:45 AM	16		99	0				0	343	32	0	131	297		0	918		0	0	0	0
8:00 AM	16		106	0				0	333	34	0	136	264		0	889		0	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Bents Ct NE & Ehlen Rd NE

Tuesday, February 27, 2018
7:00 AM to 9:00 AM

Peak Hour Summary
7:05 AM to 8:05 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Bents Ct NE				Southbound Bents Ct NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
	L		R	Total				Total	T	R	Total		L	T		Total	
7:00 AM	0		0	0				0	0	1	1		5	8		13	14
7:05 AM	0		2	2				0	4	0	4		3	3		6	12
7:10 AM	0		2	2				0	11	1	12		2	5		7	21
7:15 AM	1		0	1				0	3	1	4		4	3		7	12
7:20 AM	0		3	3				0	6	0	6		8	4		12	21
7:25 AM	0		1	1				0	3	1	4		4	3		7	12
7:30 AM	1		2	3				0	1	0	1		5	6		11	15
7:35 AM	0		0	0				0	8	1	9		3	3		6	15
7:40 AM	0		3	3				0	2	0	2		5	9		14	19
7:45 AM	0		0	0				0	7	0	7		3	4		7	14
7:50 AM	0		2	2				0	6	0	6		3	13		16	24
7:55 AM	1		2	3				0	6	1	7		2	5		7	17
8:00 AM	0		2	2				0	2	1	3		0	2		2	7
8:05 AM	0		3	3				0	4	0	4		1	2		3	10
8:10 AM	0		1	1				0	6	0	6		6	2		8	15
8:15 AM	1		4	5				0	1	0	1		6	3		9	15
8:20 AM	1		1	2				0	2	0	2		6	3		9	13
8:25 AM	0		0	0				0	6	0	6		3	2		5	11
8:30 AM	1		2	3				0	6	1	7		6	2		8	18
8:35 AM	0		2	2				0	8	2	10		5	4		9	21
8:40 AM	2		2	4				0	1	1	2		9	3		12	18
8:45 AM	0		6	6				0	8	0	8		9	5		14	28
8:50 AM	1		1	2				0	2	2	4		9	5		14	20
8:55 AM	0		2	2				0	5	0	5		5	6		11	18
Total Survey	9		43	52				0	108	13	121		112	105		217	390

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Bents Ct NE				Southbound Bents Ct NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
	L		R	Total				Total	T	R	Total		L	T		Total	
7:00 AM	0		4	4				0	15	2	17		10	16		26	47
7:15 AM	1		4	5				0	12	2	14		16	10		26	45
7:30 AM	1		5	6				0	11	1	12		13	18		31	49
7:45 AM	1		4	5				0	19	1	20		8	22		30	55
8:00 AM	0		6	6				0	12	1	13		7	6		13	32
8:15 AM	2		5	7				0	9	0	9		15	8		23	39
8:30 AM	3		6	9				0	15	4	19		20	9		29	57
8:45 AM	1		9	10				0	15	2	17		23	16		39	66
Total Survey	9		43	52				0	108	13	121		112	105		217	390

Heavy Vehicle Peak Hour Summary
7:05 AM to 8:05 AM

By Approach	Northbound Bents Ct NE			Southbound Bents Ct NE			Eastbound Ehlen Rd NE			Westbound Ehlen Rd NE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	22	48	70	0	0	0	65	63	128	102	78	180	189
PHF	0.79			0.00			0.74			0.69			0.83

By Movement	Northbound Bents Ct NE				Southbound Bents Ct NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total
	L		R	Total				Total	T	R	Total		L	T		Total	
Volume	3		19	22				0	59	6	65		42	60		102	189
PHF	0.75		0.79	0.79				0.00	0.74	0.75	0.74		0.62	0.58		0.69	0.83

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

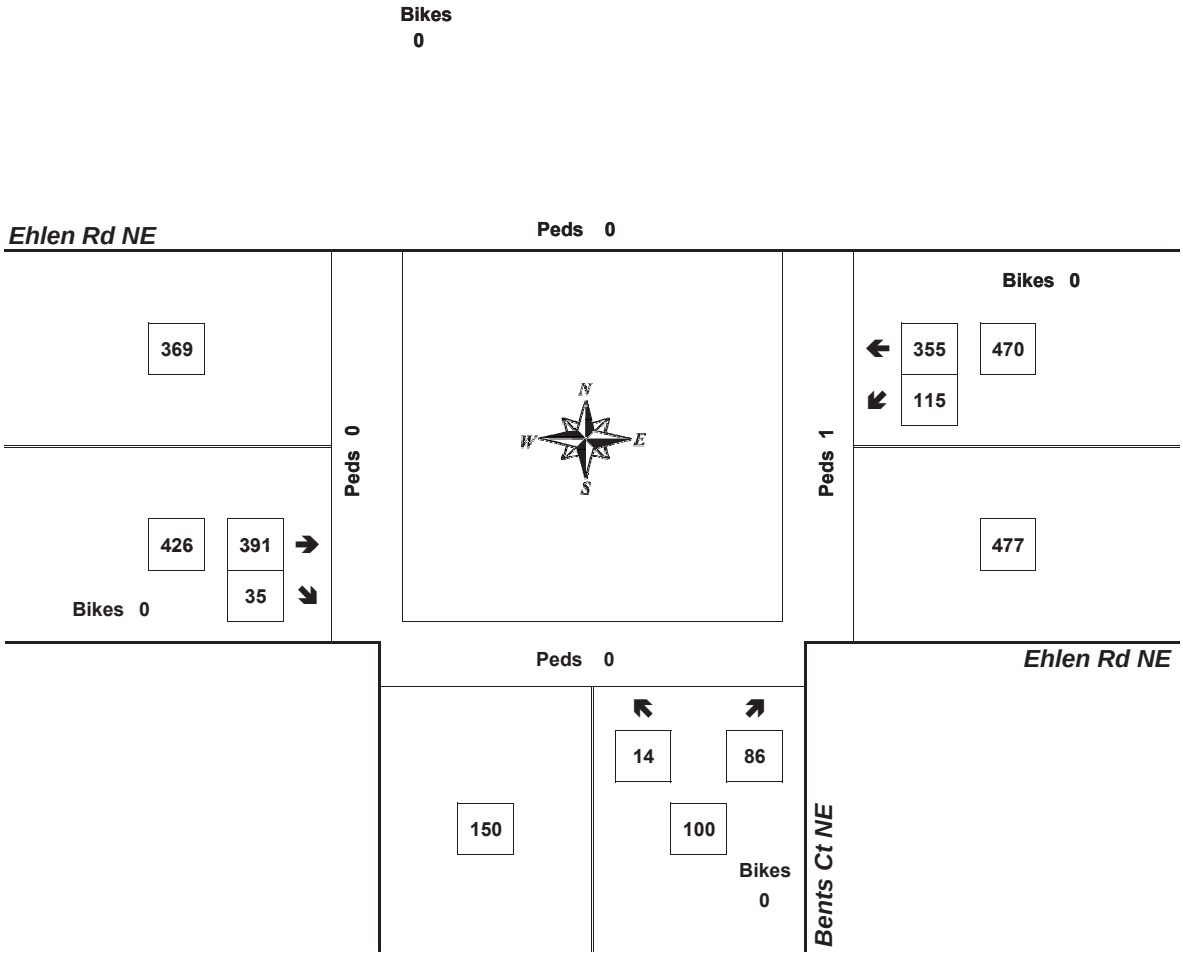
Interval Start Time	Northbound Bents Ct NE				Southbound Bents Ct NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
	L		R	Total				Total	T	R	Total		L	T		Total	
7:00 AM	3		17	20				0	57	6	63		47	66		113	196
7:15 AM	3		19	22				0	54	5	59		44	56		100	181
7:30 AM	4		20	24				0	51	3	54		43	54		97	175
7:45 AM	6		21	27				0	55	6	61		50	45		95	183
8:00 AM	6		26	32				0	51	7	58		65	39		104	194

Peak Hour Summary

Clay Carney
(503) 833-2740

Bents Ct NE & Ehlen Rd NE

7:05 AM to 8:05 AM
Tuesday, February 27, 2018

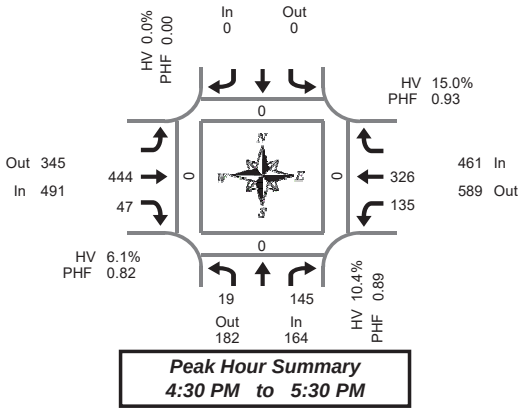


Approach	PHF	HV%	Volume
EB	0.83	15.3%	426
WB	0.83	21.7%	470
NB	0.93	22.0%	100
SB	0.00	0.0%	0
Intersection	0.92	19.0%	996

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:30 PM to 5:30 PM

Bents Ct NE & Ehlen Rd NE

Tuesday, February 27, 2018
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Bents Ct NE				Southbound Bents Ct NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes	T	R	Bikes	L	T		Bikes		North	South	East	West
4:00 PM	4		9	0				0	20	2	0	13	26		0	74	0	0	0	0
4:05 PM	2		15	0				0	23	6	0	13	30		0	89	0	0	0	0
4:10 PM	2		6	0				0	35	4	0	13	24		0	84	0	0	0	0
4:15 PM	1		12	0				0	33	4	0	10	17		0	77	0	0	0	0
4:20 PM	4		10	0				0	29	4	0	7	30		0	84	0	0	0	0
4:25 PM	0		6	0				0	37	0	0	12	23		0	78	0	0	0	0
4:30 PM	4		13	0				0	50	3	0	11	28		0	109	0	0	0	0
4:35 PM	1		11	0				0	52	1	0	9	27		0	101	0	0	0	0
4:40 PM	1		16	0				0	27	3	0	12	22		0	81	0	0	0	0
4:45 PM	0		9	0				0	36	1	0	13	30		0	89	0	0	0	0
4:50 PM	1		12	0				0	33	10	0	10	29		0	95	0	0	0	0
4:55 PM	1		16	0				0	30	2	0	10	28		0	87	0	0	0	0
5:00 PM	2		10	1				0	31	1	0	10	28		0	82	0	0	0	0
5:05 PM	0		6	0				0	33	6	0	11	37		0	93	0	0	0	0
5:10 PM	2		16	0				0	50	8	0	14	23		0	113	0	0	0	0
5:15 PM	2		18	0				0	42	3	0	7	25		0	97	0	0	0	0
5:20 PM	1		7	0				0	39	7	0	8	23		0	85	0	0	0	0
5:25 PM	4		11	0				0	21	2	0	20	26		0	84	0	0	0	0
5:30 PM	2		12	0				0	45	3	0	7	28		0	97	0	0	0	0
5:35 PM	1		8	0				0	27	1	0	11	38		0	86	0	0	0	0
5:40 PM	2		9	0				0	34	0	0	11	21		0	77	0	0	0	0
5:45 PM	0		12	0				0	25	3	0	12	20		0	72	0	0	0	0
5:50 PM	2		6	0				0	41	2	0	19	17		0	87	0	0	0	0
5:55 PM	0		11	0				0	36	5	0	12	27		0	91	0	0	0	0
Total Survey	39		261	1				0	829	81	0	275	627		0	2,112	0	0	0	0

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Bents Ct NE				Southbound Bents Ct NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes	T	R	Bikes	L	T		Bikes		North	South	East	West
4:00 PM	8		30	0				0	78	12	0	39	80		0	247	0	0	0	0
4:15 PM	5		28	0				0	99	8	0	29	70		0	239	0	0	0	0
4:30 PM	6		40	0				0	129	7	0	32	77		0	291	0	0	0	0
4:45 PM	2		37	0				0	99	13	0	33	87		0	271	0	0	0	0
5:00 PM	4		32	1				0	114	15	0	35	88		0	288	0	0	0	0
5:15 PM	7		36	0				0	102	12	0	35	74		0	266	0	0	0	0
5:30 PM	5		29	0				0	106	4	0	29	87		0	260	0	0	0	0
5:45 PM	2		29	0				0	102	10	0	43	64		0	250	0	0	0	0
Total Survey	39		261	1				0	829	81	0	275	627		0	2,112	0	0	0	0

Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound Bents Ct NE				Southbound Bents Ct NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	164	182	346	1	0	0	0	0	491	345	836	0	461	589	1,050	0	1,116	0	0	0	0
%HV	10.4%				0.0%				6.1%				15.0%				10.4%				
PHF	0.89				0.00				0.82				0.93				0.92				

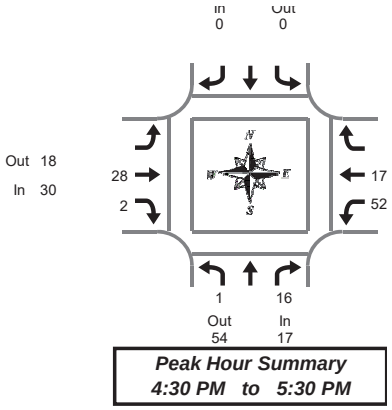
By Movement	Northbound Bents Ct NE				Southbound Bents Ct NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	19		145	164				0		444	47	491	135	326		461	1,116
%HV	5.3%	NA	11.0%	10.4%	NA	NA	NA	0.0%	NA	6.3%	4.3%	6.1%	38.5%	5.2%	NA	15.0%	10.4%
PHF	0.68		0.88	0.89				0.00		0.85	0.65	0.82	0.96	0.88		0.93	0.92

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Bents Ct NE				Southbound Bents Ct NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes	T	R	Bikes	L	T		Bikes		North	South	East	West
4:00 PM	21		135	0				0	405	40	0	133	314		0	1,048	0	0	0	0
4:15 PM	17		137	1				0	441	43	0	129	322		0	1,089	0	0	0	0
4:30 PM	19		145	1				0	444	47	0	135	326		0	1,116	0	0	0	0
4:45 PM	18		134	1				0	421	44	0	132	336		0	1,085	0	0	0	0
5:00 PM	18		126	1				0	424	41	0	142	313		0	1,064	0	0	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Bents Ct NE & Ehlen Rd NE

Tuesday, February 27, 2018
4:00 PM to 6:00 PM

Peak Hour Summary
4:30 PM to 5:30 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Bents Ct NE				Southbound Bents Ct NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
	L		R	Total				Total	T	R	Total		L	T		Total	
4:00 PM	0		0	0				0	1	1	2		2	2		4	6
4:05 PM	0		0	0				0	4	0	4		4	2		6	10
4:10 PM	0		1	1				0	5	3	8		6	1		7	16
4:15 PM	0		2	2				0	2	1	3		8	2		10	15
4:20 PM	0		1	1				0	1	0	1		2	1		3	5
4:25 PM	0		0	0				0	2	0	2		5	1		6	8
4:30 PM	0		1	1				0	6	0	6		3	4		7	14
4:35 PM	0		0	0				0	2	0	2		3	2		5	7
4:40 PM	1		1	2				0	2	0	2		3	1		4	8
4:45 PM	0		0	0				0	2	0	2		5	1		6	8
4:50 PM	0		2	2				0	2	1	3		3	1		4	9
4:55 PM	0		3	3				0	3	0	3		4	2		6	12
5:00 PM	0		4	4				0	2	0	2		4	1		5	11
5:05 PM	0		0	0				0	1	0	1		7	0		7	8
5:10 PM	0		1	1				0	2	0	2		6	2		8	11
5:15 PM	0		2	2				0	3	0	3		2	1		3	8
5:20 PM	0		2	2				0	3	1	4		3	0		3	9
5:25 PM	0		0	0				0	0	0	0		9	2		11	11
5:30 PM	0		1	1				0	3	1	4		4	1		5	10
5:35 PM	0		2	2				0	1	0	1		5	1		6	9
5:40 PM	0		2	2				0	2	0	2		5	2		7	11
5:45 PM	0		4	4				0	1	1	2		8	2		10	16
5:50 PM	0		2	2				0	3	0	3		11	1		12	17
5:55 PM	0		1	1				0	0	0	0		7	2		9	10
Total Survey	1		32	33				0	53	9	62		119	35		154	249

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Bents Ct NE				Southbound Bents Ct NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
	L		R	Total				Total	T	R	Total		L	T		Total	
4:00 PM	0		1	1				0	10	4	14		12	5		17	32
4:15 PM	0		3	3				0	5	1	6		15	4		19	28
4:30 PM	1		2	3				0	10	0	10		9	7		16	29
4:45 PM	0		5	5				0	7	1	8		12	4		16	29
5:00 PM	0		5	5				0	5	0	5		17	3		20	30
5:15 PM	0		4	4				0	6	1	7		14	3		17	28
5:30 PM	0		5	5				0	6	1	7		14	4		18	30
5:45 PM	0		7	7				0	4	1	5		26	5		31	43
Total Survey	1		32	33				0	53	9	62		119	35		154	249

Heavy Vehicle Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound Bents Ct NE			Southbound Bents Ct NE			Eastbound Ehlen Rd NE			Westbound Ehlen Rd NE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	17	54	71	0	0	0	30	18	48	69	44	113	116
PHF	0.47			0.00			0.75			0.86			0.91

By Movement	Northbound Bents Ct NE				Southbound Bents Ct NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total
	L		R	Total				Total	T	R	Total		L	T		Total	
Volume	1		16	17				0	28	2	30		52	17		69	116
PHF	0.25		0.44	0.47				0.00	0.70	0.50	0.75		0.76	0.61		0.86	0.91

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

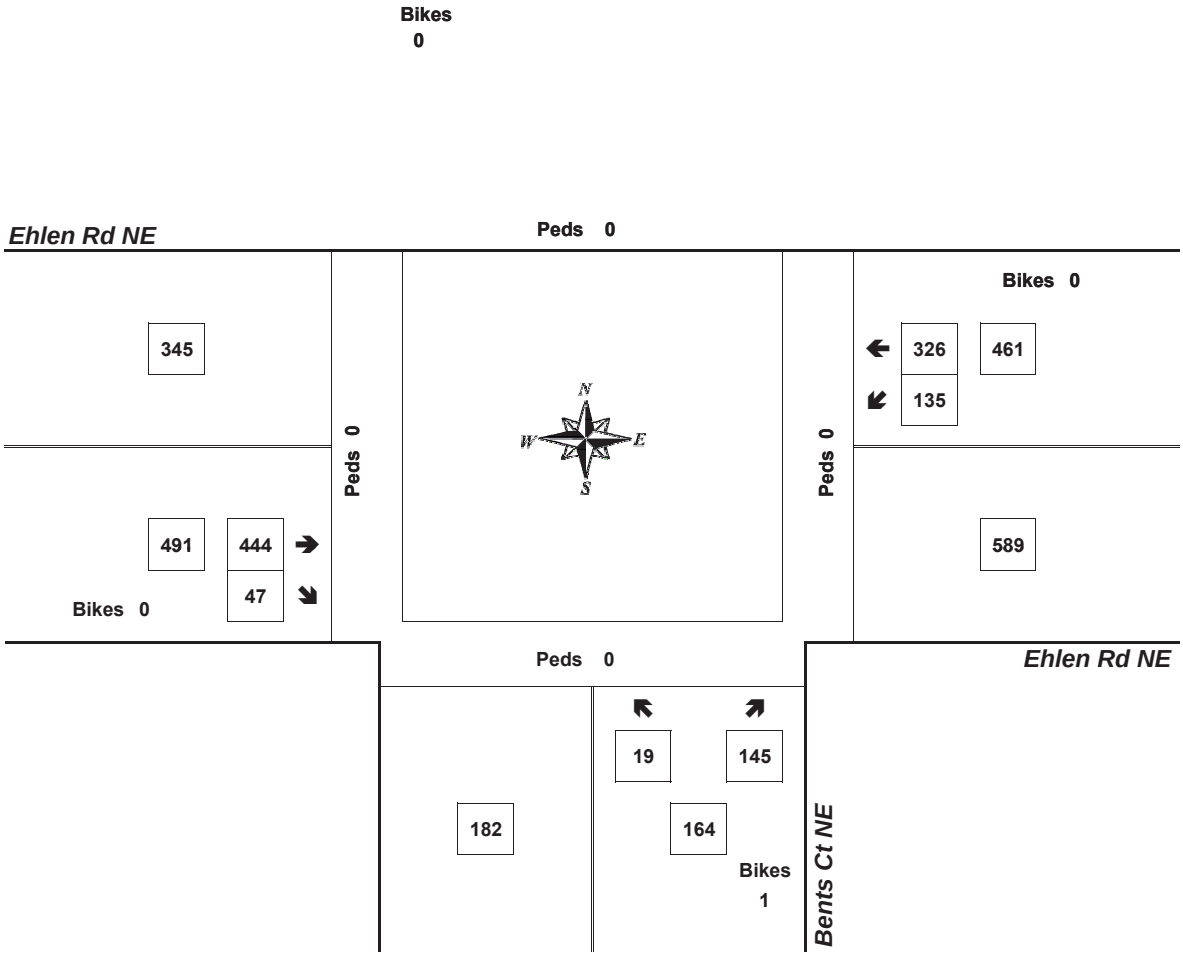
Interval Start Time	Northbound Bents Ct NE				Southbound Bents Ct NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
	L		R	Total				Total	T	R	Total		L	T		Total	
4:00 PM	1		11	12				0	32	6	38		48	20		68	118
4:15 PM	1		15	16				0	27	2	29		53	18		71	116
4:30 PM	1		16	17				0	28	2	30		52	17		69	116
4:45 PM	0		19	19				0	24	3	27		57	14		71	117
5:00 PM	0		21	21				0	21	3	24		71	15		86	131

Peak Hour Summary

Clay Carney
(503) 833-2740

Bents Ct NE & Ehlen Rd NE

4:30 PM to 5:30 PM
Tuesday, February 27, 2018

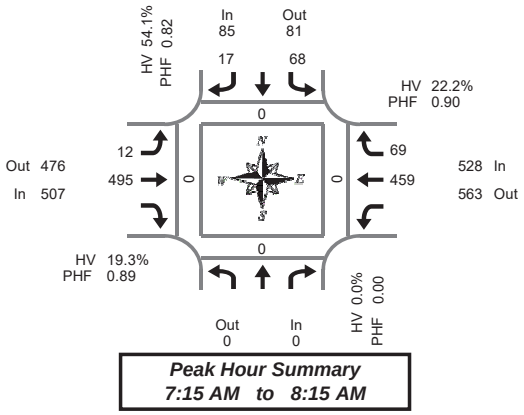


Approach	PHF	HV%	Volume
EB	0.82	6.1%	491
WB	0.93	15.0%	461
NB	0.89	10.4%	164
SB	0.00	0.0%	0
Intersection	0.92	10.4%	1,116

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Bents Rd NE & Ehlen Rd NE

Thursday, February 15, 2018
7:00 AM to 9:00 AM

Peak Hour Summary
7:15 AM to 8:15 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Bents Rd NE				Southbound Bents Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
				Bikes	L		R	Bikes	L	T		Bikes	T	R	Bikes			North	South	East	West
7:00 AM				0	3		0	0	1	30		0	26	4	0		64	0	0	0	0
7:05 AM				0	11		1	0	2	36		0	32	5	0		87	0	0	0	0
7:10 AM				0	5		1	0	0	46		0	32	2	0		86	0	0	0	0
7:15 AM				0	6		0	0	0	40		0	33	8	0		87	0	0	0	0
7:20 AM				0	6		2	0	3	40		0	42	8	0		101	0	0	0	0
7:25 AM				0	3		1	0	2	40		0	42	6	0		94	0	0	0	0
7:30 AM				0	4		2	0	0	50		0	36	5	0		97	0	0	0	0
7:35 AM				0	4		2	0	1	49		0	33	3	0		92	0	0	0	0
7:40 AM				0	5		2	0	0	36		0	45	2	0		90	0	0	0	0
7:45 AM				0	6		1	0	0	34		0	38	7	0		86	0	0	0	0
7:50 AM				0	6		1	0	0	44		0	44	6	0		101	0	0	0	0
7:55 AM				0	6		3	0	1	37		0	45	6	0		98	0	0	0	0
8:00 AM				0	7		1	0	1	40		0	33	4	0		86	0	0	0	0
8:05 AM				0	8		1	0	1	44		0	34	8	0		96	0	0	0	0
8:10 AM				0	7		1	0	3	41		0	34	6	0		92	0	0	0	0
8:15 AM				0	4		1	0	2	22		0	30	2	0		61	0	0	0	0
8:20 AM				0	4		3	0	0	41		0	24	9	0		81	0	0	0	0
8:25 AM				0	3		0	0	3	26		0	33	7	0		72	0	0	0	0
8:30 AM				0	5		2	0	0	37		0	32	7	0		83	0	0	0	0
8:35 AM				0	6		0	0	2	37		0	24	2	0		71	0	0	0	0
8:40 AM				0	6		2	0	0	33		0	42	4	0		87	0	0	0	0
8:45 AM				0	4		2	0	3	41		0	29	11	0		90	0	0	0	0
8:50 AM				0	4		5	0	0	35		0	27	5	0		76	0	0	0	0
8:55 AM				0	5		3	0	2	29		0	34	9	0		82	0	0	0	0
Total Survey				0	128		37	0	27	908		0	824	136	0		2,060	0	0	0	0

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Bents Rd NE				Southbound Bents Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
				Bikes	L		R	Bikes	L	T		Bikes	T	R	Bikes			North	South	East	West
7:00 AM				0	19		2	0	3	112		0	90	11	0		237	0	0	0	0
7:15 AM				0	15		3	0	5	120		0	117	22	0		282	0	0	0	0
7:30 AM				0	13		6	0	1	135		0	114	10	0		279	0	0	0	0
7:45 AM				0	18		5	0	1	115		0	127	19	0		285	0	0	0	0
8:00 AM				0	22		3	0	5	125		0	101	18	0		274	0	0	0	0
8:15 AM				0	11		4	0	5	89		0	87	18	0		214	0	0	0	0
8:30 AM				0	17		4	0	2	107		0	98	13	0		241	0	0	0	0
8:45 AM				0	13		10	0	5	105		0	90	25	0		248	0	0	0	0
Total Survey				0	128		37	0	27	908		0	824	136	0		2,060	0	0	0	0

Peak Hour Summary
7:15 AM to 8:15 AM

By Approach	Northbound Bents Rd NE				Southbound Bents Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	0	0	0	0	85	81	166	0	507	476	983	0	528	563	1,091	0	1,120	0	0	0	0
%HV	0.0%				54.1%				19.3%				22.2%				23.3%				
PHF	0.00				0.82				0.89				0.90				0.96				

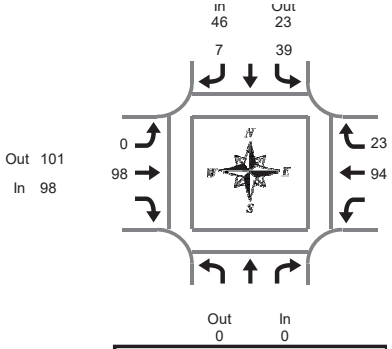
By Movement	Northbound Bents Rd NE				Southbound Bents Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total
				Total	L		R	Total	L	T		Total	T	R	Total		
Volume				0	68		17	85	12	495		507	459	69	528		1,120
%HV	NA	NA	NA	0.0%	57.4%	NA	41.2%	54.1%	0.0%	19.8%	NA	19.3%	NA	20.5%	33.3%	22.2%	23.3%
PHF				0.00	0.77		0.71	0.82	0.60	0.89		0.89		0.90	0.78	0.90	0.96

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Bents Rd NE				Southbound Bents Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
				Bikes	L		R	Bikes	L	T		Bikes	T	R	Bikes			North	South	East	West
7:00 AM				0	65		16	0	10	482		0	448	62	0		1,083	0	0	0	0
7:15 AM				0	68		17	0	12	495		0	459	69	0		1,120	0	0	0	0
7:30 AM				0	64		18	0	12	464		0	429	65	0		1,052	0	0	0	0
7:45 AM				0	68		16	0	13	436		0	413	68	0		1,014	0	0	0	0
8:00 AM				0	63		21	0	17	426		0	376	74	0		977	0	0	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Bents Rd NE & Ehlen Rd NE

Thursday, February 15, 2018
7:00 AM to 9:00 AM

Peak Hour Summary
7:15 AM to 8:15 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Bents Rd NE				Southbound Bents Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
7:00 AM				0	2		0	2	0	2		2		5	0	5	9
7:05 AM				0	6		0	6	0	8		8		9	0	9	23
7:10 AM				0	4		1	5	0	10		10		6	0	6	21
7:15 AM				0	3		0	3	0	11		11		8	3	11	25
7:20 AM				0	3		0	3	0	7		7		5	5	10	20
7:25 AM				0	2		1	3	0	10		10		7	1	8	21
7:30 AM				0	4		1	5	0	9		9		6	1	7	21
7:35 AM				0	2		0	2	0	9		9		6	3	9	20
7:40 AM				0	4		2	6	0	4		4		14	0	14	24
7:45 AM				0	3		1	4	0	7		7		6	2	8	19
7:50 AM				0	4		0	4	0	6		6		5	3	8	18
7:55 AM				0	4		2	6	0	10		10		10	1	11	27
8:00 AM				0	4		0	4	0	4		4		9	1	10	18
8:05 AM				0	3		0	3	0	11		11		7	1	8	22
8:10 AM				0	3		0	3	0	10		10		11	2	13	26
8:15 AM				0	2		1	3	0	5		5		6	1	7	15
8:20 AM				0	3		1	4	0	7		7		4	2	6	17
8:25 AM				0	1		0	1	0	8		8		4	1	5	14
8:30 AM				0	5		1	6	0	6		6		9	4	13	25
8:35 AM				0	2		0	2	0	9		9		9	1	10	21
8:40 AM				0	3		2	5	0	10		10		14	1	15	30
8:45 AM				0	2		0	2	1	10		11		5	2	7	20
8:50 AM				0	0		3	3	0	5		5		3	1	4	12
8:55 AM				0	2		2	4	0	14		14		8	1	9	27
Total Survey				0	71		18	89	1	192		193		176	37	213	495

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Bents Rd NE				Southbound Bents Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
7:00 AM				0	12		1	13	0	20		20		20	0	20	53
7:15 AM				0	8		1	9	0	28		28		20	9	29	66
7:30 AM				0	10		3	13	0	22		22		26	4	30	65
7:45 AM				0	11		3	14	0	23		23		21	6	27	64
8:00 AM				0	10		0	10	0	25		25		27	4	31	66
8:15 AM				0	6		2	8	0	20		20		14	4	18	46
8:30 AM				0	10		3	13	0	25		25		32	6	38	76
8:45 AM				0	4		5	9	1	29		30		16	4	20	59
Total Survey				0	71		18	89	1	192		193		176	37	213	495

Heavy Vehicle Peak Hour Summary
7:15 AM to 8:15 AM

By Approach	Northbound Bents Rd NE			Southbound Bents Rd NE			Eastbound Ehlen Rd NE			Westbound Ehlen Rd NE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	46	23	69	98	101	199	117	137	254	261
PHF	0.00			0.82			0.88			0.94			0.97

By Movement	Northbound Bents Rd NE				Southbound Bents Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total
				Total	L		R	Total	L	T		Total		T	R	Total	
Volume				0	39		7	46	0	98		98		94	23	117	261
PHF				0.00	0.81		0.58	0.82	0.00	0.88		0.88		0.87	0.64	0.94	0.97

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

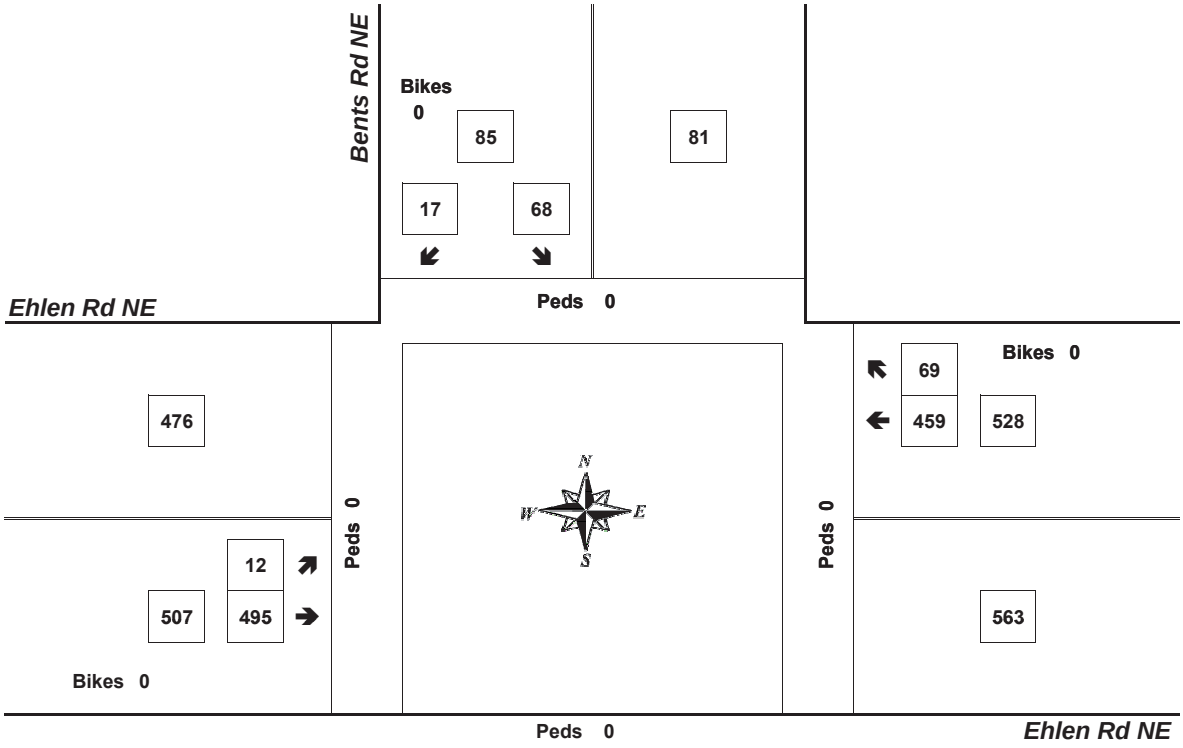
Interval Start Time	Northbound Bents Rd NE				Southbound Bents Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
7:00 AM				0	41		8	49	0	93		93		87	19	106	248
7:15 AM				0	39		7	46	0	98		98		94	23	117	261
7:30 AM				0	37		8	45	0	90		90		88	18	106	241
7:45 AM				0	37		8	45	0	93		93		94	20	114	252
8:00 AM				0	30		10	40	1	99		100		89	18	107	247

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Bents Rd NE & Ehlen Rd NE

7:15 AM to 8:15 AM
Thursday, February 15, 2018



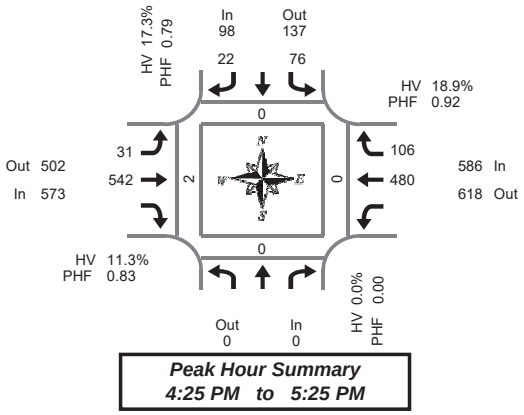
Bikes
0

Approach	PHF	HV%	Volume
EB	0.89	19.3%	507
WB	0.90	22.2%	528
NB	0.00	0.0%	0
SB	0.82	54.1%	85
Intersection	0.96	23.3%	1,120

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Bents Rd NE & Ehlen Rd NE

Thursday, February 15, 2018
4:00 PM to 6:00 PM

Peak Hour Summary
4:25 PM to 5:25 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Bents Rd NE				Southbound Bents Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
				Bikes	L		R	Bikes	L	T		Bikes	T	R		Bikes		North	South	East	West
4:00 PM				0	5		3	0	0	48		0	31	10		0	97	0	0	0	0
4:05 PM				0	10		2	0	1	34		0	40	2		0	89	0	0	0	0
4:10 PM				0	7		1	0	1	41		0	47	6		0	103	0	0	0	0
4:15 PM				0	1		2	0	1	53		0	36	9		0	102	0	0	0	0
4:20 PM				0	3		2	0	0	47		0	29	14		0	95	0	0	0	0
4:25 PM				0	5		2	0	3	36		0	35	13		0	94	0	0	0	0
4:30 PM				0	8		1	0	1	45		0	36	10		0	101	0	0	0	1
4:35 PM				0	6		2	0	3	56		0	40	12		0	119	0	0	0	0
4:40 PM				0	3		3	0	1	38		0	44	7		0	96	0	0	0	0
4:45 PM				0	9		3	0	4	43		0	43	7		0	109	0	0	0	0
4:50 PM				0	8		3	0	2	39		0	48	11		0	111	0	0	0	0
4:55 PM				0	4		2	0	2	47		0	40	7		0	102	0	0	0	1
5:00 PM				0	12		2	0	2	43		0	42	9		0	110	0	0	0	0
5:05 PM				0	6		2	0	5	30		0	44	7		0	94	0	0	0	0
5:10 PM				0	2		1	0	3	58		0	35	9		0	108	0	0	0	0
5:15 PM				0	4		1	0	0	57		0	37	6		0	105	0	0	0	0
5:20 PM				0	9		0	0	5	50		0	36	8		0	108	0	0	0	0
5:25 PM				0	6		0	0	0	32		0	41	12		0	91	0	0	0	0
5:30 PM				0	11		2	0	2	30		0	44	9		0	98	0	0	0	0
5:35 PM				0	5		2	0	0	27		0	42	6		0	82	0	0	0	0
5:40 PM				0	2		2	0	3	43		0	39	14		0	103	0	0	0	0
5:45 PM				0	10		3	0	0	32		0	30	12		0	87	0	0	0	0
5:50 PM				0	8		3	0	2	28		0	36	14		0	91	0	0	0	0
5:55 PM				0	8		2	0	1	42		0	35	8		0	96	0	0	0	0
Total Survey				0	152		46	0	42	999		0	930	222		0	2,391	0	0	0	2

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Bents Rd NE				Southbound Bents Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
				Bikes	L		R	Bikes	L	T		Bikes	T	R		Bikes		North	South	East	West
4:00 PM				0	22		6	0	2	123		0	118	18		0	289	0	0	0	0
4:15 PM				0	9		6	0	4	136		0	100	36		0	291	0	0	0	0
4:30 PM				0	17		6	0	5	139		0	120	29		0	316	0	0	0	1
4:45 PM				0	21		8	0	8	129		0	131	25		0	322	0	0	0	1
5:00 PM				0	20		5	0	10	131		0	121	25		0	312	0	0	0	0
5:15 PM				0	19		1	0	5	139		0	114	26		0	304	0	0	0	0
5:30 PM				0	18		6	0	5	100		0	125	29		0	283	0	0	0	0
5:45 PM				0	26		8	0	3	102		0	101	34		0	274	0	0	0	0
Total Survey				0	152		46	0	42	999		0	930	222		0	2,391	0	0	0	2

Peak Hour Summary
4:25 PM to 5:25 PM

By Approach	Northbound Bents Rd NE				Southbound Bents Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	0	0	0	0	98	137	235	0	573	502	1,075	0	586	618	1,204	0	1,257	0	0	0	2
%HV	0.0%				17.3%				11.3%				18.9%				15.4%				
PHF	0.00				0.79				0.83				0.92				0.97				

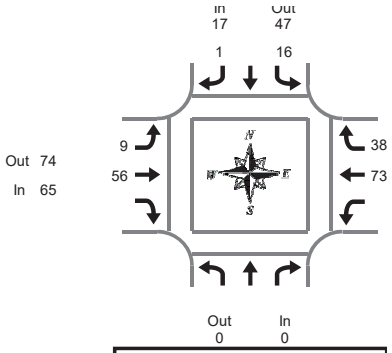
By Movement	Northbound Bents Rd NE				Southbound Bents Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total
				Total	L		R	Total	L	T		Total	T	R	Total		
Volume				0	76		22	98	31	542		573	480	106	586		1,257
%HV	NA	NA	NA	0.0%	21.1%	NA	4.5%	17.3%	29.0%	10.3%	NA	11.3%	NA	15.2%	35.8%	18.9%	15.4%
PHF				0.00	0.79		0.61	0.79	0.78	0.82		0.83		0.89	0.76	0.92	0.97

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Bents Rd NE				Southbound Bents Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
				Bikes	L		R	Bikes	L	T		Bikes	T	R		Bikes		North	South	East	West
4:00 PM				0	69		26	0	19	527		0	469	108		0	1,218	0	0	0	2
4:15 PM				0	67		25	0	27	535		0	472	115		0	1,241	0	0	0	2
4:30 PM				0	77		20	0	28	538		0	486	105		0	1,254	0	0	0	2
4:45 PM				0	78		20	0	28	499		0	491	105		0	1,221	0	0	0	1
5:00 PM				0	83		20	0	23	472		0	461	114		0	1,173	0	0	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Bents Rd NE & Ehlen Rd NE

Thursday, February 15, 2018
4:00 PM to 6:00 PM

Peak Hour Summary
4:25 PM to 5:25 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Bents Rd NE				Southbound Bents Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
4:00 PM				0	2		0	2	0	4		4		4	3	7	13
4:05 PM				0	2		1	3	1	6		7		8	0	8	18
4:10 PM				0	1		0	1	0	5		5		6	5	11	17
4:15 PM				0	0		1	1	0	8		8		9	2	11	20
4:20 PM				0	2		0	2	0	1		1		6	3	9	12
4:25 PM				0	0		0	0	2	7		9		6	5	11	20
4:30 PM				0	2		0	2	0	3		3		4	4	8	13
4:35 PM				0	2		0	2	1	4		5		6	2	8	15
4:40 PM				0	1		0	1	0	5		5		6	3	9	15
4:45 PM				0	1		1	2	1	5		6		10	4	14	22
4:50 PM				0	1		0	1	0	3		3		7	2	9	13
4:55 PM				0	0		0	0	0	2		2		10	4	14	16
5:00 PM				0	1		0	1	0	3		3		7	5	12	16
5:05 PM				0	1		0	1	2	6		8		6	3	9	18
5:10 PM				0	0		0	0	0	10		10		4	3	7	17
5:15 PM				0	3		0	3	0	3		3		4	2	6	12
5:20 PM				0	4		0	4	3	5		8		3	1	4	16
5:25 PM				0	1		0	1	0	1		1		5	3	8	10
5:30 PM				0	2		0	2	0	2		2		4	3	7	11
5:35 PM				0	2		0	2	0	3		3		4	4	8	13
5:40 PM				0	1		1	2	1	7		8		4	3	7	17
5:45 PM				0	0		1	1	0	3		3		4	4	8	12
5:50 PM				0	2		0	2	1	2		3		4	3	7	12
5:55 PM				0	1		0	1	0	3		3		7	2	9	13
Total Survey				0	32		5	37	12	101		113		138	73	211	361

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Bents Rd NE				Southbound Bents Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
4:00 PM				0	5		1	6	1	15		16		18	8	26	48
4:15 PM				0	2		1	3	2	16		18		21	10	31	52
4:30 PM				0	5		0	5	1	12		13		16	9	25	43
4:45 PM				0	2		1	3	1	10		11		27	10	37	51
5:00 PM				0	2		0	2	2	19		21		17	11	28	51
5:15 PM				0	8		0	8	3	9		12		12	6	18	38
5:30 PM				0	5		1	6	1	12		13		12	10	22	41
5:45 PM				0	3		1	4	1	8		9		15	9	24	37
Total Survey				0	32		5	37	12	101		113		138	73	211	361

Heavy Vehicle Peak Hour Summary
4:25 PM to 5:25 PM

By Approach	Northbound Bents Rd NE			Southbound Bents Rd NE			Eastbound Ehlen Rd NE			Westbound Ehlen Rd NE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	17	47	64	65	74	139	111	72	183	193
PHF	0.00			0.61			0.77			0.75			0.93

By Movement	Northbound Bents Rd NE				Southbound Bents Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total
				Total	L		R	Total	L	T		Total		T	R	Total	
Volume				0	16		1	17	9	56		65		73	38	111	193
PHF				0.00	0.57		0.25	0.61	0.75	0.74		0.77		0.68	0.79	0.75	0.93

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

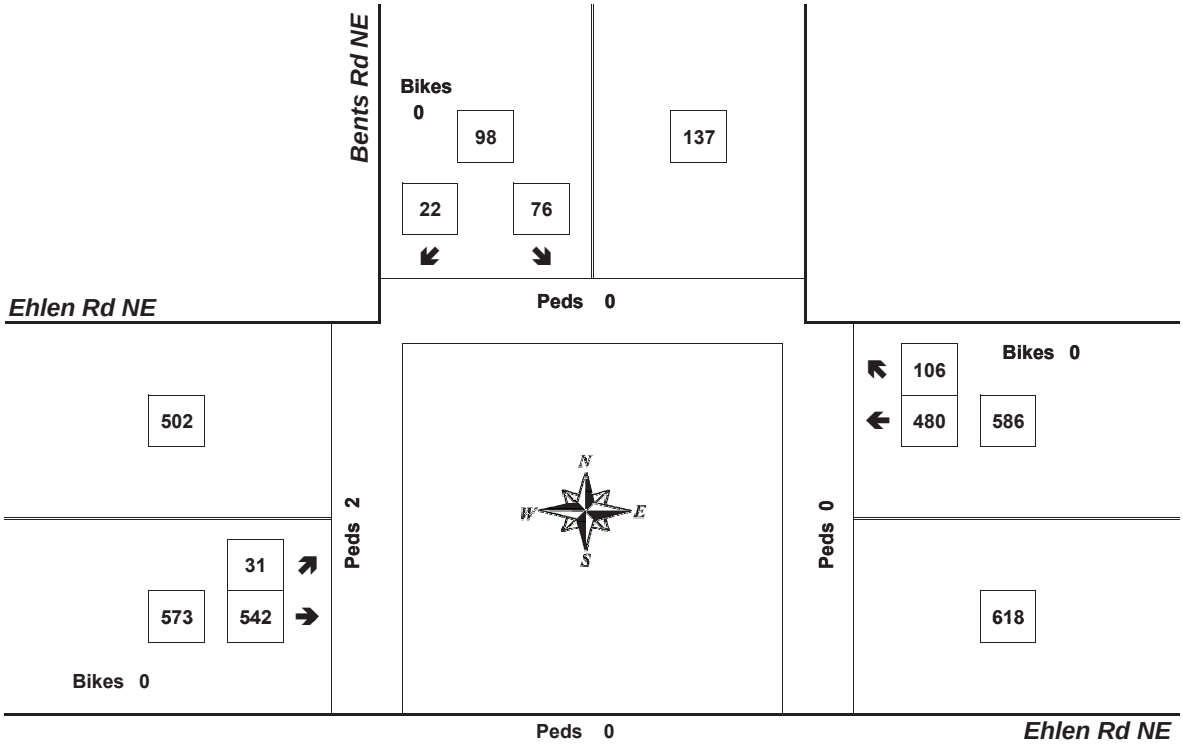
Interval Start Time	Northbound Bents Rd NE				Southbound Bents Rd NE				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
4:00 PM				0	14		3	17	5	53		58		82	37	119	194
4:15 PM				0	11		2	13	6	57		63		81	40	121	197
4:30 PM				0	17		1	18	7	50		57		72	36	108	183
4:45 PM				0	17		2	19	7	50		57		68	37	105	181
5:00 PM				0	18		2	20	7	48		55		56	36	92	167

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Bents Rd NE & Ehlen Rd NE

4:25 PM to 5:25 PM
Thursday, February 15, 2018



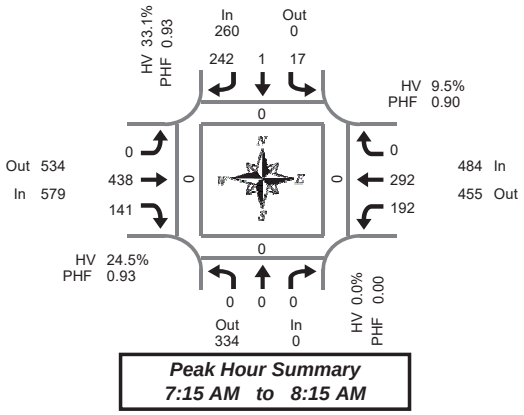
Bikes
0

Approach	PHF	HV%	Volume
EB	0.83	11.3%	573
WB	0.92	18.9%	586
NB	0.00	0.0%	0
SB	0.79	17.3%	98
Intersection	0.97	15.4%	1,257

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
7:15 AM to 8:15 AM

I-5 SB Ramp & Ehlen Rd NE

Thursday, February 15, 2018
7:00 AM to 9:00 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	0	0	0	0	2	0	16	0	0	30	4	0	20	15	0	0	87	0	0	0	0
7:05 AM	0	0	0	0	3	0	24	0	0	39	10	0	12	12	0	0	100	0	0	0	0
7:10 AM	0	0	0	0	0	0	11	0	0	43	6	0	16	26	0	0	102	0	0	0	0
7:15 AM	0	0	0	0	0	0	20	0	0	39	10	0	18	20	0	0	107	0	0	0	0
7:20 AM	0	0	0	0	0	1	22	0	0	34	10	0	21	29	0	0	117	0	0	0	0
7:25 AM	0	0	0	0	1	0	20	0	0	35	12	0	15	31	0	0	114	0	0	0	0
7:30 AM	0	0	0	0	0	0	20	0	0	38	15	0	21	12	0	0	106	0	0	0	0
7:35 AM	0	0	0	0	0	0	16	0	0	39	16	0	22	22	0	0	115	0	0	0	0
7:40 AM	0	0	0	0	2	0	26	0	0	33	7	0	9	24	0	0	101	0	0	0	0
7:45 AM	0	0	0	0	2	0	18	0	0	36	10	0	21	23	0	0	110	0	0	0	0
7:50 AM	0	0	0	0	1	0	21	0	0	35	11	0	8	35	0	0	111	0	0	0	0
7:55 AM	0	0	0	0	2	0	18	0	0	34	12	0	13	29	0	0	108	0	0	0	0
8:00 AM	0	0	0	0	5	0	23	0	0	37	8	0	19	16	0	0	108	0	0	0	0
8:05 AM	0	0	0	0	3	0	14	0	0	43	18	0	13	28	0	0	119	0	0	0	0
8:10 AM	0	0	0	0	1	0	24	0	0	35	12	0	12	23	0	0	107	0	0	0	0
8:15 AM	0	0	0	0	3	0	18	0	0	21	7	0	16	11	0	0	76	1	0	0	0
8:20 AM	0	0	0	0	1	0	14	0	0	29	11	0	12	21	0	0	88	0	0	0	0
8:25 AM	0	0	0	0	1	0	23	0	0	23	8	0	12	18	0	0	85	0	0	0	0
8:30 AM	0	0	0	0	3	0	20	0	0	31	8	0	18	15	0	0	95	0	0	0	0
8:35 AM	0	0	0	0	1	0	14	0	0	40	9	0	9	10	0	0	83	0	0	0	0
8:40 AM	0	0	0	0	2	0	31	0	0	31	9	0	7	15	0	0	95	1	0	0	0
8:45 AM	0	0	0	0	0	0	19	0	0	35	9	0	11	25	0	0	99	0	0	0	0
8:50 AM	0	0	0	0	3	0	14	0	0	28	12	0	10	14	0	0	81	0	0	0	0
8:55 AM	0	0	0	0	1	0	23	0	0	25	13	0	6	23	0	0	91	0	0	0	0
Total Survey	0	0	0	0	37	1	469	0	0	813	247	0	341	497	0	0	2,405	2	0	0	0

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	0	0	0	0	5	0	51	0	0	112	20	0	48	53	0	0	289	0	0	0	0
7:15 AM	0	0	0	0	1	1	62	0	0	108	32	0	54	80	0	0	338	0	0	0	0
7:30 AM	0	0	0	0	2	0	62	0	0	110	38	0	52	58	0	0	322	0	0	0	0
7:45 AM	0	0	0	0	5	0	57	0	0	105	33	0	42	87	0	0	329	0	0	0	0
8:00 AM	0	0	0	0	9	0	61	0	0	115	38	0	44	67	0	0	334	0	0	0	0
8:15 AM	0	0	0	0	5	0	55	0	0	73	26	0	40	50	0	0	249	1	0	0	0
8:30 AM	0	0	0	0	6	0	65	0	0	102	26	0	34	40	0	0	273	1	0	0	0
8:45 AM	0	0	0	0	4	0	56	0	0	88	34	0	27	62	0	0	271	0	0	0	0
Total Survey	0	0	0	0	37	1	469	0	0	813	247	0	341	497	0	0	2,405	2	0	0	0

Peak Hour Summary
7:15 AM to 8:15 AM

By Approach	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	0	334	334	0	260	0	260	0	579	534	1,113	0	484	455	939	0	1,323	0	0	0	0
%HV		0.0%				33.1%				24.5%				9.5%			20.7%				
PHF		0.00				0.93				0.93				0.90			0.98				

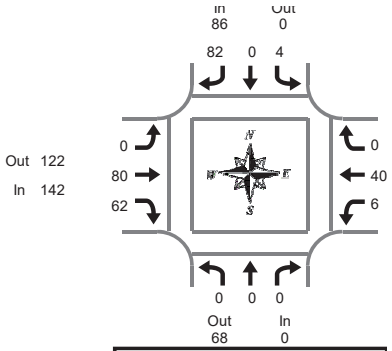
By Movement	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	17	1	242	260	0	438	141	579	192	292	0	484	1,323
%HV	0.0%	0.0%	0.0%	0.0%	23.5%	0.0%	33.9%	33.1%	0.0%	18.3%	44.0%	24.5%	3.1%	13.7%	0.0%	9.5%	20.7%
PHF	0.00	0.00	0.00	0.00	0.43	0.25	0.93	0.93	0.00	0.95	0.82	0.93	0.83	0.84	0.00	0.90	0.98

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	0	0	0	0	13	1	232	0	0	435	123	0	196	278	0	0	1,278	0	0	0	0
7:15 AM	0	0	0	0	17	1	242	0	0	438	141	0	192	292	0	0	1,323	0	0	0	0
7:30 AM	0	0	0	0	21	0	235	0	0	403	135	0	178	262	0	0	1,234	1	0	0	0
7:45 AM	0	0	0	0	25	0	238	0	0	395	123	0	160	244	0	0	1,185	2	0	0	0
8:00 AM	0	0	0	0	24	0	237	0	0	378	124	0	145	219	0	0	1,127	2	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



I-5 SB Ramp & Ehlen Rd NE

Thursday, February 15, 2018
7:00 AM to 9:00 AM

Peak Hour Summary
7:15 AM to 8:15 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	4	4	0	4	3	7	1	0	0	1	12
7:05 AM	0	0	0	0	0	0	9	9	0	8	4	12	0	0	0	0	21
7:10 AM	0	0	0	0	0	0	1	1	0	10	4	14	0	5	0	5	20
7:15 AM	0	0	0	0	0	0	11	11	0	11	4	15	0	4	0	4	30
7:20 AM	0	0	0	0	0	0	4	4	0	6	3	9	1	2	0	3	16
7:25 AM	0	0	0	0	1	0	4	5	0	4	8	12	0	5	0	5	22
7:30 AM	0	0	0	0	0	0	5	5	0	9	4	13	1	2	0	3	21
7:35 AM	0	0	0	0	0	0	4	4	0	5	6	11	1	5	0	6	21
7:40 AM	0	0	0	0	1	0	10	11	0	6	3	9	0	4	0	4	24
7:45 AM	0	0	0	0	0	0	7	7	0	6	4	10	1	1	0	2	19
7:50 AM	0	0	0	0	0	0	6	6	0	4	6	10	0	2	0	2	18
7:55 AM	0	0	0	0	0	0	7	7	0	7	8	15	0	4	0	4	26
8:00 AM	0	0	0	0	2	0	7	9	0	7	3	10	2	3	0	5	24
8:05 AM	0	0	0	0	0	0	7	7	0	8	9	17	0	3	0	3	27
8:10 AM	0	0	0	0	0	0	10	10	0	7	4	11	0	5	0	5	26
8:15 AM	0	0	0	0	2	0	3	5	0	6	3	9	1	2	0	3	17
8:20 AM	0	0	0	0	0	0	3	3	0	8	3	11	1	3	0	4	18
8:25 AM	0	0	0	0	0	0	5	5	0	5	3	8	2	1	0	3	16
8:30 AM	0	0	0	0	0	0	11	11	0	8	2	10	1	4	0	5	26
8:35 AM	0	0	0	0	1	0	7	8	0	10	2	12	0	1	0	1	21
8:40 AM	0	0	0	0	0	0	12	12	0	10	3	13	0	5	0	5	30
8:45 AM	0	0	0	0	0	0	6	6	0	9	3	12	0	3	0	3	21
8:50 AM	0	0	0	0	0	0	3	3	0	4	4	8	0	0	0	0	11
8:55 AM	0	0	0	0	1	0	11	12	0	10	3	13	2	0	0	2	27
Total Survey	0	0	0	0	8	0	157	165	0	172	99	271	14	64	0	78	514

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	14	14	0	22	11	33	1	5	0	6	53
7:15 AM	0	0	0	0	1	0	19	20	0	21	15	36	1	11	0	12	68
7:30 AM	0	0	0	0	1	0	19	20	0	20	13	33	2	11	0	13	66
7:45 AM	0	0	0	0	0	0	20	20	0	17	18	35	1	7	0	8	63
8:00 AM	0	0	0	0	2	0	24	26	0	22	16	38	2	11	0	13	77
8:15 AM	0	0	0	0	2	0	11	13	0	19	9	28	4	6	0	10	51
8:30 AM	0	0	0	0	1	0	30	31	0	28	7	35	1	10	0	11	77
8:45 AM	0	0	0	0	1	0	20	21	0	23	10	33	2	3	0	5	59
Total Survey	0	0	0	0	8	0	157	165	0	172	99	271	14	64	0	78	514

Heavy Vehicle Peak Hour Summary
7:15 AM to 8:15 AM

By Approach	Northbound I-5 SB Ramp			Southbound I-5 SB Ramp			Eastbound Ehlen Rd NE			Westbound Ehlen Rd NE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	68	68	86	0	86	142	122	264	46	84	130	274
PHF	0.00			0.83			0.85			0.82			0.89

By Movement	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	4	0	82	86	0	80	62	142	6	40	0	46	274
PHF	0.00	0.00	0.00	0.00	0.50	0.00	0.85	0.83	0.00	0.91	0.78	0.85	0.75	0.83	0.00	0.82	0.89

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	2	0	72	74	0	80	57	137	5	34	0	39	250
7:15 AM	0	0	0	0	4	0	82	86	0	80	62	142	6	40	0	46	274
7:30 AM	0	0	0	0	5	0	74	79	0	78	56	134	9	35	0	44	257
7:45 AM	0	0	0	0	5	0	85	90	0	86	50	136	8	34	0	42	268
8:00 AM	0	0	0	0	6	0	85	91	0	92	42	134	9	30	0	39	264

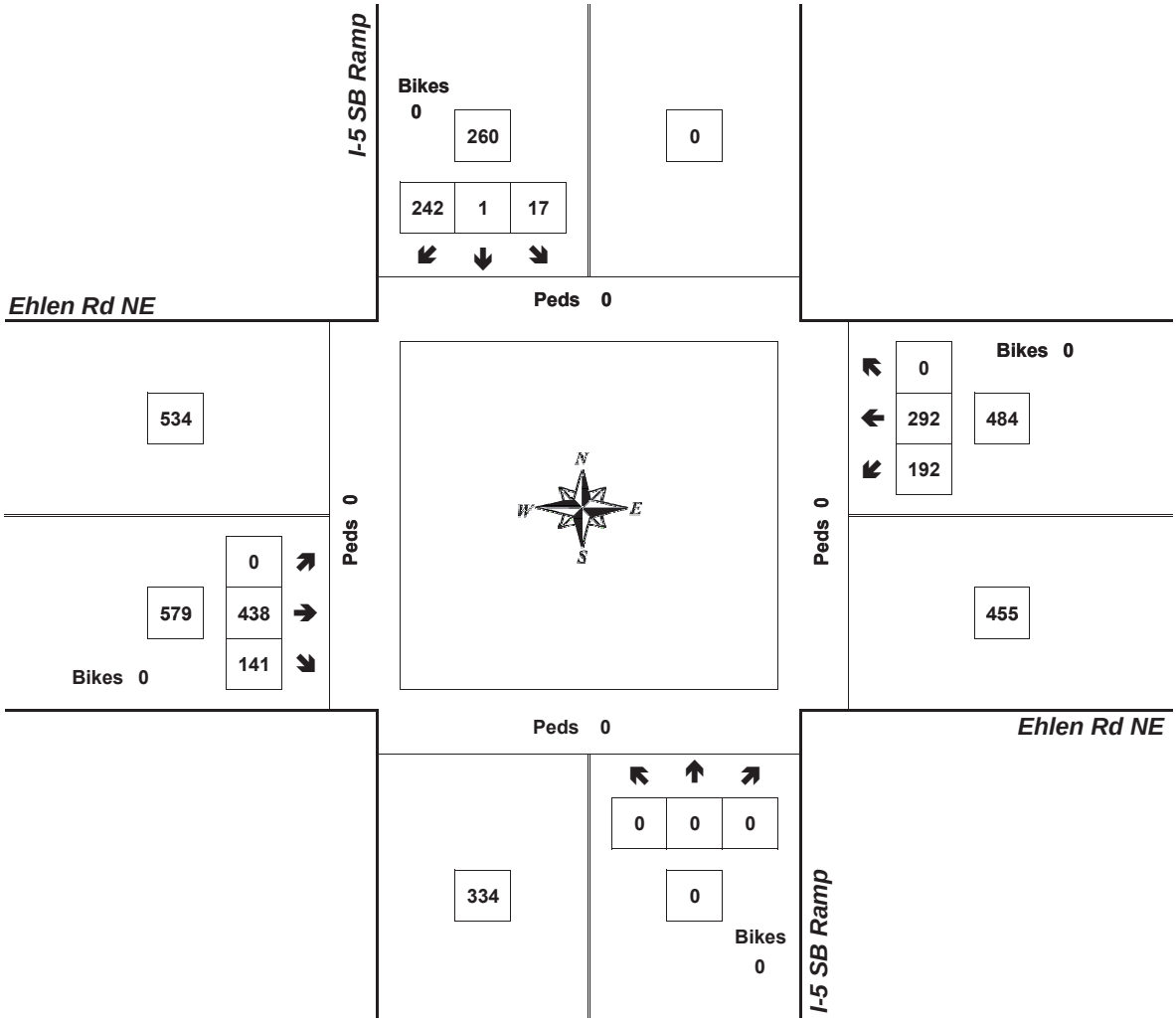
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

I-5 SB Ramp & Ehlen Rd NE

7:15 AM to 8:15 AM
Thursday, February 15, 2018

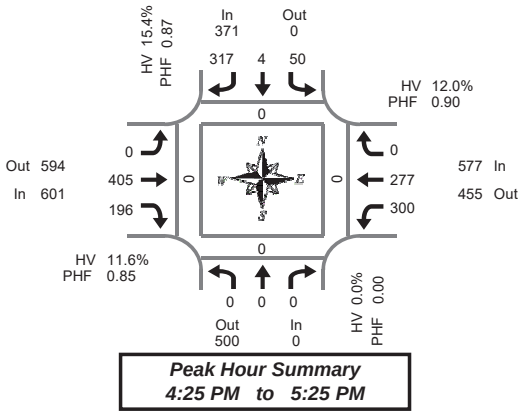


Approach	PHF	HV%	Volume
EB	0.93	24.5%	579
WB	0.90	9.5%	484
NB	0.00	0.0%	0
SB	0.93	33.1%	260
Intersection	0.98	20.7%	1,323

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:25 PM to 5:25 PM

I-5 SB Ramp & Ehlen Rd NE

Thursday, February 15, 2018
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	0	0	0	3	0	25	0	0	44	10	0	18	14	0	0	114	0	0	0	0
4:05 PM	0	0	0	0	9	0	24	0	0	26	18	0	14	20	0	0	111	0	0	0	0
4:10 PM	0	0	0	0	4	0	27	0	0	32	16	0	16	23	0	0	118	0	0	0	0
4:15 PM	0	0	0	0	4	0	29	0	0	35	15	0	30	18	0	0	131	0	0	0	0
4:20 PM	0	0	0	0	7	0	28	0	0	40	7	0	12	16	0	0	110	0	0	0	0
4:25 PM	0	0	0	0	5	0	23	0	0	32	11	0	23	27	0	0	121	0	0	0	0
4:30 PM	0	0	0	0	1	0	22	0	0	30	20	0	20	24	0	0	117	0	0	0	0
4:35 PM	0	0	0	0	3	1	31	0	0	44	20	0	34	19	0	0	152	0	0	0	0
4:40 PM	0	0	0	0	2	0	28	0	0	27	14	0	31	26	0	0	128	0	0	0	0
4:45 PM	0	0	0	0	1	0	22	0	0	36	16	0	23	28	0	0	126	0	0	0	0
4:50 PM	0	0	0	0	9	1	36	0	0	23	16	0	27	22	0	0	134	0	0	0	0
4:55 PM	0	0	0	0	6	0	21	0	0	35	15	0	28	27	0	0	132	0	0	0	0
5:00 PM	0	0	0	0	7	0	22	0	0	32	13	0	15	29	0	0	118	0	0	0	0
5:05 PM	0	0	0	0	7	1	28	0	0	27	14	0	30	22	0	0	129	0	0	0	0
5:10 PM	0	0	0	0	6	1	35	0	0	50	16	0	22	14	0	0	144	0	0	0	0
5:15 PM	0	0	0	0	1	0	18	0	0	33	26	0	20	19	0	0	117	0	0	0	0
5:20 PM	0	0	0	0	2	0	31	0	0	36	15	0	27	20	0	0	131	0	0	0	0
5:25 PM	0	0	0	0	6	0	25	0	0	27	19	0	18	24	0	0	119	0	0	0	0
5:30 PM	0	0	0	0	6	0	26	0	0	21	12	0	23	25	0	0	113	0	0	0	0
5:35 PM	0	0	0	0	6	0	30	0	0	24	12	0	20	24	0	0	116	0	0	0	0
5:40 PM	0	0	0	0	2	0	36	0	0	35	13	0	16	17	0	0	119	0	0	0	0
5:45 PM	0	0	0	0	2	0	18	0	0	21	15	0	19	25	0	0	100	0	0	0	0
5:50 PM	0	0	0	0	4	0	29	0	0	31	11	0	16	21	0	0	112	0	0	0	0
5:55 PM	0	0	0	0	4	1	26	0	0	41	7	0	16	17	0	0	112	0	0	0	0
Total Survey	0	0	0	0	107	5	640	0	0	782	351	0	518	521	0	0	2,924	0	0	0	0

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	0	0	0	16	0	76	0	0	102	44	0	48	57	0	0	343	0	0	0	0
4:15 PM	0	0	0	0	16	0	80	0	0	107	33	0	65	61	0	0	362	0	0	0	0
4:30 PM	0	0	0	0	6	1	81	0	0	101	54	0	85	69	0	0	397	0	0	0	0
4:45 PM	0	0	0	0	16	1	79	0	0	94	47	0	78	77	0	0	392	0	0	0	0
5:00 PM	0	0	0	0	20	2	85	0	0	109	43	0	67	65	0	0	391	0	0	0	0
5:15 PM	0	0	0	0	9	0	74	0	0	96	60	0	65	63	0	0	367	0	0	0	0
5:30 PM	0	0	0	0	14	0	92	0	0	80	37	0	59	66	0	0	348	0	0	0	0
5:45 PM	0	0	0	0	10	1	73	0	0	93	33	0	51	63	0	0	324	0	0	0	0
Total Survey	0	0	0	0	107	5	640	0	0	782	351	0	518	521	0	0	2,924	0	0	0	0

Peak Hour Summary
4:25 PM to 5:25 PM

By Approach	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	0	500	500	0	371	0	371	0	601	594	1,195	0	577	455	1,032	0	1,549	0	0	0	0
%HV		0.0%				15.4%				11.6%				12.0%			12.7%				
PHF		0.00				0.87				0.85				0.90			0.95				

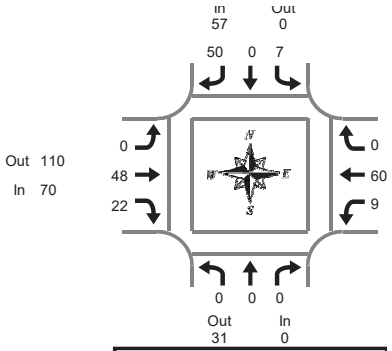
By Movement	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	50	4	317	371	0	405	196	601	300	277	0	577	1,549
%HV	0.0%	0.0%	0.0%	0.0%	14.0%	0.0%	15.8%	15.4%	0.0%	11.9%	11.2%	11.6%	3.0%	21.7%	0.0%	12.0%	12.7%
PHF	0.00	0.00	0.00	0.00	0.57	0.50	0.92	0.87	0.00	0.85	0.86	0.85	0.85	0.89	0.00	0.90	0.95

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	0	0	0	54	2	316	0	0	404	178	0	276	264	0	0	1,494	0	0	0	0
4:15 PM	0	0	0	0	58	4	325	0	0	411	177	0	295	272	0	0	1,542	0	0	0	0
4:30 PM	0	0	0	0	51	4	319	0	0	400	204	0	295	274	0	0	1,547	0	0	0	0
4:45 PM	0	0	0	0	59	3	330	0	0	379	187	0	269	271	0	0	1,498	0	0	0	0
5:00 PM	0	0	0	0	53	3	324	0	0	378	173	0	242	257	0	0	1,430	0	0	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
4:25 PM to 5:25 PM

I-5 SB Ramp & Ehlen Rd NE

Thursday, February 15, 2018
4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	4	4	0	8	2	10	1	3	0	4	18
4:05 PM	0	0	0	0	1	0	0	1	0	4	2	6	2	8	0	10	17
4:10 PM	0	0	0	0	0	0	5	5	0	3	1	4	2	6	0	8	17
4:15 PM	0	0	0	0	0	0	8	8	0	5	3	8	1	1	0	2	18
4:20 PM	0	0	0	0	0	0	6	6	0	5	0	5	0	5	0	5	16
4:25 PM	0	0	0	0	0	0	5	5	0	5	3	8	1	6	0	7	20
4:30 PM	0	0	0	0	1	0	3	4	0	3	4	7	0	5	0	5	16
4:35 PM	0	0	0	0	1	0	5	6	0	3	1	4	3	3	0	6	16
4:40 PM	0	0	0	0	0	0	4	4	0	5	1	6	1	4	0	5	15
4:45 PM	0	0	0	0	0	0	7	7	0	6	0	6	1	6	0	7	20
4:50 PM	0	0	0	0	1	0	5	6	0	1	2	3	1	5	0	6	15
4:55 PM	0	0	0	0	2	0	6	8	0	3	0	3	0	8	0	8	19
5:00 PM	0	0	0	0	1	0	5	6	0	1	1	2	1	6	0	7	15
5:05 PM	0	0	0	0	0	0	3	3	0	7	1	8	0	5	0	5	16
5:10 PM	0	0	0	0	1	0	5	6	0	6	2	8	1	4	0	5	19
5:15 PM	0	0	0	0	0	0	0	0	0	5	3	8	0	6	0	6	14
5:20 PM	0	0	0	0	0	0	2	2	0	3	4	7	0	2	0	2	11
5:25 PM	0	0	0	0	1	0	3	4	0	0	2	2	2	4	0	6	12
5:30 PM	0	0	0	0	0	0	3	3	0	1	3	4	1	4	0	5	12
5:35 PM	0	0	0	0	1	0	5	6	0	1	3	4	0	3	0	3	13
5:40 PM	0	0	0	0	0	0	3	3	0	5	3	8	1	5	0	6	17
5:45 PM	0	0	0	0	1	0	6	7	0	3	0	3	1	3	0	4	14
5:50 PM	0	0	0	0	0	0	4	4	0	5	0	5	0	4	0	4	13
5:55 PM	0	0	0	0	2	0	3	5	0	5	0	5	1	4	0	5	15
Total Survey	0	0	0	0	13	0	100	113	0	93	41	134	21	110	0	131	378

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	1	0	9	10	0	15	5	20	5	17	0	22	52
4:15 PM	0	0	0	0	0	0	19	19	0	15	6	21	2	12	0	14	54
4:30 PM	0	0	0	0	2	0	12	14	0	11	6	17	4	12	0	16	47
4:45 PM	0	0	0	0	3	0	18	21	0	10	2	12	2	19	0	21	54
5:00 PM	0	0	0	0	2	0	13	15	0	14	4	18	2	15	0	17	50
5:15 PM	0	0	0	0	1	0	5	6	0	8	9	17	2	12	0	14	37
5:30 PM	0	0	0	0	1	0	11	12	0	7	9	16	2	12	0	14	42
5:45 PM	0	0	0	0	3	0	13	16	0	13	0	13	2	11	0	13	42
Total Survey	0	0	0	0	13	0	100	113	0	93	41	134	21	110	0	131	378

Heavy Vehicle Peak Hour Summary
4:25 PM to 5:25 PM

By Approach	Northbound I-5 SB Ramp			Southbound I-5 SB Ramp			Eastbound Ehlen Rd NE			Westbound Ehlen Rd NE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	31	31	57	0	57	70	110	180	69	55	124	196
PHF	0.00			0.68			0.73			0.82			0.91

By Movement	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	7	0	50	57	0	48	22	70	9	60	0	69	196
PHF	0.00	0.00	0.00	0.00	0.44	0.00	0.69	0.68	0.00	0.67	0.61	0.73	0.45	0.79	0.00	0.82	0.91

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 SB Ramp				Southbound I-5 SB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	6	0	58	64	0	51	19	70	13	60	0	73	207
4:15 PM	0	0	0	0	7	0	62	69	0	50	18	68	10	58	0	68	205
4:30 PM	0	0	0	0	8	0	48	56	0	43	21	64	10	58	0	68	188
4:45 PM	0	0	0	0	7	0	47	54	0	39	24	63	8	58	0	66	183
5:00 PM	0	0	0	0	7	0	42	49	0	42	22	64	8	50	0	58	171

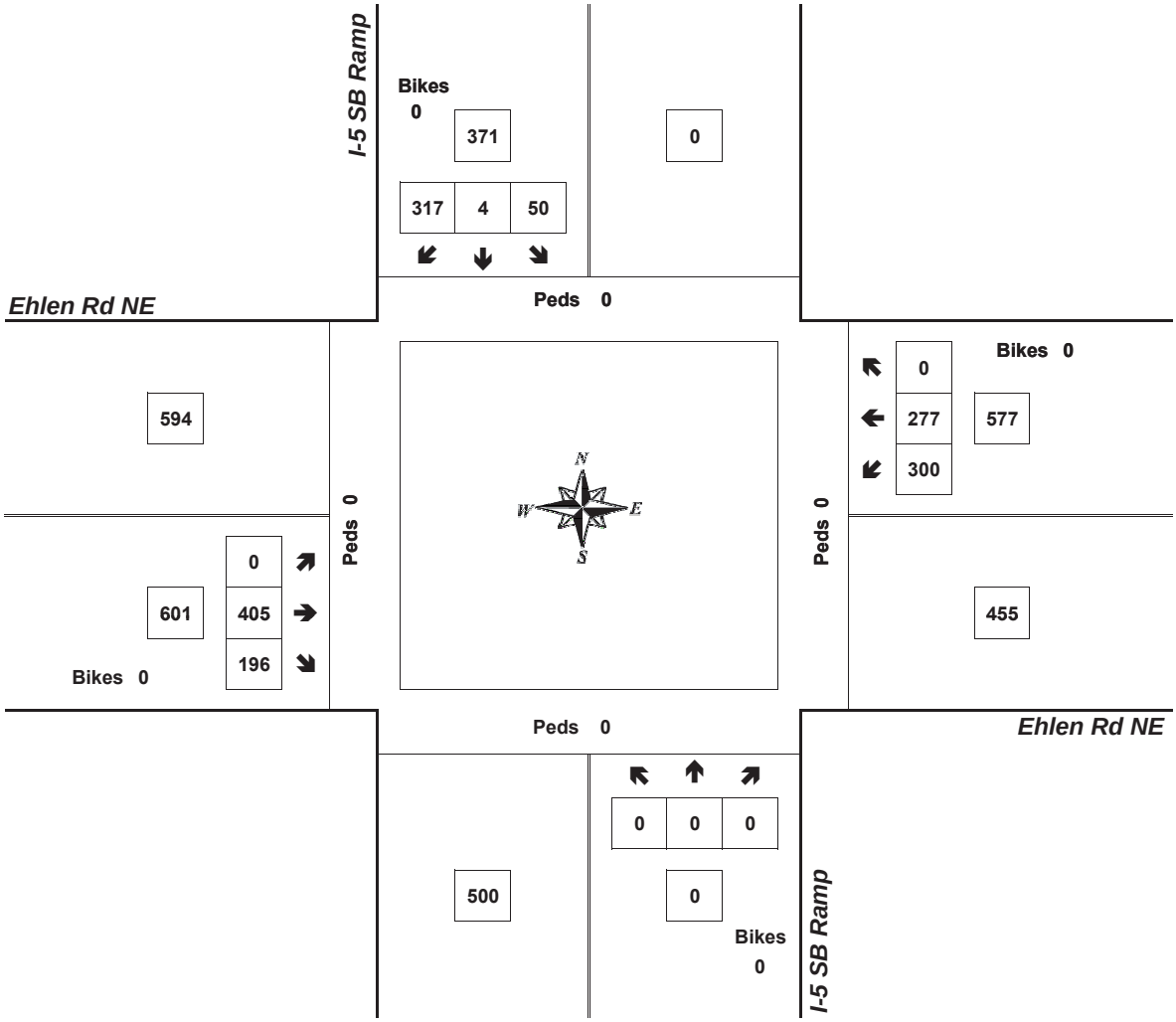
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

I-5 SB Ramp & Ehlen Rd NE

4:25 PM to 5:25 PM
Thursday, February 15, 2018

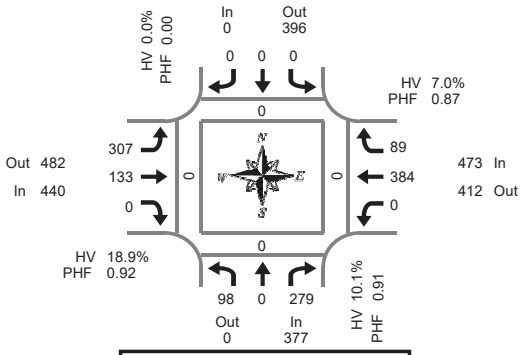


Approach	PHF	HV%	Volume
EB	0.85	11.6%	601
WB	0.90	12.0%	577
NB	0.00	0.0%	0
SB	0.87	15.4%	371
Intersection	0.95	12.7%	1,549

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



I-5 NB Ramp & Ehlen Rd NE

Thursday, February 15, 2018
7:00 AM to 9:00 AM

Peak Hour Summary
7:00 AM to 8:00 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	8	0	28	0	0	0	0	0	24	10	0	0	0	28	6	0	104	0	0	0	0
7:05 AM	5	0	23	0	0	0	0	0	28	11	0	0	0	21	6	0	94	0	0	0	0
7:10 AM	6	0	24	0	0	0	0	0	34	10	0	0	0	33	7	0	114	0	0	0	0
7:15 AM	10	0	23	0	0	0	0	0	28	8	0	0	0	32	5	0	106	0	0	0	0
7:20 AM	11	0	23	0	0	0	0	0	27	11	0	0	0	37	7	0	116	0	0	0	0
7:25 AM	13	0	24	0	0	0	0	0	17	15	0	0	0	36	4	0	109	0	0	0	0
7:30 AM	7	0	22	0	0	0	0	0	28	11	0	0	0	26	7	0	101	0	0	0	0
7:35 AM	5	0	32	0	0	0	0	0	17	15	0	0	0	41	12	0	122	0	0	0	0
7:40 AM	8	0	23	0	0	0	0	0	26	15	0	0	0	25	11	0	108	0	0	0	0
7:45 AM	6	0	23	0	0	0	0	0	26	6	0	0	0	38	9	0	108	0	0	0	0
7:50 AM	11	0	21	0	0	0	0	0	29	15	0	0	0	31	9	0	116	0	0	0	0
7:55 AM	8	0	13	0	0	0	0	0	23	6	0	0	0	36	6	0	92	0	0	0	0
8:00 AM	5	0	10	0	0	0	0	0	35	13	0	0	0	30	11	0	104	0	0	0	0
8:05 AM	10	0	3	0	0	0	0	0	34	8	0	0	0	34	5	0	94	0	0	0	0
8:10 AM	9	0	23	0	0	0	0	0	25	9	0	0	0	28	3	0	97	0	0	0	0
8:15 AM	3	0	20	0	0	0	0	0	19	8	0	0	0	22	6	0	78	0	1	0	0
8:20 AM	9	0	13	0	0	0	0	0	24	9	0	0	0	25	6	0	86	0	0	0	0
8:25 AM	8	0	11	0	0	0	0	0	17	6	0	0	0	21	5	0	68	0	0	0	0
8:30 AM	5	0	12	0	0	0	0	0	31	5	0	0	0	31	6	0	90	0	0	0	0
8:35 AM	2	0	15	0	0	0	0	0	24	9	0	0	0	18	5	0	73	0	1	0	0
8:40 AM	7	0	8	0	0	0	0	0	32	9	0	0	0	14	5	0	75	0	0	0	0
8:45 AM	7	0	10	0	0	0	0	0	27	10	0	0	0	27	6	0	87	0	0	0	0
8:50 AM	10	0	8	0	0	0	0	0	28	5	0	0	0	15	4	0	70	0	0	0	0
8:55 AM	10	0	10	0	0	0	0	0	15	11	0	0	0	19	4	0	69	0	0	0	0
Total Survey	183	0	422	0	0	0	0	0	618	235	0	0	0	668	155	0	2,281	0	2	0	0

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	19	0	75	0	0	0	0	0	86	31	0	0	0	82	19	0	312	0	0	0	0
7:15 AM	34	0	70	0	0	0	0	0	72	34	0	0	0	105	16	0	331	0	0	0	0
7:30 AM	20	0	77	0	0	0	0	0	71	41	0	0	0	92	30	0	331	0	0	0	0
7:45 AM	25	0	57	0	0	0	0	0	78	27	0	0	0	105	24	0	316	0	0	0	0
8:00 AM	24	0	36	0	0	0	0	0	94	30	0	0	0	92	19	0	295	0	0	0	0
8:15 AM	20	0	44	0	0	0	0	0	60	23	0	0	0	68	17	0	232	0	1	0	0
8:30 AM	14	0	35	0	0	0	0	0	87	23	0	0	0	63	16	0	238	0	1	0	0
8:45 AM	27	0	28	0	0	0	0	0	70	26	0	0	0	61	14	0	226	0	0	0	0
Total Survey	183	0	422	0	0	0	0	0	618	235	0	0	0	668	155	0	2,281	0	2	0	0

Peak Hour Summary
7:00 AM to 8:00 AM

By Approach	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	377	0	377	0	0	396	396	0	440	482	922	0	473	412	885	0	1,290	0	0	0	0
%HV	10.1%				0.0%				18.9%				7.0%				11.9%				
PHF	0.91				0.00				0.92				0.87				0.95				

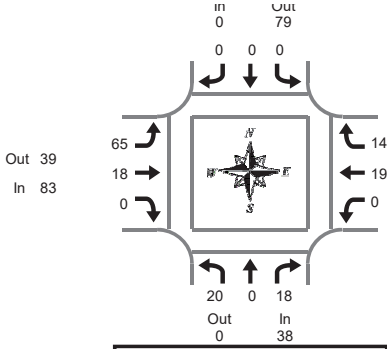
By Movement	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	98	0	279	377	0	0	0	0	307	133	0	440	0	384	89	473	1,290
%HV	20.4%	0.0%	6.5%	10.1%	0.0%	0.0%	0.0%	0.0%	21.2%	13.5%	0.0%	18.9%	0.0%	4.9%	15.7%	7.0%	11.9%
PHF	0.72	0.00	0.89	0.91	0.00	0.00	0.00	0.00	0.85	0.81	0.00	0.92	0.00	0.91	0.70	0.87	0.95

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	98	0	279	0	0	0	0	0	307	133	0	0	0	384	89	0	1,290	0	0	0	0
7:15 AM	103	0	240	0	0	0	0	0	315	132	0	0	0	394	89	0	1,273	0	0	0	0
7:30 AM	89	0	214	0	0	0	0	0	303	121	0	0	0	357	90	0	1,174	0	1	0	0
7:45 AM	83	0	172	0	0	0	0	0	319	103	0	0	0	328	76	0	1,081	0	2	0	0
8:00 AM	85	0	143	0	0	0	0	0	311	102	0	0	0	284	66	0	991	0	2	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



I-5 NB Ramp & Ehlen Rd NE

Thursday, February 15, 2018
7:00 AM to 9:00 AM

Peak Hour Summary
7:00 AM to 8:00 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	0	0	3	1	0	4	0	1	1	2	6
7:05 AM	0	0	1	1	0	0	0	0	7	3	0	10	0	0	1	1	12
7:10 AM	2	0	0	2	0	0	0	0	9	0	0	9	0	2	0	2	13
7:15 AM	4	0	2	6	0	0	0	0	10	0	0	10	0	0	0	0	16
7:20 AM	2	0	2	4	0	0	0	0	7	1	0	8	0	1	1	2	14
7:25 AM	2	0	1	3	0	0	0	0	1	4	0	5	0	4	1	5	13
7:30 AM	3	0	0	3	0	0	0	0	7	1	0	8	0	0	1	1	12
7:35 AM	3	0	2	5	0	0	0	0	3	1	0	4	0	3	2	5	14
7:40 AM	2	0	3	5	0	0	0	0	6	4	0	10	0	2	0	2	17
7:45 AM	0	0	1	1	0	0	0	0	4	0	0	4	0	2	1	3	8
7:50 AM	1	0	3	4	0	0	0	0	3	3	0	6	0	1	3	4	14
7:55 AM	1	0	3	4	0	0	0	0	5	0	0	5	0	3	3	6	15
8:00 AM	2	0	2	4	0	0	0	0	7	3	0	10	0	2	4	6	20
8:05 AM	1	0	1	2	0	0	0	0	8	0	0	8	0	1	2	3	13
8:10 AM	4	0	3	7	0	0	0	0	6	0	0	6	0	1	0	1	14
8:15 AM	2	0	2	4	0	0	0	0	4	2	0	6	0	1	0	1	11
8:20 AM	3	0	0	3	0	0	0	0	7	1	0	8	0	1	4	5	16
8:25 AM	0	0	1	1	0	0	0	0	4	2	0	6	0	2	1	3	10
8:30 AM	1	0	1	2	0	0	0	0	7	2	0	9	0	4	1	5	16
8:35 AM	1	0	1	2	0	0	0	0	5	3	0	8	0	1	0	1	11
8:40 AM	3	0	0	3	0	0	0	0	11	1	0	12	0	2	0	2	17
8:45 AM	3	0	1	4	0	0	0	0	9	1	0	10	0	0	1	1	15
8:50 AM	0	0	1	1	0	0	0	0	3	1	0	4	0	0	0	0	5
8:55 AM	0	0	2	2	0	0	0	0	7	4	0	11	0	2	1	3	16
Total Survey	40	0	33	73	0	0	0	0	143	38	0	181	0	36	28	64	318

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	2	0	1	3	0	0	0	0	19	4	0	23	0	3	2	5	31
7:15 AM	8	0	5	13	0	0	0	0	18	5	0	23	0	5	2	7	43
7:30 AM	8	0	5	13	0	0	0	0	16	6	0	22	0	5	3	8	43
7:45 AM	2	0	7	9	0	0	0	0	12	3	0	15	0	6	7	13	37
8:00 AM	7	0	6	13	0	0	0	0	21	3	0	24	0	4	6	10	47
8:15 AM	5	0	3	8	0	0	0	0	15	5	0	20	0	4	5	9	37
8:30 AM	5	0	2	7	0	0	0	0	23	6	0	29	0	7	1	8	44
8:45 AM	3	0	4	7	0	0	0	0	19	6	0	25	0	2	2	4	36
Total Survey	40	0	33	73	0	0	0	0	143	38	0	181	0	36	28	64	318

Heavy Vehicle Peak Hour Summary
7:00 AM to 8:00 AM

By Approach	Northbound I-5 NB Ramp			Southbound I-5 NB Ramp			Eastbound Ehlen Rd NE			Westbound Ehlen Rd NE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	38	0	38	0	79	79	83	39	122	33	36	69	154
PHF	0.73			0.00			0.72			0.63			0.90

By Movement	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	20	0	18	38	0	0	0	0	65	18	0	83	0	19	14	33	154
PHF	0.63	0.00	0.64	0.73	0.00	0.00	0.00	0.00	0.63	0.64	0.00	0.72	0.00	0.68	0.50	0.63	0.90

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	20	0	18	38	0	0	0	0	65	18	0	83	0	19	14	33	154
7:15 AM	25	0	23	48	0	0	0	0	67	17	0	84	0	20	18	38	170
7:30 AM	22	0	21	43	0	0	0	0	64	17	0	81	0	19	21	40	164
7:45 AM	19	0	18	37	0	0	0	0	71	17	0	88	0	21	19	40	165
8:00 AM	20	0	15	35	0	0	0	0	78	20	0	98	0	17	14	31	164

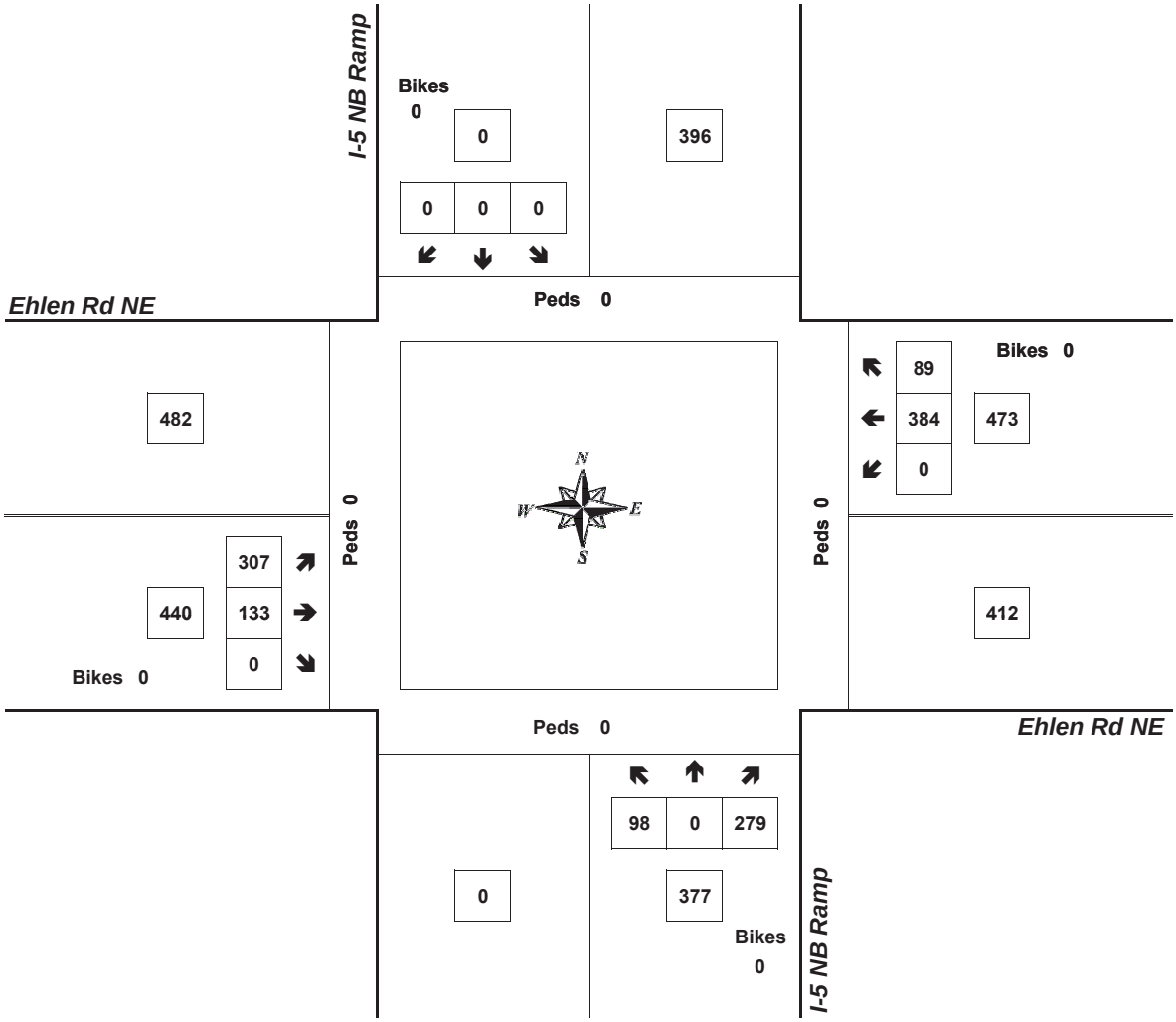
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

I-5 NB Ramp & Ehlen Rd NE

7:00 AM to 8:00 AM
Thursday, February 15, 2018

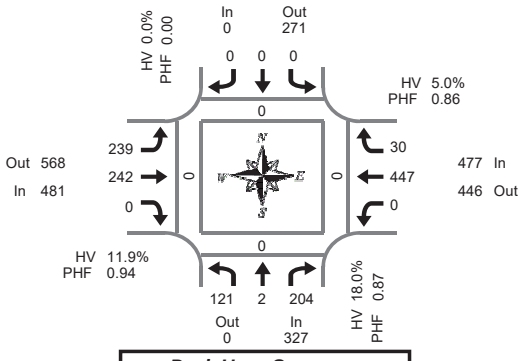


Approach	PHF	HV%	Volume
EB	0.92	18.9%	440
WB	0.87	7.0%	473
NB	0.91	10.1%	377
SB	0.00	0.0%	0
Intersection	0.95	11.9%	1,290

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:20 PM to 5:20 PM

I-5 NB Ramp & Ehlen Rd NE

Thursday, February 15, 2018
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	5	0	12	0	0	0	0	0	20	25	0	0	0	32	6	0	100	0	0	0	0
4:05 PM	9	0	18	0	0	0	0	0	18	20	0	0	0	26	6	0	97	0	0	0	0
4:10 PM	8	0	12	0	0	0	0	0	22	11	0	0	0	32	3	0	88	0	0	0	0
4:15 PM	9	0	12	0	0	0	0	0	23	23	0	0	0	38	2	0	107	0	0	0	0
4:20 PM	9	0	13	0	0	0	0	0	28	21	0	0	0	19	3	0	93	0	0	0	0
4:25 PM	12	0	22	0	0	0	0	0	15	19	0	0	0	40	0	0	108	0	0	0	0
4:30 PM	14	0	19	0	0	0	0	0	18	20	0	0	0	28	8	0	107	0	0	0	0
4:35 PM	4	0	12	0	0	0	0	0	22	20	0	0	0	49	3	0	110	0	0	0	0
4:40 PM	13	0	11	0	0	0	0	0	16	17	0	0	0	50	1	0	108	0	0	0	0
4:45 PM	12	0	22	0	0	0	0	0	23	16	0	0	0	35	1	0	109	0	0	0	0
4:50 PM	6	0	12	0	0	0	0	0	19	18	0	0	0	46	1	0	102	0	0	0	0
4:55 PM	10	0	6	0	0	0	0	0	17	27	0	0	0	47	1	0	108	0	0	0	0
5:00 PM	14	0	39	0	0	0	0	0	16	29	0	0	0	29	1	0	128	0	0	0	0
5:05 PM	9	1	15	0	0	0	0	0	16	14	0	0	0	43	5	0	103	0	0	0	0
5:10 PM	6	0	5	0	0	0	0	0	28	25	0	0	0	31	2	0	97	0	0	0	0
5:15 PM	12	1	28	0	0	0	0	0	21	16	0	0	0	30	4	0	112	0	0	0	0
5:20 PM	6	0	9	0	0	0	0	0	19	20	0	0	0	36	3	0	93	0	0	0	0
5:25 PM	15	1	21	0	0	0	0	0	17	18	0	0	0	31	1	0	104	0	0	0	0
5:30 PM	10	0	14	0	0	0	0	0	21	11	0	0	0	33	1	0	90	0	0	0	0
5:35 PM	10	0	21	0	0	0	0	0	12	14	0	0	0	34	4	0	95	0	0	0	0
5:40 PM	7	0	25	0	0	0	0	0	17	18	0	0	0	26	5	0	98	0	0	0	0
5:45 PM	11	0	16	0	0	0	0	0	18	14	0	0	0	31	4	0	94	0	0	0	0
5:50 PM	9	0	16	0	0	0	0	0	12	15	0	0	0	32	0	0	84	0	0	0	0
5:55 PM	6	0	16	0	0	0	0	0	29	21	0	0	0	28	1	0	101	0	0	0	0
Total Survey	226	3	396	0	0	0	0	0	467	452	0	0	0	826	66	0	2,436	0	0	0	0

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	22	0	42	0	0	0	0	0	60	56	0	0	0	90	15	0	285	0	0	0	0
4:15 PM	30	0	47	0	0	0	0	0	66	63	0	0	0	97	5	0	308	0	0	0	0
4:30 PM	31	0	42	0	0	0	0	0	56	57	0	0	0	127	12	0	325	0	0	0	0
4:45 PM	28	0	40	0	0	0	0	0	59	61	0	0	0	128	3	0	319	0	0	0	0
5:00 PM	29	1	59	0	0	0	0	0	60	68	0	0	0	103	8	0	328	0	0	0	0
5:15 PM	33	2	58	0	0	0	0	0	57	54	0	0	0	97	8	0	309	0	0	0	0
5:30 PM	27	0	60	0	0	0	0	0	50	43	0	0	0	93	10	0	283	0	0	0	0
5:45 PM	26	0	48	0	0	0	0	0	59	50	0	0	0	91	5	0	279	0	0	0	0
Total Survey	226	3	396	0	0	0	0	0	467	452	0	0	0	826	66	0	2,436	0	0	0	0

Peak Hour Summary
4:20 PM to 5:20 PM

By Approach	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	327	0	327	0	0	271	271	0	481	568	1,049	0	477	446	923	0	1,285	0	0	0	0
%HV	18.0%				0.0%				11.9%				5.0%				10.9%				
PHF	0.87				0.00				0.94				0.86				0.95				

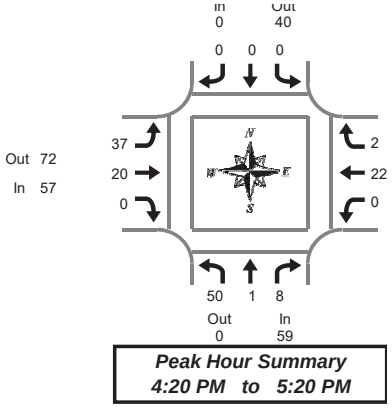
By Movement	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	121	2	204	327	0	0	0	0	239	242	0	481	0	447	30	477	1,285
%HV	41.3%	50.0%	3.9%	18.0%	0.0%	0.0%	0.0%	0.0%	15.5%	8.3%	0.0%	11.9%	0.0%	4.9%	6.7%	5.0%	10.9%
PHF	0.86	0.25	0.85	0.87	0.00	0.00	0.00	0.00	0.92	0.82	0.00	0.94	0.00	0.83	0.63	0.86	0.95

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	111	0	171	0	0	0	0	0	241	237	0	0	0	442	35	0	1,237	0	0	0	0
4:15 PM	118	1	188	0	0	0	0	0	241	249	0	0	0	455	28	0	1,280	0	0	0	0
4:30 PM	121	3	199	0	0	0	0	0	232	240	0	0	0	455	31	0	1,281	0	0	0	0
4:45 PM	117	3	217	0	0	0	0	0	226	226	0	0	0	421	29	0	1,239	0	0	0	0
5:00 PM	115	3	225	0	0	0	0	0	226	215	0	0	0	384	31	0	1,199	0	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



I-5 NB Ramp & Ehlen Rd NE

Thursday, February 15, 2018
4:00 PM to 6:00 PM

Peak Hour Summary
4:20 PM to 5:20 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	2	0	1	3	0	0	0	0	2	3	0	5	0	3	0	3	11
4:05 PM	4	0	2	6	0	0	0	0	5	1	0	6	0	5	0	5	17
4:10 PM	5	0	0	5	0	0	0	0	5	0	0	5	0	4	0	4	14
4:15 PM	2	0	0	2	0	0	0	0	4	0	0	4	0	1	0	1	7
4:20 PM	2	0	1	3	0	0	0	0	4	1	0	5	0	1	0	1	9
4:25 PM	7	0	0	7	0	0	0	0	2	2	0	4	0	2	0	2	13
4:30 PM	2	0	0	2	0	0	0	0	1	1	0	2	0	2	1	3	7
4:35 PM	3	0	0	3	0	0	0	0	4	2	0	6	0	3	0	3	12
4:40 PM	4	0	1	5	0	0	0	0	2	3	0	5	0	2	1	3	13
4:45 PM	5	0	2	7	0	0	0	0	4	2	0	6	0	2	0	2	15
4:50 PM	2	0	1	3	0	0	0	0	2	1	0	3	0	3	0	3	9
4:55 PM	6	0	0	6	0	0	0	0	0	3	0	3	0	3	0	3	12
5:00 PM	6	0	2	8	0	0	0	0	2	2	0	4	0	1	0	1	13
5:05 PM	4	0	0	4	0	0	0	0	4	2	0	6	0	1	0	1	11
5:10 PM	3	0	1	4	0	0	0	0	8	1	0	9	0	2	0	2	15
5:15 PM	6	1	0	7	0	0	0	0	4	0	0	4	0	0	0	0	11
5:20 PM	2	0	0	2	0	0	0	0	3	1	0	4	0	0	0	0	6
5:25 PM	5	1	0	6	0	0	0	0	0	1	0	1	0	1	0	1	8
5:30 PM	4	0	0	4	0	0	0	0	1	0	0	1	0	1	0	1	6
5:35 PM	3	0	0	3	0	0	0	0	2	1	0	3	0	0	0	0	6
5:40 PM	4	0	0	4	0	0	0	0	4	0	0	4	0	2	0	2	10
5:45 PM	2	0	0	2	0	0	0	0	3	2	0	5	0	2	0	2	9
5:50 PM	4	0	0	4	0	0	0	0	2	2	0	4	0	1	0	1	9
5:55 PM	3	0	1	4	0	0	0	0	5	2	0	7	0	2	0	2	13
Total Survey	90	2	12	104	0	0	0	0	73	33	0	106	0	44	2	46	256

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	11	0	3	14	0	0	0	0	12	4	0	16	0	12	0	12	42
4:15 PM	11	0	1	12	0	0	0	0	10	3	0	13	0	4	0	4	29
4:30 PM	9	0	1	10	0	0	0	0	7	6	0	13	0	7	2	9	32
4:45 PM	13	0	3	16	0	0	0	0	6	6	0	12	0	8	0	8	36
5:00 PM	13	0	3	16	0	0	0	0	14	5	0	19	0	4	0	4	39
5:15 PM	13	2	0	15	0	0	0	0	7	2	0	9	0	1	0	1	25
5:30 PM	11	0	0	11	0	0	0	0	7	1	0	8	0	3	0	3	22
5:45 PM	9	0	1	10	0	0	0	0	10	6	0	16	0	5	0	5	31
Total Survey	90	2	12	104	0	0	0	0	73	33	0	106	0	44	2	46	256

Heavy Vehicle Peak Hour Summary
4:20 PM to 5:20 PM

By Approach	Northbound I-5 NB Ramp			Southbound I-5 NB Ramp			Eastbound Ehlen Rd NE			Westbound Ehlen Rd NE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	59	0	59	0	40	40	57	72	129	24	28	52	140
PHF	0.82			0.00			0.75			0.67			0.88

By Movement	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	50	1	8	59	0	0	0	0	37	20	0	57	0	22	2	24	140
PHF	0.78	0.25	0.50	0.82	0.00	0.00	0.00	0.00	0.58	0.71	0.00	0.75	0.00	0.69	0.25	0.67	0.88

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

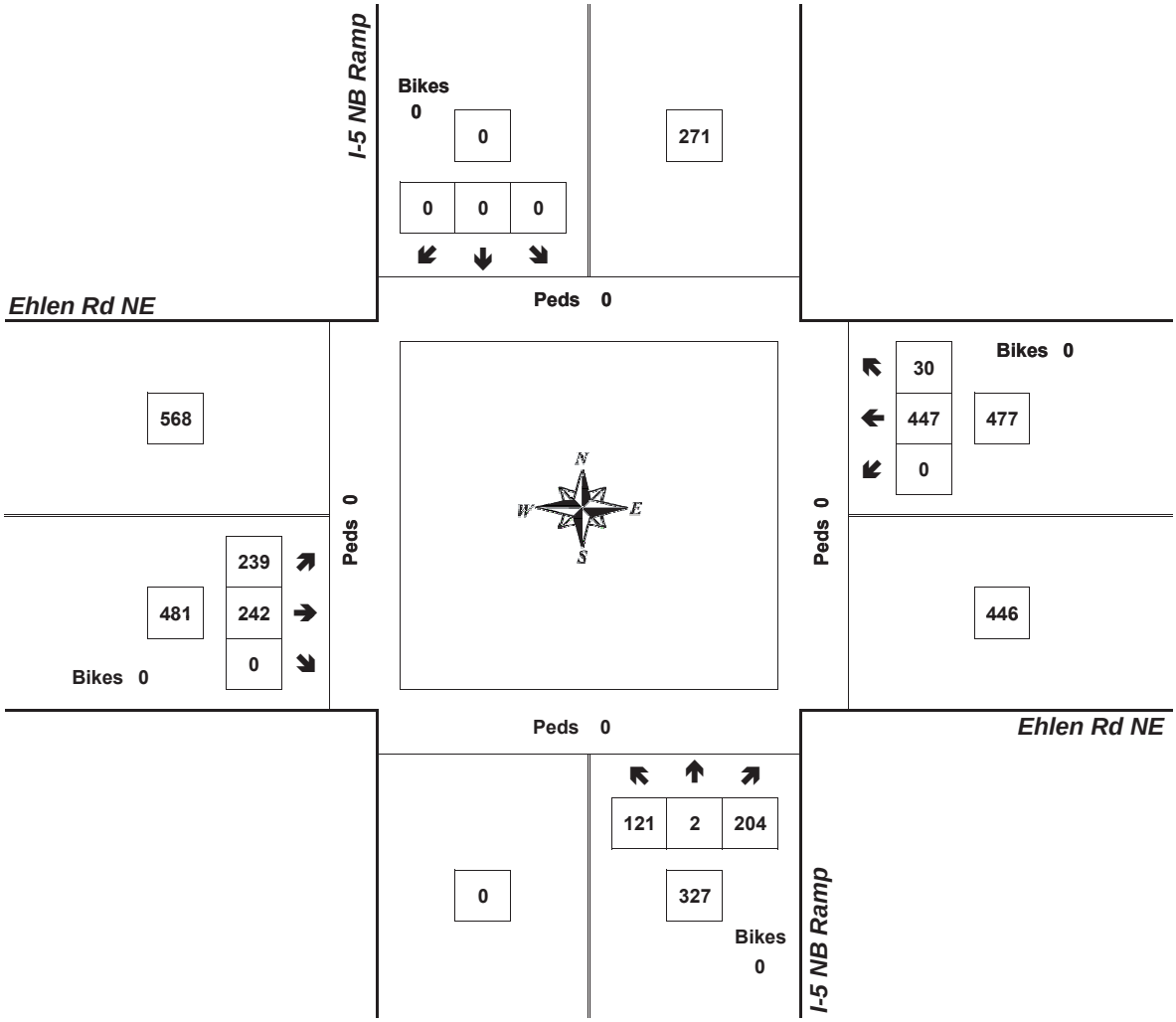
Interval Start Time	Northbound I-5 NB Ramp				Southbound I-5 NB Ramp				Eastbound Ehlen Rd NE				Westbound Ehlen Rd NE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	44	0	8	52	0	0	0	0	35	19	0	54	0	31	2	33	139
4:15 PM	46	0	8	54	0	0	0	0	37	20	0	57	0	23	2	25	136
4:30 PM	48	2	7	57	0	0	0	0	34	19	0	53	0	20	2	22	132
4:45 PM	50	2	6	58	0	0	0	0	34	14	0	48	0	16	0	16	122
5:00 PM	46	2	4	52	0	0	0	0	38	14	0	52	0	13	0	13	117

Peak Hour Summary

Clay Carney
(503) 833-2740

I-5 NB Ramp & Ehlen Rd NE

4:20 PM to 5:20 PM
Thursday, February 15, 2018

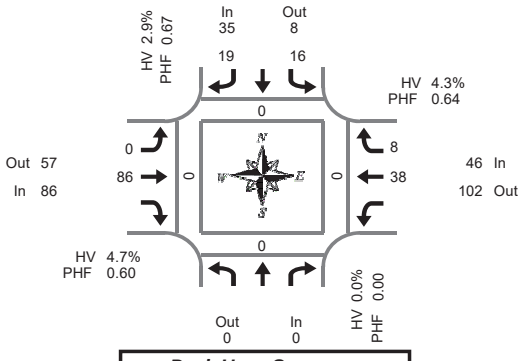


Approach	PHF	HV%	Volume
EB	0.94	11.9%	481
WB	0.86	5.0%	477
NB	0.87	18.0%	327
SB	0.00	0.0%	0
Intersection	0.95	10.9%	1,285

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Huckleberry Ln NE & Donald Rd NE

Thursday, February 15, 2018
7:00 AM to 9:00 AM

Peak Hour Summary
7:10 AM to 8:10 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total	Pedestrians Crosswalk			
				Bikes	L		R	Bikes	L	T		Bikes		T	R	Bikes		North	South	East	West
7:00 AM				0	2		1	0	0	4		0		1	1	0	9	0	0	0	0
7:05 AM				0	2		0	0	0	4		0		0	0	0	6	0	0	0	0
7:10 AM				0	1		4	0	0	6		0		3	0	0	14	0	0	0	0
7:15 AM				0	1		2	0	0	2		0		0	0	0	5	0	0	0	0
7:20 AM				0	2		2	0	0	5		0		4	0	0	13	0	0	0	0
7:25 AM				0	0		2	0	0	5		0		4	0	0	11	0	0	0	0
7:30 AM				0	1		2	0	0	6		0		5	0	0	14	0	0	0	0
7:35 AM				0	2		2	0	0	9		0		5	0	0	18	0	0	0	0
7:40 AM				0	1		2	0	0	10		0		0	1	0	14	0	0	0	0
7:45 AM				0	5		1	0	0	12		0		2	2	0	22	0	0	0	0
7:50 AM				0	1		0	0	0	14		0		2	0	0	17	0	0	0	0
7:55 AM				0	1		1	0	0	8		0		6	2	0	18	0	0	0	0
8:00 AM				0	0		0	0	0	3		0		5	0	0	8	0	0	0	0
8:05 AM				0	1		1	0	0	6		0		2	3	0	13	0	0	0	0
8:10 AM				0	0		0	0	0	1		0		4	1	0	6	0	0	0	0
8:15 AM				0	0		1	0	0	1		0		1	0	0	3	0	0	0	0
8:20 AM				0	0		0	0	0	2		0		3	1	0	6	0	0	0	0
8:25 AM				0	2		0	0	0	5		0		2	0	0	9	0	0	0	0
8:30 AM				0	1		1	0	0	2		0		2	0	0	6	0	0	0	0
8:35 AM				0	2		2	0	0	4		0		1	0	0	9	0	0	0	0
8:40 AM				0	1		3	0	0	4		0		2	2	0	12	0	0	0	0
8:45 AM				0	1		0	0	0	5		0		2	1	0	9	0	0	0	0
8:50 AM				0	0		2	0	0	6		0		2	1	0	11	0	0	0	0
8:55 AM				0	3		0	0	0	1		0		2	1	0	7	0	0	0	0
Total Survey				0	30		29	0	0	125		0		60	16	0	260	0	0	0	0

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total	Pedestrians Crosswalk			
				Bikes	L		R	Bikes	L	T		Bikes		T	R	Bikes		North	South	East	West
7:00 AM				0	5		5	0	0	14		0		4	1	0	29	0	0	0	0
7:15 AM				0	3		6	0	0	12		0		8	0	0	29	0	0	0	0
7:30 AM				0	4		6	0	0	25		0		10	1	0	46	0	0	0	0
7:45 AM				0	7		2	0	0	34		0		10	4	0	57	0	0	0	0
8:00 AM				0	1		1	0	0	10		0		11	4	0	27	0	0	0	0
8:15 AM				0	2		1	0	0	8		0		6	1	0	18	0	0	0	0
8:30 AM				0	4		6	0	0	10		0		5	2	0	27	0	0	0	0
8:45 AM				0	4		2	0	0	12		0		6	3	0	27	0	0	0	0
Total Survey				0	30		29	0	0	125		0		60	16	0	260	0	0	0	0

Peak Hour Summary
7:10 AM to 8:10 AM

By Approach	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	0	0	0	0	35	8	43	0	86	57	143	0	46	102	148	0	167	0	0	0	0
%HV	0.0%				2.9%				4.7%				4.3%				4.2%				
PHF	0.00				0.67				0.60				0.64				0.73				

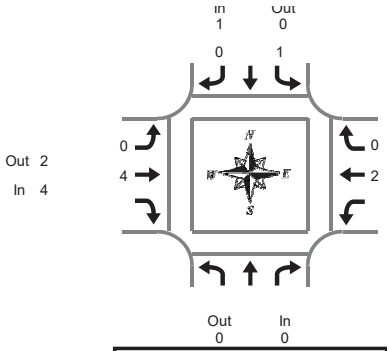
By Movement	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Total
				Total	L		R	Total	L	T		Total		T	R	Total	
Volume				0	16		19	35	0	86		86		38	8	46	167
%HV	NA	NA	NA	0.0%	6.3%	NA	0.0%	2.9%	0.0%	4.7%	NA	4.7%	NA	5.3%	0.0%	4.3%	4.2%
PHF				0.00	0.50		0.59	0.67	0.00	0.60		0.60		0.68	0.40	0.64	0.73

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total	Pedestrians Crosswalk			
				Bikes	L		R	Bikes	L	T		Bikes		T	R	Bikes		North	South	East	West
7:00 AM				0	19		19	0	0	85		0		32	6	0	161	0	0	0	0
7:15 AM				0	15		15	0	0	81		0		39	9	0	159	0	0	0	0
7:30 AM				0	14		10	0	0	77		0		37	10	0	148	0	0	0	0
7:45 AM				0	14		10	0	0	62		0		32	11	0	129	0	0	0	0
8:00 AM				0	11		10	0	0	40		0		28	10	0	99	0	0	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Huckleberry Ln NE & Donald Rd NE

Thursday, February 15, 2018
7:00 AM to 9:00 AM

Peak Hour Summary
7:10 AM to 8:10 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
7:00 AM				0	0		0	0	0	0		0		0	0	0	0
7:05 AM				0	0		0	0	0	0		0		0	0	0	0
7:10 AM				0	0		0	0	0	0		0		0	0	0	0
7:15 AM				0	0		0	0	0	0		0		0	0	0	0
7:20 AM				0	0		0	0	0	0		0		0	0	0	0
7:25 AM				0	0		0	0	0	0		0		0	0	0	0
7:30 AM				0	1		0	1	0	2		2		0	0	0	3
7:35 AM				0	0		0	0	0	0		0		1	0	1	1
7:40 AM				0	0		0	0	0	1		1		0	0	0	1
7:45 AM				0	0		0	0	0	0		0		1	0	1	1
7:50 AM				0	0		0	0	0	0		0		0	0	0	0
7:55 AM				0	0		0	0	0	0		0		0	0	0	0
8:00 AM				0	0		0	0	0	0		0		0	0	0	0
8:05 AM				0	0		0	0	0	1		1		0	0	0	1
8:10 AM				0	0		0	0	0	0		0		0	0	0	0
8:15 AM				0	0		0	0	0	1		1		0	0	0	1
8:20 AM				0	0		0	0	0	0		0		0	0	0	0
8:25 AM				0	1		0	1	0	0		0		0	0	0	1
8:30 AM				0	0		0	0	0	1		1		0	0	0	1
8:35 AM				0	1		0	1	0	2		2		0	0	0	3
8:40 AM				0	0		0	0	0	0		0		0	0	0	0
8:45 AM				0	0		0	0	0	0		0		0	0	0	0
8:50 AM				0	0		0	0	0	0		0		0	0	0	0
8:55 AM				0	0		0	0	0	0		0		0	0	0	0
Total Survey				0	3		0	3	0	8		8		2	0	2	13

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
7:00 AM				0	0		0	0	0	0		0		0	0	0	0
7:15 AM				0	0		0	0	0	0		0		0	0	0	0
7:30 AM				0	1		0	1	0	3		3		1	0	1	5
7:45 AM				0	0		0	0	0	0		0		1	0	1	1
8:00 AM				0	0		0	0	0	1		1		0	0	0	1
8:15 AM				0	1		0	1	0	1		1		0	0	0	2
8:30 AM				0	1		0	1	0	3		3		0	0	0	4
8:45 AM				0	0		0	0	0	0		0		0	0	0	0
Total Survey				0	3		0	3	0	8		8		2	0	2	13

Heavy Vehicle Peak Hour Summary
7:10 AM to 8:10 AM

By Approach	Northbound Huckleberry Ln NE			Southbound Huckleberry Ln NE			Eastbound Donald Rd NE			Westbound Donald Rd NE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	1	0	1	4	2	6	2	5	7	7
PHF	0.00			0.25			0.33			0.25			0.35

By Movement	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Total
				Total	L		R	Total	L	T		Total		T	R	Total	
Volume				0	1		0	1	0	4		4		2	0	2	7
PHF				0.00	0.25		0.00	0.25	0.00	0.33		0.33		0.25	0.00	0.25	0.35

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

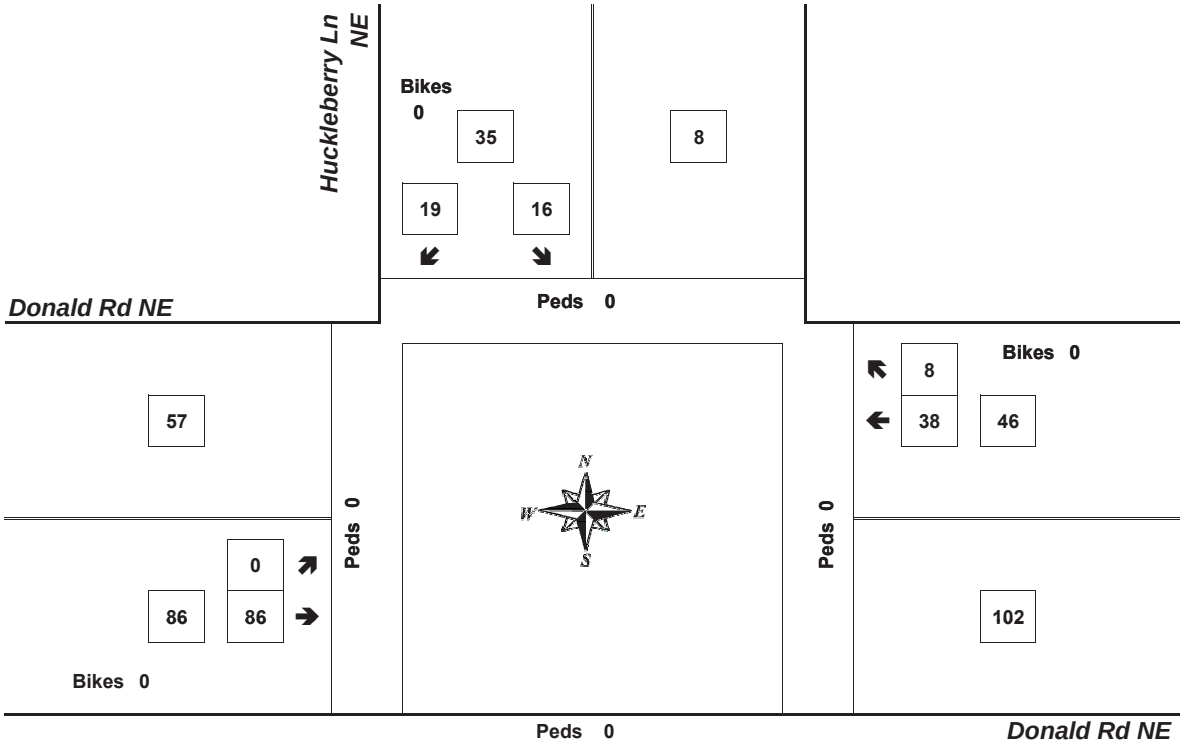
Interval Start Time	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
7:00 AM				0	1		0	1	0	3		3		2	0	2	6
7:15 AM				0	1		0	1	0	4		4		2	0	2	7
7:30 AM				0	2		0	2	0	5		5		2	0	2	9
7:45 AM				0	2		0	2	0	5		5		1	0	1	8
8:00 AM				0	2		0	2	0	5		5		0	0	0	7

Peak Hour Summary

Clay Carney
(503) 833-2740

Huckleberry Ln NE & Donald Rd NE

7:10 AM to 8:10 AM
Thursday, February 15, 2018



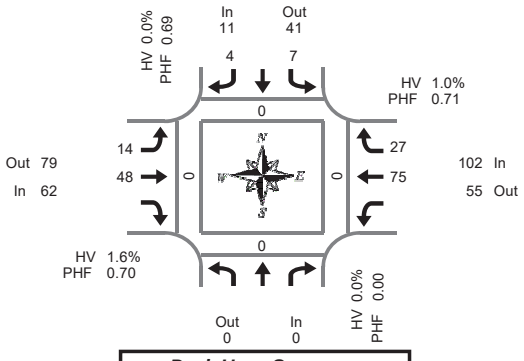
Bikes
0

Approach	PHF	HV%	Volume
EB	0.60	4.7%	86
WB	0.64	4.3%	46
NB	0.00	0.0%	0
SB	0.67	2.9%	35
Intersection	0.73	4.2%	167

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Huckleberry Ln NE & Donald Rd NE

Thursday, February 15, 2018
4:00 PM to 6:00 PM

Peak Hour Summary
4:20 PM to 5:20 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total	Pedestrians Crosswalk			
				Bikes	L		R	Bikes	L	T		Bikes		T	R	Bikes		North	South	East	West
4:00 PM				0	0		0	0	1	2		0		6	2	0	11	0	0	0	0
4:05 PM				0	1		1	0	0	5		0		7	0	0	14	0	0	0	0
4:10 PM				0	0		1	0	2	4		0		4	0	0	11	0	0	0	0
4:15 PM				0	0		0	0	0	5		0		2	1	0	8	0	0	0	0
4:20 PM				0	1		1	0	0	4		0		10	2	0	18	0	0	0	0
4:25 PM				0	0		0	0	0	7		0		11	3	0	21	0	0	0	0
4:30 PM				0	0		0	0	1	5		0		7	3	0	16	0	0	0	0
4:35 PM				0	0		0	0	2	7		0		7	3	0	19	0	0	0	0
4:40 PM				0	2		0	0	2	4		0		3	2	0	13	0	0	0	0
4:45 PM				0	0		1	0	0	2		0		4	1	0	8	0	0	0	0
4:50 PM				0	0		1	0	2	4		0		5	1	0	13	0	0	0	0
4:55 PM				0	0		1	0	0	2		0		4	5	0	12	0	0	0	0
5:00 PM				0	1		0	0	1	3		0		8	3	0	16	0	0	0	0
5:05 PM				0	0		0	0	2	3		0		6	1	0	12	0	0	0	0
5:10 PM				0	1		0	0	1	4		0		4	2	0	12	0	0	0	0
5:15 PM				0	2		0	0	3	3		0		6	1	0	15	0	0	0	0
5:20 PM				0	0		0	0	0	3		0		3	2	0	8	0	0	0	0
5:25 PM				0	0		0	0	1	5		0		3	0	0	9	0	0	0	0
5:30 PM				0	1		0	0	1	6		0		4	1	0	13	0	0	0	0
5:35 PM				0	0		0	0	0	2		0		4	2	0	8	0	0	0	0
5:40 PM				0	1		0	0	3	4		0		5	2	0	15	0	0	0	0
5:45 PM				0	1		0	0	2	11		0		0	1	0	15	0	0	0	0
5:50 PM				0	1		0	0	1	1		0		2	0	0	5	0	0	0	0
5:55 PM				0	0		0	0	3	1		0		4	3	0	11	0	0	0	0
Total Survey				0	12		6	0	28	97		0		119	41	0	303	0	0	0	0

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total	Pedestrians Crosswalk			
				Bikes	L		R	Bikes	L	T		Bikes		T	R	Bikes		North	South	East	West
4:00 PM				0	1		2	0	3	11		0		17	2	0	36	0	0	0	0
4:15 PM				0	1		1	0	0	16		0		23	6	0	47	0	0	0	0
4:30 PM				0	2		0	0	5	16		0		17	8	0	48	0	0	0	0
4:45 PM				0	0		3	0	2	8		0		13	7	0	33	0	0	0	0
5:00 PM				0	2		0	0	4	10		0		18	6	0	40	0	0	0	0
5:15 PM				0	2		0	0	4	11		0		12	3	0	32	0	0	0	0
5:30 PM				0	2		0	0	4	12		0		13	5	0	36	0	0	0	0
5:45 PM				0	2		0	0	6	13		0		6	4	0	31	0	0	0	0
Total Survey				0	12		6	0	28	97		0		119	41	0	303	0	0	0	0

Peak Hour Summary
4:20 PM to 5:20 PM

By Approach	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	0	0	0	0	11	41	52	0	62	79	141	0	102	55	157	0	175	0	0	0	0
%HV	0.0%				0.0%				1.6%				1.0%				1.1%				
PHF	0.00				0.69				0.70				0.71				0.78				

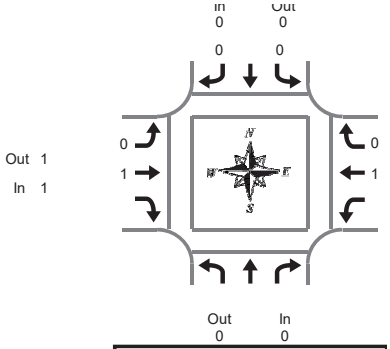
By Movement	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Total
				Total	L		R	Total	L	T		Total		T	R	Total	
Volume				0	7		4	11	14	48		62		75	27	102	175
%HV	NA	NA	NA	0.0%	0.0%	NA	0.0%	0.0%	0.0%	2.1%	NA	1.6%	NA	1.3%	0.0%	1.0%	1.1%
PHF				0.00	0.58		0.33	0.69	0.58	0.63		0.70		0.67	0.75	0.71	0.78

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total	Pedestrians Crosswalk			
				Bikes	L		R	Bikes	L	T		Bikes		T	R	Bikes		North	South	East	West
4:00 PM				0	4		6	0	10	51		0		70	23	0	164	0	0	0	0
4:15 PM				0	5		4	0	11	50		0		71	27	0	168	0	0	0	0
4:30 PM				0	6		3	0	15	45		0		60	24	0	153	0	0	0	0
4:45 PM				0	6		3	0	14	41		0		56	21	0	141	0	0	0	0
5:00 PM				0	8		0	0	18	46		0		49	18	0	139	0	0	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Huckleberry Ln NE & Donald Rd NE

Thursday, February 15, 2018
4:00 PM to 6:00 PM

Peak Hour Summary
4:20 PM to 5:20 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
4:00 PM				0	0		0	0	0	0		0		1	0	1	1
4:05 PM				0	0		0	0	0	2		2		1	0	1	3
4:10 PM				0	0		0	0	0	0		0		0	0	0	0
4:15 PM				0	0		0	0	0	0		0		0	0	0	0
4:20 PM				0	0		0	0	0	0		0		0	0	0	0
4:25 PM				0	0		0	0	0	0		0		0	0	0	0
4:30 PM				0	0		0	0	0	0		0		0	0	0	0
4:35 PM				0	0		0	0	0	0		0		1	0	1	1
4:40 PM				0	0		0	0	0	0		0		0	0	0	0
4:45 PM				0	0		0	0	0	0		0		0	0	0	0
4:50 PM				0	0		0	0	0	0		0		0	0	0	0
4:55 PM				0	0		0	0	0	0		0		0	0	0	0
5:00 PM				0	0		0	0	0	0		0		0	0	0	0
5:05 PM				0	0		0	0	0	1		1		0	0	0	1
5:10 PM				0	0		0	0	0	0		0		0	0	0	0
5:15 PM				0	0		0	0	0	0		0		0	0	0	0
5:20 PM				0	0		0	0	0	0		0		0	0	0	0
5:25 PM				0	0		0	0	0	0		0		0	0	0	0
5:30 PM				0	0		0	0	0	0		0		0	0	0	0
5:35 PM				0	0		0	0	0	1		1		0	0	0	1
5:40 PM				0	0		0	0	0	0		0		0	0	0	0
5:45 PM				0	0		0	0	0	0		0		0	0	0	0
5:50 PM				0	0		0	0	0	0		0		0	0	0	0
5:55 PM				0	0		0	0	0	0		0		0	0	0	0
Total Survey				0	0		0	0	0	4		4		3	0	3	7

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
4:00 PM				0	0		0	0	0	2		2		2	0	2	4
4:15 PM				0	0		0	0	0	0		0		0	0	0	0
4:30 PM				0	0		0	0	0	0		0		1	0	1	1
4:45 PM				0	0		0	0	0	0		0		0	0	0	0
5:00 PM				0	0		0	0	0	1		1		0	0	0	1
5:15 PM				0	0		0	0	0	0		0		0	0	0	0
5:30 PM				0	0		0	0	0	1		1		0	0	0	1
5:45 PM				0	0		0	0	0	0		0		0	0	0	0
Total Survey				0	0		0	0	0	4		4		3	0	3	7

Heavy Vehicle Peak Hour Summary
4:20 PM to 5:20 PM

By Approach	Northbound Huckleberry Ln NE			Southbound Huckleberry Ln NE			Eastbound Donald Rd NE			Westbound Donald Rd NE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	0	0	1	1	2	1	1	2	2
PHF	0.00			0.00			0.25			0.25			0.50

By Movement	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Total
				Total	L		R	Total	L	T		Total		T	R	Total	
Volume				0	0		0	0	0	1		1		1	0	1	2
PHF				0.00	0.00		0.00	0.00	0.00	0.25		0.25		0.25	0.00	0.25	0.50

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

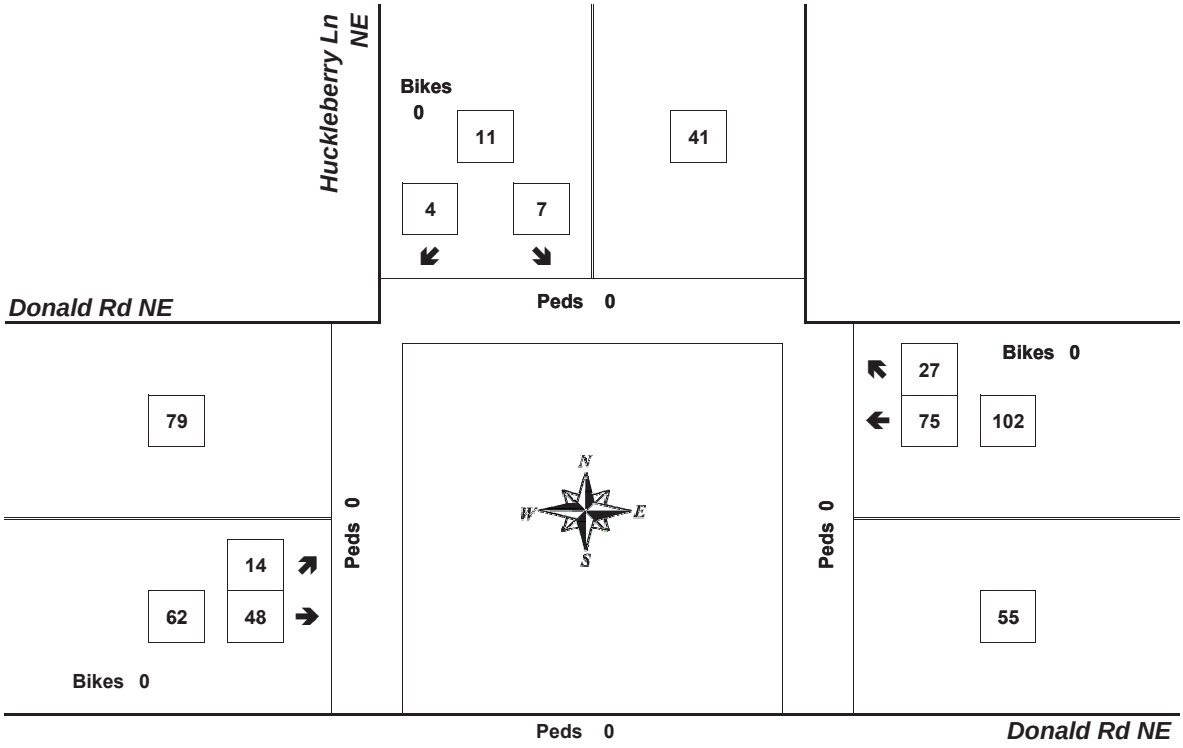
Interval Start Time	Northbound Huckleberry Ln NE				Southbound Huckleberry Ln NE				Eastbound Donald Rd NE				Westbound Donald Rd NE				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
4:00 PM				0	0		0	0	0	2		2		3	0	3	5
4:15 PM				0	0		0	0	0	1		1		1	0	1	2
4:30 PM				0	0		0	0	0	1		1		1	0	1	2
4:45 PM				0	0		0	0	0	2		2		0	0	0	2
5:00 PM				0	0		0	0	0	2		2		0	0	0	2

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Huckleberry Ln NE & Donald Rd NE

4:20 PM to 5:20 PM
Thursday, February 15, 2018



Bikes
0

Approach	PHF	HV%	Volume
EB	0.70	1.6%	62
WB	0.71	1.0%	102
NB	0.00	0.0%	0
SB	0.69	0.0%	11
Intersection	0.78	1.1%	175

Count Period: 4:00 PM to 6:00 PM

1e

TRIP GENERATION CALCULATIONS

Land Use: Single-Family Detached Housing
Land Use Code: 210
Setting/Location General Urban/Suburban
Variable: Dwelling Units
Variable Value: 297

AM PEAK HOUR

Trip Rate: 0.74

	Enter	Exit	Total
Directional Distribution	25%	75%	
Trip Ends	**55**	**165**	**220**

PM PEAK HOUR

Trip Rate: 0.99

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	**185**	**109**	**294**

WEEKDAY

Trip Rate: 9.44

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**1,402**	**1,402**	**2,804**

SATURDAY

Trip Rate: 9.54

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**1,417**	**1,417**	**2,834**

Source: Trip Generation Manual, Tenth Edition

LEVEL OF SERVICE

Level of service is used to describe the quality of traffic flow. Levels of service A to C are considered good, and rural roads are usually designed for level of service C. Urban streets and signalized intersections are typically designed for level of service D. Level of service E is considered to be the limit of acceptable delay. For unsignalized intersections, level of service E is generally considered acceptable. Here is a more complete description of levels of service:

Level of service A: Very low delay at intersections, with all traffic signal cycles clearing and no vehicles waiting through more than one signal cycle. On highways, low volume and high speeds, with speeds not restricted by other vehicles.

Level of service B: Operating speeds beginning to be affected by other traffic; short traffic delays at intersections. Higher average intersection delay than for level of service A resulting from more vehicles stopping.

Level of service C: Operating speeds and maneuverability closely controlled by other traffic; higher delays at intersections than for level of service B due to a significant number of vehicles stopping. Not all signal cycles clear the waiting vehicles. This is the recommended design standard for rural highways.

Level of service D: Tolerable operating speeds; long traffic delays occur at intersections. The influence of congestion is noticeable. At traffic signals many vehicles stop, and the proportion of vehicles not stopping declines. The number of signal cycle failures, for which vehicles must wait through more than one signal cycle, are noticeable. This is typically the design level for urban signalized intersections.

Level of service E: Restricted speeds, very long traffic delays at traffic signals, and traffic volumes near capacity. Flow is unstable so that any interruption, no matter how minor, will cause queues to form and service to deteriorate to level of service F. Traffic signal cycle failures are frequent occurrences. For unsignalized intersections, level of service E or better is generally considered acceptable.

Level of service F: Extreme delays, resulting in long queues which may interfere with other traffic movements. There may be stoppages of long duration, and speeds may drop to zero. There may be frequent signal cycle failures. Level of service F will typically result when vehicle arrival rates are greater than capacity. It is considered unacceptable by most drivers.

LEVEL OF SERVICE CRITERIA
FOR SIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds)
A	<10
B	10-20
C	20-35
D	35-55
E	55-80
F	>80

LEVEL OF SERVICE CRITERIA
FOR UNSIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds)
A	<10
B	10-15
C	15-25
D	25-35
E	35-50
F	>50

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	36	7	30	18	55	32	85	31	15	32	5
Future Vol, veh/h	3	36	7	30	18	55	32	85	31	15	32	5
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	2	2	2	6	6	6	6	6	6	16	16	16
Mvmt Flow	4	43	8	36	21	65	38	101	37	18	38	6
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.9	8.1	8.6	8.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	22%	7%	29%	29%
Vol Thru, %	57%	78%	17%	62%
Vol Right, %	21%	15%	53%	10%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	148	46	103	52
LT Vol	32	3	30	15
Through Vol	85	36	18	32
RT Vol	31	7	55	5
Lane Flow Rate	176	55	123	62
Geometry Grp	1	1	1	1
Degree of Util (X)	0.215	0.069	0.148	0.082
Departure Headway (Hd)	4.396	4.548	4.356	4.772
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	818	789	824	752
Service Time	2.415	2.57	2.376	2.793
HCM Lane V/C Ratio	0.215	0.07	0.149	0.082
HCM Control Delay	8.6	7.9	8.1	8.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.8	0.2	0.5	0.3

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	309	8	37	268	2	5	23	114	11	22	3
Future Vol, veh/h	2	309	8	37	268	2	5	23	114	11	22	3
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	120	-	-	210	-	-	-	-	-	-	-	-
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, %	13	13	13	17	17	17	5	5	5	3	3	3
Mvmt Flow	2	325	8	39	282	2	5	24	120	12	23	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	284	0	0	333	0	0	707	695	329	766	698	283
Stage 1	-	-	-	-	-	-	333	333	-	361	361	-
Stage 2	-	-	-	-	-	-	374	362	-	405	337	-
Critical Hdwy	4.23	-	-	4.27	-	-	7.15	6.55	6.25	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.13	5.53	-
Follow-up Hdwy	2.317	-	-	2.353	-	-	3.545	4.045	3.345	3.527	4.027	3.327
Pot Cap-1 Maneuver	1218	-	-	1147	-	-	346	362	706	318	363	754
Stage 1	-	-	-	-	-	-	674	638	-	655	624	-
Stage 2	-	-	-	-	-	-	641	620	-	620	639	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1218	-	-	1147	-	-	318	349	706	243	350	754
Mov Cap-2 Maneuver	-	-	-	-	-	-	318	349	-	243	350	-
Stage 1	-	-	-	-	-	-	673	637	-	654	603	-
Stage 2	-	-	-	-	-	-	593	599	-	494	638	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1	13.3	17.7
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	584	1218	-	-	1147	-	-	321
HCM Lane V/C Ratio	0.256	0.002	-	-	0.034	-	-	0.118
HCM Control Delay (s)	13.3	8	-	-	8.2	-	-	17.7
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	1	0	-	-	0.1	-	-	0.4

Intersection	
Int Delay, s/veh	2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	400	36	118	364	14	88
Future Vol, veh/h	400	36	118	364	14	88
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	300	-	0	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	15	15	22	22	54	54
Mvmt Flow	435	39	128	396	15	96

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	474	0	1107	455
Stage 1	-	-	-	-	455	-
Stage 2	-	-	-	-	652	-
Critical Hdwy	-	-	4.32	-	6.94	6.74
Critical Hdwy Stg 1	-	-	-	-	5.94	-
Critical Hdwy Stg 2	-	-	-	-	5.94	-
Follow-up Hdwy	-	-	2.398	-	3.986	3.786
Pot Cap-1 Maneuver	-	-	991	-	185	510
Stage 1	-	-	-	-	543	-
Stage 2	-	-	-	-	432	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	991	-	161	510
Mov Cap-2 Maneuver	-	-	-	-	161	-
Stage 1	-	-	-	-	473	-
Stage 2	-	-	-	-	432	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.2	15.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	161	510	-	-	991	-
HCM Lane V/C Ratio	0.095	0.188	-	-	0.129	-
HCM Control Delay (s)	29.7	13.7	-	-	9.2	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	0.7	-	-	0.4	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	12	507	470	71	70	17
Future Vol, veh/h	12	507	470	71	70	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	19	19	22	22	54	54
Mvmt Flow	13	528	490	74	73	18

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	564	0	-	0	1081	527
Stage 1	-	-	-	-	527	-
Stage 2	-	-	-	-	554	-
Critical Hdwy	4.29	-	-	-	6.94	6.74
Critical Hdwy Stg 1	-	-	-	-	5.94	-
Critical Hdwy Stg 2	-	-	-	-	5.94	-
Follow-up Hdwy	2.371	-	-	-	3.986	3.786
Pot Cap-1 Maneuver	928	-	-	-	193	462
Stage 1	-	-	-	-	500	-
Stage 2	-	-	-	-	484	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	928	-	-	-	189	462
Mov Cap-2 Maneuver	-	-	-	-	189	-
Stage 1	-	-	-	-	490	-
Stage 2	-	-	-	-	484	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	33.6
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	928	-	-	-	214
HCM Lane V/C Ratio	0.013	-	-	-	0.423
HCM Control Delay (s)	8.9	0	-	-	33.6
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0	-	-	-	2

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	449	144	197	299	0	0	0	0	17	1	248
Future Vol, veh/h	0	449	144	197	299	0	0	0	0	17	1	248
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	25	25	25	10	10	10	0	0	0	33	33	33
Mvmt Flow	0	458	147	201	305	0	0	0	0	17	1	253

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	605	0	0	1239	1312	305
Stage 1	-	-	-	-	-	-	707	707	-
Stage 2	-	-	-	-	-	-	532	605	-
Critical Hdwy	-	-	-	4.2	-	-	6.73	6.83	6.53
Critical Hdwy Stg 1	-	-	-	-	-	-	5.73	5.83	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.73	5.83	-
Follow-up Hdwy	-	-	-	2.29	-	-	3.797	4.297	3.597
Pot Cap-1 Maneuver	0	-	-	935	-	0	168	138	668
Stage 1	0	-	-	-	-	0	437	395	-
Stage 2	0	-	-	-	-	0	531	442	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	935	-	-	124	0	668
Mov Cap-2 Maneuver	-	-	-	-	-	-	124	0	-
Stage 1	-	-	-	-	-	-	324	0	-
Stage 2	-	-	-	-	-	-	531	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	3.9	19.2
HCM LOS			C

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	935	-	521
HCM Lane V/C Ratio	-	-	0.215	-	0.521
HCM Control Delay (s)	-	-	9.9	0	19.2
HCM Lane LOS	-	-	A	A	C
HCM 95th %tile Q(veh)	-	-	0.8	-	3

Intersection	
Int Delay, s/veh	54.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	314	136	0	0	393	91	100	0	286	0	0	0
Future Vol, veh/h	314	136	0	0	393	91	100	0	286	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	19	19	19	7	7	7	10	10	10	0	0	0
Mvmt Flow	331	143	0	0	414	96	105	0	301	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	510	0	-	-	-	0	1267	1315	143
Stage 1	-	-	-	-	-	-	805	805	-
Stage 2	-	-	-	-	-	-	462	510	-
Critical Hdwy	4.29	-	-	-	-	-	6.5	6.6	6.3
Critical Hdwy Stg 1	-	-	-	-	-	-	5.5	5.6	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.5	5.6	-
Follow-up Hdwy	2.371	-	-	-	-	-	3.59	4.09	3.39
Pot Cap-1 Maneuver	973	-	0	0	-	-	179	152	884
Stage 1	-	-	0	0	-	-	426	384	-
Stage 2	-	-	0	0	-	-	618	525	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	973	-	-	-	-	-	113	0	884
Mov Cap-2 Maneuver	-	-	-	-	-	-	113	0	-
Stage 1	-	-	-	-	-	-	268	0	-
Stage 2	-	-	-	-	-	-	618	0	-

Approach	EB	WB	NB
HCM Control Delay, s	7.4	0	179.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	319	973	-	-	-
HCM Lane V/C Ratio	1.274	0.34	-	-	-
HCM Control Delay (s)	179.2	10.6	0	-	-
HCM Lane LOS	F	B	A	-	-
HCM 95th %tile Q(veh)	19	1.5	-	-	-

Intersection	
Intersection Delay, s/veh	8.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	14	35	62	24	26	29	11	46	29	34	132	7
Future Vol, veh/h	14	35	62	24	26	29	11	46	29	34	132	7
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles, %	2	2	2	3	3	3	4	4	4	3	3	3
Mvmt Flow	18	44	78	30	33	37	14	58	37	43	167	9
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.5	8.5	8.4	9.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	13%	13%	30%	20%
Vol Thru, %	53%	32%	33%	76%
Vol Right, %	34%	56%	37%	4%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	86	111	79	173
LT Vol	11	14	24	34
Through Vol	46	35	26	132
RT Vol	29	62	29	7
Lane Flow Rate	109	141	100	219
Geometry Grp	1	1	1	1
Degree of Util (X)	0.139	0.176	0.132	0.283
Departure Headway (Hd)	4.613	4.52	4.734	4.653
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	774	791	755	771
Service Time	2.658	2.561	2.776	2.692
HCM Lane V/C Ratio	0.141	0.178	0.132	0.284
HCM Control Delay	8.4	8.5	8.5	9.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.5	0.6	0.5	1.2

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	328	4	111	281	10	7	28	77	8	30	10
Future Vol, veh/h	11	328	4	111	281	10	7	28	77	8	30	10
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	120	-	-	210	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	8	8	8	8	8	8	6	6	6	9	9	9
Mvmt Flow	11	338	4	114	290	10	7	29	79	8	31	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	300	0	0	342	0	0	906	890	340	939	887	295
Stage 1	-	-	-	-	-	-	362	362	-	523	523	-
Stage 2	-	-	-	-	-	-	544	528	-	416	364	-
Critical Hdwy	4.18	-	-	4.18	-	-	7.16	6.56	6.26	7.19	6.59	6.29
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.56	-	6.19	5.59	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.56	-	6.19	5.59	-
Follow-up Hdwy	2.272	-	-	2.272	-	-	3.554	4.054	3.354	3.581	4.081	3.381
Pot Cap-1 Maneuver	1228	-	-	1184	-	-	253	278	693	237	276	728
Stage 1	-	-	-	-	-	-	648	618	-	525	519	-
Stage 2	-	-	-	-	-	-	516	521	-	600	612	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1228	-	-	1184	-	-	208	249	693	176	247	728
Mov Cap-2 Maneuver	-	-	-	-	-	-	208	249	-	176	247	-
Stage 1	-	-	-	-	-	-	642	612	-	520	469	-
Stage 2	-	-	-	-	-	-	429	471	-	502	606	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	2.3	16.2	21.6
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	435	1228	-	-	1184	-	-	266
HCM Lane V/C Ratio	0.265	0.009	-	-	0.097	-	-	0.186
HCM Control Delay (s)	16.2	8	-	-	8.4	-	-	21.6
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	1.1	0	-	-	0.3	-	-	0.7

Intersection	
Int Delay, s/veh	3.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	455	48	138	334	19	148
Future Vol, veh/h	455	48	138	334	19	148
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	300	-	0	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	6	6	15	15	10	10
Mvmt Flow	495	52	150	363	21	161

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	547	0	1184	521
Stage 1	-	-	-	-	521	-
Stage 2	-	-	-	-	663	-
Critical Hdwy	-	-	4.25	-	6.5	6.3
Critical Hdwy Stg 1	-	-	-	-	5.5	-
Critical Hdwy Stg 2	-	-	-	-	5.5	-
Follow-up Hdwy	-	-	2.335	-	3.59	3.39
Pot Cap-1 Maneuver	-	-	960	-	201	540
Stage 1	-	-	-	-	580	-
Stage 2	-	-	-	-	498	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	960	-	170	540
Mov Cap-2 Maneuver	-	-	-	-	170	-
Stage 1	-	-	-	-	490	-
Stage 2	-	-	-	-	498	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.8	16.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	170	540	-	-	960	-
HCM Lane V/C Ratio	0.121	0.298	-	-	0.156	-
HCM Control Delay (s)	29.1	14.5	-	-	9.4	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	1.2	-	-	0.6	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	32	555	492	109	78	23
Future Vol, veh/h	32	555	492	109	78	23
Conflicting Peds, #/hr	0	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	11	11	19	19	17	17
Mvmt Flow	33	572	507	112	80	24

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	619	0	-	0	1201	565
Stage 1	-	-	-	-	563	-
Stage 2	-	-	-	-	638	-
Critical Hdwy	4.21	-	-	-	6.57	6.37
Critical Hdwy Stg 1	-	-	-	-	5.57	-
Critical Hdwy Stg 2	-	-	-	-	5.57	-
Follow-up Hdwy	2.299	-	-	-	3.653	3.453
Pot Cap-1 Maneuver	919	-	-	-	190	497
Stage 1	-	-	-	-	541	-
Stage 2	-	-	-	-	499	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	919	-	-	-	180	496
Mov Cap-2 Maneuver	-	-	-	-	180	-
Stage 1	-	-	-	-	512	-
Stage 2	-	-	-	-	499	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	37.6
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	919	-	-	-	211
HCM Lane V/C Ratio	0.036	-	-	-	0.493
HCM Control Delay (s)	9.1	0	-	-	37.6
HCM Lane LOS	A	A	-	-	E
HCM 95th %tile Q(veh)	0.1	-	-	-	2.5

Intersection	
Int Delay, s/veh	42.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	415	201	307	284	0	0	0	0	51	4	325
Future Vol, veh/h	0	415	201	307	284	0	0	0	0	51	4	325
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	12	12	12	12	12	12	0	0	0	15	15	15
Mvmt Flow	0	437	212	323	299	0	0	0	0	54	4	342

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	649	0	0	1488	1594	301
Stage 1	-	-	-	-	-	-	945	945	-
Stage 2	-	-	-	-	-	-	543	649	-
Critical Hdwy	-	-	-	4.22	-	-	6.55	6.65	6.35
Critical Hdwy Stg 1	-	-	-	-	-	-	5.55	5.65	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.55	5.65	-
Follow-up Hdwy	-	-	-	2.308	-	-	3.635	4.135	3.435
Pot Cap-1 Maneuver	0	-	-	891	-	0	128	100	709
Stage 1	0	-	-	-	-	0	358	324	-
Stage 2	0	-	-	-	-	0	557	446	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	891	-	-	72	0	708
Mov Cap-2 Maneuver	-	-	-	-	-	-	72	0	-
Stage 1	-	-	-	-	-	-	202	0	-
Stage 2	-	-	-	-	-	-	557	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	5.9	166.7
HCM LOS			F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	891	-	322
HCM Lane V/C Ratio	-	-	0.363	-	1.242
HCM Control Delay (s)	-	-	11.3	0	166.7
HCM Lane LOS	-	-	B	A	F
HCM 95th %tile Q(veh)	-	-	1.7	-	18.1

Intersection	
Int Delay, s/veh	63.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	245	248	0	0	458	31	124	2	209	0	0	0
Future Vol, veh/h	245	248	0	0	458	31	124	2	209	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	12	12	12	5	5	5	18	18	18	0	0	0
Mvmt Flow	258	261	0	0	482	33	131	2	220	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	515	0	-	-	-	0	1276	1292	261
Stage 1	-	-	-	-	-	-	777	777	-
Stage 2	-	-	-	-	-	-	499	515	-
Critical Hdwy	4.22	-	-	-	-	-	6.58	6.68	6.38
Critical Hdwy Stg 1	-	-	-	-	-	-	5.58	5.68	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.58	5.68	-
Follow-up Hdwy	2.308	-	-	-	-	-	3.662	4.162	3.462
Pot Cap-1 Maneuver	1001	-	0	0	-	-	170	152	740
Stage 1	-	-	0	0	-	-	427	385	-
Stage 2	-	-	0	0	-	-	578	509	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1001	-	-	-	-	-	~ 119	0	740
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 119	0	-
Stage 1	-	-	-	-	-	-	298	0	-
Stage 2	-	-	-	-	-	-	578	0	-

Approach	EB	WB	NB
HCM Control Delay, s	4.9	0	242.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	251	1001	-	-	-
HCM Lane V/C Ratio	1.405	0.258	-	-	-
HCM Control Delay (s)	242.2	9.8	0	-	-
HCM Lane LOS	F	A	A	-	-
HCM 95th %tile Q(veh)	19.5	1	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	8.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	46	9	38	23	70	41	108	39	19	41	6
Future Vol, veh/h	4	46	9	38	23	70	41	108	39	19	41	6
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	2	2	2	6	6	6	6	6	6	16	16	16
Mvmt Flow	5	55	11	45	27	83	49	129	46	23	49	7
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.3	8.7	9.4	8.6
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	22%	7%	29%	29%
Vol Thru, %	57%	78%	18%	62%
Vol Right, %	21%	15%	53%	9%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	188	59	131	66
LT Vol	41	4	38	19
Through Vol	108	46	23	41
RT Vol	39	9	70	6
Lane Flow Rate	224	70	156	79
Geometry Grp	1	1	1	1
Degree of Util (X)	0.283	0.093	0.197	0.108
Departure Headway (Hd)	4.55	4.765	4.546	4.968
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	790	750	789	720
Service Time	2.582	2.804	2.579	3.009
HCM Lane V/C Ratio	0.284	0.093	0.198	0.11
HCM Control Delay	9.4	8.3	8.7	8.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.2	0.3	0.7	0.4

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	392	10	47	340	3	6	29	145	14	28	4
Future Vol, veh/h	3	392	10	47	340	3	6	29	145	14	28	4
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	120	-	-	210	-	-	-	-	-	-	-	-
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, %	13	13	13	17	17	17	5	5	5	3	3	3
Mvmt Flow	3	413	11	49	358	3	6	31	153	15	29	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	361	0	0	424	0	0	899	884	419	975	888	360
Stage 1	-	-	-	-	-	-	425	425	-	458	458	-
Stage 2	-	-	-	-	-	-	474	459	-	517	430	-
Critical Hdwy	4.23	-	-	4.27	-	-	7.15	6.55	6.25	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.13	5.53	-
Follow-up Hdwy	2.317	-	-	2.353	-	-	3.545	4.045	3.345	3.527	4.027	3.327
Pot Cap-1 Maneuver	1139	-	-	1059	-	-	257	281	628	230	282	682
Stage 1	-	-	-	-	-	-	601	581	-	581	565	-
Stage 2	-	-	-	-	-	-	566	561	-	539	582	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1139	-	-	1059	-	-	225	267	628	153	268	682
Mov Cap-2 Maneuver	-	-	-	-	-	-	225	267	-	153	268	-
Stage 1	-	-	-	-	-	-	599	579	-	579	539	-
Stage 2	-	-	-	-	-	-	507	535	-	385	580	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1	16.8	25
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	492	1139	-	-	1059	-	-	228
HCM Lane V/C Ratio	0.385	0.003	-	-	0.047	-	-	0.212
HCM Control Delay (s)	16.8	8.2	-	-	8.6	-	-	25
HCM Lane LOS	C	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	1.8	0	-	-	0.1	-	-	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	495	46	146	443	90	18	3	109	89	4	18
Future Volume (vph)	12	495	46	146	443	90	18	3	109	89	4	18
Ideal Flow (vphpl)	1900	1750	1750	1750	1750	1900	1750	1900	1750	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1570	1502		1363	1398		1363	1557	1205	1171	1080	
Flt Permitted	0.40	1.00		0.24	1.00		0.74	1.00	1.00	0.60	1.00	
Satd. Flow (perm)	662	1502		348	1398		1064	1557	1205	734	1080	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	538	50	159	482	98	20	3	118	97	4	20
RTOR Reduction (vph)	0	4	0	0	6	0	0	0	93	0	17	0
Lane Group Flow (vph)	13	584	0	159	574	0	20	3	25	97	7	0
Confl. Peds. (#/hr)									1	1		
Heavy Vehicles (%)	15%	15%	15%	22%	22%	22%	22%	22%	22%	54%	54%	54%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	36.8	35.9		47.9	42.5		9.9	8.2	15.7	14.3	10.4	
Effective Green, g (s)	36.8	35.9		47.9	42.5		9.9	8.2	15.7	14.3	10.4	
Actuated g/C Ratio	0.50	0.49		0.65	0.58		0.13	0.11	0.21	0.19	0.14	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	342	733		330	808		150	173	331	165	152	
v/s Ratio Prot	0.00	c0.39		c0.05	c0.41		0.00	0.00	0.01	c0.03	0.01	
v/s Ratio Perm	0.02			0.26			0.01		0.01	c0.08		
v/c Ratio	0.04	0.80		0.48	0.71		0.13	0.02	0.08	0.59	0.04	
Uniform Delay, d1	9.3	15.8		8.1	11.1		27.9	29.1	23.1	26.6	27.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	6.0		1.1	2.9		0.4	0.0	0.1	5.3	0.1	
Delay (s)	9.4	21.8		9.2	14.0		28.3	29.1	23.2	31.9	27.4	
Level of Service	A	C		A	B		C	C	C	C	C	
Approach Delay (s)		21.5			12.9			24.1			31.0	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	73.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	13

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	569	183	250	379	0	0	0	0	22	1	314
Future Vol, veh/h	0	569	183	250	379	0	0	0	0	22	1	314
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	25	25	25	10	10	10	0	0	0	33	33	33
Mvmt Flow	0	581	187	255	387	0	0	0	0	22	1	320

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	768	0	0	1572	1665	387
Stage 1	-	-	-	-	-	-	897	897	-
Stage 2	-	-	-	-	-	-	675	768	-
Critical Hdwy	-	-	-	4.2	-	-	6.73	6.83	6.53
Critical Hdwy Stg 1	-	-	-	-	-	-	5.73	5.83	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.73	5.83	-
Follow-up Hdwy	-	-	-	2.29	-	-	3.797	4.297	3.597
Pot Cap-1 Maneuver	0	-	-	811	-	0	103	82	598
Stage 1	0	-	-	-	-	0	352	319	-
Stage 2	0	-	-	-	-	0	453	369	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	811	-	-	62	0	598
Mov Cap-2 Maneuver	-	-	-	-	-	-	62	0	-
Stage 1	-	-	-	-	-	-	211	0	-
Stage 2	-	-	-	-	-	-	453	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	4.6	57.7
HCM LOS			F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	811	-	382
HCM Lane V/C Ratio	-	-	0.315	-	0.9
HCM Control Delay (s)	-	-	11.5	0	57.7
HCM Lane LOS	-	-	B	A	F
HCM 95th %tile Q(veh)	-	-	1.4	-	9.2

Intersection	
Int Delay, s/veh	292.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	398	172	0	0	498	115	127	0	363	0	0	0
Future Vol, veh/h	398	172	0	0	498	115	127	0	363	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	19	19	19	7	7	7	10	10	10	0	0	0
Mvmt Flow	419	181	0	0	524	121	134	0	382	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	645	0	-	-	-	0	1604	1664	181
Stage 1	-	-	-	-	-	-	1019	1019	-
Stage 2	-	-	-	-	-	-	585	645	-
Critical Hdwy	4.29	-	-	-	-	-	6.5	6.6	6.3
Critical Hdwy Stg 1	-	-	-	-	-	-	5.5	5.6	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.5	5.6	-
Follow-up Hdwy	2.371	-	-	-	-	-	3.59	4.09	3.39
Pot Cap-1 Maneuver	864	-	0	0	-	-	~ 111	93	841
Stage 1	-	-	0	0	-	-	337	304	-
Stage 2	-	-	0	0	-	-	541	455	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	864	-	-	-	-	-	~ 51	0	841
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 51	0	-
Stage 1	-	-	-	-	-	-	155	0	-
Stage 2	-	-	-	-	-	-	541	0	-

Approach	EB	WB	NB
HCM Control Delay, s	9.1	0	$ 988.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	168	864	-	-	-
HCM Lane V/C Ratio	3.07	0.485	-	-	-
HCM Control Delay (s)	$ 988.8	13	0	-	-
HCM Lane LOS	F	B	A	-	-
HCM 95th %tile Q(veh)	47.5	2.7	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	9.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	44	79	30	33	37	14	58	37	43	167	9
Future Vol, veh/h	18	44	79	30	33	37	14	58	37	43	167	9
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles, %	2	2	2	3	3	3	4	4	4	3	3	3
Mvmt Flow	23	56	100	38	42	47	18	73	47	54	211	11
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.4	9.2	9.1	10.9
HCM LOS	A	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	13%	13%	30%	20%
Vol Thru, %	53%	31%	33%	76%
Vol Right, %	34%	56%	37%	4%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	109	141	100	219
LT Vol	14	18	30	43
Through Vol	58	44	33	167
RT Vol	37	79	37	9
Lane Flow Rate	138	178	127	277
Geometry Grp	1	1	1	1
Degree of Util (X)	0.187	0.238	0.177	0.375
Departure Headway (Hd)	4.884	4.799	5.029	4.874
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	727	741	706	732
Service Time	2.968	2.876	3.113	2.948
HCM Lane V/C Ratio	0.19	0.24	0.18	0.378
HCM Control Delay	9.1	9.4	9.2	10.9
HCM Lane LOS	A	A	A	B
HCM 95th-tile Q	0.7	0.9	0.6	1.7

Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	14	416	5	141	356	13	9	35	98	10	38	13
Future Vol, veh/h	14	416	5	141	356	13	9	35	98	10	38	13
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	120	-	-	210	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	8	8	8	8	8	8	6	6	6	9	9	9
Mvmt Flow	14	429	5	145	367	13	9	36	101	10	39	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	380	0	0	434	0	0	1150	1130	432	1192	1126	374
Stage 1	-	-	-	-	-	-	460	460	-	664	664	-
Stage 2	-	-	-	-	-	-	690	670	-	528	462	-
Critical Hdwy	4.18	-	-	4.18	-	-	7.16	6.56	6.26	7.19	6.59	6.29
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.56	-	6.19	5.59	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.56	-	6.19	5.59	-
Follow-up Hdwy	2.272	-	-	2.272	-	-	3.554	4.054	3.354	3.581	4.081	3.381
Pot Cap-1 Maneuver	1146	-	-	1094	-	-	172	200	615	159	199	657
Stage 1	-	-	-	-	-	-	574	559	-	439	448	-
Stage 2	-	-	-	-	-	-	429	449	-	521	553	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1146	-	-	1094	-	-	124	171	615	100	171	657
Mov Cap-2 Maneuver	-	-	-	-	-	-	124	171	-	100	171	-
Stage 1	-	-	-	-	-	-	567	552	-	434	388	-
Stage 2	-	-	-	-	-	-	328	389	-	402	546	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	2.4	24.8	35.9
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	325	1146	-	-	1094	-	-	178
HCM Lane V/C Ratio	0.45	0.013	-	-	0.133	-	-	0.353
HCM Control Delay (s)	24.8	8.2	-	-	8.8	-	-	35.9
HCM Lane LOS	C	A	-	-	A	-	-	E
HCM 95th %tile Q(veh)	2.2	0	-	-	0.5	-	-	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	544	61	169	400	138	24	8	180	99	6	23
Future Volume (vph)	33	544	61	169	400	138	24	8	180	99	6	23
Ideal Flow (vphpl)	1900	1750	1750	1750	1750	1900	1750	1900	1750	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.96		1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1703	1626		1446	1463		1511	1727	1339	1543	1434	
Flt Permitted	0.38	1.00		0.19	1.00		0.74	1.00	1.00	0.59	1.00	
Satd. Flow (perm)	688	1626		289	1463		1171	1727	1339	957	1434	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	591	66	184	435	150	26	9	196	108	7	25
RTOR Reduction (vph)	0	4	0	0	11	0	0	0	152	0	22	0
Lane Group Flow (vph)	36	653	0	184	574	0	26	9	44	108	10	0
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	6%	6%	6%	15%	15%	15%	10%	10%	10%	17%	17%	17%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	39.7	36.9		50.5	43.2		9.8	8.0	17.1	14.2	10.2	
Effective Green, g (s)	39.7	36.9		50.5	43.2		9.8	8.0	17.1	14.2	10.2	
Actuated g/C Ratio	0.52	0.49		0.66	0.57		0.13	0.11	0.23	0.19	0.13	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	396	789		330	831		159	181	380	209	192	
v/s Ratio Prot	0.00	c0.40		c0.07	c0.39		0.00	0.01	0.01	c0.03	0.01	
v/s Ratio Perm	0.04			0.30			0.02		0.02	c0.07		
v/c Ratio	0.09	0.83		0.56	0.69		0.16	0.05	0.12	0.52	0.05	
Uniform Delay, d1	9.0	16.8		9.6	11.7		29.3	30.6	23.4	27.3	28.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	7.1		2.0	2.5		0.5	0.1	0.1	2.2	0.1	
Delay (s)	9.1	23.9		11.6	14.1		29.8	30.7	23.6	29.5	28.8	
Level of Service	A	C		B	B		C	C	C	C	C	
Approach Delay (s)		23.2			13.5			24.6			29.3	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	76.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	310.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	526	255	389	360	0	0	0	0	65	5	412
Future Vol, veh/h	0	526	255	389	360	0	0	0	0	65	5	412
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	12	12	12	12	12	12	0	0	0	15	15	15
Mvmt Flow	0	554	268	409	379	0	0	0	0	68	5	434

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	822	0	0	1885	2019	379
Stage 1	-	-	-	-	-	-	1197	1197	-
Stage 2	-	-	-	-	-	-	688	822	-
Critical Hdwy	-	-	-	4.22	-	-	6.55	6.65	6.35
Critical Hdwy Stg 1	-	-	-	-	-	-	5.55	5.65	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.55	5.65	-
Follow-up Hdwy	-	-	-	2.308	-	-	3.635	4.135	3.435
Pot Cap-1 Maneuver	0	-	-	766	-	0	72	54	640
Stage 1	0	-	-	-	-	0	270	245	-
Stage 2	0	-	-	-	-	0	476	370	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	766	-	-	~ 23	0	640
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 23	0	-
Stage 1	-	-	-	-	-	-	87	0	-
Stage 2	-	-	-	-	-	-	476	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	7.8	$ 1282.8
HCM LOS			F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	766	-	137
HCM Lane V/C Ratio	-	-	0.535	-	3.703
HCM Control Delay (s)	-	-	15	-	$ 1282.8
HCM Lane LOS	-	-	B	A	F
HCM 95th %tile Q(veh)	-	-	3.2	-	50.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	287.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	311	314	0	0	581	39	157	3	265	0	0	0
Future Vol, veh/h	311	314	0	0	581	39	157	3	265	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	12	12	12	5	5	5	18	18	18	0	0	0
Mvmt Flow	327	331	0	0	612	41	165	3	279	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	653	0	-	-	-	0	1618	1638	331
Stage 1	-	-	-	-	-	-	985	985	-
Stage 2	-	-	-	-	-	-	633	653	-
Critical Hdwy	4.22	-	-	-	-	-	6.58	6.68	6.38
Critical Hdwy Stg 1	-	-	-	-	-	-	5.58	5.68	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.58	5.68	-
Follow-up Hdwy	2.308	-	-	-	-	-	3.662	4.162	3.462
Pot Cap-1 Maneuver	888	-	0	0	-	-	~ 104	92	675
Stage 1	-	-	0	0	-	-	338	306	-
Stage 2	-	-	0	0	-	-	500	440	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	888	-	-	-	-	-	~ 57	0	675
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 57	0	-
Stage 1	-	-	-	-	-	-	186	0	-
Stage 2	-	-	-	-	-	-	500	0	-

Approach	EB	WB	NB
HCM Control Delay, s	5.7	0	$ 1121.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	134	888	-	-	-
HCM Lane V/C Ratio	3.339	0.369	-	-	-
HCM Control Delay (s)	$ 1121.3	11.4	0	-	-
HCM Lane LOS	F	B	A	-	-
HCM 95th %tile Q(veh)	43.1	1.7	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	3.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	146	35	6	65	93	16
Future Vol, veh/h	146	35	6	65	93	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	73	73	73	73	73	73
Heavy Vehicles, %	5	5	4	4	2	2
Mvmt Flow	200	48	8	89	127	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	248	0	329	224
Stage 1	-	-	-	-	224	-
Stage 2	-	-	-	-	105	-
Critical Hdwy	-	-	4.14	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.236	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1306	-	665	815
Stage 1	-	-	-	-	813	-
Stage 2	-	-	-	-	919	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1306	-	661	815
Mov Cap-2 Maneuver	-	-	-	-	661	-
Stage 1	-	-	-	-	813	-
Stage 2	-	-	-	-	913	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	11.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	680	-	-	1306	-
HCM Lane V/C Ratio	0.22	-	-	0.006	-
HCM Control Delay (s)	11.8	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	150	23	3	169	59	11
Future Vol, veh/h	150	23	3	169	59	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	73	73	73	73	73	73
Heavy Vehicles, %	5	5	4	4	2	2
Mvmt Flow	205	32	4	232	81	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	237	0	461	221
Stage 1	-	-	-	-	221	-
Stage 2	-	-	-	-	240	-
Critical Hdwy	-	-	4.14	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.236	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1318	-	559	819
Stage 1	-	-	-	-	816	-
Stage 2	-	-	-	-	800	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1318	-	557	819
Mov Cap-2 Maneuver	-	-	-	-	557	-
Stage 1	-	-	-	-	816	-
Stage 2	-	-	-	-	798	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	586	-	-	1318	-
HCM Lane V/C Ratio	0.164	-	-	0.003	-
HCM Control Delay (s)	12.3	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0	-

Intersection	
Intersection Delay, s/veh	11.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	57	9	88	53	159	41	108	58	53	41	6
Future Vol, veh/h	4	57	9	88	53	159	41	108	58	53	41	6
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	2	2	2	6	6	6	6	6	6	16	16	16
Mvmt Flow	5	68	11	105	63	189	49	129	69	63	49	7
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.2	12.5	11.1	10.2
HCM LOS	A	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	20%	6%	29%	53%
Vol Thru, %	52%	81%	18%	41%
Vol Right, %	28%	13%	53%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	207	70	300	100
LT Vol	41	4	88	53
Through Vol	108	57	53	41
RT Vol	58	9	159	6
Lane Flow Rate	246	83	357	119
Geometry Grp	1	1	1	1
Degree of Util (X)	0.357	0.125	0.487	0.191
Departure Headway (Hd)	5.22	5.413	4.91	5.781
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	690	662	739	620
Service Time	3.252	3.449	2.91	3.818
HCM Lane V/C Ratio	0.357	0.125	0.483	0.192
HCM Control Delay	11.1	9.2	12.5	10.2
HCM Lane LOS	B	A	B	B
HCM 95th-tile Q	1.6	0.4	2.7	0.7

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	392	10	81	340	3	6	29	234	14	28	4
Future Vol, veh/h	3	392	10	81	340	3	6	29	234	14	28	4
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	120	-	-	210	-	-	-	-	-	-	-	-
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, %	13	13	13	17	17	17	5	5	5	3	3	3
Mvmt Flow	3	413	11	85	358	3	6	31	246	15	29	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	361	0	0	424	0	0	971	956	419	1093	960	360
Stage 1	-	-	-	-	-	-	425	425	-	530	530	-
Stage 2	-	-	-	-	-	-	546	531	-	563	430	-
Critical Hdwy	4.23	-	-	4.27	-	-	7.15	6.55	6.25	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.13	5.53	-
Follow-up Hdwy	2.317	-	-	2.353	-	-	3.545	4.045	3.345	3.527	4.027	3.327
Pot Cap-1 Maneuver	1139	-	-	1059	-	-	229	255	628	191	256	682
Stage 1	-	-	-	-	-	-	601	581	-	531	525	-
Stage 2	-	-	-	-	-	-	517	521	-	509	582	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1139	-	-	1059	-	-	193	234	628	98	235	682
Mov Cap-2 Maneuver	-	-	-	-	-	-	193	234	-	98	235	-
Stage 1	-	-	-	-	-	-	599	579	-	529	483	-
Stage 2	-	-	-	-	-	-	444	479	-	292	580	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.7	20.5	33.9
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	510	1139	-	-	1059	-	-	172
HCM Lane V/C Ratio	0.555	0.003	-	-	0.081	-	-	0.282
HCM Control Delay (s)	20.5	8.2	-	-	8.7	-	-	33.9
HCM Lane LOS	C	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	3.3	0	-	-	0.3	-	-	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	584	46	146	477	90	18	3	109	89	4	18
Future Volume (vph)	12	584	46	146	477	90	18	3	109	89	4	18
Ideal Flow (vphpl)	1900	1750	1750	1750	1750	1900	1750	1900	1750	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1570	1505		1363	1400		1363	1557	1205	1171	1080	
Flt Permitted	0.38	1.00		0.21	1.00		0.74	1.00	1.00	0.59	1.00	
Satd. Flow (perm)	633	1505		303	1400		1064	1557	1205	731	1080	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	635	50	159	518	98	20	3	118	97	4	20
RTOR Reduction (vph)	0	3	0	0	6	0	0	0	95	0	18	0
Lane Group Flow (vph)	13	682	0	159	610	0	20	3	23	97	7	0
Confl. Peds. (#/hr)									1	1		
Heavy Vehicles (%)	15%	15%	15%	22%	22%	22%	22%	22%	22%	54%	54%	54%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	44.8	43.9		56.0	50.6		9.9	8.0	15.6	14.3	10.2	
Effective Green, g (s)	44.8	43.9		56.0	50.6		9.9	8.0	15.6	14.3	10.2	
Actuated g/C Ratio	0.55	0.54		0.69	0.62		0.12	0.10	0.19	0.18	0.12	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	357	809		306	868		136	152	296	150	135	
v/s Ratio Prot	0.00	c0.45		c0.05	c0.44		0.00	0.00	0.01	c0.03	0.01	
v/s Ratio Perm	0.02			0.31			0.01		0.01	c0.08		
v/c Ratio	0.04	0.84		0.52	0.70		0.15	0.02	0.08	0.65	0.05	
Uniform Delay, d1	8.5	15.9		9.1	10.4		32.0	33.3	27.1	31.0	31.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	8.0		1.5	2.6		0.5	0.1	0.1	9.2	0.1	
Delay (s)	8.6	23.9		10.6	13.0		32.5	33.3	27.2	40.2	31.6	
Level of Service	A	C		B	B		C	C	C	D	C	
Approach Delay (s)		23.7			12.5			28.1			38.5	
Approach LOS		C			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	81.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	68.0%	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 (veh/h)	12	584	46	146	477	90	18	3	109	89	4	18
Future Volume (veh/h)	12	584	46	146	477	90	18	3	109	89	4	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		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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1678	1545	1545	1450	1450	1574	1450	1574	1450	1100	1100	1100
Adj Flow Rate, veh/h	13	635	50	159	518	98	20	3	118	97	4	20
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, %	15	15	15	22	22	22	22	22	22	54	54	54
Cap, veh/h	264	683	54	243	647	122	258	187	242	262	27	134
Arrive On Green	0.02	0.48	0.48	0.08	0.55	0.55	0.02	0.12	0.12	0.07	0.17	0.17
Sat Flow, veh/h	1598	1414	111	1381	1185	224	1381	1574	1223	1047	159	795
Grp Volume(v), veh/h	13	0	685	159	0	616	20	3	118	97	0	24
Grp Sat Flow(s),veh/h/ln	1598	0	1525	1381	0	1409	1381	1574	1223	1047	0	954
Q Serve(g_s), s	0.3	0.0	30.7	3.9	0.0	25.7	0.9	0.1	6.2	5.3	0.0	1.6
Cycle Q Clear(g_c), s	0.3	0.0	30.7	3.9	0.0	25.7	0.9	0.1	6.2	5.3	0.0	1.6
Prop In Lane	1.00		0.07	1.00		0.16	1.00		1.00	1.00		0.83
Lane Grp Cap(c), veh/h	264	0	737	243	0	769	258	187	242	262	0	161
V/C Ratio(X)	0.05	0.00	0.93	0.65	0.00	0.80	0.08	0.02	0.49	0.37	0.00	0.15
Avail Cap(c_a), veh/h	348	0	849	281	0	836	321	397	405	262	0	244
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	0.00	1.00
Uniform Delay (d), s/veh	12.4	0.0	17.7	16.0	0.0	13.4	27.3	28.4	26.0	25.4	0.0	25.9
Incr Delay (d2), s/veh	0.1	0.0	15.2	4.3	0.0	5.2	0.1	0.0	1.5	0.9	0.0	0.4
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	11.2	1.4	0.0	7.8	0.3	0.0	1.8	1.5	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.4	0.0	32.9	20.3	0.0	18.6	27.4	28.4	27.5	26.3	0.0	26.3
LnGrp LOS	B	A	C	C	A	B	C	C	C	C	A	C
Approach Vol, veh/h		698			775			141			121	
Approach Delay, s/veh		32.5			18.9			27.5			26.3	
Approach LOS		C			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.8	13.2	10.2	39.7	6.2	16.8	5.7	44.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.3	18.4	7.7	40.6	5.0	18.7	5.0	43.3
Max Q Clear Time (g_c+I1), s	7.3	8.2	5.9	32.7	2.9	3.6	2.3	27.7
Green Ext Time (p_c), s	0.0	0.2	0.1	2.5	0.0	0.1	0.0	3.8

Intersection Summary	
HCM 6th Ctrl Delay	25.6
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	18.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	628	213	250	394	0	0	0	0	22	1	333
Future Vol, veh/h	0	628	213	250	394	0	0	0	0	22	1	333
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	25	25	25	10	10	10	0	0	0	33	33	33
Mvmt Flow	0	641	217	255	402	0	0	0	0	22	1	340

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	858	0	0	1662	1770	402
Stage 1	-	-	-	-	-	-	912	912	-
Stage 2	-	-	-	-	-	-	750	858	-
Critical Hdwy	-	-	-	4.2	-	-	6.73	6.83	6.53
Critical Hdwy Stg 1	-	-	-	-	-	-	5.73	5.83	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.73	5.83	-
Follow-up Hdwy	-	-	-	2.29	-	-	3.797	4.297	3.597
Pot Cap-1 Maneuver	0	-	-	750	-	0	90	70	586
Stage 1	0	-	-	-	-	0	346	314	-
Stage 2	0	-	-	-	-	0	416	334	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	750	-	-	51	0	586
Mov Cap-2 Maneuver	-	-	-	-	-	-	51	0	-
Stage 1	-	-	-	-	-	-	346	0	-
Stage 2	-	-	-	-	-	-	234	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	4.8	88.9
HCM LOS			F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	750	-	355
HCM Lane V/C Ratio	-	-	0.34	-	1.023
HCM Control Delay (s)	-	-	12.3	0	88.9
HCM Lane LOS	-	-	B	A	F
HCM 95th %tile Q(veh)	-	-	1.5	-	12.2

Intersection	
Int Delay, s/veh	477.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	448	181	0	0	502	115	138	0	363	0	0	0
Future Vol, veh/h	448	181	0	0	502	115	138	0	363	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	19	19	19	7	7	7	10	10	10	0	0	0
Mvmt Flow	472	191	0	0	528	121	145	0	382	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	649	0	-	-	-	0	1724	1784	191
Stage 1	-	-	-	-	-	-	1135	1135	-
Stage 2	-	-	-	-	-	-	589	649	-
Critical Hdwy	4.29	-	-	-	-	-	6.5	6.6	6.3
Critical Hdwy Stg 1	-	-	-	-	-	-	5.5	5.6	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.5	5.6	-
Follow-up Hdwy	2.371	-	-	-	-	-	3.59	4.09	3.39
Pot Cap-1 Maneuver	861	-	0	0	-	-	~ 93	78	831
Stage 1	-	-	0	0	-	-	296	268	-
Stage 2	-	-	0	0	-	-	539	453	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	861	-	-	-	-	-	~ 36	0	831
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 36	0	-
Stage 1	-	-	-	-	-	-	~ 115	0	-
Stage 2	-	-	-	-	-	-	539	0	-

Approach	EB	WB	NB
HCM Control Delay, s	10.1	0	$ 1652.7
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	117	861	-	-	-
HCM Lane V/C Ratio	4.507	0.548	-	-	-
HCM Control Delay (s)	$ 1652.7	14.1	0	-	-
HCM Lane LOS	F	B	A	-	-
HCM 95th %tile Q(veh)	54.9	3.4	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	80	70	13	147	41	7
Future Vol, veh/h	80	70	13	147	41	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	2	2	1	1	2	2
Mvmt Flow	103	90	17	188	53	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	193	0	370	148
Stage 1	-	-	-	-	148	-
Stage 2	-	-	-	-	222	-
Critical Hdwy	-	-	4.11	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.209	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1386	-	630	899
Stage 1	-	-	-	-	880	-
Stage 2	-	-	-	-	815	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1386	-	621	899
Mov Cap-2 Maneuver	-	-	-	-	621	-
Stage 1	-	-	-	-	880	-
Stage 2	-	-	-	-	804	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	11.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	650	-	-	1386	-
HCM Lane V/C Ratio	0.095	-	-	0.012	-
HCM Control Delay (s)	11.1	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	152	70	12	147	41	7
Future Vol, veh/h	152	70	12	147	41	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	2	2	1	1	2	2
Mvmt Flow	195	90	15	188	53	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	285	0	458	240
Stage 1	-	-	-	-	240	-
Stage 2	-	-	-	-	218	-
Critical Hdwy	-	-	4.11	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.209	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1283	-	561	799
Stage 1	-	-	-	-	800	-
Stage 2	-	-	-	-	818	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1283	-	554	799
Mov Cap-2 Maneuver	-	-	-	-	554	-
Stage 1	-	-	-	-	800	-
Stage 2	-	-	-	-	807	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	11.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	580	-	-	1283	-
HCM Lane V/C Ratio	0.106	-	-	0.012	-
HCM Control Delay (s)	11.9	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Intersection	
Intersection Delay, s/veh	13.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	72	79	57	49	87	14	58	84	125	167	9
Future Vol, veh/h	18	72	79	57	49	87	14	58	84	125	167	9
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles, %	2	2	2	3	3	3	4	4	4	3	3	3
Mvmt Flow	23	91	100	72	62	110	18	73	106	158	211	11
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12	12.6	11.4	17.1
HCM LOS	B	B	B	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	9%	11%	30%	42%
Vol Thru, %	37%	43%	25%	55%
Vol Right, %	54%	47%	45%	3%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	156	169	193	301
LT Vol	14	18	57	125
Through Vol	58	72	49	167
RT Vol	84	79	87	9
Lane Flow Rate	197	214	244	381
Geometry Grp	1	1	1	1
Degree of Util (X)	0.312	0.345	0.393	0.603
Departure Headway (Hd)	5.693	5.798	5.798	5.697
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	626	614	616	629
Service Time	3.786	3.889	3.887	3.772
HCM Lane V/C Ratio	0.315	0.349	0.396	0.606
HCM Control Delay	11.4	12	12.6	17.1
HCM Lane LOS	B	B	B	C
HCM 95th-tile Q	1.3	1.5	1.9	4

Intersection	
Int Delay, s/veh	10.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	14	416	5	223	356	13	9	35	148	10	38	13
Future Vol, veh/h	14	416	5	223	356	13	9	35	148	10	38	13
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	120	-	-	210	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	8	8	8	8	8	8	6	6	6	9	9	9
Mvmt Flow	14	429	5	230	367	13	9	36	153	10	39	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	380	0	0	434	0	0	1320	1300	432	1388	1296	374
Stage 1	-	-	-	-	-	-	460	460	-	834	834	-
Stage 2	-	-	-	-	-	-	860	840	-	554	462	-
Critical Hdwy	4.18	-	-	4.18	-	-	7.16	6.56	6.26	7.19	6.59	6.29
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.56	-	6.19	5.59	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.56	-	6.19	5.59	-
Follow-up Hdwy	2.272	-	-	2.272	-	-	3.554	4.054	3.354	3.581	4.081	3.381
Pot Cap-1 Maneuver	1146	-	-	1094	-	-	131	158	615	116	157	657
Stage 1	-	-	-	-	-	-	574	559	-	353	374	-
Stage 2	-	-	-	-	-	-	345	375	-	504	553	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1146	-	-	1094	-	-	81	123	615	57	123	657
Mov Cap-2 Maneuver	-	-	-	-	-	-	81	123	-	57	123	-
Stage 1	-	-	-	-	-	-	567	552	-	349	295	-
Stage 2	-	-	-	-	-	-	231	296	-	350	546	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	3.5	37	63.2
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	302	1146	-	-	1094	-	-	121
HCM Lane V/C Ratio	0.655	0.013	-	-	0.21	-	-	0.52
HCM Control Delay (s)	37	8.2	-	-	9.2	-	-	63.2
HCM Lane LOS	E	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	4.3	0	-	-	0.8	-	-	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	594	61	169	482	138	24	8	180	99	6	23
Future Volume (vph)	33	594	61	169	482	138	24	8	180	99	6	23
Ideal Flow (vphpl)	1900	1750	1750	1750	1750	1900	1750	1900	1750	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1703	1628		1446	1471		1511	1727	1338	1543	1434	
Flt Permitted	0.32	1.00		0.17	1.00		0.74	1.00	1.00	0.60	1.00	
Satd. Flow (perm)	567	1628		262	1471		1171	1727	1338	967	1434	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	646	66	184	524	150	26	9	196	108	7	25
RTOR Reduction (vph)	0	3	0	0	9	0	0	0	154	0	22	0
Lane Group Flow (vph)	36	709	0	184	665	0	26	9	42	108	10	0
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	6%	6%	6%	15%	15%	15%	10%	10%	10%	17%	17%	17%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	43.6	40.7		54.1	46.7		9.9	8.0	16.9	14.1	10.1	
Effective Green, g (s)	43.6	40.7		54.1	46.7		9.9	8.0	16.9	14.1	10.1	
Actuated g/C Ratio	0.55	0.51		0.68	0.59		0.12	0.10	0.21	0.18	0.13	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	351	832		310	863		153	173	359	200	181	
v/s Ratio Prot	0.00	c0.44		c0.07	c0.45		0.00	0.01	0.01	c0.03	0.01	
v/s Ratio Perm	0.05			0.34			0.02		0.02	c0.07		
v/c Ratio	0.10	0.85		0.59	0.77		0.17	0.05	0.12	0.54	0.06	
Uniform Delay, d1	8.9	16.8		10.5	12.4		31.0	32.4	25.3	29.4	30.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	8.4		3.0	4.3		0.5	0.1	0.1	3.0	0.1	
Delay (s)	9.0	25.2		13.6	16.7		31.6	32.5	25.5	32.3	30.7	
Level of Service	A	C		B	B		C	C	C	C	C	
Approach Delay (s)		24.4			16.0			26.4			32.0	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	79.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.5%	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 (veh/h)	33	594	61	169	482	138	24	8	180	99	6	23
Future Volume (veh/h)	33	594	61	169	482	138	24	8	180	99	6	23
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		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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1668	1668	1545	1545	1678	1614	1752	1614	1648	1648	1648
Adj Flow Rate, veh/h	36	646	66	184	524	150	26	9	196	108	7	25
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, %	6	6	6	15	15	15	10	10	10	17	17	17
Cap, veh/h	231	685	70	248	592	169	323	280	332	354	62	222
Arrive On Green	0.03	0.46	0.46	0.09	0.51	0.51	0.03	0.16	0.16	0.06	0.20	0.20
Sat Flow, veh/h	1725	1489	152	1472	1155	331	1537	1752	1337	1570	316	1129
Grp Volume(v), veh/h	36	0	712	184	0	674	26	9	196	108	0	32
Grp Sat Flow(s),veh/h/ln	1725	0	1641	1472	0	1486	1537	1752	1337	1570	0	1445
Q Serve(g_s), s	0.8	0.0	32.6	4.9	0.0	31.9	1.1	0.3	10.2	4.5	0.0	1.4
Cycle Q Clear(g_c), s	0.8	0.0	32.6	4.9	0.0	31.9	1.1	0.3	10.2	4.5	0.0	1.4
Prop In Lane	1.00		0.09	1.00		0.22	1.00		1.00	1.00		0.78
Lane Grp Cap(c), veh/h	231	0	755	248	0	762	323	280	332	354	0	284
V/C Ratio(X)	0.16	0.00	0.94	0.74	0.00	0.89	0.08	0.03	0.59	0.31	0.00	0.11
Avail Cap(c_a), veh/h	281	0	810	286	0	807	379	425	443	354	0	352
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	0.00	1.00
Uniform Delay (d), s/veh	15.4	0.0	20.3	17.2	0.0	17.1	26.5	28.0	26.2	25.1	0.0	26.0
Incr Delay (d2), s/veh	0.3	0.0	18.5	8.6	0.0	11.1	0.1	0.0	1.7	0.5	0.0	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	13.7	2.0	0.0	11.7	0.4	0.1	3.2	1.7	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.7	0.0	38.8	25.9	0.0	28.2	26.6	28.0	27.9	25.6	0.0	26.2
LnGrp LOS	B	A	D	C	A	C	C	C	C	C	A	C
Approach Vol, veh/h		748			858			231			140	
Approach Delay, s/veh		37.6			27.7			27.7			25.7	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.6	17.1	11.3	40.8	6.7	20.0	7.2	44.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.1	19.1	8.9	38.9	5.0	19.2	5.0	42.8
Max Q Clear Time (g_c+I1), s	6.5	12.2	6.9	34.6	3.1	3.4	2.8	33.9
Green Ext Time (p_c), s	0.0	0.4	0.1	1.7	0.0	0.1	0.0	3.1

Intersection Summary	
HCM 6th Ctrl Delay	31.3
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	447.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	560	271	389	395	0	0	0	0	65	5	459
Future Vol, veh/h	0	560	271	389	395	0	0	0	0	65	5	459
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	12	12	12	12	12	12	0	0	0	15	15	15
Mvmt Flow	0	589	285	409	416	0	0	0	0	68	5	483

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	874	0	0	1966	2108	416
Stage 1	-	-	-	-	-	-	1234	1234	-
Stage 2	-	-	-	-	-	-	732	874	-
Critical Hdwy	-	-	-	4.22	-	-	6.55	6.65	6.35
Critical Hdwy Stg 1	-	-	-	-	-	-	5.55	5.65	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.55	5.65	-
Follow-up Hdwy	-	-	-	2.308	-	-	3.635	4.135	3.435
Pot Cap-1 Maneuver	0	-	-	731	-	0	~ 64	47	610
Stage 1	0	-	-	-	-	0	258	235	-
Stage 2	0	-	-	-	-	0	453	350	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	731	-	-	~ 17	0	610
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 17	0	-
Stage 1	-	-	-	-	-	-	258	0	-
Stage 2	-	-	-	-	-	-	123	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	7.9	$ 1803.8
HCM LOS			F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	731	-	115
HCM Lane V/C Ratio	-	-	0.56	-	4.842
HCM Control Delay (s)	-	-	16	-	$ 1803.8
HCM Lane LOS	-	-	C	A	F
HCM 95th %tile Q(veh)	-	-	3.5	-	58.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	444.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	338	321	0	0	588	39	185	3	265	0	0	0
Future Vol, veh/h	338	321	0	0	588	39	185	3	265	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	12	12	12	5	5	5	18	18	18	0	0	0
Mvmt Flow	356	338	0	0	619	41	195	3	279	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	660	0	-	-	-	0	1690	1710	338
Stage 1	-	-	-	-	-	-	1050	1050	-
Stage 2	-	-	-	-	-	-	640	660	-
Critical Hdwy	4.22	-	-	-	-	-	6.58	6.68	6.38
Critical Hdwy Stg 1	-	-	-	-	-	-	5.58	5.68	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.58	5.68	-
Follow-up Hdwy	2.308	-	-	-	-	-	3.662	4.162	3.462
Pot Cap-1 Maneuver	883	-	0	0	-	-	~ 94	83	669
Stage 1	-	-	0	0	-	-	314	285	-
Stage 2	-	-	0	0	-	-	496	436	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	883	-	-	-	-	-	~ 47	0	669
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 47	0	-
Stage 1	-	-	-	-	-	-	~ 158	0	-
Stage 2	-	-	-	-	-	-	496	0	-

Approach	EB	WB	NB
HCM Control Delay, s	6.1	0	$ 1696
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	104	883	-	-	-
HCM Lane V/C Ratio	4.585	0.403	-	-	-
HCM Control Delay (s)	$ 1696	11.8	0	-	-
HCM Lane LOS	F	B	A	-	-
HCM 95th %tile Q(veh)	50.2	2	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	392	10	72	340	3	6	29	219	14	28	4
Future Volume (vph)	3	392	10	72	340	3	6	29	219	14	28	4
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.88			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.98	
Satd. Flow (prot)	1471	1543		1421	1494			1471			1654	
Flt Permitted	0.55	1.00		0.49	1.00			0.99			0.88	
Satd. Flow (perm)	845	1543		734	1494			1462			1474	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	413	11	76	358	3	6	31	231	15	29	4
RTOR Reduction (vph)	0	2	0	0	1	0	0	172	0	0	3	0
Lane Group Flow (vph)	3	422	0	76	360	0	0	96	0	0	45	0
Heavy Vehicles (%)	13%	13%	13%	17%	17%	17%	5%	5%	5%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	13.6	13.6		13.6	13.6			7.7			7.7	
Effective Green, g (s)	13.6	13.6		13.6	13.6			7.7			7.7	
Actuated g/C Ratio	0.45	0.45		0.45	0.45			0.25			0.25	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	379	692		329	670			371			374	
v/s Ratio Prot		c0.27			0.24							
v/s Ratio Perm	0.00			0.10				c0.07			0.03	
v/c Ratio	0.01	0.61		0.23	0.54			0.26			0.12	
Uniform Delay, d1	4.6	6.3		5.1	6.1			9.0			8.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	1.6		0.4	0.8			0.4			0.1	
Delay (s)	4.6	7.9		5.5	6.9			9.4			8.8	
Level of Service	A	A		A	A			A			A	
Approach Delay (s)		7.9			6.7			9.4			8.8	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	30.3	Sum of lost time (s)	9.0
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
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 (veh/h)	3	392	10	72	340	3	6	29	219	14	28	4
Future Volume (veh/h)	3	392	10	72	340	3	6	29	219	14	28	4
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		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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1573	1573	1573	1518	1518	1518	1682	1682	1682	1709	1709	1709
Adj Flow Rate, veh/h	3	413	11	76	358	3	6	31	231	15	29	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	13	13	13	17	17	17	5	5	5	3	3	3
Cap, veh/h	457	660	18	412	651	5	125	51	338	229	316	35
Arrive On Green	0.43	0.43	0.43	0.43	0.43	0.43	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	858	1525	41	782	1503	13	12	189	1252	269	1171	131
Grp Volume(v), veh/h	3	0	424	76	0	361	268	0	0	48	0	0
Grp Sat Flow(s),veh/h/ln	858	0	1565	782	0	1516	1452	0	0	1571	0	0
Q Serve(g_s), s	0.1	0.0	6.4	2.5	0.0	5.4	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.4	0.0	6.4	8.9	0.0	5.4	5.0	0.0	0.0	0.6	0.0	0.0
Prop In Lane	1.00		0.03	1.00		0.01	0.02		0.86	0.31		0.08
Lane Grp Cap(c), veh/h	457	0	678	412	0	656	513	0	0	580	0	0
V/C Ratio(X)	0.01	0.00	0.63	0.18	0.00	0.55	0.52	0.00	0.00	0.08	0.00	0.00
Avail Cap(c_a), veh/h	922	0	1525	835	0	1477	1150	0	0	1194	0	0
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	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	8.4	0.0	6.7	10.1	0.0	6.4	9.9	0.0	0.0	8.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	1.0	0.2	0.0	0.7	0.8	0.0	0.0	0.1	0.0	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	0.0	0.0	0.6	0.2	0.0	0.5	0.8	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.4	0.0	7.6	10.4	0.0	7.1	10.7	0.0	0.0	8.4	0.0	0.0
LnGrp LOS	A	A	A	B	A	A	B	A	A	A	A	A
Approach Vol, veh/h		427			437			268			48	
Approach Delay, s/veh		7.6			7.7			10.7			8.4	
Approach LOS		A			A			B			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		12.7		17.6		12.7		17.6				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		21.5		29.5		21.5		29.5				
Max Q Clear Time (g_c+I1), s		7.0		8.4		2.6		10.9				
Green Ext Time (p_c), s		1.2		2.2		0.1		2.2				

Intersection Summary												
HCM 6th Ctrl Delay			8.4									
HCM 6th LOS			A									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	416	5	223	356	13	9	35	148	10	38	13
Future Volume (vph)	14	416	5	223	356	13	9	35	148	10	38	13
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.98			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.90			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1539	1618		1539	1612			1451			1541	
Flt Permitted	0.54	1.00		0.48	1.00			0.98			0.92	
Satd. Flow (perm)	868	1618		784	1612			1432			1436	
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)	14	429	5	230	367	13	9	36	153	10	39	13
RTOR Reduction (vph)	0	1	0	0	3	0	0	117	0	0	10	0
Lane Group Flow (vph)	14	433	0	230	377	0	0	81	0	0	52	0
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	6%	6%	6%	9%	9%	9%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.6	16.6		16.6	16.6			7.9			7.9	
Effective Green, g (s)	16.6	16.6		16.6	16.6			7.9			7.9	
Actuated g/C Ratio	0.50	0.50		0.50	0.50			0.24			0.24	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.5			4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	430	801		388	798			337			338	
v/s Ratio Prot		0.27			0.23							
v/s Ratio Perm	0.02			c0.29				c0.06			0.04	
v/c Ratio	0.03	0.54		0.59	0.47			0.24			0.15	
Uniform Delay, d1	4.3	5.8		6.0	5.6			10.4			10.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	0.7		2.4	0.4			0.4			0.2	
Delay (s)	4.4	6.6		8.5	6.0			10.7			10.4	
Level of Service	A	A		A	A			B			B	
Approach Delay (s)		6.5			6.9			10.7			10.4	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	7.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	33.5	Sum of lost time (s)	9.0
Intersection Capacity Utilization	62.2%	ICU Level of Service	B
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 (veh/h)	14	416	5	223	356	13	9	35	148	10	38	13
Future Volume (veh/h)	14	416	5	223	356	13	9	35	148	10	38	13
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		0.98
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1641	1641	1641	1641	1641	1641	1668	1668	1668	1627	1627	1627
Adj Flow Rate, veh/h	14	429	5	230	367	13	9	36	153	10	39	13
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	8	8	8	8	8	8	6	6	6	9	9	9
Cap, veh/h	558	879	10	519	856	30	112	60	225	140	222	65
Arrive On Green	0.54	0.54	0.54	0.54	0.54	0.54	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	880	1619	19	837	1575	56	29	296	1104	108	1091	318
Grp Volume(v), veh/h	14	0	434	230	0	380	198	0	0	62	0	0
Grp Sat Flow(s),veh/h/ln	880	0	1637	837	0	1631	1429	0	0	1517	0	0
Q Serve(g_s), s	0.3	0.0	5.9	8.4	0.0	4.9	0.5	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.3	0.0	5.9	14.2	0.0	4.9	4.5	0.0	0.0	1.2	0.0	0.0
Prop In Lane	1.00		0.01	1.00		0.03	0.05		0.77	0.16		0.21
Lane Grp Cap(c), veh/h	558	0	889	519	0	886	397	0	0	427	0	0
V/C Ratio(X)	0.03	0.00	0.49	0.44	0.00	0.43	0.50	0.00	0.00	0.15	0.00	0.00
Avail Cap(c_a), veh/h	884	0	1495	829	0	1489	845	0	0	880	0	0
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	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	6.4	0.0	5.1	9.5	0.0	4.8	13.1	0.0	0.0	11.7	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.4	0.6	0.0	0.3	1.0	0.0	0.0	0.2	0.0	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	0.0	0.0	0.4	0.8	0.0	0.3	1.0	0.0	0.0	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.4	0.0	5.5	10.1	0.0	5.2	14.0	0.0	0.0	11.9	0.0	0.0
LnGrp LOS	A	A	A	B	A	A	B	A	A	B	A	A
Approach Vol, veh/h		448			610			198			62	
Approach Delay, s/veh		5.5			7.0			14.0			11.9	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		11.8		23.8		11.8		23.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.5		32.5		18.5		32.5				
Max Q Clear Time (g_c+I1), s		6.5		7.9		3.2		16.2				
Green Ext Time (p_c), s		0.7		2.4		0.2		3.1				

Intersection Summary												
HCM 6th Ctrl Delay			7.8									
HCM 6th LOS			A									

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	427	437	268	48
Demand Flow Rate, veh/h	482	512	282	49
Vehicles Circulating, veh/h	134	42	485	514
Vehicles Exiting, veh/h	429	725	131	40
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.6	7.1	8.4	5.1
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	482	512	282	49
Cap Entry Lane, veh/h	1204	1322	841	817
Entry HV Adj Factor	0.886	0.854	0.952	0.982
Flow Entry, veh/h	427	437	268	48
Cap Entry, veh/h	1067	1129	801	802
V/C Ratio	0.400	0.387	0.335	0.060
Control Delay, s/veh	7.6	7.1	8.4	5.1
LOS	A	A	A	A
95th %tile Queue, veh	2	2	1	0

Intersection	
Intersection Delay, s/veh	8.7
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	448	610	198	62
Demand Flow Rate, veh/h	483	658	210	68
Vehicles Circulating, veh/h	302	63	489	654
Vehicles Exiting, veh/h	420	636	296	67
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	9.6	8.6	7.3	6.6
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	483	658	210	68
Cap Entry Lane, veh/h	1014	1294	838	708
Entry HV Adj Factor	0.927	0.927	0.942	0.918
Flow Entry, veh/h	448	610	198	62
Cap Entry, veh/h	940	1199	790	650
V/C Ratio	0.476	0.509	0.251	0.096
Control Delay, s/veh	9.6	8.6	7.3	6.6
LOS	A	A	A	A
95th %tile Queue, veh	3	3	1	0

Intersection	
Int Delay, s/veh	3.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	155	31	5	140	93	16
Future Vol, veh/h	155	31	5	140	93	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	5	5	4	4	2	2
Mvmt Flow	207	41	7	187	124	21

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	248	0	429	228
Stage 1	-	-	-	-	228	-
Stage 2	-	-	-	-	201	-
Critical Hdwy	-	-	4.14	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.236	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1306	-	583	811
Stage 1	-	-	-	-	810	-
Stage 2	-	-	-	-	833	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1306	-	580	811
Mov Cap-2 Maneuver	-	-	-	-	580	-
Stage 1	-	-	-	-	810	-
Stage 2	-	-	-	-	828	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	12.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	605	-	-	1306	-
HCM Lane V/C Ratio	0.24	-	-	0.005	-
HCM Control Delay (s)	12.8	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.9	-	-	0	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	167	20	4	72	62	11
Future Vol, veh/h	167	20	4	72	62	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	5	5	4	4	2	2
Mvmt Flow	223	27	5	96	83	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	250	0	343	237
Stage 1	-	-	-	-	237	-
Stage 2	-	-	-	-	106	-
Critical Hdwy	-	-	4.14	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.236	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1304	-	653	802
Stage 1	-	-	-	-	802	-
Stage 2	-	-	-	-	918	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1304	-	650	802
Mov Cap-2 Maneuver	-	-	-	-	650	-
Stage 1	-	-	-	-	802	-
Stage 2	-	-	-	-	914	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	669	-	-	1304	-
HCM Lane V/C Ratio	0.145	-	-	0.004	-
HCM Control Delay (s)	11.3	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0	-

Intersection	
Intersection Delay, s/veh	13
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	63	10	103	62	188	45	121	64	58	45	7
Future Vol, veh/h	4	63	10	103	62	188	45	121	64	58	45	7
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	6	6	6	6	6	6	16	16	16
Mvmt Flow	5	74	12	121	73	221	53	142	75	68	53	8
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.7	14.9	12.3	10.8
HCM LOS	A	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	20%	5%	29%	53%
Vol Thru, %	53%	82%	18%	41%
Vol Right, %	28%	13%	53%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	230	77	353	110
LT Vol	45	4	103	58
Through Vol	121	63	62	45
RT Vol	64	10	188	7
Lane Flow Rate	271	91	415	129
Geometry Grp	1	1	1	1
Degree of Util (X)	0.411	0.143	0.582	0.218
Departure Headway (Hd)	5.463	5.678	5.044	6.063
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	658	630	714	590
Service Time	3.505	3.731	3.08	4.114
HCM Lane V/C Ratio	0.412	0.144	0.581	0.219
HCM Control Delay	12.3	9.7	14.9	10.8
HCM Lane LOS	B	A	B	B
HCM 95th-tile Q	2	0.5	3.8	0.8

Intersection	
Int Delay, s/veh	9.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	441	12	89	383	3	7	32	271	16	31	4
Future Vol, veh/h	3	441	12	89	383	3	7	32	271	16	31	4
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	120	-	-	210	-	-	-	-	-	-	-	-
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, %	13	13	13	17	17	17	5	5	5	3	3	3
Mvmt Flow	3	464	13	94	403	3	7	34	285	17	33	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	406	0	0	477	0	0	1088	1071	471	1229	1076	405
Stage 1	-	-	-	-	-	-	477	477	-	593	593	-
Stage 2	-	-	-	-	-	-	611	594	-	636	483	-
Critical Hdwy	4.23	-	-	4.27	-	-	7.15	6.55	6.25	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.13	5.53	-
Follow-up Hdwy	2.317	-	-	2.353	-	-	3.545	4.045	3.345	3.527	4.027	3.327
Pot Cap-1 Maneuver	1096	-	-	1011	-	-	191	218	587	154	218	644
Stage 1	-	-	-	-	-	-	563	551	-	490	492	-
Stage 2	-	-	-	-	-	-	476	488	-	464	551	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1096	-	-	1011	-	-	154	197	587	64	197	644
Mov Cap-2 Maneuver	-	-	-	-	-	-	154	197	-	64	197	-
Stage 1	-	-	-	-	-	-	561	549	-	489	446	-
Stage 2	-	-	-	-	-	-	398	443	-	223	549	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.7	29.3	55.2
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	463	1096	-	-	1011	-	-	123
HCM Lane V/C Ratio	0.705	0.003	-	-	0.093	-	-	0.436
HCM Control Delay (s)	29.3	8.3	-	-	8.9	-	-	55.2
HCM Lane LOS	D	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	5.4	0	-	-	0.3	-	-	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	664	35	110	535	101	14	2	84	99	5	20
Future Volume (vph)	16	664	35	110	535	101	14	2	84	99	5	20
Ideal Flow (vphpl)	1900	1750	1750	1750	1750	1900	1750	1900	1750	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1570	1510		1363	1400		1363	1557	1203	1171	1084	
Flt Permitted	0.32	1.00		0.19	1.00		0.74	1.00	1.00	0.55	1.00	
Satd. Flow (perm)	536	1510		279	1400		1062	1557	1203	684	1084	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	699	37	116	563	106	15	2	88	104	5	21
RTOR Reduction (vph)	0	2	0	0	5	0	0	0	73	0	18	0
Lane Group Flow (vph)	17	734	0	116	664	0	15	2	15	104	8	0
Confl. Peds. (#/hr)									1	1		
Heavy Vehicles (%)	15%	15%	15%	22%	22%	22%	22%	22%	22%	54%	54%	54%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	47.2	46.3		56.3	50.9		9.7	8.8	14.3	16.1	12.0	
Effective Green, g (s)	47.2	46.3		56.3	50.9		9.7	8.8	14.3	16.1	12.0	
Actuated g/C Ratio	0.57	0.56		0.68	0.62		0.12	0.11	0.17	0.19	0.15	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	317	845		262	861		127	165	273	157	157	
v/s Ratio Prot	0.00	c0.49		c0.03	c0.47		0.00	0.00	0.00	c0.03	0.01	
v/s Ratio Perm	0.03			0.27			0.01		0.01	c0.10		
v/c Ratio	0.05	0.87		0.44	0.77		0.12	0.01	0.06	0.66	0.05	
Uniform Delay, d1	8.3	15.6		9.5	11.6		32.6	33.1	28.6	30.7	30.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	9.4		1.2	4.3		0.4	0.0	0.1	10.0	0.1	
Delay (s)	8.4	25.0		10.7	15.9		33.0	33.1	28.6	40.7	30.6	
Level of Service	A	C		B	B		C	C	C	D	C	
Approach Delay (s)		24.7			15.2			29.4			38.7	
Approach LOS		C			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	82.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	70.3%	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 (veh/h)	16	664	35	110	535	101	14	2	84	99	5	20
Future Volume (veh/h)	16	664	35	110	535	101	14	2	84	99	5	20
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		0.99	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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1678	1545	1545	1450	1450	1574	1450	1574	1450	1100	1100	1100
Adj Flow Rate, veh/h	17	699	37	116	563	106	15	2	88	104	5	21
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	15	15	15	22	22	22	22	22	22	54	54	54
Cap, veh/h	241	750	40	224	662	125	230	155	197	252	28	119
Arrive On Green	0.02	0.52	0.52	0.06	0.56	0.56	0.02	0.10	0.10	0.07	0.15	0.15
Sat Flow, veh/h	1598	1454	77	1381	1186	223	1381	1574	1222	1047	184	773
Grp Volume(v), veh/h	17	0	736	116	0	669	15	2	88	104	0	26
Grp Sat Flow(s),veh/h/ln	1598	0	1531	1381	0	1410	1381	1574	1222	1047	0	958
Q Serve(g_s), s	0.4	0.0	32.3	2.7	0.0	28.7	0.7	0.1	4.7	5.3	0.0	1.7
Cycle Q Clear(g_c), s	0.4	0.0	32.3	2.7	0.0	28.7	0.7	0.1	4.7	5.3	0.0	1.7
Prop In Lane	1.00		0.05	1.00		0.16	1.00		1.00	1.00		0.81
Lane Grp Cap(c), veh/h	241	0	789	224	0	786	230	155	197	252	0	147
V/C Ratio(X)	0.07	0.00	0.93	0.52	0.00	0.85	0.07	0.01	0.45	0.41	0.00	0.18
Avail Cap(c_a), veh/h	320	0	904	243	0	842	301	409	394	252	0	253
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	0.00	1.00
Uniform Delay (d), s/veh	12.6	0.0	16.3	15.8	0.0	13.4	28.4	29.3	27.3	26.3	0.0	26.5
Incr Delay (d2), s/veh	0.1	0.0	15.0	1.9	0.0	7.9	0.1	0.0	1.6	1.1	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	0.1	0.0	11.3	1.0	0.0	9.0	0.2	0.0	1.4	1.6	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.7	0.0	31.2	17.7	0.0	21.3	28.5	29.3	28.9	27.4	0.0	27.0
LnGrp LOS	B	A	C	B	A	C	C	C	C	C	A	C
Approach Vol, veh/h		753			785			105			130	
Approach Delay, s/veh		30.8			20.8			28.8			27.4	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.8	11.6	9.0	41.6	5.8	15.6	5.9	44.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.3	18.7	5.5	42.5	5.0	19.0	5.0	43.0
Max Q Clear Time (g_c+I1), s	7.3	6.7	4.7	34.3	2.7	3.7	2.4	30.7
Green Ext Time (p_c), s	0.0	0.2	0.0	2.8	0.0	0.1	0.0	3.7

Intersection Summary	
HCM 6th Ctrl Delay	26.0
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	65.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	713	242	281	443	0	0	0	0	25	1	374
Future Vol, veh/h	0	713	242	281	443	0	0	0	0	25	1	374
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	25	25	25	10	10	10	0	0	0	33	33	33
Mvmt Flow	0	728	247	287	452	0	0	0	0	26	1	382

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	975	0	0	1878	2001	452
Stage 1	-	-	-	-	-	-	1026	1026	-
Stage 2	-	-	-	-	-	-	852	975	-
Critical Hdwy	-	-	-	4.2	-	-	6.73	6.83	6.53
Critical Hdwy Stg 1	-	-	-	-	-	-	5.73	5.83	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.73	5.83	-
Follow-up Hdwy	-	-	-	2.29	-	-	3.797	4.297	3.597
Pot Cap-1 Maneuver	0	-	-	676	-	0	65	49	548
Stage 1	0	-	-	-	-	0	303	276	-
Stage 2	0	-	-	-	-	0	370	292	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	676	-	-	28	0	548
Mov Cap-2 Maneuver	-	-	-	-	-	-	28	0	-
Stage 1	-	-	-	-	-	-	303	0	-
Stage 2	-	-	-	-	-	-	160	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	5.5	$ 328.6
HCM LOS			F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	676	-	253
HCM Lane V/C Ratio	-	-	0.424	-	1.613
HCM Control Delay (s)	-	-	14.2	0	$ 328.6
HCM Lane LOS	-	-	B	A	F
HCM 95th %tile Q(veh)	-	-	2.1	-	25.4

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1713.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	540	206	0	0	565	130	155	0	408	0	0	0
Future Vol, veh/h	540	206	0	0	565	130	155	0	408	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	19	19	19	7	7	7	10	10	10	0	0	0
Mvmt Flow	568	217	0	0	595	137	163	0	429	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	732	0	-	-	-	0	2017	2085	217
Stage 1	-	-	-	-	-	-	1353	1353	-
Stage 2	-	-	-	-	-	-	664	732	-
Critical Hdwy	4.29	-	-	-	-	-	6.5	6.6	6.3
Critical Hdwy Stg 1	-	-	-	-	-	-	5.5	5.6	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.5	5.6	-
Follow-up Hdwy	2.371	-	-	-	-	-	3.59	4.09	3.39
Pot Cap-1 Maneuver	800	-	0	0	-	-	~ 61	50	803
Stage 1	-	-	0	0	-	-	231	210	-
Stage 2	-	-	0	0	-	-	497	415	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	800	-	-	-	-	-	~ 12	0	803
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 12	0	-
Stage 1	-	-	-	-	-	-	~ 45	0	-
Stage 2	-	-	-	-	-	-	497	0	-

Approach	EB	WB	NB
HCM Control Delay, s	14.3	0	$ 6081.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	42	800	-	-	-
HCM Lane V/C Ratio	14.11	0.711	-	-	-
HCM Control Delay (s)	$ 6081.2	19.7	0	-	-
HCM Lane LOS	F	C	A	-	-
HCM 95th %tile Q(veh)	71.9	6.1	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	2.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	159	103	18	164	60	11
Future Vol, veh/h	159	103	18	164	60	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	2	2	1	1	2	2
Mvmt Flow	199	129	23	205	75	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	328	0	515	264
Stage 1	-	-	-	-	264	-
Stage 2	-	-	-	-	251	-
Critical Hdwy	-	-	4.11	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.209	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1237	-	520	775
Stage 1	-	-	-	-	780	-
Stage 2	-	-	-	-	791	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1237	-	509	775
Mov Cap-2 Maneuver	-	-	-	-	509	-
Stage 1	-	-	-	-	780	-
Stage 2	-	-	-	-	774	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	13
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	538	-	-	1237	-
HCM Lane V/C Ratio	0.165	-	-	0.018	-
HCM Control Delay (s)	13	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	94	69	12	165	40	7
Future Vol, veh/h	94	69	12	165	40	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	2	2	1	1	2	2
Mvmt Flow	118	86	15	206	50	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	204	0	397	161
Stage 1	-	-	-	-	161	-
Stage 2	-	-	-	-	236	-
Critical Hdwy	-	-	4.11	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.209	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1374	-	608	884
Stage 1	-	-	-	-	868	-
Stage 2	-	-	-	-	803	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1374	-	601	884
Mov Cap-2 Maneuver	-	-	-	-	601	-
Stage 1	-	-	-	-	868	-
Stage 2	-	-	-	-	793	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	631	-	-	1374	-
HCM Lane V/C Ratio	0.093	-	-	0.011	-
HCM Control Delay (s)	11.3	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Intersection	
Intersection Delay, s/veh	23.8
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	91	89	73	61	112	16	66	108	169	189	10
Future Vol, veh/h	20	91	89	73	61	112	16	66	108	169	189	10
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles, %	2	2	2	3	3	3	4	4	4	3	3	3
Mvmt Flow	25	114	111	91	76	140	20	83	135	211	236	13
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	16.2	18.8	15.2	35.7
HCM LOS	C	C	C	E

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	8%	10%	30%	46%
Vol Thru, %	35%	45%	25%	51%
Vol Right, %	57%	45%	46%	3%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	190	200	246	368
LT Vol	16	20	73	169
Through Vol	66	91	61	189
RT Vol	108	89	112	10
Lane Flow Rate	238	250	308	460
Geometry Grp	1	1	1	1
Degree of Util (X)	0.447	0.479	0.579	0.844
Departure Headway (Hd)	6.775	6.903	6.783	6.609
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	530	520	532	552
Service Time	4.835	4.968	4.844	4.609
HCM Lane V/C Ratio	0.449	0.481	0.579	0.833
HCM Control Delay	15.2	16.2	18.8	35.7
HCM Lane LOS	C	C	C	E
HCM 95th-tile Q	2.3	2.6	3.6	8.9

Intersection	
Int Delay, s/veh	30.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	468	6	279	400	15	10	39	181	12	42	15
Future Vol, veh/h	16	468	6	279	400	15	10	39	181	12	42	15
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	120	-	-	210	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	8	8	8	8	8	8	6	6	6	9	9	9
Mvmt Flow	16	482	6	288	412	15	10	40	187	12	43	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	427	0	0	488	0	0	1542	1520	485	1627	1516	420
Stage 1	-	-	-	-	-	-	517	517	-	996	996	-
Stage 2	-	-	-	-	-	-	1025	1003	-	631	520	-
Critical Hdwy	4.18	-	-	4.18	-	-	7.16	6.56	6.26	7.19	6.59	6.29
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.56	-	6.19	5.59	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.56	-	6.19	5.59	-
Follow-up Hdwy	2.272	-	-	2.272	-	-	3.554	4.054	3.354	3.581	4.081	3.381
Pot Cap-1 Maneuver	1101	-	-	1045	-	-	92	116	574	79	115	619
Stage 1	-	-	-	-	-	-	534	527	-	286	313	-
Stage 2	-	-	-	-	-	-	279	315	-	457	521	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1101	-	-	1045	-	-	42	83	574	26	82	619
Mov Cap-2 Maneuver	-	-	-	-	-	-	42	83	-	26	82	-
Stage 1	-	-	-	-	-	-	526	519	-	282	227	-
Stage 2	-	-	-	-	-	-	159	228	-	280	513	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	3.9	121.1	219.9
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	225	1101	-	-	1045	-	-	69
HCM Lane V/C Ratio	1.054	0.015	-	-	0.275	-	-	1.031
HCM Control Delay (s)	121.1	8.3	-	-	9.7	-	-	219.9
HCM Lane LOS	F	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	10.2	0	-	-	1.1	-	-	5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	683	47	128	572	155	19	8	137	111	7	25
Future Volume (vph)	37	683	47	128	572	155	19	8	137	111	7	25
Ideal Flow (vphpl)	1900	1750	1750	1750	1750	1900	1750	1900	1750	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1703	1635		1446	1473		1511	1727	1336	1543	1432	
Flt Permitted	0.23	1.00		0.16	1.00		0.74	1.00	1.00	0.60	1.00	
Satd. Flow (perm)	418	1635		251	1473		1170	1727	1336	970	1432	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	39	719	49	135	602	163	20	8	144	117	7	26
RTOR Reduction (vph)	0	2	0	0	9	0	0	0	118	0	23	0
Lane Group Flow (vph)	39	766	0	135	756	0	20	8	26	117	10	0
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	6%	6%	6%	15%	15%	15%	10%	10%	10%	17%	17%	17%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	46.1	43.2		53.1	46.7		10.0	8.1	14.5	14.2	10.2	
Effective Green, g (s)	46.1	43.2		53.1	46.7		10.0	8.1	14.5	14.2	10.2	
Actuated g/C Ratio	0.58	0.54		0.67	0.59		0.13	0.10	0.18	0.18	0.13	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	288	886		263	863		154	175	318	201	183	
v/s Ratio Prot	0.00	0.47		c0.04	c0.51		0.00	0.00	0.01	c0.03	0.01	
v/s Ratio Perm	0.07			0.30			0.01		0.01	c0.07		
v/c Ratio	0.14	0.86		0.51	0.88		0.13	0.05	0.08	0.58	0.06	
Uniform Delay, d1	9.0	15.7		10.5	14.0		30.9	32.3	27.1	29.7	30.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	8.8		1.7	9.9		0.4	0.1	0.1	4.2	0.1	
Delay (s)	9.3	24.5		12.2	24.0		31.3	32.4	27.2	33.9	30.7	
Level of Service	A	C		B	C		C	C	C	C	C	
Approach Delay (s)		23.8			22.2			27.9			33.2	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	79.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	73.9%	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 (veh/h)	37	683	47	128	572	155	19	8	137	111	7	25
Future Volume (veh/h)	37	683	47	128	572	155	19	8	137	111	7	25
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		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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1668	1668	1545	1545	1678	1614	1752	1614	1648	1648	1648
Adj Flow Rate, veh/h	39	719	49	135	602	163	20	8	144	117	7	26
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	6	6	6	15	15	15	10	10	10	17	17	17
Cap, veh/h	187	782	53	234	627	170	280	223	260	332	52	195
Arrive On Green	0.04	0.51	0.51	0.07	0.54	0.54	0.02	0.13	0.13	0.07	0.17	0.17
Sat Flow, veh/h	1725	1544	105	1472	1171	317	1537	1752	1336	1570	306	1137
Grp Volume(v), veh/h	39	0	768	135	0	765	20	8	144	117	0	33
Grp Sat Flow(s),veh/h/ln	1725	0	1649	1472	0	1488	1537	1752	1336	1570	0	1443
Q Serve(g_s), s	0.8	0.0	33.1	3.3	0.0	37.8	0.9	0.3	7.5	4.9	0.0	1.5
Cycle Q Clear(g_c), s	0.8	0.0	33.1	3.3	0.0	37.8	0.9	0.3	7.5	4.9	0.0	1.5
Prop In Lane	1.00		0.06	1.00		0.21	1.00		1.00	1.00		0.79
Lane Grp Cap(c), veh/h	187	0	835	234	0	797	280	223	260	332	0	247
V/C Ratio(X)	0.21	0.00	0.92	0.58	0.00	0.96	0.07	0.04	0.55	0.35	0.00	0.13
Avail Cap(c_a), veh/h	236	0	881	260	0	822	345	442	427	332	0	366
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	0.00	1.00
Uniform Delay (d), s/veh	16.9	0.0	17.5	16.7	0.0	17.1	28.1	29.4	28.0	26.3	0.0	27.0
Incr Delay (d2), s/veh	0.5	0.0	14.2	2.5	0.0	21.9	0.1	0.1	1.8	0.6	0.0	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	12.7	1.2	0.0	15.6	0.3	0.1	2.4	1.8	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.5	0.0	31.7	19.2	0.0	39.0	28.2	29.5	29.9	26.9	0.0	27.3
LnGrp LOS	B	A	C	B	A	D	C	C	C	C	A	C
Approach Vol, veh/h		807			900			172			150	
Approach Delay, s/veh		31.0			36.0			29.7			27.0	
Approach LOS		C			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.6	14.3	9.6	43.4	6.2	17.7	7.3	45.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.1	19.4	6.4	41.1	5.0	19.5	5.0	42.5
Max Q Clear Time (g_c+I1), s	6.9	9.5	5.3	35.1	2.9	3.5	2.8	39.8
Green Ext Time (p_c), s	0.0	0.3	0.0	2.4	0.0	0.1	0.0	1.4

Intersection Summary	
HCM 6th Ctrl Delay	32.8
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	4493.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	639	310	438	458	0	0	0	0	73	6	531
Future Vol, veh/h	0	639	310	438	458	0	0	0	0	73	6	531
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	12	12	12	12	12	12	0	0	0	15	15	15
Mvmt Flow	0	673	326	461	482	0	0	0	0	77	6	559

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	999	0	0	2240	2403	482
Stage 1	-	-	-	-	-	-	1404	1404	-
Stage 2	-	-	-	-	-	-	836	999	-
Critical Hdwy	-	-	-	4.22	-	-	6.55	6.65	6.35
Critical Hdwy Stg 1	-	-	-	-	-	-	5.55	5.65	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.55	5.65	-
Follow-up Hdwy	-	-	-	2.308	-	-	3.635	4.135	3.435
Pot Cap-1 Maneuver	0	-	-	655	-	0	~ 42	30	559
Stage 1	0	-	-	-	-	0	213	194	-
Stage 2	0	-	-	-	-	0	404	305	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	655	-	-	~ 2	0	559
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 2	0	-
Stage 1	-	-	-	-	-	-	213	0	-
Stage 2	-	-	-	-	-	-	~ 16	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	11	$ 18067
HCM LOS			F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	655	-	16
HCM Lane V/C Ratio	-	-	0.704	-	40.132
HCM Control Delay (s)	-	-	22.5	A	$ 18067
HCM Lane LOS	-	-	C	A	F
HCM 95th %tile Q(veh)	-	-	5.8	-	81.2

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1068.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	388	362	0	0	666	44	217	3	298	0	0	0
Future Vol, veh/h	388	362	0	0	666	44	217	3	298	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	12	12	12	5	5	5	18	18	18	0	0	0
Mvmt Flow	408	381	0	0	701	46	228	3	314	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	747	0	-	-	-	0	1921	1944	381
Stage 1	-	-	-	-	-	-	1197	1197	-
Stage 2	-	-	-	-	-	-	724	747	-
Critical Hdwy	4.22	-	-	-	-	-	6.58	6.68	6.38
Critical Hdwy Stg 1	-	-	-	-	-	-	5.58	5.68	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.58	5.68	-
Follow-up Hdwy	2.308	-	-	-	-	-	3.662	4.162	3.462
Pot Cap-1 Maneuver	818	-	0	0	-	-	~ 67	59	632
Stage 1	-	-	0	0	-	-	266	242	-
Stage 2	-	-	0	0	-	-	452	397	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	818	-	-	-	-	-	~ 25	0	632
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 25	0	-
Stage 1	-	-	-	-	-	-	~ 98	0	-
Stage 2	-	-	-	-	-	-	452	0	-

Approach	EB	WB	NB
HCM Control Delay, s	7.1	0	$ 4071.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	56	818	-	-	-
HCM Lane V/C Ratio	9.737	0.499	-	-	-
HCM Control Delay (s)	$ 4071.2	13.7	0	-	-
HCM Lane LOS	F	B	A	-	-
HCM 95th %tile Q(veh)	64.3	2.8	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANAYLYSIS AND REPORTING UNIT
COUNTY ROAD CRASH LISTING

BUTTEVILLE RD, MP -999.99 to 999.99, 01/01/2013 to 12/31/2017

1 - 20 of 20 Crash records shown (Filtered to 16 relevant study area collisions).

SER#	S P	D R	M J	S	W	DATE	MILEPNT	COUNTY ROADS		INT-TYPE					SPCL USE										
INVEST	E	A	U	I	C	O	DAY	DIST FROM	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR QTY	MOVE			A	S				
RD DPT	E	L	G	N	H	R	TIME	INTERSECT	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	LICNS	PED			
UNLOC?	D	C	S	V	L	K	LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V# TYPE	TO	P# TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE
02820	N	N	N				07/06/2016	6.00	BUTTEVILLE RD	INTER	CROSS	N	N	CLR	ANGL-STP	01 NONE 9	TURN-L										08
NO RPT							WE			N		STOP SIGN	N	DRY	TURN	N/A	W -N								000		00
N							8A			06	0		N	DAY	PDO	SEMI TOW		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 13 49.83	-122 50 25.55															UNK				
																02 NONE 9	STOP										
																N/A	N -S								011		00
																PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																							UNK				
01924	Y	N	N		N	N	05/12/2013	6.00	BUTTEVILLE RD	INTER	CROSS	N	Y	RAIN	FIX OBJ	01 NONE 0	TURN-L									124,079,058	01
COUNTY							SU			S		UNKNOWN	N	WET	FIX	PRVTE	E -S								000	124,079,058	00
N							6P			05	0		N	DAY	INJ	PSNGR CAR		01	DRVR	INJC	21	M	OR-Y	047,080,081	017		01
N							45 13 49.7814239	-122 50 25.5506279															OR<25				
03025	N	N	N		N	N	07/26/2017	6.00	BUTTEVILLE RD	INTER	CROSS	N	Y	CLR	FIX OBJ	01 NONE 9	STRGHT									057,053,092	26
COUNTY							WE			S		STOP SIGN	N	DRY	FIX	N/A	W -E								007		00
N							6P			06	0		N	DAY	PDO	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 13 49.83	-122 50 25.55															UNK				
04178	N	N	N		N	N	10/29/2015	6.00	BUTTEVILLE RD	INTER	CROSS	N	N	CLD	ANGL-OTH	01 NONE 0	STRGHT										02
CITY							TH			CN		STOP SIGN	N	WET	ANGL	PRVTE	N -S								000		00
N							1P			01	0		N	DAY	INJ	PSNGR CAR		01	DRVR	INJC	84	F	OR-Y	028	000		02
N							45 13 49.83	-122 50 25.55															OR<25				
																02 NONE 0	STRGHT										
																PRVTE	E -W								000		00
																PSNGR CAR		01	DRVR	NONE	40	M	OR-Y	000	000		00
																							OR<25				

OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANAYLYSIS AND REPORTING UNIT
COUNTY ROAD CRASH LISTING

BUTTEVILLE RD, MP -999.99 to 999.99, 01/01/2013 to 12/31/2017

1 - 20 of 20 Crash records shown (Filtered to 16 relevant study area collisions).

03871	N	N	N	N	10/09/2015	6.00	BUTTEVILLE RD	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE	0	TURN-L													001	02
COUNTY					FR			CN		STOP SIGN	N	DRY	TURN		PRVTE		W -N													000	00
N					11P			02	0		N	DARK	INJ		PSNGR CAR			01	DRVR	INJB	17	F	OR-Y	028,004					000		02
N					45 13 49.83	-122 50 25.55																		OR<25							
														02	NONE	0	STRGHT														
															PRVTE		E -W													000	00
															MTRCYCLE			01	DRVR	INJB	21	M	OR-Y	000					000	001	00
																								OR>25							
00521	N	N	N	N	02/05/2016	6.00	BUTTEVILLE RD	INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE	0	STRGHT													087	03
COUNTY					FR			CN		STOP SIGN	N	WET	ANGL		PRVTE		E -W													000	087	00
N					6P			02	0		N	DLIT	INJ		PSNGR CAR			01	DRVR	INJB	40	M	OR-Y	000					000		00
N					45 13 49.83	-122 50 25.55																		OR<25							
														02	NONE	0	STRGHT														
															PRVTE		S -N													000	00
															PSNGR CAR			01	DRVR	INJB	32	F	NONE	021					000		03
																								OR<25							
01849	N	N	N	N	04/30/2016	6.00	BUTTEVILLE RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	0	STRGHT													040,010	03
COUNTY					SA			CN		STOP SIGN	N	DRY	ANGL		PRVTE		E -W													000	040,010	00
N					7P			02	0		N	DUSK	FAT		PSNGR CAR			01	DRVR	INJA	42	M	OR-Y	000					000		00
N					45 13 49.83	-122 50 25.55																		OR<25							
														01	NONE	0	STRGHT														
															PRVTE		E -W													000	040,010	00
															PSNGR CAR			02	PSNG	INJB	46	F		000					000		00
														02	NONE	0	STRGHT														
															PRVTE		S -N													000	00
															PSNGR CAR			01	DRVR	INJA	52	F	NONE	021					000		03
																								OR<25							
														02	NONE	0	STRGHT														
															PRVTE		S -N													000	00
															PSNGR CAR			02	PSNG	KILL	29	M		000					000		00

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is

01055	N	N	N	N	N	03/17/2017	6.00	BUTTEVILLE RD	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE	0	STRGHT													02
COUNTY						FR			CN		STOP SIGN	N	DRY	ANGL		PRVTE		S -N													000		00
N						7A			02	0		N	DAY	INJ		PSNGR CAR			01	DRVR	INJC	29	M	OR-Y	028					000		02
N						45 13 49.83	-122 50 25.55																	OR<25								
															02	NONE	0	STRGHT														
																PRVTE		E -W													000		00
																PSNGR CAR			01	DRVR	INJB	29	F	OR-Y	000					000		00
																								OR>25								
04439	N	N	N			10/20/2017	6.00	BUTTEVILLE RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	9	STRGHT															02
NONE						FR			CN		STOP SIGN	N	DRY	ANGL		N/A		S -N													000		00
N						4P			02	0		N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	00	Unk	UNK	000					000		00
N						45 13 49.83	-122 50 25.55																	UNK								
															02	NONE	9	STRGHT														
																N/A		E -W													000		00
																PSNGR CAR			01	DRVR	NONE	00	Unk	UNK	000					000		00
																								UNK								
03125	N	N	N	N	N	09/10/2014	6.00	BUTTEVILLE RD	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE	1	STRGHT													079,001		02
COUNTY						WE			CN		STOP SIGN	N	DRY	ANGL		PRVTE		N -S													000		00
N						8A			03	0		N	DAY	INJ		PSNGR CAR			01	DRVR	NONE	61	M	OR-Y	028					000		02
N						45 13 49.7811719	-122 50 25.5540479																	OR<25								
															02	NONE	0	STRGHT														
																PRVTE		W -E													000	079	00
																MTRCYCLE			01	DRVR	INJB	20	F	OR-Y	000					000	001	00
																								OR<25								
01712	N	N	N			05/12/2015	6.00	BUTTEVILLE RD	INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE	0	STRGHT															03
COUNTY						TU			CN		STOP SIGN	N	WET	ANGL		PRVTE		N -S													000		00
N						6P			03	0		N	DAY	INJ		PSNGR CAR			01	DRVR	INJC	18	M	OR-Y	021					000		03
N						45 13 49.83	-122 50 25.55																	OR<25								

02 NONE 1 STRGHT
PRVTE W -E 000 00
SEMI TOW 01 DRVR INJC 63 M OR-Y 000 000 00
OR<25

01088 N N N N N 03/15/2016 6.00 BUTTEVILLE RD INTER CROSS N N RAIN ANGL-OTH 01 NONE 0 STRGHT 093 27,02
COUNTY TU CN STOP SIGN N WET ANGL PRVTE W -E 000 00
N 8A 03 0 N DAWN INJ PSNGR CAR 01 DRVR INJB 42 F OR-Y 000 000 00
N 45 13 49.83 -122 50 25.55 OR>25

02 NONE 0 STRGHT
PRVTE N -S 000 00
PSNGR CAR 01 DRVR INJB 41 M OR-Y 016,028 038 093 27,02
OR<25

01269 N N N 04/09/2015 6.00 BUTTEVILLE RD INTER CROSS N N CLR ANGL-OTH 01 NONE 0 STRGHT 02
NO RPT TH CN STOP SIGN N DRY ANGL PRVTE W -E 000 00
N 3P 04 0 N DAY INJ PSNGR CAR 01 DRVR INJB 44 F OR-Y 000 000 00
N 45 13 49.83 -122 50 25.55 OR<25

01 NONE 0 STRGHT
PRVTE W -E 000 00
PSNGR CAR 02 PSNG INJB 00 F 000 000 00

02 NONE 0 STRGHT
PRVTE S -N 000 00
PSNGR CAR 01 DRVR NONE 90 M UNK 028 000 02
OR<25

01999 N N N N N 06/04/2015 6.00 BUTTEVILLE RD INTER CROSS N N CLR ANGL-OTH 01 NONE 0 TURN-L 02
COUNTY TH CN STOP SIGN N DRY TURN PRVTE S -W 000 00
N 12P 04 0 N DAY INJ PSNGR CAR 01 DRVR INJA 59 F OR-Y 028 000 02
N 45 13 49.83 -122 50 25.55 OR<25

02 NONE 0 STRGHT
PRVTE W -E 000 00
PSNGR CAR 01 DRVR NONE 23 M OR-Y 000 000 00

OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANAYLYSIS AND REPORTING UNIT
COUNTY ROAD CRASH LISTING

BUTTEVILLE RD, MP -999.99 to 999.99, 01/01/2013 to 12/31/2017

1 - 20 of 20 Crash records shown (Filtered to 16 relevant study area collisions).

04179 N N N 10/29/2015 6.00 BUTTEVILLE RD INTER CROSS N N RAIN ANGL-OTH 01 NONE 0 STRGHT 013 02
NO RPT TH CN STOP SIGN N WET ANGL PRVTE S -N 000 00
N 1P 04 0 N DAY INJ PSNGR CAR 01 DRVR NONE 00 F UNK 028 000 02
N 45 13 49.83 -122 50 25.55 UNK
02 NONE 0 STRGHT
PRVTE W -E 000 013 00
PSNGR CAR 01 DRVR NONE 00 M UNK 000 022 00
UNK
03 NONE 0 STRGHT
PRVTE E -W 000 00
PSNGR CAR 01 DRVR INJC 27 F OR-Y 000 000 00
OR>25
03 NONE 0 STRGHT
PRVTE E -W 000 00
PSNGR CAR 02 PSNG INJC 27 M 000 000 00

03177 N N N N N 08/21/2015 7.77 BUTTEVILLE RD INTER CROSS N N CLR ANGL-OTH 01 NONE 0 STRGHT 03
COUNTY FR CN STOP SIGN N DRY ANGL PRVTE E -W 000 00
N 4P 02 0 N DAY INJ PSNGR CAR 01 DRVR INJC 66 M OR-Y 000 000 00
N 45 13 49.83 -122 50 25.55 OR<25
01 NONE 0 STRGHT
PRVTE E -W 000 00
PSNGR CAR 02 PSNG INJC 65 F 000 000 00
02 NONE 0 STRGHT
PRVTE S -N 000 00
PSNGR CAR 01 DRVR INJB 71 F OR-Y 021 000 03
OR<25

SER# / INVEST / RD DPT / UNLOC?	S P / E / E / D	D R / A / L / C	M J / U / G / S	S / I / N / V	W / C / H / L	O / R / K	DATE / DAY / TIME / LAT	MILEPNT / DIST FROM / INTERSECT / LONG	COUNTY ROADS / FIRST STREET / SECOND STREET / LRS	INT-TYPE / RD CHAR / DIRECT / LOCTN	(MEDIAN) / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY
03215	N	N	Y		N	N	07/24/2016	6.00	BUTTEVILLE RD NE	INTER	CROSS	N	N	CLR	ANGL-OTH
COUNTY							SU			CN		STOP SIGN	N	DRY	ANGL
N							3P			02	0		N	DAY	FAT
N							45 13 49.83	-122 50 25.55							

V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC / TYPE	INJ / SVRTY	A / G / E / X	S / LICNS / RES	PED / LOC	ERROR	ACT	EVENT	CAUSE
01	NONE 1	STRGHT									010,022,058	03
	PRVTE	E -W								000	010,022	00
	PSNGR CAR		01	DRVR	INJA	21 M	OR-Y		000	000		00
							OR<25					
01	NONE 1	STRGHT										
	PRVTE	E -W								000	010,022	00
	PSNGR CAR		02	PSNG	INJA	21 F			000	000		00
02	NONE 0	STRGHT										
	PRVTE	S -N								000	058	00
	PSNGR CAR		01	DRVR	INJA	26 M	OTH-Y		021	000		03
							N-RES					
02	NONE 0	STRGHT										
	PRVTE	S -N								000	058	00
	PSNGR CAR		02	PSNG	KILL	25 F			000	000		00

SER#	S P	D R	M J	S	W	DATE	MILEPNT	COUNTY ROADS		INT-TYPE					SPCL USE											
INVEST	E	A	U	I	C	O	DAY	DIST FROM	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH		TRLR QTY		MOVE			A	S				
RD DPT	E	L	G	N	H	R	TIME	INTERSECT	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL		OWNER		FROM		PRTC	INJ	G	E	LICNS	PED		
UNLOC?	D	C	S	V	L	K	LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE		TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE
04637	Y	N	N		N	N	12/25/2013	3.55	EHLEN RD NE	INTER	CROSS	N	Y	FOG	FIX OBJ	01	NONE	0	STRGHT									079	01,03
COUNTY							WE			E		STOP SIGN	N	WET	FIX		PRVTE		S -N								000	079	00
N							6A			06	0		N	DARK	INJ		PSNGR CAR			01	DRVR	INJC	44	F	OR-Y		047,021,080	088		01,03
N							45 13 49.7814239	-122 50 25.5506279																	OR-?					
01795	N	N	N				06/03/2013	3.55	EHLEN RD NE	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	0	STRGHT										03
COUNTY							MO			CN		STOP SIGN	N	DRY	ANGL		PRVTE		E -W								000		00
N							7A			02	0		N	DAY	INJ		PSNGR CAR			01	DRVR	INJC	29	F	OR-Y		000	000		00
N							45 13 49.7814239	-122 50 25.5506279																	OR>25					
																02	NONE	1	STRGHT										
																	PRVTE		S -N								000		00
																	SEMI TOW			01	DRVR	NONE	45	M	OTH-Y		021	000		03
																									N-RES					
02150	N	N	N		N	N	06/12/2015	3.55	EHLEN RD NE	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	0	STRGHT										02
COUNTY							FR			CN		STOP SIGN	N	DRY	ANGL		PRVTE		E -W								000		00
N							6P			02	0		N	DAY	INJ		PSNGR CAR			01	DRVR	INJC	64	M	OTH-Y		000	000		00
N							45 13 49.83	-122 50 25.55																	N-RES					
																02	NONE	0	STRGHT										
																	PRVTE		S -N								000		00
																	PSNGR CAR			01	DRVR	INJC	51	M	OR-Y		028	000		02
																									OR<25					
01581	N	N	N				04/14/2016	3.55	EHLEN RD NE	INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE	0	STRGHT										02
NO RPT							TH			CN		STOP SIGN	N	WET	ANGL		PRVTE		W -E								000		00
N							7A			03	0		N	DAY	INJ		PSNGR CAR			01	DRVR	INJC	40	M	OR-Y		000	000		00

N 45 13 49.83 -122 50 25.55 OR<25

02 NONE 0 STRGHT

PRVTE N -S 000 00

SCHL BUS 01 DRVR NONE 46 F OR-Y 028 000 02

OR<25

02 NONE 0 STRGHT

PRVTE N -S 000 00

SCHL BUS 02 PSNG INJC 16 F 000 000 00

00863 N N N 03/05/2017 5.02 EHLEN RD NE INTER 3-LEG N N CLR ANGL-OTH 01 NONE 9 TURN-L 02

NONE SU CN STOP SIGN N UNK TURN N/A S -W 000 00

N 7A 02 0 N DAY PDO PSNGR CAR 01 DRVR NONE 00 Unk UNK 000 000 00

N 45 14 3.08 -122 48 40.25 UNK

02 NONE 9 STRGHT

N/A E -W 000 00

PSNGR CAR 01 DRVR NONE 00 Unk UNK 000 000 00

UNK

04530 N N N 10/25/2017 5.18 EHLEN RD NE INTER 5-LEG N N RAIN ANGL-OTH 01 NONE 0 STRGHT 02

NONE WE CN STOP SIGN N WET TURN PRVTE N -S 018 00

N 7P 03 1 N DLIT INJ PSNGR CAR 01 DRVR NONE 57 F OR-Y 028 000 02

N 45 14 5.4 -122 48 29.11 OR>25

02 NONE 0 STRGHT

PRVTE W -E 000 00

PSNGR CAR 01 DRVR INJC 42 F OR-Y 000 000 00

OR>25

02 NONE 0 STRGHT

PRVTE W -E 000 00

PSNGR CAR 02 PSNG NO<5 01 M 000 000 00

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

SER# / INVEST / RD DPT / UNLOC?	S P / E / E / D	D R / A / L / C	M J / U / G / S	S / I / N / V	W / C / H / L	O / R / K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# / MLG TYP / MILEPNT	FC	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / TYPE / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02814	N	N	N	N			08/20/2013	MARION	1	01	3	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	TURN-L										02
NONE							TU		CN 0			N		UNKNOWN	N	DRY	TURN		PRVTE	W -N								000		00
N							7A		278.62			05	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00 M		UNK		004,028	000		02
N							45 14 3.629184	-122 48 22.6296359			0001QL100S00															UNK					
																		02	NONE 0	TURN-R										
																			PRVTE	E -N								000		00
																			PSNGR CAR		01	DRVR	NONE	62 F		OR-Y		000	000		00
																										OR<25					
03782	N	N	N	N	N	N	10/02/2015	MARION	1	01	3	INTER	CROSS	N	N	CLR	OVERTURN	01	NONE 1	TURN-L										021	10
STATE							FR		CN 0			N		STOP SIGN	N	DRY	NCOL		PRVTE	W -N								000	021	00
N							7P		278.62			05	0		N	DARK	INJ		SEMI TOW		01	DRVR	INJC	58 M		OR-Y		085,017	000		10
N							45 14 3.63	-122 48 22.63			0001QL100S00															OR<25					
02752	N	N	N	N	N	N	08/15/2014	MARION	1	06	2	INTER	4-LEG	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT											02
COUNTY							FR		CN 0			CN		STOP SIGN	N	DRY	ANGL		PRVTE	N -S								000		00
N							6P		278.63			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	72 F		OR-Y		028	000		02
N							45 14 5.4001679	-122 48 29.1147839			0001QK100S00															OR<25					
																		02	NONE 0	STRGHT										
																			PRVTE	E -W								000		00
																			PSNGR CAR		01	DRVR	INJC	53 M		OR-Y		000	000		00
																										OR<25					
																		02	NONE 0	STRGHT										
																			PRVTE	E -W								000		00
																			PSNGR CAR		02	PSNG	INJC	15 F				000	000		00
																		02	NONE 0	STRGHT										
																			PRVTE	E -W								000		00
																			PSNGR CAR		03	PSNG	INJC	17 F				000	000		00

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

												02 NONE	0	STRGHT											
												PRVTE		E -W									000		00
												PSNGR CAR			04 PSNG	INJC	23	M			000	000		00
02956	N N N N N N	08/29/2014	MARION	1	06	2	INTER	4-LEG	N	N	CLR	ANGL-OTH	01 NONE	0	TURN-L										32,02
COUNTY		FR		CN	0		CN		STOP SIGN	N	DRY	TURN	PRVTE		N -E								000		00
N		12P		278.63			01	0		N	DAY	INJ	PSNGR CAR			01 DRVR	NONE	31	F	OR-Y	052,028	000		32,02
N		45 14 5.4001679	-122 48 29.1147839			0001QK100S00														OR<25					
												02 NONE	0	STRGHT											
												PRVTE		E -W									000		00
												PSNGR CAR			01 DRVR	INJC	40	F	OR-Y	000	000		00
																				OR<25					
83476	N N N N	12/01/2015	MARION	1	06	2	INTER	6-LEG	N	N	RAIN	S-STRGHT	01 NONE	0	STRGHT									013	07
NONE		TU		CN	0		CN		STOP SIGN	N	WET	REAR	PRVTE		E -W								000		00
N		5P		278.63			02	0		N	DLIT	PDO	PSNGR CAR			01 DRVR	NONE	00	M	OR-Y	042	000		07
N		45 14 5.4	-122 48 29.11			0001QK100S00														OR<25					
												02 UNKN	0	STRGHT											
												UNKN		E -W									000	013	00
												UNKNOWN			01 DRVR	NONE	00	Unk	UNK	000	022		00
																				UNK					
												03 NONE	0	STOP											
												PRVTE		N -S									011		00
												PSNGR CAR			01 DRVR	NONE	74	M	OR-Y	000	000		00
																				OR<25					
02598	N N N N N N	06/21/2016	MARION	1	06	2	INTER	3-LEG	N	N	CLD	O-1 L-TURN	01 NONE	0	TURN-L										02
COUNTY		TU		CN	0		CN		STOP SIGN	N	DRY	TURN	PRVTE		W -N								000		00
N		7A		278.63			02	0		N	DAY	INJ	PSNGR CAR			01 DRVR	INJC	61	F	OR-Y	028,004	000		02
N		45 14 5.4	-122 48 29.11			0001QK100S00														OR<25					
												01 NONE	0	TURN-L											
												PRVTE		W -N									000		00
												PSNGR CAR			02 PSNG	INJC	63	F		000	000		00
												02 NONE	0	STRGHT											

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

														PRVTE		E -W										000		00
														PSNGR CAR				01	DRVR	INJC	59	M	OR-Y	000		000		00
																							OR>25					
03241	N	N	N	N	08/01/2016	MARION		1	06	2	INTER	5-LEG	N	N	CLR	O-1 L-TURN	01	NONE	9	STRGHT										02
NONE					MO			CN	0		CN		STOP SIGN	N	DRY	TURN		N/A		E -W								000		00
N					1P			278.63			02	0		N	DAY	PDO		PSNGR CAR				01	DRVR	NONE	00	Unk	UNK	000		000		00
N					45 14 5.4	-122 48 29.11				0001QK100S00																	UNK				
																	02	NONE	9	TURN-L										
														N/A		W -N										000		00
														PSNGR CAR				01	DRVR	NONE	00	Unk	UNK	000		000		00
																							UNK					
01784	N	N	N	N	N	N	06/19/2013	MARION		1	06	2	INTER	5-LEG	N	N	CLR	ANGL-OTH	01	NONE	0	STRGHT										02
STATE					WE			CN	0		CN		STOP SIGN	N	DRY	ANGL		PRVTE		N -S								015		00
N					11P			278.63			03	0		N	DLIT	PDO		PSNGR CAR				01	DRVR	NONE	58	M	OTH-Y	028		000		02
N					45 14 5.3999159	-122 48 29.1126599				0001QK100S00																	N-RES				
																	02	NONE	0	STRGHT										
														RENTL		W -E										000		00
														PSNGR CAR				01	DRVR	NONE	27	M	OR-Y	000		000		00
																							OR>25					
03127	N	N	N	N	09/13/2013	MARION		1	06	2	INTER	5-LEG	N	N	CLR	ANGL-OTH	01	NONE	0	STRGHT										02
NONE					FR			CN	0		CN		STOP SIGN	N	DRY	ANGL		PRVTE		N -S								000		00
N					8A			278.63			03	0		N	DAY	INJ		PSNGR CAR				01	DRVR	NONE	49	M	OTH-Y	028		000		02
N					45 14 5.3999159	-122 48 29.1126599				0001QK100S00																	N-RES				
																	02	NONE	0	STRGHT										
														PRVTE		W -E										000		00
														PSNGR CAR				01	DRVR	INJC	55	M	OR-Y	000		000		00
																							OR<25					
00187	N	N	N	N	N	N	01/17/2014	MARION		1	06	2	INTER	3-LEG	N	N	FOG	ANGL-OTH	01	NONE	0	TURN-L										02
STATE					FR			CN	0		CN		STOP SIGN	N	DRY	TURN		PRVTE		N -E								000		00
N					6P			278.63			03	0		N	DLIT	PDO		PSNGR CAR				01	DRVR	NONE	19	M	OR-Y	028		000		02
N					45 14 5.4001679	-122 48 29.1147839				0001QK100S00																	OR<25				
																	02	NONE	0	STRGHT										
														PRVTE		W -E										000		00

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

													PSNGR CAR			01 DRVR	NONE	69	M	OR-Y	000	000	00
																				OR<25			
01700	N N N N N N	05/22/2014	MARION	1	06	2	INTER	3-LEG	N	N	CLR	ANGL-OTH	01 NONE	0	TURN-L								02
COUNTY		TH		CN	0		CN		STOP SIGN	N	DRY	TURN	PRVTE		N -E							000	00
N		6P		278.63			03	0		N	DAY	INJ	PSNGR CAR			01 DRVR	INJC	61	F	OR-Y	028	000	02
N		45 14 5.4001679	-122 48 29.1147839			0001QK100S00														OR<25			
													02 NONE	0	STRGHT								
													PRVTE		W -E							000	00
													PSNGR CAR			01 DRVR	NONE	50	M	OR-Y	000	000	00
																				OR<25			
02962	N N N N	08/29/2014	MARION	1	06	2	INTER	4-LEG	N	N	CLR	O-1 L-TURN	01 NONE	0	STRGHT								02
NONE		FR		CN	0		CN		STOP SIGN	N	DRY	TURN	PRVTE		W -E							000	00
N		6P		278.63			03	0		N	DAY	INJ	PSNGR CAR			01 DRVR	NONE	41	M	OR-Y	000	000	00
N		45 14 5.4001679	-122 48 29.1147839			0001QK100S00														OR<25			
													01 NONE	0	STRGHT								
													PRVTE		W -E							000	00
													PSNGR CAR			02 PSNG	INJB	56	F		000	000	00
													02 NONE	0	TURN-L								
													PRVTE		E -S							000	00
													PSNGR CAR			01 DRVR	NONE	19	F	OR-Y	028,004	000	02
																				OR<25			
00824	N N N N N N	03/06/2015	MARION	1	06	2	INTER	4-LEG	N	N	CLR	ANGL-OTH	01 NONE	0	TURN-L								02
COUNTY		FR		CN	0		CN		STOP SIGN	N	DRY	TURN	PRVTE		N -E							015	00
N		5P		278.63			03	0		N	DAY	INJ	PSNGR CAR			01 DRVR	NONE	77	M	OTH-Y	028	000	02
N		45 14 5.4	-122 48 29.11			0001QK100S00														N-RES			
													02 NONE	2	STRGHT								
													PRVTE		W -E							000	00
													SEMI TOW			01 DRVR	INJC	54	F	OTH-Y	000	000	00
																				N-RES			
02961	N N N N	08/05/2015	MARION	1	01	2	INTER	5-LEG	N	N	CLR	ANGL-OTH	01 NONE	0	STRGHT								02
NONE		WE		CN	0		CN		STOP SIGN	N	DRY	ANGL	PRVTE		N -S							000	00

001: PACIFIC

Highway 001 ALL ROAD TYPES, MP 278 to 280 01/01/2013 to 12/31/2017, Both Add and Non-Add mileage

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

N		2P			278.63			03	0		N	DAY	PDO	PSNGR CAR			01 DRVR	NONE	27	M	OTH-Y	028	000	02
N		45 14 5.4	-122 48 29.11			0001QK100S00															N-RES			
														02 NONE	0	STRGHT								
														PRVTE		W -E							000	00
														PSNGR CAR			01 DRVR	NONE	66	M	OR-Y	000	000	00
																					OR<25			
03610	N N N N N N	08/22/2016	MARION		1 06 2			INTER	5-LEG	N	N	CLR	ANGL-OTH	01 NONE	0	STRGHT								02
STATE		MO			CN 0			CN		STOP SIGN	N	DRY	ANGL	PRVTE		N -S							015	00
N		1P			278.63			03	0		N	DAY	INJ	PSNGR CAR			01 DRVR	NONE	78	M	OR-Y	028	000	02
N		45 14 5.4	-122 48 29.11			0001QK100S00															OR<25			
														02 NONE	0	STRGHT								
														PRVTE		W -E							000	00
														PSNGR CAR			01 DRVR	INJB	26	F	OR-Y	000	000	00
																					OR<25			
														02 NONE	0	STRGHT								
														PRVTE		W -E							000	00
														PSNGR CAR			02 PSNG	INJC	01	M		000	000	00
04153	N N N N N N	09/21/2016	MARION		1 06 2			INTER	5-LEG	N	N	CLR	ANGL-OTH	01 NONE	0	STRGHT								02
COUNTY		WE			CN 0			CN		STOP SIGN	N	DRY	ANGL	PRVTE		N -S							015	00
N		8A			278.63			03	0		N	DAY	INJ	PSNGR CAR			01 DRVR	NONE	35	F	OR-Y	028	000	02
N		45 14 5.4	-122 48 29.11			0001QK100S00															OR<25			
														02 NONE	0	STRGHT								
														PRVTE		W -E							000	00
														PSNGR CAR			01 DRVR	INJC	31	M	OR-Y	000	000	00
																					OR<25			
80367	N N N N N N	01/22/2016	MARION		1 06 2			INTER	5-LEG	N	N	RAIN	ANGL-OTH	01 NONE	9	STRGHT								02
STATE		FR			CN 0			CN		STOP SIGN	N	WET	TURN	N/A		W -E							000	00
N		1P			278.63			03	0		N	DAY	PDO	PSNGR CAR			01 DRVR	NONE	00	Unk	UNK	000	000	00
N		45 14 5.4	-122 48 29.11			0001QK100S00															UNK			
														02 NONE	9	TURN-L								
														N/A		N -E							000	00
														PSNGR CAR			01 DRVR	NONE	00	Unk	UNK	000	000	00
																					UNK			

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

05022	N N N N	11/21/2017	MARION	1	06	2	INTER	3-LEG	N	N	RAIN	ANGL-OTH	01	NONE	0	TURN-L												02
NONE		TU		CN	0		CN		STOP SIGN	N	WET	TURN		PRVTE		N -E										015		00
N		6P		278.63			03	0		N	DUSK	INJ		SEMI TOW			01	DRVR	NONE	78	M	OTH-Y	028	000		02	
N		45 14 5.4	-122 48 29.11			0001QK100S00																N-RES					
													02	NONE	0	STRGHT												
														PRVTE		W -E									000		00	
														PSNGR CAR			01	DRVR	INJC	39	M	OR-Y	000	000		00	
																						OR<25					
05607	N N N N N N	12/25/2017	MARION	1	02	2	INTER	3-LEG	N	N	CLD	ANGL-OTH	01	NONE	9	STRGHT												03
STATE		MO		CN	0		CN		STOP SIGN	N	WET	TURN		N/A		W -E									000		00
N		5P		278.63			03	0		N	DLIT	PDO		PSNGR CAR			01	DRVR	NONE	00	Unk	UNK	000	000		00	
N		45 14 5.4	-122 48 29.11			0001QK100S00																UNK					
													02	NONE	9	TURN-L												
														N/A		N -E									000		00	
														PSNGR CAR			01	DRVR	NONE	00	Unk	UNK	000	000		00	
																						UNK					
04534	N N N N	12/17/2013	MARION	1	06	1	INTER	CROSS	N	N	CLR	S-1TURN	01	NONE	1	TURN-R												10
NO RPT		TU		CN	0		N		STOP SIGN	N	UNK	TURN		PRVTE		N -W									015		00
N		1P		278.64			06	0		N	DAY	INJ		SEMI TOW			01	DRVR	NONE	00	Unk	UNK	000	000		00	
N		45 14 5.27604	-122 48 28.3003559			0001QK100S00																UNK					
													02	NONE	0	STRGHT												
														PRVTE		N -S									031		00	
														PSNGR CAR			01	DRVR	INJC	41	M	OR-Y	031,080	000		10	
																						OR<25					
00043	N N N N N N	01/04/2014	MARION	1	06	2	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	0	STRGHT												02
COUNTY		SA		CN	0		UN		STOP SIGN	N	DRY	TURN		PRVTE		E -W									000		00
N		2P		278.64			01	1		N	DAY	INJ		PSNGR CAR			01	DRVR	INJC	27	M	OR-Y	000	000		00	
N		45 14 5.276076	-122 48 28.300392			0001QK100S00																OR<25					
													02	NONE	0	TURN-L												
														PRVTE		N -E									015		00	
														PSNGR CAR			01	DRVR	NONE	21	M	OTH-Y	028	000		02	
																						N-RES					

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

03732	N N N N N N	10/23/2014	MARION	1	06	2	INTER	4-LEG	N	N	RAIN	S-1STOP	01	NONE	0	STRGHT												013	07
COUNTY		TH		CN	0		UN		STOP SIGN	N	WET	REAR		PRVTE		E -W												000	00
N		3P		278.64			06	0		N	DAY	INJ		PSNGR CAR			01	DRVR	INJC	54	F	OR-Y	026	000	07
N		45 14 5.28	-122 48 28.3			0001QK100S00																OR>25			
													02	NONE	0	STOP														
														PRVTE		E -W												011	013	00
														PSNGR CAR			01	DRVR	INJB	71	M	OR-Y	000	000	00
																						OR<25			
													03	NONE	0	STOP														
														PRVTE		E -W												011		00
														PSNGR CAR			01	DRVR	INJB	24	F	OR-Y	000	000	00
																						OR<25			
02938	N N N N N N	07/14/2016	MARION	1	06	2	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	0	STRGHT												013	16
COUNTY		TH		CN	0		E		STOP SIGN	N	DRY	REAR		PRVTE		E -W												022	00
N		12P		278.64			06	0		N	DAY	INJ		PSNGR CAR			01	DRVR	NONE	19	M	OR-Y	016	025	16
N		45 14 5.28	-122 48 28.3			0001QK100S00																OR<25			
													02	NONE	0	STOP														
														PRVTE		E -W												022	013	00
														PSNGR CAR			01	DRVR	NONE	39	F	OR-Y	000	000	00
																						OR<25			
													03	NONE	0	STOP														
														PRVTE		E -W												012		00
														PSNGR CAR			01	DRVR	INJC	50	M	OR-Y	000	000	00
																						OR>25			
80109	N N N N	01/31/2015	MARION	1	06	2	INTER	5-LEG	N	N	CLR	S-1STOP	01	NONE	0	STRGHT													29
NONE		SA		CN	0		W		UNKNOWN	N	WET	REAR		PRVTE		W -E												000	00
N		5P		278.64			06	1		N	DUSK	PDO		PSNGR CAR			01	DRVR	NONE	51	M	OR-Y	026	000	29
N		45 14 5.28	-122 48 28.3			0001QK100S00																OR>25			
													02	NONE	0	STOP														
														PRVTE		W -S												013		00
														PSNGR CAR			01	DRVR	NONE	00	F	OR-Y	000	000	00
																						OR>25			
01728	N N N N	05/28/2013	MARION	1	06	2	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	0	STRGHT													02

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is

001: PACIFIC

Highway 001 ALL ROAD TYPES, MP 278 to 280 01/01/2013 to 12/31/2017, Both Add and Non-Add mileage

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

NONE		TU			CN 0			CN			STOP SIGN	N	DRY	ANGL	PRVTE		E -W										000		00
N		5P			278.64			01	0			N	DAY	PDO	PSNGR CAR			01 DRVR	NONE	18	M	OR-Y	000		000		00
N		45 14 5.27604	-122 48 28.3003559			0001QK100S00																OR<25					
															02 NONE 0		STRGHT												
															PRVTE		N -S										015		00
															PSNGR CAR			01 DRVR	NONE	00	M	OTH-Y	028		000		02
																						N-RES							
03515	N N N N	10/08/2014	MARION		1 06 2			INTER	4-LEG		N	N	CLR	ANGL-OTH	01 NONE 0		TURN-L												02
NO RPT		WE			CN 0			CN			STOP SIGN	N	DRY	TURN	PRVTE		N -E										015		00
N		6P			278.64			01	0			N	DAY	INJ	PSNGR CAR			01 DRVR	NONE	54	F	OR-Y	028		000		02
N		45 14 5.28	-122 48 28.3			0001QK100S00																OR>25					
															02 NONE 0		STRGHT												
															PRVTE		E -W										000		00
															PSNGR CAR			01 DRVR	INJC	30	M	OR-Y	000		000		00
																						OR>25					
															02 NONE 0		STRGHT												
															PRVTE		E -W										000		00
															PSNGR CAR			02 PSNG	INJC	29	F		000		000		00
01149	N N N N N N	03/31/2015	MARION		1 06 2			INTER	4-LEG		N	N	CLD	ANGL-OTH	01 NONE 0		TURN-L											087	02
STATE		TU			CN 0			CN			STOP SIGN	N	WET	TURN	PRVTE		N -E										015	087	00
N		6P			278.64			01	0			N	DAY	INJ	PSNGR CAR			01 DRVR	INJB	62	M	OR-Y	028		026		02
N		45 14 5.28	-122 48 28.3			0001QK100S00																OR<25					
															01 NONE 0		TURN-L												
															PRVTE		N -E										015	087	00
															PSNGR CAR			02 PSNG	NONE	59	F		000		000		00
															01 NONE 0		TURN-L												
															PRVTE		N -E										015	087	00
															PSNGR CAR			03 PSNG	INJB	06	F		000		000		00
															02 NONE 0		TURN-L												
															PRVTE		E -S										000	087	00
															PSNGR CAR			01 DRVR	INJC	18	F	OR-Y	000		000		00
																						OR>25					

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

01681	N N N N N N	05/08/2015	MARION	1	01	2	INTER	4-LEG	N	N	CLR	S-OTHER	01	NONE	0	TURN-L												06
STATE		FR		CN	0		CN		STOP SIGN	N	DRY	TURN		PRVTE		N -E											000	00
N		7A		278.64			01	0		N	DAY	INJ		PSNGR CAR			01	DRVR	INJC	69	M	OR-Y	034	000	06
N		45 14 5.28	-122 48 28.3			0001QK100S00																OR<25			
													02	NONE	1	TURN-L											
														PRVTE		N -E									015	00
														SEMI TOW			01	DRVR	NONE	40	M	OTH-Y	000	000	00
																						N-RES			
00242	N N N N	01/23/2015	MARION	1	01	2	INTER	4-LEG	N	N	CLR	ANGL-OTH	01	NONE	0	STRGHT												02
NONE		FR		CN	0		CN		STOP SIGN	N	DRY	TURN		PRVTE		E -W											000	00
N		1P		278.64			01	0		N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	50	M	OR-Y	000	000	00
N		45 14 5.28	-122 48 28.3			0001QK100S00																OR<25			
													02	NONE	0	TURN-R											
														PRVTE		N -W									000	00
														PSNGR CAR			01	DRVR	NONE	49	M	OR-Y	028	000	02
																						OR<25			
02358	N N N N	06/15/2017	MARION	1	01	2	INTER	5-LEG	N	N	RAIN	ANGL-OTH	01	UNKN	0	TURN-R												02
NO RPT		TH		CN	0		CN		STOP SIGN	N	WET	TURN		UNKN		N -W											000	00
N		8A		278.64			01	0		N	DAY	INJ		UNKNOWN			01	DRVR	NONE	00	Unk	UNK	028	000	02
N		45 14 5.28	-122 48 28.3			0001QK100S00																UNK			
													02	NONE	0	STRGHT											
														PRVTE		E -W									000	00
														PSNGR CAR			01	DRVR	INJB	33	M	OR-Y	000	000	00
																						OR<25			
00150	N N N N N N	01/13/2013	MARION	1	06	2	INTER	CROSS	N	N	CLD	O-1 L-TURN	01	NONE	0	STRGHT												02
STATE		SU		CN	0		CN		UNKNOWN	N	DRY	TURN		PRVTE		W -E											000	00
N		1P		278.64			03	0		N	DAY	PDO		TRUCK			01	DRVR	NONE	53	F	OR-Y	000	000	00
N		45 14 5.27604	-122 48 28.3003559			0001QK100S00																OR>25			
													02	NONE	0	TURN-L											
														PRVTE		E -S									000	00
														PSNGR CAR			01	DRVR	NONE	39	M	OR-Y	004,028	000	02
																						OR>25			

001: PACIFIC

Highway 001 ALL ROAD TYPES, MP 278 to 280 01/01/2013 to 12/31/2017, Both Add and Non-Add mileage

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

00844	N N N N	03/14/2014	MARION	1	06	2	INTER	CROSS	N	N	CLD	O-1 L-TURN	01	NONE	0	TURN-L											16,02
COUNTY		FR		CN	0		CN		STOP SIGN	N	WET	TURN		PRVTE		E -S									000	00	
N		8A		278.64			03	0		N	DAY	INJ		PSNGR CAR			01	DRVR	INJB	19	F	NONE		028,004	025	16,02	
N		45 14 5.276076	-122 48 28.300392			0001QK100S00																OR<25					
													02	NONE	0	STRGHT											
														PRVTE		W -E									000	00	
														PSNGR CAR			01	DRVR	INJC	39	M	OR-Y		000	000	00	
																						OR<25					
00907	N N N N	03/20/2014	MARION	1	06	2	INTER	CROSS	N	N	CLD	O-1 L-TURN	01	NONE	0	STRGHT											02
COUNTY		TH		CN	0		CN		STOP SIGN	N	DRY	TURN		PRVTE		W -E									000	00	
N		3P		278.64			03	0		N	DAY	INJ		PSNGR CAR			01	DRVR	INJB	48	F	OR-Y		000	000	00	
N		45 14 5.276076	-122 48 28.300392			0001QK100S00																OR>25					
													02	NONE	0	TURN-L											
														PRVTE		E -S									000	00	
														PSNGR CAR			01	DRVR	INJC	49	F	OR-Y		028,004	000	02	
																						OR<25					
													02	NONE	0	TURN-L											
														PRVTE		E -S									000	00	
														PSNGR CAR			02	PSNG	INJC	17	M			000	000	00	
00311	N N N N	01/26/2015	MARION	1	06	2	INTER	5-LEG	N	N	FOG	ANGL-OTH	01	NONE	0	TURN-R											08
NO RPT		MO		CN	0		CN		STOP SIGN	N	WET	TURN		PRVTE		N -W									000	00	
N		11P		278.64			03	0		N	DLIT	INJ		PSNGR CAR			01	DRVR	INJC	51	M	OR-Y		001	000	08	
N		45 14 5.28	-122 48 28.3			0001QK100S00																OR<25					
													02	NONE	0	STRGHT											
														PRVTE		W -E									000	00	
														PSNGR CAR			01	DRVR	NONE	00	Unk	UNK		000	000	00	
																						UNK					
00947	N N N N N N	03/15/2015	MARION	1	06	2	INTER	4-LEG	N	N	RAIN	O-1 L-TURN	01	NONE	0	STRGHT											27,02
STATE		SU		CN	0		CN		STOP SIGN	N	WET	TURN		PRVTE		W -E									000	00	
N		6P		278.64			03	0		N	DAY	INJ		PSNGR CAR			01	DRVR	INJB	44	M	OR-Y		000	000	00	
N		45 14 5.28	-122 48 28.3			0001QK100S00																OR<25					

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

													01 NONE	0	STRGHT												
													PRVTE		W -E										000		00
													PSNGR CAR			02 PSNG	INJB	44	F				000		000	00
													01 NONE	0	STRGHT												
													PRVTE		W -E										000		00
													PSNGR CAR			03 PSNG	INJC	13	F				000		000	00
													02 NONE	0	TURN-L												
													PRVTE		E -S										000		00
													PSNGR CAR			01 DRVR	INJB	55	M	OR-Y		016,028,004	038		27,02
																					OR<25						
01969	N N N N N N	05/31/2015	MARION	1	01 2	INTER	4-LEG	N	N	CLR	O-1 L-TURN	01 NONE	0	STRGHT													02
COUNTY		SU		CN	0	CN		STOP SIGN	N	DRY	TURN	PRVTE		W -E										000		00	
N		3P		278.64		03	0		N	DAY	INJ	PSNGR CAR			01 DRVR	INJC	43	M	OTH-Y		000		000		00	
N		45 14 5.28	-122 48 28.3		0001QK100S00															N-RES							
												01 NONE	0	STRGHT													
												PRVTE		W -E										000		00	
												PSNGR CAR			01 PSNG	INJC	39	F			000		000		00	
												02 NONE	0	TURN-L													
												PRVTE		E -S										000		00	
												PSNGR CAR			01 DRVR	NONE	18	M	OR-Y		028,004	000		02	
																					OR<25						
02274	N N N N	06/19/2015	MARION	1	01 2	INTER	4-LEG	N	N	CLR	O-1 L-TURN	01 NONE	0	STRGHT												001	02
NONE		FR		CN	0	CN		STOP SIGN	N	DRY	TURN	PRVTE		W -E										000		00	
N		9P		278.64		03	0		N	DLIT	INJ	MTRCYCLE			01 DRVR	INJB	28	M	OR-Y		000		000	001	00	
N		45 14 5.28	-122 48 28.3		0001QK100S00															OR<25							
												02 NONE	0	TURN-L													
												PRVTE		E -S										000		00	
												PSNGR CAR			01 DRVR	NONE	21	M	OR-Y		028,004	000		02	
																					OR<25						
03379	N N N N	09/04/2015	MARION	1	01 2	INTER	CROSS	N	N	RAIN	ANGL-OTH	01 NONE	0	STRGHT													02
STATE		FR		CN	0	CN		STOP SIGN	N	WET	TURN	PRVTE		W -E										000		00	

001: PACIFIC

Highway 001 ALL ROAD TYPES, MP 278 to 280 01/01/2013 to 12/31/2017, Both Add and Non-Add mileage

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

N	4P		278.64		03	0		N	DAY	INJ	PSNGR CAR		01 DRVR	INJC	44	F	OR-Y	000	000	00
N	45 14 5.28	-122 48 28.3		0001QK100S00													OR<25			
											01 NONE	0	STRGHT							
											PRVTE		W -E						000	00
											PSNGR CAR		02 PSNG	NO<5	04	F		000	000	00
											02 NONE	0	TURN-L							
											PRVTE		N -E						000	00
											PSNGR CAR		01 DRVR	NONE	00	Unk	UNK	028	000	02
																	UNK			
03125 N N N N N N	08/18/2015	MARION	1	01 2	INTER	5-LEG	N	N	CLR	O-1 L-TURN	01 NONE	0	TURN-L							02
STATE	TU		CN	0	CN		STOP SIGN	N	DRY	TURN	PRVTE		E -S						000	00
N	8A		278.64		03	0		N	DAY	INJ	PSNGR CAR		01 DRVR	INJB	63	F	OR-Y	028,004	000	02
N	45 14 5.28	-122 48 28.3		0001QK100S00													OR<25			
											02 NONE	0	STRGHT							
											PRVTE		W -E						000	00
											PSNGR CAR		01 DRVR	INJC	23	F	OR-Y	000	000	00
																	OR<25			
94402 N N N N	11/08/2015	MARION	1	01 2	INTER	5-LEG	N	N	CLR	ANGL-OTH	01 NONE	0	TURN-L							02
NO RPT	SU		CN	0	CN		STOP SIGN	N	SNO	TURN	PRVTE		N -E						000	00
N	7A		278.64		03	0		N	DAY	PDO	PSNGR CAR		01 DRVR	NONE	35	F	OR-Y	028	000	02
N	45 14 5.28	-122 48 28.3		0001QK100S00													OR<25			
											02 NONE	0	STRGHT							
											PRVTE		W -E						000	00
											PSNGR CAR		01 DRVR	NONE	26	M	OR-Y	000	000	00
																	OR<25			
01353 N N N N	04/14/2015	MARION	1	01 2	INTER	CROSS	N	N	CLR	O-1 L-TURN	01 NONE	0	STRGHT							02
NO RPT	TU		CN	0	CN		STOP SIGN	N	DRY	TURN	PRVTE		W -E						000	00
N	8A		278.64		03	0		N	DAY	PDO	PSNGR CAR		01 DRVR	NONE	16	M	OR-Y	000	000	00
N	45 14 5.28	-122 48 28.3		0001QK100S00													OR<25			
											02 NONE	0	TURN-L							
											PRVTE		E -S						000	00
											PSNGR CAR		01 DRVR	NONE	74	F	OR-Y	028,004	000	02
																	OR<25			

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

01957	Y N N N	06/01/2015	MARION	1	01	2	INTER	5-LEG	N	N	CLD	O-1 L-TURN	01	NONE	0	STRGHT											30,27
STATE		MO		CN	0		CN		STOP SIGN	N	DRY	TURN		PRVTE		W -E									000		00
N		2P		278.64			03	0		N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	40	M	OR-Y	050,016	038		30,27
N		45 14 5.28	-122 48 28.3			0001QK100S00																OR>25				
													02	NONE	0	TURN-L										
														PRVTE		E -S								000		00
														PSNGR CAR			01	DRVR	NONE	17	M	OR-Y	028	000		00
																						OR<25				
04104	N N N N	10/24/2015	MARION	1	01	2	INTER	5-LEG	N	N	CLR	O-1 L-TURN	01	NONE	0	TURN-L											02
NONE		SA		CN	0		CN		STOP SIGN	N	DRY	TURN		PRVTE		E -S								000		00
N		5P		278.64			03	0		N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	25	M	OR-Y	028,004	000		02
N		45 14 5.28	-122 48 28.3			0001QK100S00																OR<25				
													02	NONE	0	STRGHT										
														PRVTE		W -E								000		00
														PSNGR CAR			01	DRVR	NONE	36	F	OR-Y	000	000		00
																						OR<25				
													02	NONE	0	STRGHT										
														PRVTE		W -E								000		00
														PSNGR CAR			02	PSNG	NO<5	04	M		000	000		00
02381	N N N N N N	06/08/2016	MARION	1	01	2	INTER	5-LEG	N	N	CLR	O-1 L-TURN	01	NONE	0	TURN-L											02
STATE		WE		CN	0		CN		STOP SIGN	N	DRY	TURN		PRVTE		E -S								000		00
N		11A		278.64			03	0		N	DAY	INJ		PSNGR CAR			01	DRVR	INJC	23	M	OTH-Y	028,004	000		02
N		45 14 5.28	-122 48 28.3			0001QK100S00																N-RES				
													01	NONE	0	TURN-L										
														PRVTE		E -S								000		00
														PSNGR CAR			02	PSNG	INJC	25	F		000	000		00
													02	NONE	0	STRGHT										
														PRVTE		W -E								000		00
														PSNGR CAR			01	DRVR	NONE	64	M	OR-Y	000	000		00
																						OR<25				
03090	N N N N	07/23/2016	MARION	1	01	2	INTER	5-LEG	N	N	CLR	ANGL-OTH	01	NONE	9	TURN-L									082		02
NONE		SA		CN	0		CN		STOP SIGN	N	DRY	TURN		N/A		N -E								000		00

001: PACIFIC

Highway 001 ALL ROAD TYPES, MP 278 to 280 01/01/2013 to 12/31/2017, Both Add and Non-Add mileage

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

N	1P		278.64		03	0		N	DAY	PDO	PSNGR CAR		01 DRVR	NONE	00	Unk	UNK	000	000	00
N	45 14 5.28	-122 48 28.3		0001QK100S00													UNK			
											02 NONE	9	STRGHT							
											N/A		W -E						000	00
											PSNGR CAR		01 DRVR	NONE	00	Unk	UNK	000	000	00
																	UNK			
00739	N N N N N N	02/26/2017	MARION	1 01 2	INTER	5-LEG	N	N	RAIN	O-1 L-TURN	01 NONE	0	TURN-L							02
STATE	SU		CN 0		CN		STOP SIGN	N	WET	TURN	PRVTE		E -S						000	00
N	5P		278.64		03	0		N	DAY	INJ	PSNGR CAR		01 DRVR	NONE	18	F	OR-Y	028,004	000	02
N	45 14 5.28	-122 48 28.3		0001QK100S00													OR<25			
											02 NONE	0	STRGHT							
											PRVTE		W -E						000	00
											PSNGR CAR		01 DRVR	INJC	62	M	OR-Y	000	000	00
																	OR<25			
											02 NONE	0	STRGHT							
											PRVTE		W -E						000	00
											PSNGR CAR		02 PSNG	INJB	59	F		000	000	00
01602	N N N N	05/19/2013	MARION	1 01 2	INTER	CROSS	N	N	CLR	O-1 L-TURN	01 NONE	0	STRGHT							02
NONE	SU		CN 0		CN		UNKNOWN	N	DRY	TURN	PRVTE		W -E						000	00
N	3P		278.64		04	0		N	DAY	PDO	PSNGR CAR		01 DRVR	NONE	35	F	OR-Y	000	000	00
N	45 14 5.27604	-122 48 28.3003559		0001QK100S00													OR>25			
											02 NONE	0	TURN-L							
											PRVTE		E -S						000	00
											PSNGR CAR		01 DRVR	NONE	19	M	OTH-Y	004,028	000	02
																	N-RES			
04401	N N N N	11/08/2015	MARION	1 01 2	INTER	5-LEG	N	N	CLD	ANGL-OTH	01 NONE	0	STRGHT							02
COUNTY	SU		CN 0		CN		STOP SIGN	N	WET	ANGL	PRVTE		N -S						000	00
N	7A		278.64		04	0		N	DAY	PDO	PSNGR CAR		01 DRVR	NONE	35	F	OR-Y	028	000	02
N	45 14 5.28	-122 48 28.3		0001QK100S00													OR<25			
											02 NONE	0	STRGHT							
											PRVTE		W -E						000	00
											PSNGR CAR		01 DRVR	NONE	26	M	OR-Y	000	000	00
																	OR<25			

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

02024	N N N N N N	06/20/2014	MARION	1	01	1	GRADE		Y	N	CLD	S-1STOP	01	NONE	0	STRGHT													27,07
STATE		FR		CN	0		UN	(NONE)	UNKNOWN	N	WET	REAR		PRVTE		S -N											000		00
N		8A		278.65			03			N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	68	F	OR-Y	016,043,026		038		27,07
N		45 14 2.3710199	-122 48 24.32718		0001QJ100S00		(01)															OR<25						
													02	NONE	0	STOP												
														PRVTE		S -N										011		00
														PSNGR CAR			01	DRVR	NONE	47	M	OR-Y	000		000		00
																						OR<25						
00823	N N N N N N	02/26/2016	MARION	1	01	1	STRGHT		Y	N	RAIN	S-1STOP	01	NONE	0	STRGHT												013	29
STATE		FR		CN	0		UN	(NONE)	ONE-WAY	N	WET	REAR		PRVTE		S -N										000		00
N		5P		278.65			03			N	DAY	INJ		PSNGR CAR			01	DRVR	NONE	22	M	OTH-Y	026		000		29
N		45 14 2.37	-122 48 24.33		0001QJ100S00		(01)															N-RES						
													02	NONE	0	STOP												
														PRVTE		S -N										011	013	00
														PSNGR CAR			01	DRVR	INJC	57	F	OR-Y	000		022		00
																						OR<25						
													03	NONE	0	STOP												
														PRVTE		S -N										011		00
														PSNGR CAR			01	DRVR	INJC	33	M	OR-Y	000		000		00
																						OR>25						
04382	N N N N	10/16/2017	MARION	1	01	1	STRGHT		Y	N	UNK	S-STRGHT	01	NONE	9	STRGHT													29
NO RPT		MO		CN	0		UN	(NONE)	ONE-WAY	N	UNK	REAR		N/A		S -N										000		00
N		6A		278.65			03			N	DAWN	PDO		PSNGR CAR			01	DRVR	NONE	00	Unk	UNK	000		000		00
N		45 14 2.37	-122 48 24.33		0001QJ100S00		(01)															UNK						
													02	NONE	9	STRGHT												
														N/A		S -N										000		00
														PSNGR CAR			01	DRVR	NONE	00	Unk	UNK	000		000		00
																						UNK						
01303	N N N N	04/05/2015	MARION	1	01	1	STRGHT		N	N	UNK	S-STRGHT	01	NONE	0	STRGHT													07
NONE		SU		CN	0		UN	(NONE)	ONE-WAY	N	UNK	REAR		PRVTE		S -N										000		00
N		5P		278.66			03			N	DAY	INJ		PSNGR CAR			01	DRVR	INJC	29	M	OR-Y	042		000		07
N		45 14 2.78	-122 48 23.74		0001QJ100S00		(01)															OR<25						
													02	UNKN	0	STRGHT												

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

```
                                                                                                                                                     UNKN           S -N                                                           000         00
                                                                                                                                                     UNKNOWN                   01 DRVR   NONE   00  F   UNK            000         000         00

                                                                                                                                                                                                        UNK
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

01976   N N N N N N 05/11/2016     MARION             1   01 1                    STRGHT            N              N       CLR     S-1STOP    01 NONE    9       STRGHT                                                                       32,27,29

STATE               WE                                CN   0                      UN         (NONE)      ONE-WAY        N       DRY     REAR          N/A            S -N                                                           000         00
N                   12P                               278.66                      03                                    N       DAY     PDO           PSNGR CAR                 01 DRVR   NONE   00  Unk UNK            000         000         00

N                   45 14 2.78     -122 48 23.74             0001QJ100S00                    (01)                                                                                                       UNK
                                                                                                                                                  02 NONE    9       STOP

                                                                                                                                                     N/A            S -N                                                           011         00
                                                                                                                                                     PSNGR CAR                 01 DRVR   NONE   00  Unk UNK            000         000         00

                                                                                                                                                                                                        UNK
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

00351   N N N N        01/27/2017     MARION             1   01 1                    STRGHT            Y              N       CLR     S-1STOP    01 NONE    9       STRGHT                                                                       29

NONE                FR                                CN   0                      UN         (NONE)      ONE-WAY        N       DRY     REAR          N/A            S -N                                                           000         00
N                   3P                                278.66                      03                                    N       DAY     PDO           PSNGR CAR                 01 DRVR   NONE   00  Unk UNK            000         000         00

N                   45 14 2.78     -122 48 23.74             0001QJ100S00                    (01)                                                                                                       UNK
                                                                                                                                                  02 NONE    9       STOP

                                                                                                                                                     N/A            S -N                                                           011         00
                                                                                                                                                     PSNGR CAR                 01 DRVR   NONE   00  Unk UNK            000         000         00

                                                                                                                                                                                                        UNK
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

02803   N N N N N N 07/14/2017     MARION             1   01 1                    STRGHT            Y              N       CLR     S-1STOP    01 NONE    0       STRGHT                                                                       07

STATE               FR                                CN   0                      UN         (NONE)      ONE-WAY        N       DRY     REAR          PRVTE          S -N                                                           000         00
N                   2P                                278.67                      03                                    N       DAY     INJ           PSNGR CAR                 01 DRVR   NONE   00  F   UNK            043,026     000         07

N                   45 14 3.2      -122 48 23.18             0001QJ100S00                    (01)                                                                                                       UNK
                                                                                                                                                  02 NONE    0       STOP

                                                                                                                                                     PRVTE          S -N                                                           011         00
                                                                                                                                                     PSNGR CAR                 01 DRVR   INJC   21  M   OTH-Y          000         000         00

                                                                                                                                                                                                        N-RES
                                                                                                                                                  02 NONE    0       STOP

                                                                                                                                                     PRVTE          S -N                                                           011         00
                                                                                                                                                     PSNGR CAR                 02 PSNG   INJC   20  F                  000         000         00

--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

01403   N N N N N N 04/29/2014     MARION             1   01 1                    INTER      CROSS       N              N       CLR     S-OTHER    01 NONE    1       TURN-R                                                             079      08

STATE               TU                                CN   0                      UN                     STOP SIGN      N       DRY     TURN          PRVTE          S -E                                                           000         00
N                   6A                                278.68                      06         0                          N       DAY     INJ           SEMI TOW                  01 DRVR   NONE   00  Unk UNK            006         000         08
```

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

N 45 14 -122 48 0001QJ100S00 UNK
3.6283919 22.6300319

02 NONE 0 STOP

PRVTE S -N 011 079 00
PSNGR CAR 01 DRVR INJC 46 M OR-Y 000 000 00
OR<25

03187 N N N N 09/15/2014 MARION 1 01 1 INTER CROSS N N CLR S-1STOP 01 UNKN 0 STRGHT 013 07

NONE MO CN 0 UN STOP SIGN N DRY REAR UNKN S -N 000 00
N 7A 278.68 06 0 N DAY PDO UNKNOWN 01 DRVR NONE 00 Unk UNK 026 000 07

N 45 14 -122 48 0001QJ100S00 UNK
3.6283919 22.6300319

02 NONE 0 STOP

PRVTE S -N 011 013 00
PSNGR CAR 01 DRVR NONE 58 M OR-Y 000 000 00
OR<25

03 UNKN 0 STOP

UNKN S -N 011 00
UNKNOWN 01 DRVR NONE 00 Unk UNK 000 000 00
UNK

05033 N N N N 12/14/2015 MARION 1 01 1 INTER CROSS N N RAIN S-1STOP 01 NONE 0 STRGHT 29

NONE MO CN 0 S STOP SIGN N WET REAR PRVTE S -N 000 00
N 8A 278.68 06 0 N DAY INJ PSNGR CAR 01 DRVR NONE 34 M OR-Y 026 000 29

N 45 14 3.63 -122 48 22.63 0001QJ100S00 OR>25

02 NONE 0 STOP

PRVTE S -N 011 00
PSNGR CAR 01 DRVR INJC 24 F OR-Y 000 000 00
OR<25

03105 N N N N 08/15/2015 MARION 1 01 1 INTER CROSS N N CLR S-1STOP 01 NONE 0 STRGHT 29

NONE SA CN 0 S STOP SIGN N DRY REAR PRVTE S -N 000 00
N 1P 278.68 06 0 N DAY PDO PSNGR CAR 01 DRVR NONE 00 F UNK 026 000 29

N 45 14 3.63 -122 48 22.63 0001QJ100S00 UNK

02 NONE 0 STOP

PRVTE S -N 011 00
PSNGR CAR 01 DRVR NONE 38 M OR-Y 000 000 00
OR>25

001: PACIFIC

Highway 001 ALL ROAD TYPES, MP 278 to 280 01/01/2013 to 12/31/2017, Both Add and Non-Add mileage

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

04366	N N N N	10/05/2016	MARION	1	01	1		INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE	0	STRGHT									29
NO RPT		WE		CN	0			S		STOP SIGN	N	WET	REAR		PRVTE		S -N								000	00
N		12P		278.68				06	0		N	DAY	INJ		PSNGR CAR			01	DRVR	NONE	32	F	OR-Y	026	000	29
N		45 14 3.63	-122 48 22.63			0001QJ100S00																	UNK			
														02	NONE	0	STOP									
															PRVTE		S -N								011	00
															PSNGR CAR			01	DRVR	INJC	38	F	OR-Y	000	000	00
																							OR>25			
02354	N N N N N N	07/16/2014	MARION	1	06	2		STRGHT		N	N	CLR	S-1STOP	01	NONE	0	STRGHT									07
COUNTY		WE		CN	0			UN	(NONE)	UNKNOWN	N	DRY	REAR		PRVTE		W -E								000	00
N		6P		278.70				03			N	DAY	INJ		PSNGR CAR			01	DRVR	INJC	15	M	OR-Y	026	000	07
N		45 14 4.0556759	-122 48 24.0381			0001QK100S00			(02)														OR<25			
														02	NONE	0	STOP									
															PRVTE		W -E								011	00
															PSNGR CAR			01	DRVR	NONE	57	M	OR-Y	000	000	00
																							OR<25			
03191	N N N N	09/15/2014	MARION	1	06	2		STRGHT		Y	N	CLR	S-1STOP	01	NONE	0	STRGHT									07
NONE		MO		CN	0			UN	(NONE)	UNKNOWN	N	DRY	REAR		PRVTE		W -E								000	00
N		7A		278.70				03			N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	24	M	OR-Y	026	000	07
N		45 14 4.0556759	-122 48 24.0381			0001QK100S00			(02)														OR<25			
														02	NONE	0	STOP									
															PRVTE		W -E								011	00
															PSNGR CAR			01	DRVR	NONE	29	M	OR-Y	000	000	00
																							OR<25			
														02	NONE	0	STOP									
															PRVTE		W -E								011	00
															PSNGR CAR			02	PSNG	NO<5	02	F		000	000	00
03872	N N N N	09/06/2016	MARION	1	06	2		STRGHT		Y	N	RAIN	S-1STOP	01	NONE	9	STRGHT									29
NONE		TU		CN	0			UN	(NONE)	UNKNOWN	N	WET	REAR		N/A		W -E								000	00
N		8A		278.70				03			N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	00	Unk	UNK	000	000	00
N		45 14 4.06	-122 48 24.04			0001QK100S00			(02)														UNK			
														02	NONE	9	STOP									

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

															N/A		W -E											011		00
															PSNGR CAR				01 DRVR	NONE	00	Unk	UNK		000		000		00
																							UNK							
03619	N	N	N	N	10/15/2014	MARION	1	06	2	STRGHT		N	Y	RAIN	FIX OBJ	01	NONE	0	STRGHT										043		16
NONE					WE		CN	0		UN	(NONE)	UNKNOWN	N	WET	FIX		PRVTE		E -W									000	043	00
Y					7A		278.70			06			N	DAY	PDO		PSNGR CAR			01 DRVR	NONE	53	M	OR-Y		081		025		16
N					45 14 4.06	-122 48 24.04			0001QK100S00		(02)													OR>25							
03690	N	N	N	N	10/21/2014	MARION	1	01	1	INTER	CROSS	N	N	UNK	ANGL-OTH	01	NONE	0	TURN-L												02
NONE					TU		CN	0		CN		STOP SIGN	N	UNK	TURN		PRVTE		S -W									000		00
N					7P		278.72			04	0		N	DLIT	PDO		PSNGR CAR			01 DRVR	NONE	35	F	OR-Y		028		000		02
N					45 14 3.63	-122 48 22.63			0001QK100S00															OR<25							
																02	NONE	0	STRGHT												
															PRVTE		W -E											000		00
															PSNGR CAR				01 DRVR	NONE	49	F	OR-Y		000		000		00
																							OR<25							
01575	N	N	N	N	N	N	04/14/2016	MARION	1	01	2	INTER	CROSS	N	N	CLR	S-OTHER	01	NONE	9	TURN-L										08
STATE					TH		CN	0		CN		STOP SIGN	N	DRY	TURN		N/A		S -W									000		00
N					10A		278.72			01	0		N	DAY	PDO		PSNGR CAR			01 DRVR	NONE	00	Unk	UNK		000		000		00
N					45 14 3.63	-122 48 22.63			0001QK100S00															UNK							
																02	NONE	9	TURN-L												
															N/A		S -W											000		00
															SEMI TOW				01 DRVR	NONE	00	Unk	UNK		000		000		00
																							UNK							
85418	N	N	N	N	12/17/2015	MARION	1	06	2	INTER	CROSS	N	N	RAIN	O-1 L-TURN	01	NONE	0	STRGHT												02
NONE					TH		CN	0		CN		STOP SIGN	N	WET	TURN		PRVTE		E -W									000		00
N					12P		278.72			02	0		N	DAY	INJ		PSNGR CAR			01 DRVR	INJB	52	M	OR-Y		000		000		00
N					45 14 3.63	-122 48 22.63			0001QK100S00															OR<25							
																02	NONE	0	TURN-L												
															PRVTE		W -N											000		00
															PSNGR CAR				01 DRVR	NONE	28	M	OR-Y		028,004		000		02
																							OR<25							
02339	N	N	N	N	06/06/2016	MARION	1	01	2	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	0	TURN-L												02
NO RPT					MO		CN	0		CN		STOP SIGN	N	DRY	TURN		PRVTE		S -W									015		00

001: PACIFIC

Highway 001 ALL ROAD TYPES, MP 278 to 280 01/01/2013 to 12/31/2017, Both Add and Non-Add mileage

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

N	12P		278.72		02	0		N	DAY	INJ	PSNGR CAR		01 DRVR	NONE	39	M	OR-Y	028	000	02
N	45 14 3.63	-122 48 22.63		0001QK100S00													OR<25			
											01 NONE	0	TURN-L							
											PRVTE		S -W						015	00
											PSNGR CAR		02 PSNG	INJC	29	M		000	000	00
											02 NONE	0	STRGHT							
											PRVTE		E -W						000	00
											PSNGR CAR		01 DRVR	NONE	47	F	OR-Y	000	000	00
																	OR<25			
04456 N N N N	10/10/2016	MARION	1 01 2		INTER	CROSS	N	N	CLR	O-1 L-TURN	01 NONE	9	TURN-L							02
NO RPT	MO		CN 0		CN		STOP SIGN	N	DRY	TURN	N/A		W -N						000	00
N	7A		278.72		02	0		N	DAY	PDO	SEMI TOW		01 DRVR	NONE	00	Unk	UNK	000	000	00
N	45 14 3.63	-122 48 22.63		0001QK100S00													UNK			
											02 NONE	9	STRGHT							
											N/A		E -W						000	00
											PSNGR CAR		01 DRVR	NONE	00	Unk	UNK	000	000	00
																	UNK			
03259 N N N N	08/02/2016	MARION	1 01 2		INTER	CROSS	N	N	CLR	S-OTHER	01 NONE	9	TURN-L							08
STATE	TU		CN 0		CN		STOP SIGN	N	DRY	TURN	N/A		S -W						000	00
N	8A		278.72		03	0		N	DAY	PDO	SEMI TOW		01 DRVR	NONE	00	Unk	UNK	000	000	00
N	45 14 3.63	-122 48 22.63		0001QK100S00													UNK			
											02 NONE	9	TURN-L							
											N/A		S -W						000	00
											PSNGR CAR		01 DRVR	NONE	00	Unk	UNK	000	000	00
																	UNK			
01804 N N N N	06/03/2013	MARION	1 06 2		INTER	CROSS	N	N	CLR	ANGL-OTH	01 NONE	0	STRGHT							02
NONE	MO		CN 0		CN		STOP SIGN	N	DRY	ANGL	PRVTE		S -N						000	00
N	5P		278.72		04	0		N	DAY	PDO	PSNGR CAR		01 DRVR	NONE	00	F	UNK	028	000	02
N	45 14 3.6283919	-122 48 22.6300319		0001QK100S00													UNK			
											02 NONE	0	STRGHT							
											PRVTE		W -E						000	00
											PSNGR CAR		01 DRVR	NONE	24	F	OR-Y	000	000	00
																	OR<25			

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

02459	N N N N N N	07/23/2014	MARION	1	06	2	INTER	CROSS	N	N	CLD	ANGL-OTH	01 NONE	0	TURN-L									02
COUNTY		WE		CN	0		CN		STOP SIGN	N	DRY	TURN	PRVTE		S -W								000	00
N		6A		278.72			04	0		N	DAY	INJ	PSNGR CAR			01 DRVR	INJB	29	F	OR-Y	028	000	02
N		45 14 3.6283919	-122 48 22.6300319		0001QK100S00															OR<25			
													01 NONE	0	TURN-L									
													PRVTE		S -W								000	00
													PSNGR CAR			02 PSNG	INJC	21	F		000	000	00
													02 NONE	0	STRGHT									
													PRVTE		W -E								000	00
													PSNGR CAR			01 DRVR	NONE	47	F	OR-Y	000	000	00
																				OR<25				
00118	N N N N N N	01/12/2015	MARION	1	01	2	INTER	CROSS	N	N	CLR	ANGL-OTH	01 NONE	0	STRGHT									02
STATE		MO		CN	0		CN		STOP SIGN	N	DRY	TURN	PRVTE		W -E								000	00
N		3P		278.72			04	0		N	DAY	INJ	PSNGR CAR			01 DRVR	INJC	62	F	OR-Y	000	000	00
N		45 14 3.63	-122 48 22.63		0001QK100S00															OR<25			
													02 NONE	0	TURN-R									
													PRVTE		S -E								015	00
													PSNGR CAR			01 DRVR	NONE	18	F	OR-Y	028	000	02
																				OR<25				
01374	N N N N	04/16/2015	MARION	1	01	2	INTER	CROSS	N	N	CLR	S-OTHER	01 NONE	0	TURN-R									08
STATE		TH		CN	0		CN		STOP SIGN	N	DRY	TURN	PRVTE		S -E								000	00
N		11A		278.72			04	0		N	DAY	PDO	PSNGR CAR			01 DRVR	NONE	29	F	OR-Y	006	000	08
N		45 14 3.63	-122 48 22.63		0001QK100S00															OR<25			
													02 NONE	1	TURN-R									
													PRVTE		S -E								000	00
													SEMI TOW			01 DRVR	NONE	53	M	OTH-Y	000	000	00
																				N-RES				
02275	N N N N N N	06/02/2016	MARION	1	01	2	INTER	CROSS	N	N	CLD	ANGL-OTH	01 NONE	0	STRGHT									03
STATE		TH		CN	0		CN		STOP SIGN	N	WET	TURN	PRVTE		W -E								000	00
N		7A		278.72			04	0		N	DAY	INJ	PSNGR CAR			01 DRVR	INJC	66	M	OR-Y	000	000	00
N		45 14 3.63	-122 48 22.63		0001QK100S00															OR<25			
													01 NONE	0	STRGHT									

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

														PRVTE		W -E									000		00
														PSNGR	CAR		02	PSNG	INJB	33	M			000	000		00
													02	NONE	0	TURN-L											
														PRVTE		S -W									000		00
														PSNGR	CAR		01	DRVR	INJC	23	M	OTH-Y	021	000			03
																						N-RES					
02553	N	N	N	N	N	N	06/26/2017	MARION	1	01	2	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	0	TURN-L							02
STATE							MO		CN	0		CN		STOP SIGN	N	DRY	TURN		PRVTE		S -W				000		00
N							5P		278.72			04	0		N	DAY	INJ		PSNGR	CAR		01	DRVR	INJC	42	F	OR-Y	028	000			02
N							45 14 3.63	-122 48 22.63			0001QK100S00																OR>25					
														02	NONE	0	STRGHT											
														PRVTE		W -E									000		00
														PSNGR	CAR		01	DRVR	NONE	60	M	OR-Y	000	000			00
																						OR<25					
02918	N	N	N	N	N	N	08/27/2014	MARION	1	01	4	STRGHT		N	N	CLR	S-STRGHT	01	NONE	0	STRGHT						013	07
STATE							WE		CN	0		UN	(NONE)	UNKNOWN	N	DRY	REAR		PRVTE		N -S				000		00
N							5P		278.87			03			N	DAY	INJ		PSNGR	CAR		01	DRVR	NONE	27	M	OR-Y	043,042	000			07
N							45 14 12.066972	-122 48 20.776356			0001QM100S00		(01)														OR<25					
														02	NONE	0	STRGHT											
														PRVTE		N -S									000	013	00
														MTRCYCLE				01	DRVR	INJC	38	M	OR-Y	000	000			00
																						OR<25					
														03	NONE	0	STRGHT											
														PRVTE		N -S									000		00
														PSNGR	CAR		01	DRVR	NONE	65	M	OR-Y	000	000			00
																						OR>25					
02075	N	N	N	N			06/09/2015	MARION	1	01	4	STRGHT		N	N	CLR	S-STRGHT	01	NONE	0	STRGHT							32,07
STATE							TU		CN	0		UN	(NONE)	UNKNOWN	N	DRY	REAR		PRVTE		N -S				000		00
N							1P		278.89			03			N	DAY	INJ		PSNGR	CAR		01	DRVR	INJC	58	M	OR-Y	052,042	000			32,07
N							45 14 11.06	-122 48 21.8			0001QM100S00		(01)														OR<25					
														01	NONE	0	STRGHT											
														PRVTE		N -S									000		00
														PSNGR	CAR		02	PSNG	INJC	00	F			000			00

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

														02 NONE	0	STRGHT														
														PRVTE		N -S													000	00
														PSNGR CAR				01 DRVR	INJC	57	F	OR-Y		000		000		00
																						OR<25								
84962	Y	N	N	N	N	N	11/23/2015	MARION		1	01	4	STRGHT		N	N	CLD	S-1STOP	01 NONE	0	STRGHT									32,01,29
STATE							MO			CN	0		UN	(NONE)	ONE-WAY	N	DRY	REAR	PRVTE		N -S							000		00
N							1P			278.89			03			N	DAY	PDO	PSNGR CAR				01 DRVR	NONE	27	M	OR-Y	052,047,026	000		32,01,29
N							45 14 11.06	-122 48 21.8				0001QM100S00		(01)														OR>25				
														02 NONE	0	STOP														
														PRVTE		N -S													011	00
														PSNGR CAR				01 DRVR	NONE	36	F	OR-Y		000		000		00
																						OR<25								
05419	N	N	N	N			10/20/2016	MARION		1	01	4	STRGHT		N	N	RAIN	S-1STOP	01 NONE	9	STRGHT									29
NONE							TH			CN	0		UN	(NONE)	UNKNOWN	N	WET	REAR	N/A		N -S							000		00
N							2P			278.91			03			N	DAY	PDO	PSNGR CAR				01 DRVR	NONE	00	Unk	UNK	000	000		00
N							45 14 10.05	-122 48 22.8				0001QM100S00		(01)														UNK				
														02 NONE	9	STOP														
														N/A		N -S													011	00
														PSNGR CAR				01 DRVR	NONE	00	Unk	UNK		000		000		00
																						UNK								
05209	N	N	N	N			12/24/2015	MARION		1	01	4	STRGHT		N	Y	RAIN	FIX OBJ	01 NONE	0	STRGHT								079	29
NO RPT							TH			CN	0		UN	(NONE)	ONE-WAY	N	WET	FIX	PRVTE		N -S							000	079	00
Y							12P			278.93			01			N	DAY	PDO	PSNGR CAR				01 DRVR	NONE	23	F	UNK	026	000		29
N							45 14 9.04	-122 48 23.8				0001QM100S00		(01)														N-RES				
														02 NONE	0	STOP														
														PRVTE		N -S													011	00
														PSNGR CAR				01 DRVR	NONE	53	M	OR-Y		000		000		00
																						OR<25								
01449	N	N	N	N	N	N	04/06/2016	MARION		1	01	4	STRGHT		Y	N	CLR	S-1STOP	01 NONE	0	STRGHT								013	07
STATE							WE			CN	0		UN	(NONE)	ONE-WAY	N	DRY	REAR	PRVTE		N -S							000		00
N							1P			278.95			03			N	DAY	INJ	PSNGR CAR				01 DRVR	NONE	58	M	OTH-Y	043,026	000		07
N							45 14 8.04	-122 48 24.81				0001QM100S00		(01)														N-RES				

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

02 NONE 0 STOP
PRVTE N -S 011 013 00
PSNGR CAR 01 DRVR INJC 60 F OR-Y 000 022 00
OR>25

02 NONE 0 STOP
PRVTE N -S 011 013 00
PSNGR CAR 02 PSNG INJC 28 F 000 000 00

03 NONE 0 STOP
PRVTE N -S 011 013 00
PSNGR CAR 01 DRVR INJC 51 M OR-Y 000 022 00
OR>25

04 NONE 0 STOP
PRVTE N -S 011 013 00
PSNGR CAR 01 DRVR NONE 74 F OR-Y 000 022 00
OR>25

05 NONE 0 STOP
PRVTE N -S 011 00
PSNGR CAR 01 DRVR INJA 42 F OR-Y 000 000 00
OR>25

05 NONE 0 STOP
PRVTE N -S 011 00
PSNGR CAR 02 PSNG INJC 48 F 000 000 00

00141 N N N N N N 01/15/2015 MARION 1 01 4 STRGHT N Y RAIN FIX OBJ 01 NONE 1 STRGHT 079,010,093 27
STATE TH CN 0 UN (NONE) UNKNOWN N WET FIX PRVTE N -S 000 079,062,010 00
Y 8P 278.97 01 N DLIT PDO SEMI TOW 01 DRVR NONE 56 M OTH-Y 016,081 038 093 27
N 45 14 7.06 -122 48 25.89 0001QM100S00 (01) N-RES

02625 N N N N 07/13/2015 MARION 1 01 4 STRGHT Y N CLR S-1STOP 01 NONE 0 STRGHT 013 29
NONE MO CN 0 UN (NONE) ONE-WAY N DRY REAR PRVTE N -S 000 00
N 2P 278.97 03 N DAY PDO PSNGR CAR 01 DRVR NONE 68 F OR-Y 026 000 29
N 45 14 7.06 -122 48 25.89 0001QM100S00 (01) OR<25

02 NONE 0 STOP
PRVTE N -S 011 013 00
PSNGR CAR 01 DRVR NONE 42 M OR-Y 000 022 00

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

																						OR>25			
														03 NONE	0	STOP									
														PRVTE		N -S								011	00
														PSNGR CAR				01 DRVR	NONE	21	M	OR-Y	000	000	00
																						OR<25			
04209	N N N N	10/30/2015	MARION	1	01	4	STRGHT		Y	N	RAIN	S-1STOP	01 NONE	0	STRGHT										29
NONE		FR		CN	0		UN	(NONE)	ONE-WAY	N	WET	REAR	PRVTE		N -S								000	00	
N		4P		278.98			03			N	DAY	PDO	PSNGR CAR				01 DRVR	NONE	38	M	OR-Y	026	000	29	
N		45 14 6.61	-122 48 26.48			0001QM100S00		(01)														OR<25			
													02 NONE	0	STOP										
													PRVTE		N -S								011	00	
													PSNGR CAR				01 DRVR	NONE	54	M	OR-Y	000	000	00	
																						OR<25			
02257	N Y N N N N	03/30/2016	MARION	1	01	4	STRGHT		Y	N	CLR	S-1STOP	01 NONE	9	STRGHT										29
STATE		WE		CN	0		UN	(NONE)	ONE-WAY	N	DRY	REAR	N/A		N -S								000	00	
N		12P		278.98			03			N	DAY	PDO	PSNGR CAR				01 DRVR	NONE	00	Unk	UNK	000	000	00	
N		45 14 6.61	-122 48 26.48			0001QM100S00		(01)														UNK			
													02 NONE	9	STOP										
													N/A		N -S								011	00	
													PSNGR CAR				01 DRVR	NONE	00	Unk	UNK	000	000	00	
																						UNK			
01322	N N N N	04/17/2014	MARION	1	01	4	STRGHT		Y	N	RAIN	S-1STOP	01 NONE	0	STRGHT										29
NONE		TH		CN	0		UN	(NONE)	UNKNOWN	N	WET	REAR	PRVTE		N -S								000	00	
N		11A		278.99			03			N	DAY	PDO	PSNGR CAR				01 DRVR	NONE	52	F	OR-Y	014,026	000	29	
N		45 14 6.1584	-122 48 27.080856			0001QM100S00		(01)														OR<25			
													02 NONE	0	STOP										
													PRVTE		N -S								011	00	
													PSNGR CAR				01 DRVR	NONE	00	F	UNK	000	000	00	
																						OR<25			
04958	N N N N	11/08/2016	MARION	1	01	4	STRGHT		Y	N	CLR	S-1STOP	01 NONE	9	STRGHT										29
NONE		TU		CN	0		UN	(NONE)	ONE-WAY	N	DRY	REAR	N/A		N -S								000	00	
N		6P		278.99			03			N	DUSK	PDO	PSNGR CAR				01 DRVR	NONE	00	Unk	UNK	000	000	00	
N		45 14 6.16	-122 48 27.08			0001QM100S00		(01)														UNK			
													02 NONE	9	STOP										

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

														N/A		N -S								011	00
														PSNGR CAR			01 DRVR	NONE	00	Unk	UNK	000	000	00
																					UNK				
00262	Y	Y	N	N	N	N	01/20/2017	MARION	1	01	4	STRGHT		Y	N	CLD	S-1STOP	01	NONE	0	STRGHT					07,01
STATE							FR		CN	0		UN	(NONE)	ONE-WAY	N	DRY	REAR		PRVTE		N -S				000	00
N							2P		278.99			03			N	DAY	INJ		PSNGR CAR			01 DRVR	INJB	40 M	N-VAL	047,043,073	000	07,01
N							45 14 6.16	-122 48 27.08			0001QM100S00		(01)												OR>25			
																		02	NONE	0	STOP						
																			PRVTE		N -S				011	00
																			SEMI TOW			01 DRVR	NONE	51 M	OR-Y	000	000	00
																					OR<25				
02120	N	N	N	N			05/30/2017	MARION	1	01	4	STRGHT		Y	N	CLR	S-1STOP	01	NONE	9	STRGHT					29
NONE							TU		CN	0		UN	(NONE)	ONE-WAY	N	DRY	REAR		N/A		N -S				000	00
N							6P		278.99			03			N	DAY	PDO		PSNGR CAR			01 DRVR	NONE	00 Unk	UNK	000	000	00
N							45 14 6.16	-122 48 27.08			0001QM100S00		(01)												UNK			
																		02	NONE	9	STOP						
																			N/A		N -S				011	00
																			PSNGR CAR			01 DRVR	NONE	00 Unk	UNK	000	000	00
																					UNK				
00563	N	N	N	N			02/18/2014	MARION	1	01	4	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	0	STRGHT					07
NONE							TU		CN	0		UN		STOP SIGN	N	DRY	REAR		PRVTE		N -S				000	00
N							3P		279.01			06	1		N	DAY	INJ		PSNGR CAR			01 DRVR	NONE	26 M	OR-Y	026	000	07
N							45 14 5.276076	-122 48 28.300392			0001QM100S00														OR<25			
																		02	NONE	0	STOP						
																			PRVTE		N -S				011	00
																			PSNGR CAR			01 DRVR	INJC	40 F	OR-Y	000	000	00
																					OR<25				
																		02	NONE	0	STOP						
																			PRVTE		N -S				011	00
																			PSNGR CAR			02 PSNG	INJC	42 M		000	000	00
03165	N	N	N	N			08/27/2014	MARION	1	01	4	INTER	4-LEG	N	N	CLR	S-1STOP	01	NONE	0	STRGHT					07
NONE							WE		CN	0		UN		STOP SIGN	N	DRY	REAR		PRVTE		N -S				000	00

001: PACIFIC

Highway 001 ALL ROAD TYPES, MP 278 to 280 01/01/2013 to 12/31/2017, Both Add and Non-Add mileage

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

N		4P		279.01		06	0		N	DAY	INJ		PSNGR CAR		01 DRVR	NONE	00	M	UNK	026	000	07
N		45 14 5.276076	-122 48 28.300392		0001QM100S00														UNK			
												02 NONE	0	STOP								
													PRVTE		N -S						011	00
													PSNGR CAR		01 DRVR	INJC	46	M	OR-Y	000	000	00
																			OR<25			
04351	N N N N	10/14/2014	MARION	1	01 4	INTER	5-LEG	N	N	RAIN	S-1STOP	01 NONE	0	STRGHT								07
NONE		TU		CN	0	UN		STOP SIGN	N	WET	REAR		PRVTE		N -S					000	00	
N		6A		279.01		06	0		N	DAWN	PDO		PSNGR CAR		01 DRVR	NONE	00	F	UNK	026	000	07
N		45 14 5.28	-122 48 28.3		0001QM100S00														OR<25			
												02 NONE	0	STOP								
													PRVTE		N -S						011	00
													PSNGR CAR		01 DRVR	NONE	25	F	OR-Y	000	000	00
																			OR<25			
00488	N N N N	02/07/2017	MARION	1	01 4	INTER	5-LEG	N	N	CLR	S-1STOP	01 NONE	0	STRGHT								29
NONE		TU		CN	0	UN		STOP SIGN	N	DRY	REAR		PRVTE		N -S					000	00	
N		11A		279.01		06	0		N	DAY	INJ		PSNGR CAR		01 DRVR	NONE	63	M	OR-Y	026	000	29
N		45 14 5.28	-122 48 28.3		0001QM100S00														OR>25			
												02 NONE	0	STOP								
													PRVTE		N -S						011	00
													PSNGR CAR		01 DRVR	NONE	71	M	OR-Y	000	000	00
																			OR<25			
												02 NONE	0	STOP								
													PRVTE		N -S						011	00
													PSNGR CAR		02 PSNG	INJC	73	F		000	000	00
01229	N N N N	04/23/2013	MARION	1	01 4	INTER	CROSS	N	N	CLR	S-1STOP	01 NONE	0	STRGHT								07
NONE		TU		CN	0	N		STOP SIGN	N	DRY	REAR		PRVTE		N -S					000	00	
N		3P		279.01		06	0		N	DAY	PDO		PSNGR CAR		01 DRVR	NONE	48	M	OR-Y	026	000	07
N		45 14 5.27604	-122 48 28.3003559		0001QM100S00														OR>25			
												02 NONE	0	STOP								
													PRVTE		N -S						011	00
													PSNGR CAR		01 DRVR	NONE	66	F	OR-Y	000	000	00
																			OR>25			

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

01242	N N N N	04/22/2013	MARION	1	01	4	INTER	CROSS	N	N	CLR	S-OTHER	01 NONE	1	TURN-R									06
NONE		MO		CN	0		N		STOP SIGN	N	DRY	TURN	PRVTE		N -W								015	00
N		4P		279.01			06	0		N	DAY	PDO	SEMI TOW			01 DRVR	NONE	53	M	OR-Y	000	000	00
N		45 14 5.27604	-122 48 28.3003559			0001QM100S00														OR>25			
													02 NONE	0	STRGHT									
													PRVTE		N -S								031	00
													PSNGR CAR			01 DRVR	NONE	61	F	OR-Y	031	000	06
																				OR>25			
02094	N N N N	06/24/2013	MARION	1	01	4	INTER	CROSS	N	N	CLR	S-1STOP	01 NONE	0	STRGHT									07
NONE		MO		CN	0		N		STOP SIGN	N	DRY	REAR	PRVTE		N -S								000	00
N		2P		279.01			06	0		N	DAY	PDO	PSNGR CAR			01 DRVR	NONE	34	M	OR-Y	026	000	07
N		45 14 5.27604	-122 48 28.3003559			0001QM100S00														OR<25			
													01 NONE	0	STRGHT									
													PRVTE		N -S								000	00
													PSNGR CAR			02 PSNG	NO<5	03	M		000	000	00
													02 NONE	0	STOP									
													PRVTE		N -S								011	00
													PSNGR CAR			01 DRVR	NONE	00	F	UNK	000	000	00
																				UNK			
02752	N N N N	08/14/2013	MARION	1	01	4	INTER	CROSS	N	N	CLR	S-OTHER	01 NONE	1	TURN-R									08
NONE		WE		CN	0		N		STOP SIGN	N	DRY	TURN	PRVTE		N -W								000	00
N		7A		279.01			06	0		N	DAY	PDO	SEMI TOW			01 DRVR	NONE	00	M	OR-Y	006	000	08
N		45 14 5.27604	-122 48 28.3003559			0001QM100S00														OR>25			
													02 NONE	0	STOP									
													PRVTE		N -S								011	00
													PSNGR CAR			01 DRVR	NONE	46	M	OR-Y	000	000	00
																				OR>25			
02821	N N N N	08/21/2013	MARION	1	01	4	INTER	CROSS	N	N	CLR	S-1STOP	01 NONE	1	STRGHT									07
NO RPT		WE		CN	0		N		STOP SIGN	N	DRY	REAR	PRVTE		N -S								000	00
N		12P		279.01			06	0		N	DAY	PDO	SEMI TOW			01 DRVR	NONE	42	M	OTH-Y	026	000	07
N		45 14 5.27604	-122 48 28.3003559			0001QM100S00														N-RES			

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

02 NONE 0 TURN-R
PRVTE N -W 013 00
PSNGR CAR 01 DRVR NONE 28 M OR-Y 000 000 00
OR>25

03844 N N N N 05/04/2013 MARION 1 01 4 INTER CROSS N N CLR S-1STOP 01 NONE 0 STRGHT 07
NONE SA CN 0 N STOP SIGN N DRY REAR PRVTE N -S 000 00
N 8A 279.01 06 0 N DAY PDO PSNGR CAR 01 DRVR NONE 00 M OR-Y 026 000 07
N 45 14 5.27604 -122 48 28.3003559 0001QM100S00 UNK
02 NONE 0 STOP
PRVTE N -S 011 00
PSNGR CAR 01 DRVR NONE 79 M OR-Y 000 000 00
OR>25

84710 Y N N N N N 12/06/2013 MARION 1 01 4 INTER CROSS N N CLR S-1STOP 01 NONE 0 STRGHT 01
STATE FR CN 0 N STOP SIGN N ICE REAR PRVTE N -S 000 00
N 3P 279.01 06 0 N DAY INJ PSNGR CAR 01 DRVR INJC 43 F OR-Y 047,026 017 01
N 45 14 5.27604 -122 48 28.3003559 0001QM100S00 OR<25
01 NONE 0 STRGHT
PRVTE N -S 000 00
PSNGR CAR 02 PSNG INJC 72 F 000 000 00
02 NONE 1 STOP
PRVTE N -S 011 00
SEMI TOW 01 DRVR NONE 60 M OR-Y 000 000 00
OR>25

03156 N N N N 08/20/2015 MARION 1 01 4 INTER 5-LEG N N CLR S-1STOP 01 NONE 0 STRGHT 29
NONE TH CN 0 N STOP SIGN N DRY REAR PRVTE N -S 000 00
N 2P 279.01 06 0 N DAY INJ PSNGR CAR 01 DRVR NONE 24 F OR-Y 026 000 29
N 45 14 5.28 -122 48 28.3 0001QM100S00 OR>25
02 NONE 0 STOP
PRVTE N -S 011 00
PSNGR CAR 01 DRVR INJC 53 F OR-Y 000 000 00
OR<25

01656 N N N N N N 05/07/2015 MARION 1 01 4 INTER 4-LEG N N CLR S-1STOP 01 NONE 1 STRGHT 29

001: PACIFIC

Highway 001 ALL ROAD TYPES, MP 278 to 280 01/01/2013 to 12/31/2017, Both Add and Non-Add mileage

1 - 260 of 260 Crash records shown (Filtered to 104 relevant study area collisions).

STATE		TH			CN 0			N			STOP SIGN	N	DRY	REAR		PRVTE		N -S											000		00
N		5P			279.01			06	0			N	DAY	PDO		SEMI TOW				01 DRVR	NONE	42	M	OTH-Y		026		000		29
N		45 14 5.28	-122 48 28.3			0001QM100S00																		N-RES							
															02	NONE	0	STOP													
																PRVTE		N -S											011		00
																PSNGR CAR				01 DRVR	NONE	28	M	OR-Y		000		000		00
																								OR<25							
00380	N N N N N N	01/26/2016	MARION		1 01 4			INTER	5-LEG		N	N	RAIN	S-1STOP	01	NONE	0	STRGHT												080,005		29
STATE		TU			CN 0			N			TRF SIGNAL	N	WET	REAR		PRVTE		N -S											000		00
N		12P			279.01			06	0			N	DAY	INJ		PSNGR CAR				01 DRVR	INJC	49	M	OTH-Y		026		000		29
N		45 14 5.28	-122 48 28.3			0001QM100S00																		N-RES							
																		-													
																		STRGHT		01 PED	INJB	46	M		SIDEWK	000		000	080,005		00
																		UN UN													
															02	NONE	1	STOP													
																PRVTE		N -S											011		00
																SEMI TOW				01 DRVR	NONE	41	M	OR-Y		000		000		00
																								OR>25							
04657	N N N N N N	12/27/2013	MARION		1 01 4			INTER	CROSS		N	N	CLD	ANGL-OTH	01	NONE	0	STRGHT														03
STATE		FR			CN 0			CN			STOP SIGN	N	WET	ANGL		PRVTE		N -S											000		00
N		7A			279.01			01	0			N	DAWN	INJ		PSNGR CAR				01 DRVR	NONE	22	F	OR-Y		021		000		03
N		45 14 5.27604	-122 48 28.3003559			0001QM100S00																		OR<25							
															02	NONE	0	STRGHT													
																PRVTE		W -E											000		00
																PSNGR CAR				01 DRVR	INJB	53	F	OR-Y		000		000		00
																								OR<25							

Left-Turn Lane Warrant Analysis

Project: Harvest Gardens Subdivision
Intersection: 1. East Access at Donald Road/Main Street NE
Date: 3/2/2020
Scenario: 2029 Buildout Conditions - AM Peak Hour (WB)

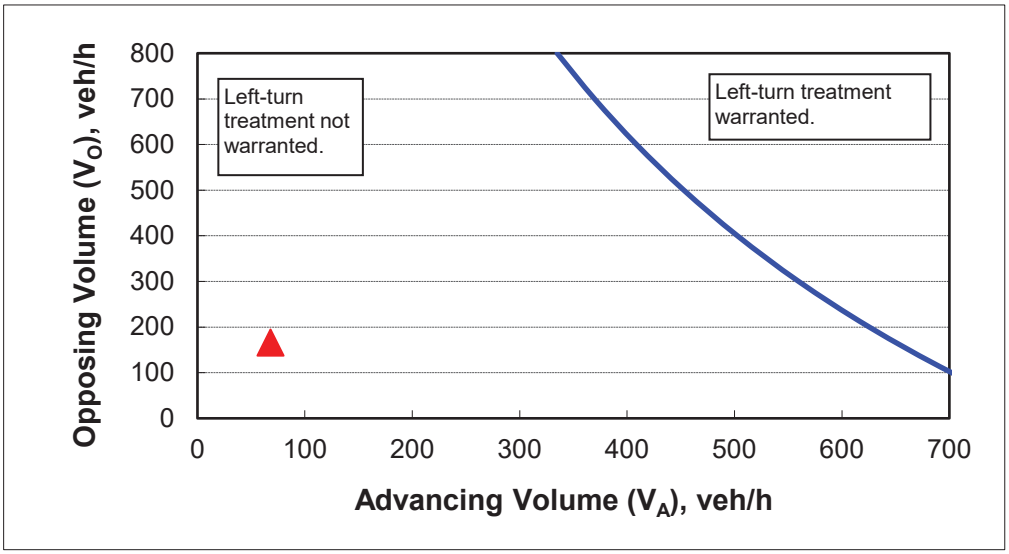
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	4%
Advancing volume (V_A), veh/h:	68
Opposing volume (V_O), veh/h:	166

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	650
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: Harvest Gardens Subdivision
Intersection: 1. East Access at Donald Road/Main Street NE
Date: 3/2/2020
Scenario: 2029 Buildout Conditions - PM Peak Hour (WB)

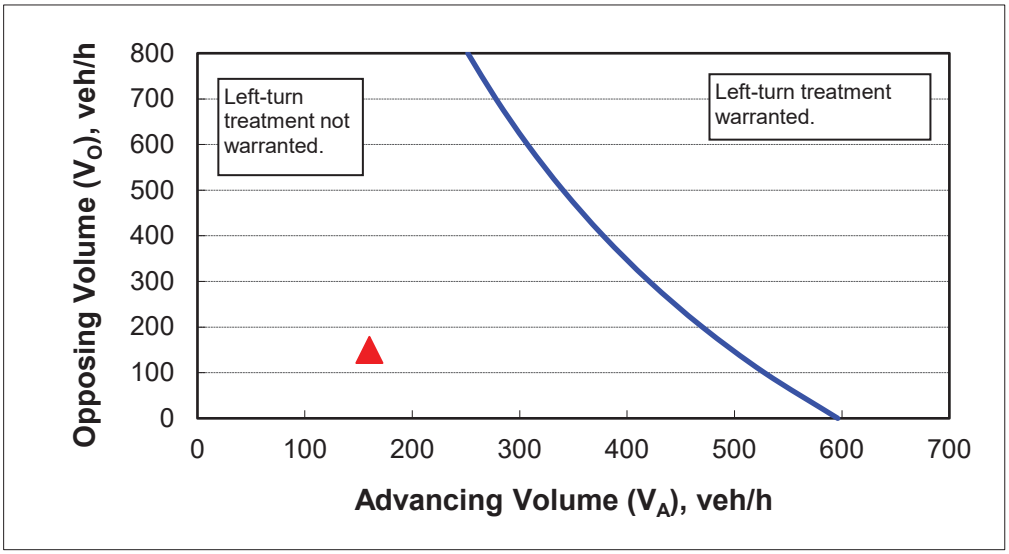
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	8%
Advancing volume (V_A), veh/h:	160
Opposing volume (V_O), veh/h:	150

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	498
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: Harvest Gardens Subdivision
Intersection: 2. West Access at Donald Road/Main Street NE
Date: 3/2/2020
Scenario: 2029 Buildout Conditions - AM Peak Hour (WB)

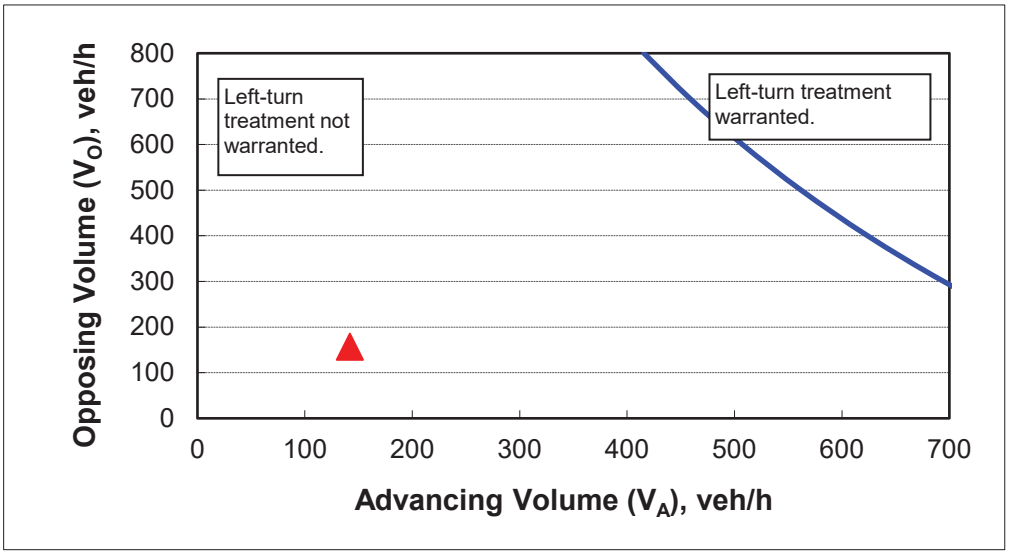
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	3%
Advancing volume (V_A), veh/h:	142
Opposing volume (V_O), veh/h:	157

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	815
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: Harvest Gardens Subdivision
Intersection: 2. West Access at Donald Road/Main Street NE
Date: 3/2/2020
Scenario: 2029 Buildout Conditions - PM Peak Hour (WB)

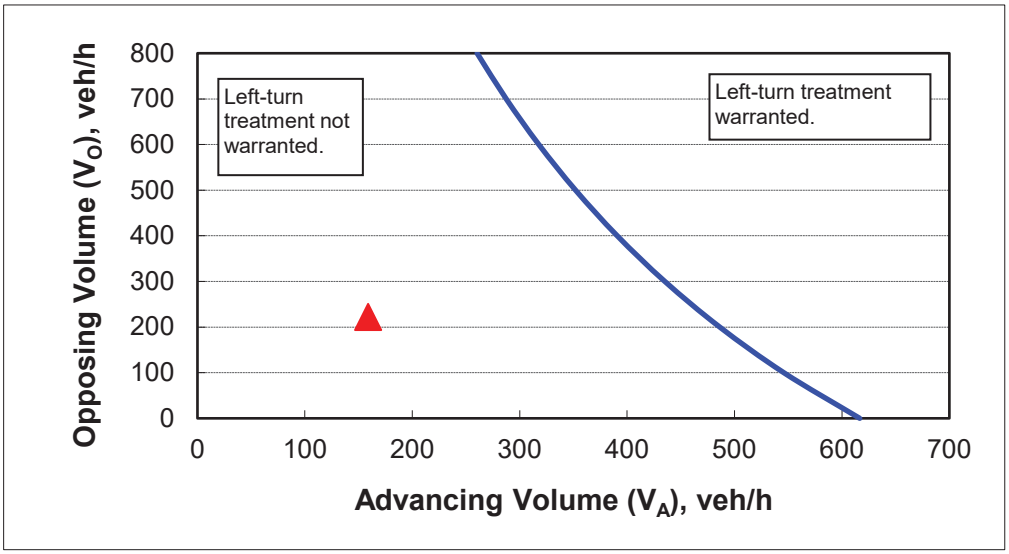
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	8%
Advancing volume (V_A), veh/h:	159
Opposing volume (V_O), veh/h:	222

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	474
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Traffic Signal Warrant Analysis

Project: Harvest Gardens Subdivision
Date: 3/2/2020
Scenario: Year 2029 Buildout Conditions

Major Street:	Butteville Road NE	Minor Street:	Donald Road/Main Street NE
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	457	PM Peak Hour Volumes:	171

Warrant Used:

_____ 100 percent of standard warrants used
X 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	4,570	6,200	
Minor Street*	1,710	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	4,570	9,300	
Minor Street*	1,710	950	**No**
Combination Warrant			
Major Street	4,570	7,440	
Minor Street*	1,710	1,480	**No**

* Minor street right-turning traffic volumes reduced by 25%

Traffic Signal Warrant Analysis

Project: Harvest Gardens Subdivision
Date: 3/2/2020
Scenario: Year 2029 Buildout Conditions

Major Street:	Ehlen Road NE	Minor Street:	Butteville Road NE
Number of Lanes:	2	Number of Lanes:	1
PM Peak Hour Volumes:	1027	PM Peak Hour Volumes:	155

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	10,270	7,400	
Minor Street*	1,550	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	10,270	11,100	
Minor Street*	1,550	950	**No**
Combination Warrant			
Major Street	10,270	8,880	
Minor Street*	1,550	1,480	**Yes**

* Minor street right-turning traffic volumes reduced by 25%

Traffic Signal Warrant Analysis

Project: Harvest Gardens Subdivision
Date: 3/2/2020
Scenario: Year 2029 Buildout Conditions

Major Street:	Ehlen Road NE	Minor Street:	Bents Road/Court NE
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	1477	PM Peak Hour Volumes:	167

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	14,770	6,200	
Minor Street*	1,670	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	14,770	9,300	
Minor Street*	1,670	950	**Yes**
Combination Warrant			
Major Street	14,770	7,440	
Minor Street*	1,670	1,480	**Yes**

* Minor street right-turning traffic volumes reduced by 25%

Exhibit J: Preliminary Geotechnical Analysis

Real-World Geotechnical Solutions
Investigation • Design • Construction Support

March 4, 2019
Project No. 19-5144

Gary Grossen
G.K. Machine
PO Box 427
Donald, Oregon 97020
Via email: mmadder@gkmachine.com

CC: Alex Hurley, AKS Engineering & Forestry, LLC. Via email: alex@aks-eng.com
Frank Daskewech, via email: fjdaskewech@gmail.com

SUBJECT: PRELIMINARY GEOTECHNICAL ENGINEERING REPORT
DONALD HARVEST GARDENS
DONALD ROAD NE
DONALD, OREGON

This report presents the results of a geotechnical engineering study conducted by GeoPacific Engineering, Inc. (GeoPacific) for the above-referenced project. The purpose of our investigation was to evaluate subsurface conditions at the site and to provide geotechnical recommendations for site development. This geotechnical study was performed in accordance with GeoPacific Proposal No. P-6862, dated January 23, 2019, and your subsequent authorization of our proposal and *General Conditions for Geotechnical Services*. This report is considered Preliminary since a grading plan has not been developed.

SITE DESCRIPTION AND PROPOSED DEVELOPMENT

The subject site is located on the south side of Donald Road NE and east of Matthieu Street in the City of Donald, Marion County, Oregon (Figures 1 & 2). The property is approximately 62.7 acres in size and topography is predominantly flat to gently sloping with grades of approximately 2 to 5 percent. An unnamed, intermittent tributary drainage to Senecal Creek is located in the southern portion of the property and has been enclosed in a subsurface drain (Figure 2). The property is currently unimproved with the exception of a gravel driveway. Vegetation consists primarily of short grasses and agricultural crops.

Preliminary site plans indicate that the proposed development will consist of a 329 lot subdivision for single family homes and townhomes, apartment structures, commercial buildings, community center, new public and private streets, parking areas, and associated underground utilities. The structures will likely be wood-framed and supported by conventional spread footing foundations. A grading plan has not been provided for our review; however, we anticipate maximum cuts and fills will be on the order of 10 feet or less.

REGIONAL AND LOCAL GEOLOGIC SETTING

Regionally, the subject site lies within the Willamette Valley/Puget Sound lowland, a broad structural depression situated between the Coast Range on the west and the Cascade Range on the east. A series of discontinuous faults subdivide the Willamette Valley into a mosaic of fault-bounded, structural blocks (Yeats et al., 1996). Uplifted structural blocks form bedrock highlands, while down-warped structural blocks form sedimentary basins.

The site is underlain by the Quaternary age (last 1.6 million years) Willamette Formation, a catastrophic flood deposit associated with repeated glacial outburst flooding of the Willamette Valley (Yeats et al., 1996; Gannett and Caldwell, 1998; Ma et al., 2012). The last of these outburst floods occurred about 10,000 years ago. These deposits typically consist of horizontally layered, micaceous, silt to coarse sand forming poorly-defined to distinct beds less than 3 feet thick.

Published regional geologic mapping indicates that the Willamette Formation is underlain by the Columbia River Basalt Formation (Yeats et al., 1996; Gannett and Caldwell, 1998). The Miocene aged (about 14.5 to 16.5 million years ago) Columbia River Basalts are a thick sequence of lava flows which form the crystalline basement of the Tualatin Valley. The basalts are composed of dense, finely crystalline rock that is commonly fractured along blocky and columnar vertical joints. Individual basalt flow units typically range from 25 to 125 feet thick and interflow zones are typically vesicular, scoriaceous, brecciated, and sometimes include sedimentary rocks.

REGIONAL SEISMIC SETTING

At least three potential source zones capable of generating damaging earthquakes are thought to exist in the region. These include the Portland Hills Fault Zone, the Gales Creek-Newberg-Mt. Angel Structural Zone, and the Cascadia Subduction Zone, as discussed below.

Portland Hills Fault Zone

The Portland Hills Fault Zone is a series of NW-trending faults that include the central Portland Hills Fault, the western Oatfield Fault, and the eastern East Bank Fault. These faults occur in a northwest-trending zone that varies in width between 3.5 and 5.0 miles. The combined three faults vertically displace the Columbia River Basalt by 1,130 feet and appear to control thickness changes in late Pleistocene (approx. 780,000 years) sediment (Madin, 1990). The Portland Hills Fault occurs along the Willamette River at the base of the Portland Hills, and is approximately 17.4 miles southwest of the site. The East Bank Fault occurs along the eastern margin of the Willamette River, and is located approximately 21.5 miles northeast of the site. The Oatfield Fault occurs along the western side of the Portland Hills, and is approximately 16.5 miles southwest of the site. The accuracy of the fault mapping is stated to be within 500 meters (Wong, et al., 2000). No historical seismicity is correlated with the mapped portion of the Portland Hills Fault Zone, but in 1991 a M3.5 earthquake occurred on a NW-trending shear plane located 1.3 miles east of the fault (Yelin, 1992). Although there is no definitive evidence of recent activity, the Portland Hills Fault Zone is assumed to be potentially active (Geomatrix Consultants, 1995).

Gales Creek-Newberg-Mt. Angel Structural Zone

The Gales Creek-Newberg-Mt. Angel Structural Zone is a 50-mile-long zone of discontinuous, NW-trending faults that lies approximately 4.4 miles southwest of the subject site. These faults are recognized in the subsurface by vertical separation of the Columbia River Basalt and offset seismic reflectors in the overlying basin sediment (Yeats et al., 1996; Werner et al., 1992). A geologic

reconnaissance and photogeologic analysis study conducted for the Scoggins Dam site in the Tualatin Basin revealed no evidence of deformed geomorphic surfaces along the structural zone (Unruh et al., 1994). No seismicity has been recorded on the Gales Creek Fault or Newberg Fault; however, these faults are considered to be potentially active because they may connect with the seismically active Mount Angel Fault and the rupture plane of the 1993 M5.6 Scotts Mills earthquake (Werner et al. 1992; Geomatrix Consultants, 1995).

Cascadia Subduction Zone

The Cascadia Subduction Zone is a 680-mile-long zone of active tectonic convergence where oceanic crust of the Juan de Fuca Plate is subducting beneath the North American continent at a rate of 4 cm per year (Goldfinger et al., 1996). A growing body of geologic evidence suggests that prehistoric subduction zone earthquakes have occurred (Atwater, 1992; Carver, 1992; Peterson et al., 1993; Geomatrix Consultants, 1995). This evidence includes: (1) buried tidal marshes recording episodic, sudden subsidence along the coast of northern California, Oregon, and Washington, (2) burial of subsided tidal marshes by tsunami wave deposits, (3) paleoliquefaction features, and (4) geodetic uplift patterns on the Oregon coast. Radiocarbon dates on buried tidal marshes indicate a recurrence interval for major subduction zone earthquakes of 250 to 650 years with the last event occurring 300 years ago (Atwater, 1992; Carver, 1992; Peterson et al., 1993; Geomatrix Consultants, 1995). The inferred seismogenic portion of the plate interface lies approximately 50 miles west of the Portland Basin at depths of between 20 and 40 kilometers below the surface.

FIELD EXPLORATION

Our site-specific explorations for this report were conducted on February 6, 2019. Eighteen exploratory test pits were excavated with a medium to large sized trackhoe to depths ranging between 9 and 11.5 feet at the approximate locations shown on Figure 2. It should be noted that exploration locations were located in the field by pacing or taping distances from apparent property corners and other site features shown on the plans provided. As such, the locations of the explorations should be considered approximate.

A GeoPacific Engineering Geologist continuously monitored the field exploration program and logged the test pits. Soils observed in the explorations were classified in general accordance with the Unified Soil Classification System (USCS). During exploration, our geologist also noted geotechnical conditions such as soil consistency, moisture and groundwater conditions. Logs of the test pits are attached to this report. The following report sections are based on the exploration program and summarize subsurface conditions encountered at the site.

Undocumented Fill: Fill was not encountered in our explorations. It is likely that areas of undocumented fill may exist in the vicinity of Donald Road NE and the existing driveway.

Topsoil Horizon: The ground surface in test pits TP-1 through TP-18 was directly underlain by a low to moderately organic topsoil horizon. The brown silt (OL-ML) was loose, contained trace fine roots throughout, and has been extensively tilled. The topsoil horizon typically extended to a depth of 10 to 15 inches with topsoil horizons extending to depths of 18 to 24 inches in deeply tilled areas.

Willamette Formation: Underlying the topsoil horizon in test pits TP-1 through TP-18 were soils belonging to the Willamette Formation. These soils generally consisted of medium stiff to very stiff, micaceous, light brown to gray, clayey silt (ML) to silty clay (CL) that displayed subtle to strong orange and gray mottling. The clayey silt transitioned to sandy silt below depths of 6.5 and 9 feet

in the majority of the test pits. In explorations, the soils belonging to the Willamette Formation extended beyond the maximum depth of exploration (11.5 feet).

Laboratory testing of a sample of the silty clay from test pit TP-4 at a depth of 1 to 1.5 feet indicates the clay is moderately expansive with an expansion index of 59. Results of laboratory testing are attached at the end of this report.

Soil Moisture and Groundwater

On February 6, 2019, soils encountered in test pits were moist to wet. Perched groundwater seepage was encountered in test pits TP-1 through TP-5 at depths of 3 to 9 feet below the ground surface. Discharge was visually estimated at approximately ¼ gallon per minute or less. Experience has shown that temporary perched storm-related groundwater conditions often occur within the surface soils over fine-grained native deposits such as those beneath the site, particularly during the wet season. It is anticipated that groundwater conditions will vary depending on the season, local subsurface conditions, changes in site utilization, and other factors.

CONCLUSIONS AND RECOMMENDATIONS

Our investigation indicates that the proposed development is geotechnically feasible, provided that the recommendations of this report are incorporated into the design and construction phases of the project. The primary geotechnical constraints to development include:

1) According to the Oregon HazVu: Statewide Geohazards Viewer, the subject site is regionally characterized as having a high risk of soil liquefaction (DOGAMI:HazVu, 2019). For construction of single family structures, special design or construction measures are not required by code to mitigate the effects of liquefaction. Multifamily and commercial structures are planned for the Donald Harvest Gardens development. GeoPacific will present the results of our liquefaction analysis addressing the potential adverse effects due to liquefaction in a separate report.

2) Thick topsoil horizons. Topsoil horizons encountered in test pits ranged from 10 to 15 inches in thickness to 18 to 24 inches in deeply tilled areas of the site.

Site Preparation

Areas of proposed buildings, streets, and areas to receive fill should be cleared of vegetation and any organic and inorganic debris. Encountered undocumented fills and any subsurface structures (dry wells, drainage tiles, old utility lines, septic leach fields, etc.) should be removed and the excavations backfilled with engineered fill. Undocumented fill was not encountered in our explorations; however, areas of fill may be present on the property, especially in the vicinity of Donald Road NE. It is our understanding that subsurface drainage tiles have been installed throughout the property.

Organic-rich topsoil should then be stripped from native soil areas of the site. The estimated depth range necessary for removal of topsoil in cut and fill areas is approximately 9 to 12 inches, respectively. Greater stripping depths may be necessary in deeply tilled areas. The final depth of soil removal will be determined on the basis of a site inspection after the stripping/ excavation has been performed. Stripped topsoil should preferably be removed from the site due to the high density of the proposed development. Any remaining topsoil should be stockpiled only in

designated areas and stripping operations should be observed and documented by the geotechnical engineer or his representative.

Once topsoil stripping and removal of organic and inorganic debris and undocumented fill soils are approved in a particular area, the area must be ripped or tilled to a depth of 12 inches, moisture conditioned, root-picked, and compacted in-place prior to the placement of engineered fill or crushed aggregate base for pavement. Exposed subgrade soils should be evaluated by the geotechnical engineer. For large areas, this evaluation is normally performed by proof-rolling the exposed subgrade with a fully loaded scraper or dump truck. For smaller areas where access is restricted, the subgrade should be evaluated by probing the soil with a steel probe. Soft/loose soils identified during subgrade preparation should be compacted to a firm and unyielding condition, over-excavated and replaced with engineered fill (as described below), or stabilized with rock prior to placement of engineered fill. The depth of overexcavation, if required, should be evaluated by the geotechnical engineer at the time of construction.

Engineered Fill

In general, we anticipate that soils from planned cuts and utility trench excavations will be suitable for use as engineered fill provided they are adequately moisture conditioned prior to compacting. All grading for the proposed construction should be performed as engineered grading in accordance with the applicable building code at time of construction with the exceptions and additions noted herein. Proper test frequency and earthwork documentation usually requires daily observation and testing during stripping, rough grading, and placement of engineered fill. Imported fill material must be approved by the geotechnical engineer prior to being imported to the site. Oversize material greater than 6 inches in size should not be used within 3 feet of foundation footings, and material greater than 12 inches in diameter should not be used in engineered fill.

Engineered fill should be compacted in horizontal lifts not exceeding 8 inches using standard compaction equipment. We recommend that engineered fill be compacted to at least 90% of the maximum dry density determined by ASTM D1557 (Modified Proctor) or equivalent. Field density testing should conform to ASTM D2922 and D3017, or D1556. All engineered fill should be observed and tested by the project geotechnical engineer or his representative. Typically, one density test is performed for at least every 2 vertical feet of fill placed or every 500 yd^3, whichever requires more testing. Because testing is performed on an on-call basis, we recommend that the earthwork contractor be held contractually responsible for test scheduling and frequency.

Site earthwork will be impacted by soil moisture and shallow groundwater conditions. Earthwork in wet weather would likely require extensive use of cement or lime treatment, or other special measures, at considerable additional cost compared to earthwork performed under dry-weather conditions.

Excavating Conditions and Utility Trenches

We anticipate that on-site soils can be excavated using conventional heavy equipment such as trackhoes to a depth of 10 feet. Perched groundwater conditions were encountered in several test pits at depths of 3 to 9 feet. These conditions could make utility trenching difficult, especially in the winter months, and adequate shoring should be maintained.

All temporary cuts in excess of 4 feet in height should be sloped in accordance with U.S. Occupational Safety and Heath Administration (OSHA) regulations (29 CFR Part 1926), or be shored. The existing native soil is classified as Type B Soil and temporary excavation side slope inclinations as steep as 1H:1V may be assumed for planning purposes. This cut slope inclination

is applicable to excavations above groundwater seepage zones only. Maintenance of safe working conditions, including temporary excavation stability, is the responsibility of the contractor. Actual slope inclinations at the time of construction should be determined based on safety requirements and actual soil and groundwater conditions.

Soft, saturated soils and groundwater may be encountered in utility trenches, particularly during the wet season. We anticipate that dewatering systems consisting of ditches, sumps and pumps would be adequate for control of perched groundwater. Regardless of the dewatering system used, it should be installed and operated such that in-place soils are prevented from being removed along with the groundwater. Trench bottom stabilization, such as one to two feet of compacted crushed aggregate base, may be necessary in deeper trenches.

Vibrations created by traffic and construction equipment may cause some caving and raveling of excavation walls. In such an event, lateral support for the excavation walls should be provided by the contractor to prevent loss of ground support and possible distress to existing or previously constructed structural improvements.

PVC pipe should be installed in accordance with the procedures specified in ASTM D2321. We recommend that trench backfill be compacted to at least 90% of the maximum dry density determined by ASTM D1557 (Modified Proctor) or equivalent. Initial backfill lift thickness for a ¾"-0 crushed aggregate base may need to be as great as 4 feet to reduce the risk of flattening underlying flexible pipe. Subsequent lift thickness should not exceed 1 foot. If imported granular fill material is used, then the lifts for large vibrating plate-compaction equipment (e.g. hoe compactor attachments) may be up to 2 feet, provided that proper compaction is being achieved and each lift is tested. Use of large vibrating compaction equipment should be carefully monitored near existing structures and improvements due to the potential for vibration-induced damage.

Adequate density testing should be performed during construction to verify that the recommended relative compaction is achieved. Typically, one density test is taken for every 4 vertical feet of backfill on each 200-lineal-foot section of trench.

Erosion Control Considerations

During our field exploration program, we did not observe soil types that would be considered highly susceptible to erosion. In our opinion, the primary concern regarding erosion potential will occur during construction, in areas that have been stripped of vegetation. Erosion at the site during construction can be minimized by implementing the project erosion control plan, which should include judicious use of straw wattles and silt fences. If used, these erosion control devices should be in place and remain in place throughout site preparation and construction.

Erosion and sedimentation of exposed soils can also be minimized by quickly re-vegetating exposed areas of soil, and by staging construction such that large areas of the project site are not denuded and exposed at the same time. Areas of exposed soil requiring immediate and/or temporary protection against exposure should be covered with either mulch or erosion control netting/blankets. Areas of exposed soil requiring permanent stabilization should be seeded with an approved grass seed mixture, or hydroseeded with an approved seed-mulch-fertilizer mixture.

Wet Weather Earthwork

Soils underlying the site are likely to be moisture sensitive and may be difficult to handle or traverse with construction equipment during periods of wet weather. Earthwork is typically most economical when performed under dry weather conditions. Earthwork performed during the wet-

weather season will probably require expensive measures such as cement treatment or imported granular material to compact fill to the recommended engineering specifications. If earthwork is to be performed or fill is to be placed in wet weather or under wet conditions when soil moisture content is difficult to control, the following recommendations should be incorporated into the contract specifications.

- Earthwork should be performed in small areas to minimize exposure to wet weather. Excavation or the removal of unsuitable soils should be followed promptly by the placement and compaction of clean engineered fill. The size and type of construction equipment used may have to be limited to prevent soil disturbance. Under some circumstances, it may be necessary to excavate soils with a backhoe to minimize subgrade disturbance caused by equipment traffic;
- The ground surface within the construction area should be graded to promote run-off of surface water and to prevent the ponding of water;
- Material used as engineered fill should consist of clean, granular soil containing less than 5 percent fines. The fines should be non-plastic. Alternatively, cement treatment of on-site soils may be performed to facilitate wet weather placement;
- The ground surface within the construction area should be sealed by a smooth drum vibratory roller, or equivalent, and under no circumstances should be left uncompacted and exposed to moisture. Soils which become too wet for compaction should be removed and replaced with clean granular materials;
- Excavation and placement of fill should be observed by the geotechnical engineer to verify that all unsuitable materials are removed and suitable compaction and site drainage is achieved; and
- Straw wattles and/or geotextile silt fences should be strategically located to control erosion.

If cement or lime treatment is used to facilitate wet weather construction, GeoPacific should be contacted to provide additional recommendations and field monitoring.

Spread Foundations – Single Family Attached and Detached Structures

The proposed residential structures may likely be supported on shallow foundations bearing on competent undisturbed, native soils and/or engineered fill, appropriately designed and constructed as recommended in this report. Foundation design, construction, and setback requirements should conform to the applicable building code at the time of construction. For maximization of bearing strength and protection against frost heave, spread footings should be embedded at a minimum depth of 12 inches below exterior grade. The recommended minimum widths for continuous footings supporting wood-framed walls without masonry are 12 inches for single-story, 15 inches for two-story, and 18 inches for three-story structures. Minimum foundation reinforcement should consist of a No. 4 bar at the top of the stem walls, and a No. 4 bar at the bottom of the footings. Concrete slab-on-grade reinforcement should consist of No. 4 bars placed on 24-inch centers in a grid pattern.

The anticipated allowable soil bearing pressure is 1,500 lbs/ft^2 for footings bearing on competent, native soil and/or engineered fill. A maximum chimney and column load of 40 kips is recommended for the site. The recommended maximum allowable bearing pressure may be increased by 1/3 for short-term transient conditions such as wind and seismic loading. For heavier loads, the geotechnical engineer should be consulted. The coefficient of friction between on-site soil and poured-in-place concrete may be taken as 0.42, which includes no factor of safety. The

maximum anticipated total and differential footing movements (generally from soil expansion and/or settlement) are 1 inch and ¾ inch over a span of 20 feet, respectively. We anticipate that the majority of the estimated settlement will occur during construction, as loads are applied. Excavations near structural footings should not extend within a 1H:1V plane projected downward from the bottom edge of footings.

Footing excavations should penetrate through topsoil and any loose soil to competent subgrade that is suitable for bearing support. All footing excavations should be trimmed neat, and all loose or softened soil should be removed from the excavation bottom prior to placing reinforcing steel bars. Due to the moisture sensitivity of on-site native soils, foundations constructed during the wet weather season may require overexcavation of footings and backfill with compacted, crushed aggregate.

Our recommendations are for house construction incorporating raised wood floors and conventional spread footing foundations. If living space of the structures will incorporate basements, a geotechnical engineer should be consulted to make additional recommendations for retaining walls, water-proofing, underslab drainage and wall subdrains. After site development, a Final Soil Engineer's Report should either confirm or modify the above recommendations.

Preliminary Recommendations for Spread Foundations – Multifamily Structures

Based on our understanding of the proposed project and the results of our exploration program, and assuming our recommendations for site preparation are followed, native deposits and/or engineered fill soils should be encountered at or near the foundation level of the proposed multifamily structures. These soils are generally stiff to very stiff, and should provide adequate support of the structural loads.

Shallow, conventional isolated or continuous spread footings may be used to support the proposed structures, provided they are founded on competent native soils, or compacted engineered fill placed directly upon the competent native soils. For multifamily structures, we recommend maximum allowable bearing pressure of 2,000 pounds per square foot (psf).

The recommended maximum allowable bearing pressures may be increased by 1/3 for short term transient conditions such as wind and seismic loading. All footings should be founded at least 18 inches below the lowest adjacent finished grade. Minimum footing widths should be determined by the project engineer/architect in accordance with applicable design codes.

Assuming construction is accomplished as recommended herein, and for the foundation loads anticipated, we estimate total settlement of spread foundations of less than about 1 inch and differential settlement between two adjacent load-bearing components supported on competent soil of less than about ½ inch. We anticipate that the majority of the estimated settlement will occur during construction, as loads are applied.

Wind, earthquakes, and unbalanced earth loads will subject the proposed structure to lateral forces. Lateral forces on a structure will be resisted by a combination of sliding resistance of its base or footing on the underlying soil and passive earth pressure against the buried portions of the structure. For use in design, a coefficient of friction of 0.42 may be assumed along the interface between the base of the footing and subgrade soils. Passive earth pressure for buried portions of structures may be calculated using an equivalent fluid weight of 320 pounds per cubic foot (pcf), assuming footings are cast against dense, natural soils or engineered fill. The recommended coefficient of friction and passive earth pressure values do not include a safety factor. The upper

12 inches of soil should be neglected in passive pressure computations unless it is protected by pavement or slabs on grade.

Footing excavations should be trimmed neat and the bottom of the excavation should be carefully prepared. Loose, wet or otherwise softened soil should be removed from the footing excavation prior to placing reinforcing steel bars.

The above foundation recommendations are for dry weather conditions. Due to the high moisture sensitivity of on-site soils, construction during wet weather may require overexcavation of footings and backfill with compacted, crushed aggregate. GeoPacific should observe foundation excavations prior to placing formwork and reinforcing steel, to verify that adequate bearing soils have been reached.

Concrete Slabs-on-Grade

Preparation of areas beneath concrete slab-on-grade floors should be performed as recommended in the *Site Preparation and Undocumented Fill Removal* section. Care should be taken during excavation for foundations and floor slabs, to avoid disturbing subgrade soils. If subgrade soils have been adversely impacted by wet weather or otherwise disturbed, the surficial soils should be scarified to a minimum depth of 8 inches, moisture conditioned to within about 3 percent of optimum moisture content, and compacted to engineered fill specifications. Alternatively, disturbed soils may be removed and the removal zone backfilled with additional crushed rock.

For evaluation of the concrete slab-on-grade floors using the beam on elastic foundation method, a modulus of subgrade reaction of 150 kcf (87 pci) should be assumed for the medium stiff native silt soils anticipated at subgrade depth. This value assumes the concrete slab system is designed and constructed as recommended herein, with a minimum thickness of crushed rock of 8 inches beneath the slab.

Interior slab-on-grade floors should be provided with an adequate moisture break. The capillary break material should consist of ODOT open graded aggregate per ODOT Standard Specifications 02630-2. The minimum recommended thickness of capillary break materials on re-compacted soil subgrade is 8 inches. The total thickness of crushed aggregate will be dependent on the subgrade conditions at the time of construction, and should be verified visually by proof-rolling. Under-slab aggregate should be compacted to at least 90% of its maximum dry density as determined by ASTM D1557 or equivalent.

In areas where moisture will be detrimental to floor coverings or equipment inside the proposed structure, appropriate vapor barrier and damp-proofing measures should be implemented. A commonly applied vapor barrier system consists of a 10-mil polyethylene vapor barrier placed directly over the capillary break material. Other damp/vapor barrier systems may also be feasible. Appropriate design professionals should be consulted regarding vapor barrier and damp proofing systems, ventilation, building material selection and mold prevention issues, which are outside GeoPacific's area of expertise.

Permanent Below-Grade Walls

Lateral earth pressures against below-grade retaining walls will depend upon the inclination of any adjacent slopes, type of backfill, degree of wall restraint, method of backfill placement, degree of backfill compaction, drainage provisions, and magnitude and location of any adjacent surcharge loads. At-rest soil pressure is exerted on a retaining wall when it is restrained against rotation. In

contrast, active soil pressure will be exerted on a wall if its top is allowed to rotate or yield a distance of roughly 0.001 times its height or greater.

If the subject retaining walls will be free to rotate at the top, they should be designed for an active earth pressure equivalent to that generated by a fluid weighing 35 pcf for level backfill against the wall. For restrained wall, an at-rest equivalent fluid pressure of 55 pcf should be used in design, again assuming level backfill against the wall. These values assume that drainage provisions are incorporated, free draining gravel backfill is used, and hydrostatic pressures are not allowed to develop against the wall.

During a seismic event, lateral earth pressures acting on below-grade structural walls will increase by an incremental amount that corresponds to the earthquake loading. Based on the Mononobe-Okabe equation and peak horizontal accelerations appropriate for the site location, seismic loading should be modeled using the active or at-rest earth pressures recommended above, plus an incremental rectangular-shaped seismic load of magnitude 6.5H, where H is the total height of the wall.

We assume relatively level ground surface below the base of the walls. As such, we recommend passive earth pressure of 320 pcf for use in design, assuming wall footings are cast against competent native soils or engineered fill. If the ground surface slopes down and away from the base of any of the walls, a lower passive earth pressure should be used and GeoPacific should be contacted for additional recommendations.

A coefficient of friction of 0.42 may be assumed along the interface between the base of the wall footing and subgrade soils. The recommended coefficient of friction and passive earth pressure values do not include a safety factor, and an appropriate safety factor should be included in design. The upper 12 inches of soil should be neglected in passive pressure computations unless it is protected by pavement or slabs on grade.

The above recommendations for lateral earth pressures assume that the backfill behind the subsurface walls will consist of properly compacted structural fill, and no adjacent surcharge loading. If the walls will be subjected to the influence of surcharge loading within a horizontal distance equal to or less than the height of the wall, the walls should be designed for the additional horizontal pressure. For uniform surcharge pressures, a uniformly distributed lateral pressure of 0.3 times the surcharge pressure should be added. Traffic surcharges may be estimated using an additional vertical load of 250 psf (2 feet of additional fill), in accordance with local practice.

The recommended equivalent fluid densities assume a free-draining condition behind the walls so that hydrostatic pressures do not build-up. This can be accomplished by placing a 12 to 18-inch wide zone of sand and gravel containing less than 5 percent passing the No. 200 sieve against the walls. A 3-inch minimum diameter perforated, plastic drain pipe should be installed at the base of the walls and connected to a suitable discharge point to remove water in this zone of sand and gravel. The drain pipe should be wrapped in filter fabric (Mirafi 140N or other as approved by the geotechnical engineer) to minimize clogging.

Wall drains are recommended to prevent detrimental effects of surface water runoff on foundations – not to dewater groundwater. Drains should not be expected to eliminate all potential sources of water entering a basement or beneath a slab-on-grade. An adequate grade to a low point outlet drain in the crawlspace is required by code. Underslab drains are sometimes added beneath the slab when placed over soils of low permeability and shallow, perched groundwater.

Water collected from the wall drains should be directed into the local storm drain system or other suitable outlet. A minimum 0.5 percent fall should be maintained throughout the drain and non-perforated pipe outlet. Down spouts and roof drains should not be connected to the wall drains in order to reduce the potential for clogging. The drains should include clean-outs to allow periodic maintenance and inspection. Grades around the proposed structure should be sloped such that surface water drains away from the building.

GeoPacific should be contacted during construction to verify subgrade strength in wall keyway excavations, to verify that backslope soils are in accordance with our assumptions, and to take density tests on the wall backfill materials.

Structures should be located a horizontal distance of at least 1.5H away from the back of the retaining wall, where H is the total height of the wall. GeoPacific should be contacted for additional foundation recommendations where structures are located closer than 1.5H to the top of any wall.

Pavement Design

For design purposes, we used an estimated resilient modulus of 9,000 for compacted native soil. Table 1 presents our recommended minimum pavement section for dry weather construction.

Table 1. Recommended Minimum Dry-Weather Pavement Section

Material Layer	Light-duty Public Streets	Compaction Standard
Asphaltic Concrete (AC)	3 in.	92% of Rice Density AASHTO T-209
Crushed Aggregate Base ¾"-0 (leveling course)	2 in.	95% of Modified Proctor AASHTO T-180
Crushed Aggregate Base 1½"-0	8 in.	95% of Modified Proctor AASHTO T-180
Subgrade	12 in.	95% of Standard Proctor AASHTO T-99 or equivalent

Any pockets of organic debris or loose fill encountered during ripping or tilling should be removed and replaced with engineered fill (see *Site Preparation* Section). In order to verify subgrade strength, we recommend proof-rolling directly on subgrade with a loaded dump truck during dry weather and on top of base course in wet weather. Soft areas that pump, rut, or weave should be stabilized prior to paving. If pavement areas are to be constructed during wet weather, the subgrade and construction plan should be reviewed by the project geotechnical engineer at the time of construction so that condition specific recommendations can be provided. The moisture sensitive subgrade soils make the site a difficult wet weather construction project.

During placement of pavement section materials, density testing should be performed to verify compliance with project specifications. Generally, one subgrade, one base course, and one asphalt compaction test is performed for every 100 to 200 linear feet of paving.

Seismic Design

The Oregon Department of Geology and Mineral Industries (Dogami), Oregon HazVu: 2019 Statewide GeoHazards Viewer indicates that the site is in an area where *very strong* ground shaking is anticipated during an earthquake. Structures should be designed to resist earthquake loading in accordance with the methodology described in the 2015 International Building Code (IBC) with applicable Oregon Structural Specialty Code (OSSC) revisions (current 2014). We recommend Site Class D be used for design per the OSSC, Table 1613.5.2 and as defined in ASCE 7, Chapter 20, Table 20.3-1. Design values determined for the site using the Applied Technology Council (ATC) 2019 Hazards by Location Online Tool are summarized in Table 2, and are based upon existing soil conditions.

Table 2. Recommended Earthquake Ground Motion Parameters (2010 ASCE-7)

Parameter	Value
Location (Lat, Long), degrees	45.218, -122.837
Mapped Spectral Acceleration Values (MCE):	
Peak Ground Acceleration PGA_M	0.451
Short Period, S_s	0.937 g
1.0 Sec Period, S_1	0.42 g
Soil Factors for Site Class D:	
F_a	1.125
F_v	1.58
$SD_s = 2/3 \times F_a \times S_s$	0.703 g
$SD_1 = 2/3 \times F_v \times S_1$	0.443 g
Residential Seismic Design Category	D

Soil liquefaction is a phenomenon wherein saturated soil deposits temporarily lose strength and behave as a liquid in response to earthquake shaking. Soil liquefaction is generally limited to loose, granular soils located below the water table. According to the Oregon HazVu: Statewide Geohazards Viewer, the subject site is regionally characterized as having a high risk of soil liquefaction (DOGAMI:HazVu, 2019).

For construction of single family structures, special design or construction measures are not required by code to mitigate the effects of liquefaction. Multifamily and commercial structures are planned for the Donald Harvest Gardens development. GeoPacific will present the results of our liquefaction analysis addressing the potential adverse effects due to liquefaction, such as vertical settlement, lateral deformation, and lateral spreading in a separate report.

Footing and Roof Drains

Construction should include typical measures for controlling subsurface water beneath the homes, including positive crawlspace drainage to an adequate low-point drain exiting the foundation, visqueen covering the expose ground in the crawlspace, and crawlspace ventilation (foundation vents). The homebuyers should be informed and educated that some slow flowing water in the crawlspaces is considered normal and not necessarily detrimental to the home given these other design elements incorporated into its construction. Appropriate design professionals should be consulting regarding crawlspace ventilation, building material selection and mold prevention issues, which are outside GeoPacific's area of expertise.

Down spouts and roof drains should collect roof water in a system separate from the footing drains to reduce the potential for clogging. Roof drain water should be directed to an appropriate discharge point and storm system well away from structural foundations. Grades should be sloped downward and away from buildings to reduce the potential for ponded water near structures.

If the proposed structures will have a raised floor, and no concrete slab-on-grade floors in living spaces are used, perimeter footing drains would not be required based on soil conditions encountered at the site and experience with standard local construction practices. Where it is desired to reduce the potential for moist crawl spaces, footing drains may be installed. If concrete slab-on-grade floors are used, perimeter footing drains should be installed as recommended below.

Where necessary, perimeter footing drains should consist of 3 or 4-inch diameter, perforated plastic pipe embedded in a minimum of 1 ft^3 per lineal foot of clean, free-draining drain rock. The drain pipe and surrounding drain rock should be wrapped in non-woven geotextile (Mirafi 140N, or approved equivalent) to minimize the potential for clogging and/or ground loss due to piping. A minimum 0.5 percent fall should be maintained throughout the drain and non-perforated pipe outlet. In our opinion, footing drains may outlet at the curb, or on the back sides of lots where sufficient fall is not available to allow drainage to meet the street.

UNCERTAINTIES AND LIMITATIONS

We have prepared this report for the owner and their consultants for use in design of this project only. This report should be provided in its entirety to prospective contractors for bidding and estimating purposes; however, the conclusions and interpretations presented in this report should not be construed as a warranty of the subsurface conditions. Experience has shown that soil and groundwater conditions can vary significantly over small distances. Inconsistent conditions can occur between explorations that may not be detected by a geotechnical study. If, during future site operations, subsurface conditions are encountered which vary appreciably from those described herein, GeoPacific should be notified for review of the recommendations of this report, and revision of such if necessary.

Sufficient geotechnical monitoring, testing and consultation should be provided during construction to confirm that the conditions encountered are consistent with those indicated by explorations. The checklist attached to this report outlines recommended geotechnical observations and testing for the project. Recommendations for design changes will be provided should conditions revealed during construction differ from those anticipated, and to verify that the geotechnical aspects of construction comply with the contract plans and specifications.

Within the limitations of scope, schedule and budget, GeoPacific attempted to execute these services in accordance with generally accepted professional principles and practices in the fields of geotechnical engineering and engineering geology at the time the report was prepared. No warranty, expressed or implied, is made. The scope of our work did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous or toxic substances in the soil, surface water, or groundwater at this site.

We appreciate this opportunity to be of service.

Sincerely,

GEOPACIFIC ENGINEERING, INC.

CERTIFIED OREGON ELIZABETH K. RAPP No. E2190 ENGINEERING GEOLOGIST

BKR 2/1/20

Beth K. Rapp, C.E.G.
Senior Engineering Geologist

REGISTERED PROFESSIONAL ENGINEER 14743PE OREGON JAN. 23, 1990 JAMES D. IMBRIE

EXPIRES: 06/30/2019

James D. Imbrie, G.E., C.E.G.
Geotechnical Engineer

Attachments: References
Figure 1 – Vicinity Map
Figure 2 – Site Plan and Exploration Locations
Test Pit Logs (TP-1 through TP-18)
Laboratory Test Results – Expansion Index of Soils

REFERENCES

Applied Technology Council (ATC), 2019, Hazards by Location Online Tool, https://hazards.atcouncil.org/#/seismic

Atwater, B.F., 1992, Geologic evidence for earthquakes during the past 2,000 years along the Copalis River, southern coastal Washington: Journal of Geophysical Research, v. 97, p. 1901-1919.

Carver, G.A., 1992, Late Cenozoic tectonics of coastal northern California: American Association of Petroleum Geologists-SEPM Field Trip Guidebook, May, 1992.

Gannett, M.W. and Caldwell, R.R., 1998, Geologic framework of the Willamette Lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-A, 32 pages text, 8 plates.

Geomatrix Consultants, 1995, Seismic Design Mapping, State of Oregon: unpublished report prepared for Oregon Department of Transportation, Personal Services Contract 11688, January 1995.

Goldfinger, C., Kulm, L.D., Yeats, R.S., Appelgate, B, MacKay, M.E., and Cochrane, G.R., 1996, Active strike-slip faulting and folding of the Cascadia Subduction-Zone plate boundary and forearc in central and northern Oregon: in Assessing earthquake hazards and reducing risk in the Pacific Northwest, v. 1: U.S. Geological Survey Professional Paper 1560, P. 223-256.

Ma, L., Madin, I.P., Duplantis, S., and Williams, K.J., 2012, Lidar-Based Surficial Geologic Map and Database of the Greater Portland Area, Clackamas, Columbia, Marion, Multnomah, Washington, and Yamhill Counties, Oregon and Clark County, Washington: Oregon Department of Geology and Mineral Industries Open-File Report 0-12-02.

Madin, I.P., 1990, Earthquake hazard geology maps of the Portland metropolitan area, Oregon: Oregon Department of Geology and Mineral Industries Open-File Report 0-90-2, scale 1:24,000, 22 p.

Oregon Department of Geology and Mineral Industries, 2019, Oregon HazVu: Statewide Geohazards Viewer (HazVu): http://www.oregongeology.org/hazvu/

Peterson, C.D., Darioenzo, M.E., Burns, S.F., and Burris, W.K., 1993, Field trip guide to Cascadia paleoseismic evidence along the northern California coast: evidence of subduction zone seismicity in the central Cascadia margin: Oregon Geology, v. 55, p. 99-144.

Unruh, J.R., Wong, I.G., Bott, J.D., Silva, W.J., and Lettis, W.R., 1994, Seismotectonic evaluation: Scoggins Dam, Tualatin Project, Northwest Oregon: unpublished report by William Lettis and Associates and Woodward Clyde Federal Services, Oakland, CA, for U. S. Bureau of Reclamation, Denver CO (in Geomatrix Consultants, 1995).

Werner, K.S., Nabelek, J., Yeats, R.S., Malone, S., 1992, The Mount Angel fault: implications of seismic-reflection data and the Woodburn, Oregon, earthquake sequence of August, 1990: Oregon Geology, v. 54, p. 112-117.

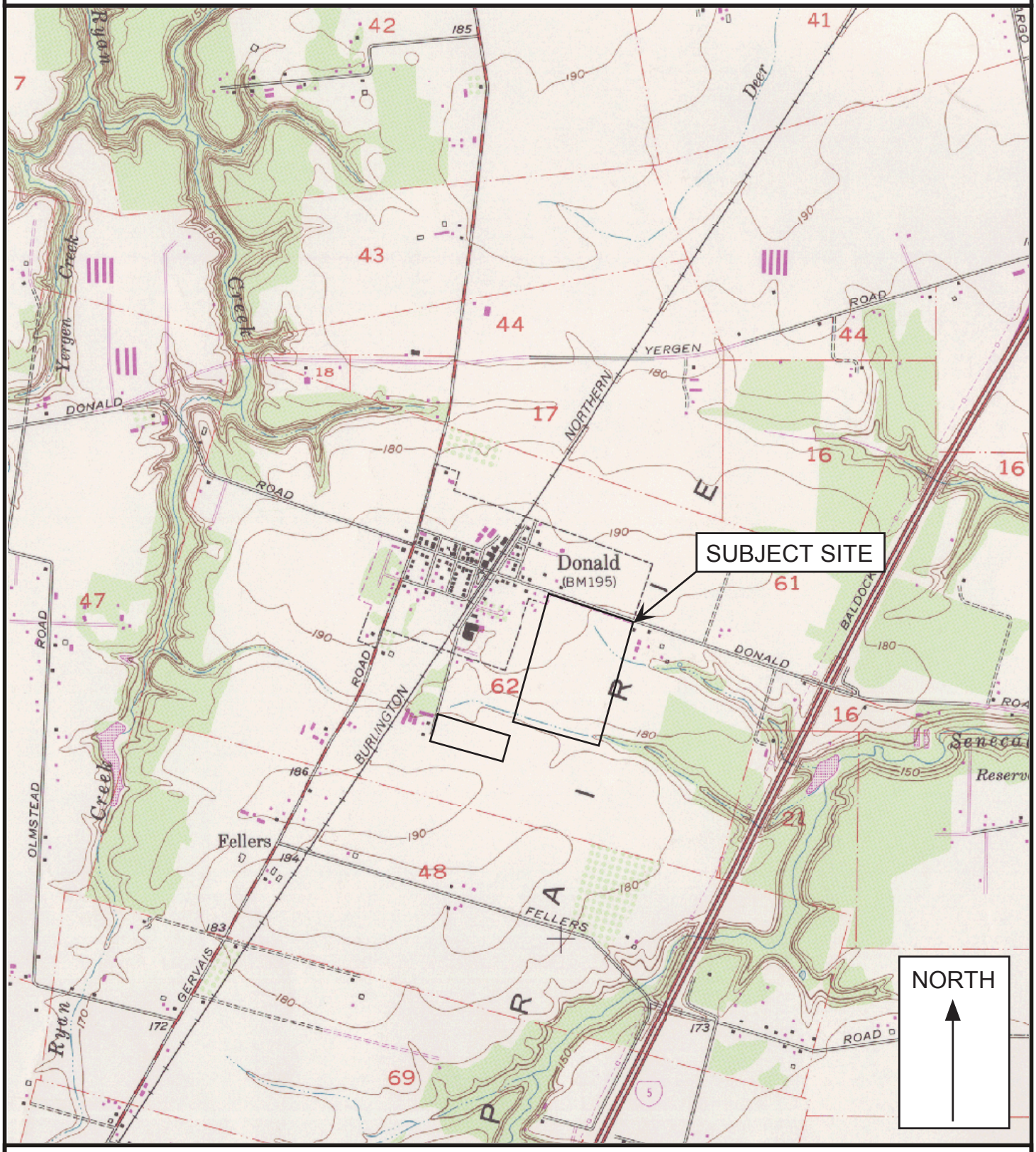
Wong, I. Silva, W., Bott, J., Wright, D., Thomas, P., Gregor, N., Li., S., Mabey, M., Sojourner, A., and Wang, Y., 2000, Earthquake Scenario and Probabilistic Ground Shaking Maps for the Portland, Oregon, Metropolitan Area; State of Oregon Department of Geology and Mineral Industries; Interpretative Map Series IMS-16.

Yeats, R.S., Graven, E.P., Werner, K.S., Goldfinger, C., and Popowski, T., 1996, Tectonics of the Willamette Valley, Oregon: in Assessing earthquake hazards and reducing risk in the Pacific Northwest, v. 1: U.S. Geological Survey Professional Paper 1560, P. 183-222, 5 plates, scale 1:100,000.

Yelin, T.S., 1992, An earthquake swarm in the north Portland Hills (Oregon): More speculations on the seismotectonics of the Portland Basin: Geological Society of America, Programs with Abstracts, v. 24, no. 5, p. 92.

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

VICINITY MAP



Legend

Approximate Scale 1 in = 2,000 ft

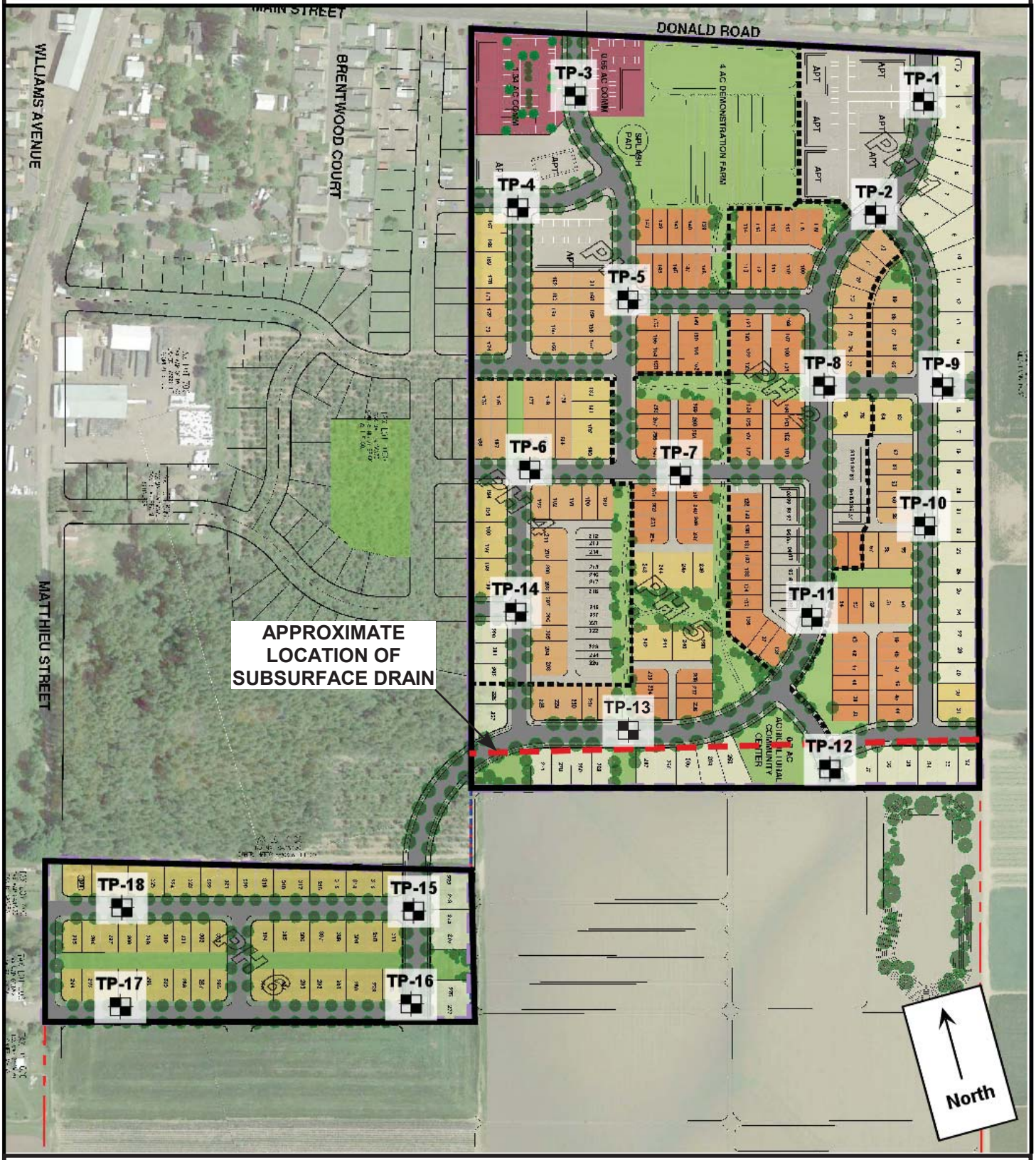
Date: 3/4/2019
Drawn by: EKR

Base map: U.S. Geological Survey 7.5 minute Topographic Map Series, Woodburn, Oregon Quadrangle, 1956 (Revised 1985)

Project: Donald Harvest Gardens Donald, Oregon	Project No. 19-5144	FIGURE 1

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

SITE PLAN AND EXPLORATION LOCATIONS



Legend

TP-1 Test Pit Designation and Approximate Location

CPT-1 CPT Designation and Approximate Location

0 350'

APPROXIMATE SCALE 1"=350'

Date: 3/4/2019
Drawn by: EKR

Project: Donald Harvest Gardens Donald, Oregon	Project No. 19-5144	FIGURE 2

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Donald Harvest Gardens
Donald, Oregon

Project No. 19-5144

Test Pit No. **TP-1**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	1.5					Moderately to highly organic SILT (OL-ML), dark brown, roots throughout, loose, tilled, moist (Topsoil Horizon)
2	2.0					Stiff to very stiff, clayey SILT (ML), light brown, micaceous, subtle to strong orange and gray mottling, moist (Willamette Formation)
3	3.0					
4	3.5					
5						
6						
7						
8						
9						
10						Test Pit Terminated at 10 Feet.
11						
12						Note: Groundwater seepage encountered at 8 and 9 feet. Discharge visually estimated at less than 1/4 gallons per minute.
13						

LEGEND

Bag Sample

Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 2/6/2019
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

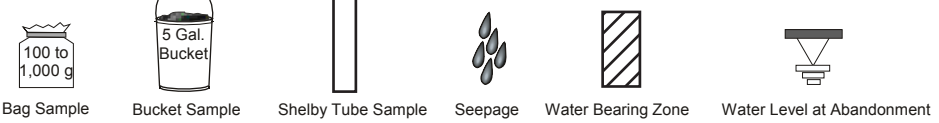
Project: Donald Harvest Gardens
Donald, Oregon

Project No. 19-5144

Test Pit No. **TP-2**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	1.0					Moderately organic SILT (OL-ML), dark brown, roots throughout, loose, tilled, moist (Topsoil Horizon)
2	2.0					Medium stiff to stiff, silty CLAY (CL) to clayey SILT (ML), gray, subtle orange and gray mottling, slightly blocky structure, moist (Willamette Formation)
3	2.5				≈	Stiff to very stiff, clayey SILT (ML), light brown, micaceous, subtle to strong orange and gray mottling, moist (Willamette Formation)
4	3.5					
5						
6						
7						
8						
9						
10						Test Pit Terminated at 10 Feet.
11						
12						Note: Groundwater seepage encountered at 3.5 feet. Discharge visually estimated at less than 1/4 gallons per minute.
13						

LEGEND



Bag Sample | Bucket Sample | Shelby Tube Sample | Seepage | Water Bearing Zone | Water Level at Abandonment

Date Excavated: 2/6/2019
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Donald Harvest Gardens
Donald, Oregon

Project No. 19-5144

Test Pit No. **TP-3**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	1.5					Moderately organic SILT (OL-ML), dark brown, trace fine roots, loose, tilled, moist (Topsoil Horizon)
2	2.0					Medium stiff to stiff, silty CLAY (CL) to clayey SILT (ML), gray, strong orange and gray mottling, slightly blocky structure, moist (Willamette Formation)
3	4.0				≈	Stiff to very stiff, clayey SILT (ML), light brown, micaceous, subtle to strong orange and gray mottling, moist (Willamette Formation)
4	3.5					
5						
6						
7						
8						Becomes sandy SILT (ML) below 8 feet
9						
10						
11						Test Pit Terminated at 10.5 Feet.
12						Note: Groundwater seepage encountered at 3.5 feet. Discharge visually estimated at approximately 1/4 gallons per minute.
13						

LEGEND

Date Excavated: 2/6/2019
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Donald Harvest Gardens
Donald, Oregon

Project No. 19-5144

Test Pit No. **TP-4**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	1.0					Moderately organic SILT (OL-ML), dark brown, trace fine roots, loose, tilled, moist (Topsoil Horizon)
2	1.5					Medium stiff to stiff, silty CLAY (CL) to clayey SILT (ML), gray to brown, strong orange and gray mottling, slightly blocky structure, moist (Willamette Formation)
3	3.5				▽	Stiff to very stiff, clayey SILT (ML), light brown, micaceous, subtle to strong orange and gray mottling, moist (Willamette Formation)
4	3.5					
5						
6						
7						Becomes sandy SILT (ML) below 7 feet
8						
9						
10						Test Pit Terminated at 10 Feet.
11						
12						Note: Groundwater seepage encountered at 3 feet. Discharge visually estimated at approximately 1/4 gallons per minute.
13						

LEGEND

Bag Sample

Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 2/6/2019
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Donald Harvest Gardens
Donald, Oregon

Project No. 19-5144

Test Pit No. **TP-5**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	1.5					Moderately organic SILT (OL-ML), brown, trace fine roots, loose, tilled, moist (Topsoil Horizon)
2	4.0					Stiff to very stiff, silty CLAY (CL) to clayey SILT (ML), gray to brown, strong orange and gray mottling, moist (Willamette Formation)
3	4.0					Stiff to very stiff, clayey SILT (ML), light brown, micaceous, subtle to strong orange and gray mottling, moist (Willamette Formation)
4	3.0					
5						
6						Becomes sandy SILT (ML) below 6.5 feet
7						
8						
9						
10						Test Pit Terminated at 9.5 Feet.
11						Note: Groundwater seepage encountered at 3.5 feet. Discharge visually estimated at approximately 1/4 gallons per minute.
12						
13						

LEGEND

Bag Sample

Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 2/6/2019
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Donald Harvest Gardens
Donald, Oregon

Project No. 19-5144

Test Pit No. **TP-6**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	2.0					Moderately organic SILT (OL-ML), brown, trace fine roots, loose, tilled, moist (Topsoil Horizon)
2	3.5					Stiff to very stiff, silty CLAY (CL) to clayey SILT (ML), gray to brown, strong orange and gray mottling, moist (Willamette Formation)
3	4.0					Stiff to very stiff, clayey SILT (ML), light brown, micaceous, subtle to strong orange and gray mottling, moist (Willamette Formation)
4	3.0					
5						
6						
7						Becomes sandy SILT (ML) below 7 feet
8						
9						
10						Test Pit Terminated at 10 Feet.
11						
12						Note: No seepage or groundwater encountered.
13						

LEGEND

Date Excavated: 2/6/2019
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Donald Harvest Gardens
Donald, Oregon

Project No. 19-5144

Test Pit No. **TP-7**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	1.0					Moderately organic SILT (OL-ML), dark brown, trace fine roots, loose, tilled, moist (Topsoil Horizon)
	2.0					Stiff, silty CLAY (CL) to clayey SILT (ML), gray to brown, moist (Willamette Formation)
2	2.0					
3	3.5					Stiff to very stiff, clayey SILT (ML), light brown, micaceous, subtle to strong orange and gray mottling, trace black staining, moist (Willamette Formation)
4	2.5					
5						
6						
7						Becomes sandy SILT (ML) below 7 feet
8						
9						
10						
11						Test Pit Terminated at 10.5 Feet.
12						Note: No seepage or groundwater encountered.
13						

LEGEND

Bag Sample (100 to 1,000 g) | Bucket Sample (5 Gal. Bucket) | Shelby Tube Sample | Seepage | Water Bearing Zone | Water Level at Abandonment

Date Excavated: 2/6/2019
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

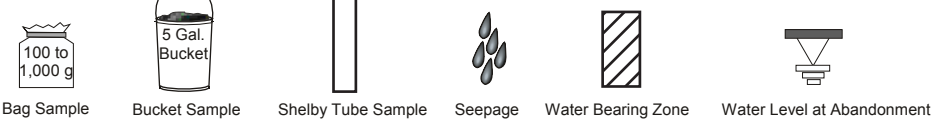
Project: Donald Harvest Gardens
Donald, Oregon

Project No. 19-5144

Test Pit No. **TP-8**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	2.0					Moderately organic SILT (OL-ML), dark brown, trace fine roots, loose, tilled, moist (Topsoil Horizon)
2	3.0					
3	4.5					Stiff to very stiff, clayey SILT (ML), light brown, micaceous, subtle to strong orange and gray mottling, trace black staining, moist (Willamette Formation)
4	3.0					
5						
6						
7						Becomes sandy SILT (ML) below 7 feet
8						
9						
10						
11						Test Pit Terminated at 10.5 Feet.
12						Note: No seepage or groundwater encountered.
13						

LEGEND



Date Excavated: 2/6/2019
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Donald Harvest Gardens
Donald, Oregon

Project No. 19-5144

Test Pit No. **TP-9**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	1.5					Moderately organic SILT (OL-ML), dark brown, trace fine roots, loose, tilled, moist (Topsoil Horizon)
2	2.0					
3	4.5					Stiff to very stiff, clayey SILT (ML), light brown, micaceous, subtle to strong orange and gray mottling, moist (Willamette Formation)
4	4.5					
5						
6						
7						
8						
9						Test Pit Terminated at 9 Feet.
10						Note: No seepage or groundwater encountered.
11						
12						
13						

LEGEND

Bag Sample

Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 2/6/2019
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

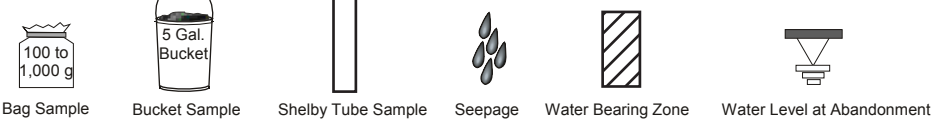
Project: Donald Harvest Gardens
Donald, Oregon

Project No. 19-5144

Test Pit No. **TP-10**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	2.0					Moderately organic SILT (OL-ML), dark brown, trace fine roots, loose, tilled, moist (Topsoil Horizon)
2	3.0					
3	4.0					Stiff to very stiff, clayey SILT (ML), light brown, micaceous, subtle to strong orange and gray mottling, trace black staining, moist (Willamette Formation)
4	4.0					
5						
6						
7						
8						
9						
10						Test Pit Terminated at 10 Feet.
11						Note: No seepage or groundwater encountered.
12						
13						

LEGEND



Date Excavated: 2/6/2019
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Donald Harvest Gardens
Donald, Oregon

Project No. 19-5144

Test Pit No. **TP-11**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	1.0					Moderately organic SILT (OL-ML), dark brown, trace fine roots, loose, tilled, moist (Topsoil Horizon)
2	2.5					
3	3.5					
4	4.0					Medium stiff to very stiff, clayey SILT (ML), light brown, micaceous, subtle to strong orange and gray mottling, trace black staining, moist (Willamette Formation)
5	4.0					
6						
7						
8						
9						
10						Test Pit Terminated at 9.5 Feet.
11						Note: No seepage or groundwater encountered.
12						
13						

LEGEND

Bag Sample (100 to 1,000 g) | Bucket Sample (5 Gal. Bucket) | Shelby Tube Sample | Seepage | Water Bearing Zone | Water Level at Abandonment

Date Excavated: 2/6/2019
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Donald Harvest Gardens
Donald, Oregon

Project No. 19-5144

Test Pit No. **TP-12**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	1.0					Low to moderately organic SILT (OL-ML), brown, trace fine roots, loose, tilled, moist (Topsoil Horizon)
2	3.0					
3	3.5					Stiff to very stiff, SILT (ML), trace clay, light brown, micaceous, subtle orange and gray mottling, trace black staining, moist (Willamette Formation)
4	4.5					
5						
6						
7						Becomes sandy SILT (ML) below 7 feet
8						
9						
10						
11						Test Pit Terminated at 10.5 Feet.
12						Note: No seepage or groundwater encountered.
13						

LEGEND

Date Excavated: 2/6/2019
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Donald Harvest Gardens
Donald, Oregon

Project No. 19-5144

Test Pit No. **TP-13**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	1.0					Moderately organic SILT (OL-ML), dark brown, trace fine roots, loose, tilled, moist (Topsoil Horizon)
	2.0					
2	4.5					Stiff, clayey SILT (ML), gray, strong mottling, moist (Willamette Formation)
3	4.0					Stiff to very stiff, SILT (ML), trace clay, light brown, micaceous, subtle to strong orange and gray mottling, trace black staining, moist (Willamette Formation)
4	3.5					
5						
6						
7						
8						Becomes sandy SILT (ML) below 8 feet
9						
10						
11						Test Pit Terminated at 11 Feet.
12						Note: No seepage or groundwater encountered.
13						

LEGEND

Bag Sample

Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 2/6/2019
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Donald Harvest Gardens
Donald, Oregon

Project No. 19-5144

Test Pit No. **TP-14**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	1.0					Moderately organic SILT (OL-ML), dark brown, trace fine roots, loose, tilled, moist (Topsoil Horizon)
	2.5					
2	3.5					Stiff, clayey SILT (ML), gray brown, strong mottling, moist (Willamette Formation)
3	4.0					Stiff to very stiff, clayey SILT (ML), light brown, micaceous, subtle to strong orange and gray mottling, moist (Willamette Formation)
4	4.5					
5						
6						
7						
8						Becomes sandy SILT (ML) below 8 feet
9						
10						
11						Test Pit Terminated at 10.5 Feet.
12						Note: No seepage or groundwater encountered.
13						

LEGEND

Bag Sample | Bucket Sample | Shelby Tube Sample | Seepage | Water Bearing Zone | Water Level at Abandonment

Date Excavated: 2/6/2019
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Donald Harvest Gardens
Donald, Oregon

Project No. 19-5144

Test Pit No. **TP-15**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	0.5					Moderately organic SILT (OL-ML), dark brown, trace fine roots, loose, tilled, moist (Topsoil Horizon)
	1.5					
2	2.0					Stiff to very stiff, silty CLAY (CL) to clayey SILT (ML), gray to light brown, strong orange and gray mottling, moist (Willamette Formation)
3	4.0					Stiff to very stiff, clayey SILT (ML), light brown, micaceous, subtle to strong orange and gray mottling, moist (Willamette Formation)
4	4.0					
5						
6						Becomes sandy SILT (ML) below 6.5 feet
7						
8						
9						
10						Test Pit Terminated at 10 Feet.
11						
12						Note: No seepage or groundwater encountered.
13						

LEGEND

Bag Sample | Bucket Sample | Shelby Tube Sample | Seepage | Water Bearing Zone | Water Level at Abandonment

Date Excavated: 2/6/2019
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Donald Harvest Gardens
Donald, Oregon

Project No. 19-5144

Test Pit No. **TP-16**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	0.5					Low to moderately organic SILT (OL-ML), dark brown, trace fine roots, loose, tilled, moist (Topsoil Horizon)
	1.0					
2	2.5					
3	4.5					Stiff to very stiff, clayey SILT (ML), light brown, micaceous, subtle to strong orange and gray mottling, moist (Willamette Formation)
4	4.0					
5						
6						
7						
8						
9						Becomes sandy SILT (ML) below 9 feet
10						
11						Test Pit Terminated at 11 Feet.
12						Note: No seepage or groundwater encountered.
13						

LEGEND

Bag Sample

Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 2/6/2019
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

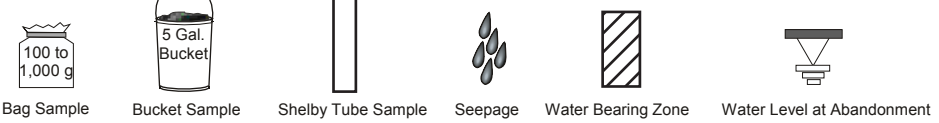
Project: Donald Harvest Gardens
Donald, Oregon

Project No. 19-5144

Test Pit No. **TP-17**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	1.5					Moderately organic SILT (OL-ML), dark brown, trace fine roots, loose, tilled, moist (Topsoil Horizon)
2	2.5					Stiff to very stiff, silty CLAY (CL) to clayey SILT (ML), gray to brown, strong orange and gray mottling, moist (Willamette Formation)
3	3.0					Stiff to very stiff, clayey SILT (ML), light brown, micaceous, subtle to strong orange and gray mottling, moist (Willamette Formation)
4	2.5					
5						
6						
7						
8						Becomes sandy SILT (ML) below 8 feet
9						
10						Test Pit Terminated at 10 Feet.
11						Note: No seepage or groundwater encountered.
12						
13						

LEGEND



Date Excavated: 2/6/2019
Logged By: B. Rapp
Surface Elevation:

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: Donald Harvest Gardens
Donald, Oregon

Project No. 19-5144

Test Pit No. **TP-18**

Depth (ft)	Pocket Penetrometer (tons/ft²)	Sample Type	In-Situ Dry Density (lb/ft³)	Moisture Content (%)	Water Bearing Zone	Material Description
1	1.0					Moderately organic SILT (OL-ML), brown, trace fine roots, loose, tilled, moist (Topsoil Horizon)
	1.0					Low organic SILT (OL-ML), light brown, trace fine roots, loose, tilled, moist (Topsoil Horizon)
2	4.0					
3	3.5					Stiff to very stiff, clayey SILT (ML), light brown, micaceous, subtle to strong orange and gray mottling, trace black staining, moist (Willamette Formation)
4	2.5					
5						
6						
7						
8						
9						Becomes sandy SILT (ML) below 9 feet
10						
11						Test Pit Terminated at 11.5 Feet.
12						Note: No seepage or groundwater encountered.
13						

LEGEND

Bag Sample

Bucket Sample


Shelby Tube Sample


Seepage


Water Bearing Zone


Water Level at Abandonment

Date Excavated: 2/6/2019
Logged By: B. Rapp
Surface Elevation:

Project Name:		Donald Harvest Gardens			
Project #:	19-5144	Sample ID:	S19-014	Depth:	1'-1.5'
Material Type:		Silty Clay			
Material Source:		TP-4			

EXPANSION INDEX ASTM D4829

Initial Height (0.001 in.)	1.000
Initial Moisture Content (0.1%)	15.5
Initial Dry Unit Weight (0.1 lbf/cu.ft.)	92.9
Initial Degree of Saturation (50.0+/-2%)	51.7
Initial Dial Reading (0.001 in.)	0.2496
Final Dial Reading (0.001 in.)	0.1905
Final Moisture Content (0.1%)	32.8
Expansion Index	**59**

Sampled By:	EKR	Tested By:	SJC
Sample Date:	2/7/2019	Tested Date:	2/12/2019

Expansion Index, EI	Potential Expansion
0-20	Very Low
21-50	Low
51-90	Medium
91-130	High
>130	Very High

Moisture Content from Trimmings

Pan #	8	Tare Wt. =	266.3	Moist Wt. + Tare=	423.3
Moisture=	15.5			Dry Wt. + Tare=	402.2

Espansion Ring

2 inch Radius x 1 inch Height= 5.08 cm Radius x 2.54 cm Height

Volume = 205.9 cm^3

Ring Wt. (g) =	369.09	**Moist Density** (g/cm^3) =	1.7
Ring + Sample (g) =	723	**Dry Density** (g/cm^3) =	1.5
		Dry Unit Wt. (lb/ft^3) =	92.9

Degree of Saturation = 51.7

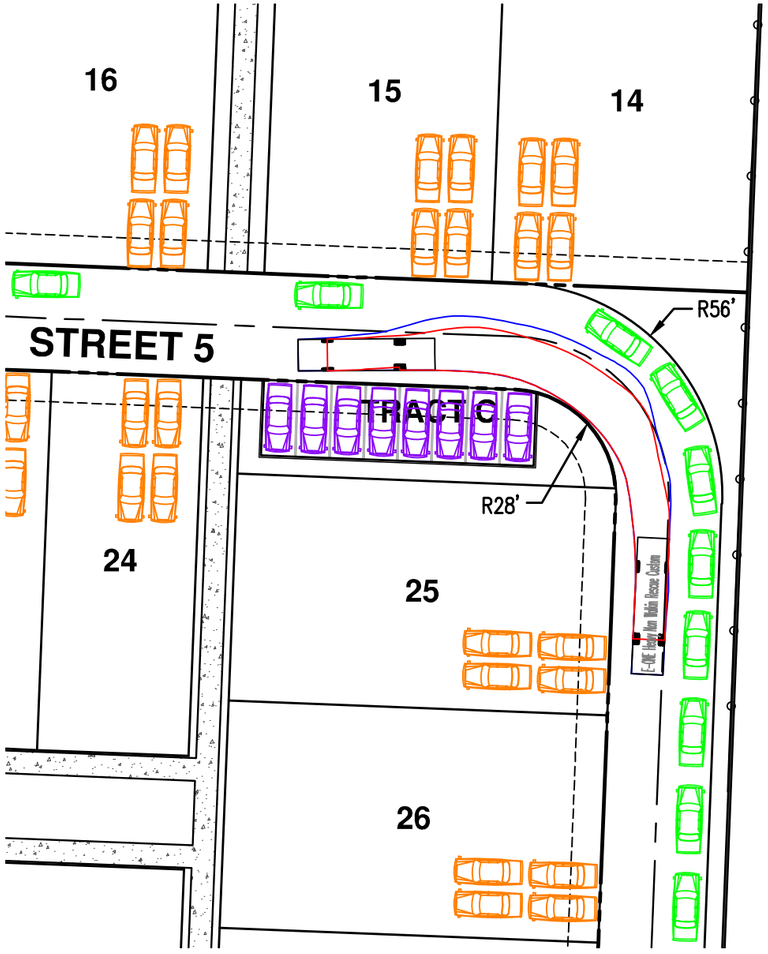
Final Moisture = 32.8

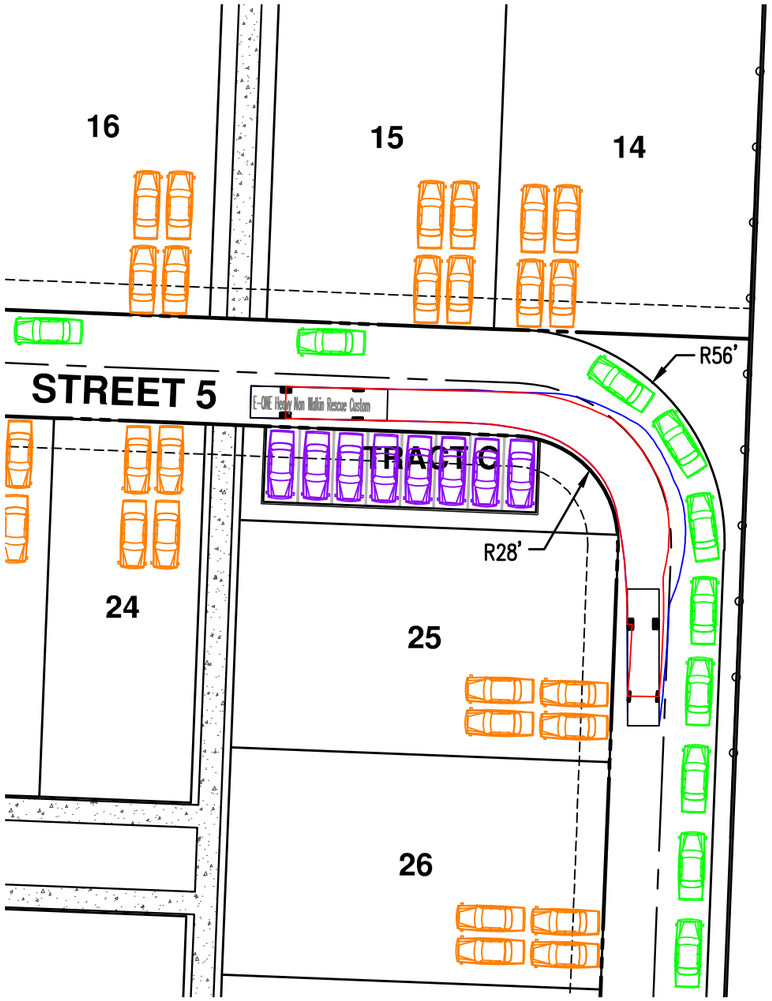
Ring + Sample after soaking (g) =	776.2
Sample after soaking (g)	407.11
Ring + Sample oven dry (g)=	675.6
Sample oven dry (g)	306.51

Expansion Index = 59

Initial Dial Reading (0.001 in.) =	0.2496
Final Dial Reading (0.001 in.) =	0.1905

Exhibit K: Transportation Supplement

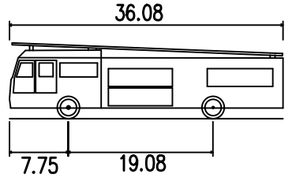




LEGEND

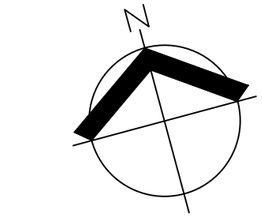
TIRE PATH ENVELOPE

VEHICLE BODY ENVELOPE



E-ONE HEAVY NON WALKIN RESCUE
FIRE TRUCK

	FEET
WIDTH	: 8.33
TRACK	: 8.33
LOCK TO LOCK TIME	: 6.0



SCALE: 1"= 40 FEET

40 0 16 24 32 40

DATE:5/18/2020

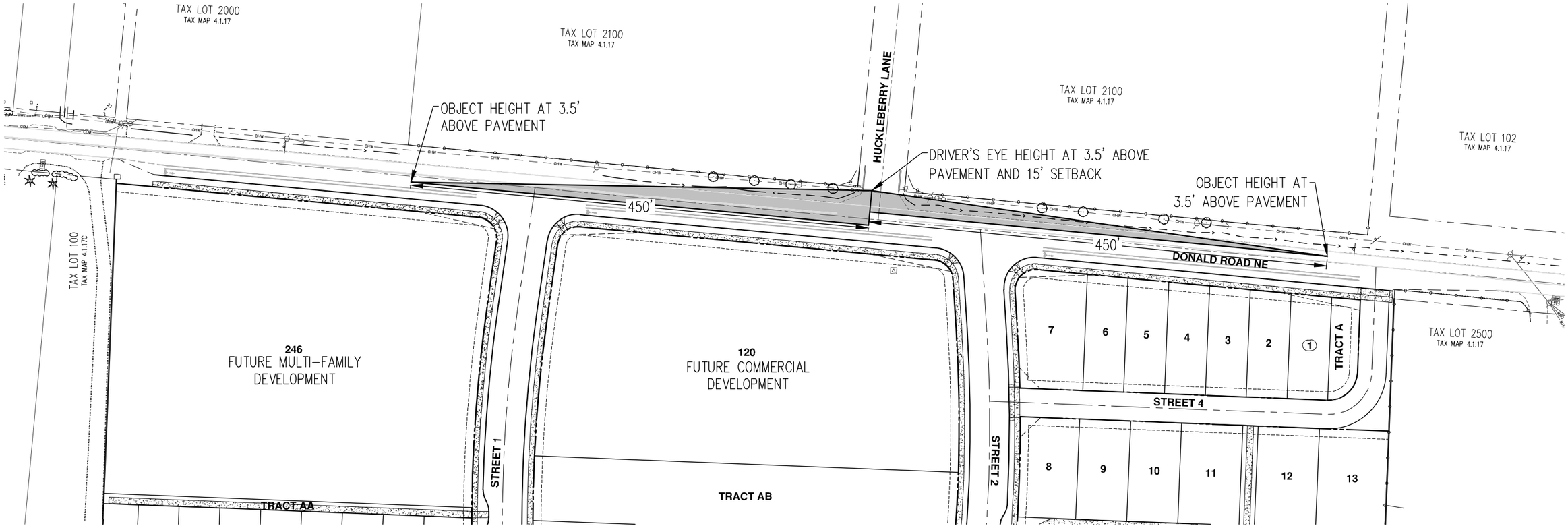
PRELIMINARY TURNING MOVEMENTS

HARVEST GARDENS PUD

EXHIBIT **A**

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151 WWW.AKS-ENG.COM

DRWN: JMS
CHKD: AHH
AKS JOB: 6732



ANALYSIS PARAMETERS:
DESIGN SPEED: 45 MPH
DISTANCE FROM EYE TO EDGE OF TRAVELLED WAY: 15'
MEASURED INTERSECTION SIGHT DISTANCE: 450'

N

SCALE: 1"=100 FEET

100 0 40 60 80 100

DATE: 5/18/2020

PRELIMINARY HUCKLEBERRY LANE SIGHT DISTANCE	EXHIBIT **A**
HARVEST GARDENS PUD	
AKS ENGINEERING & FORESTRY, LLC 12965 SW HERMAN RD, STE 100 TUALATIN, OR 97062 503.563.6151 WWW.AKS-ENG.COM	DRWN: JMS CHKD: AHH AKS JOB: 6732

DWG: 6732 PRELIM SIGHT DISTANCE EXHIBIT | LAYOUT1

Exhibit L: Project Overview

Harvest Gardens Homestead

A Willamette Valley Agri-hood Community Development

Agrihood Vision

People understand the role that food plays in health, well-being and social interactions. Most of life's moments such as holidays, weddings, birthdays, graduations, anniversaries all center on food.

Our vision is to create a community surrounded by beautiful vistas of the Willamette Valley surrounding a working farm. Nature, food, community and lifelong learning are all a part of a sustainable living environment.

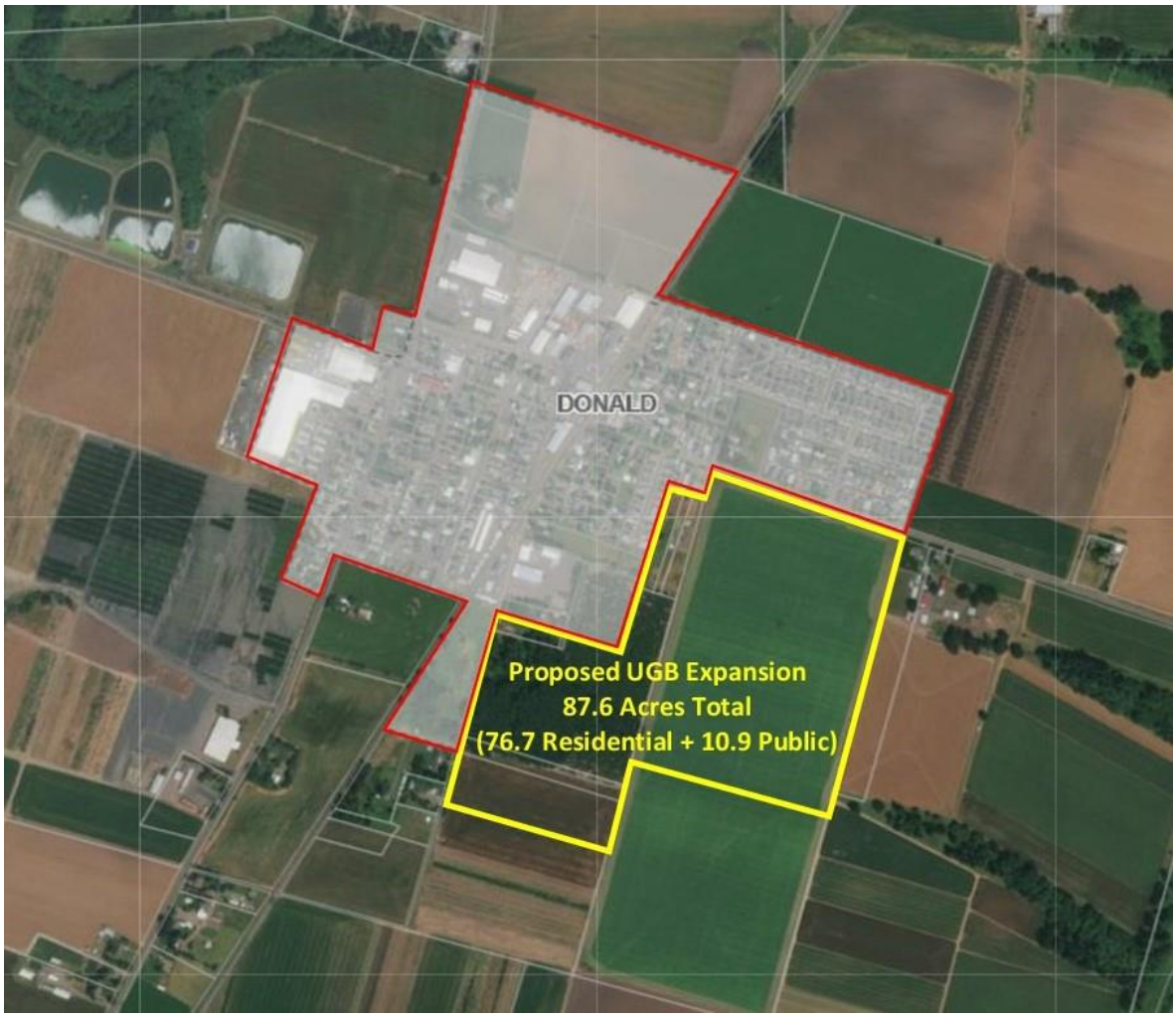
A working farm is the central feature of the community with a mix of homes styles and sizes, farm focused amenities and farm focused commercial space to enrich the relationship with food while also supporting the farm.

Active, healthy, whole foods and sustainability are integral part of the daily 'agri-hood' lifestyle.

All pictures in this presentation are for illustrations purposes only and do not reflect actual structures or designs of the Harvest Gardens Homestead.

Layout & Design Concept

The Urban Growth Boundary expansion of 87.6 acres will allow for a development of ***Harvest Gardens Homestead – a Willamette Valley Agri-hood.*** A total of 61.62 acres planned for homes/multi-family houses, 10.5 acres of open greenspace and two acres of commercial space.



The layout has been designed around the main garden, shaped like an hour glass through the neighborhood. Each street off the main garden will also have open shared green space between homes. The main community space, with garden views and farmers market, will be located off of Main Street an act as a welcoming entrance to the community.

TOTAL PROJECT: 61.62 Acres

OPEN SPACE: 10.5 Acres

COMMERCIAL: 2 Acres

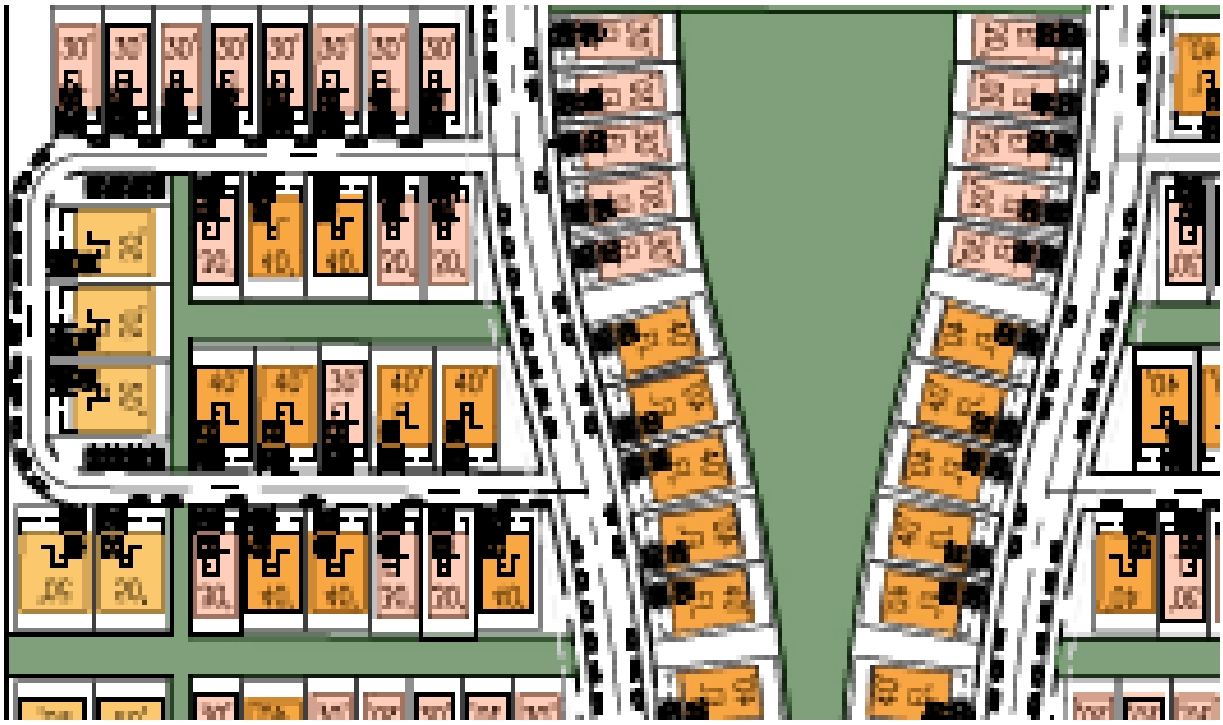
TOTAL PROJECT:	61.62 Acres
OPEN SPACE:	10.5 Acres
COMMERCIAL:	2 Acres
MULTI-FAMILY UNITS:	80
HOUSING UNITS:	297 Single Family Homes
PARKING:	1188 garages/driveways 515 on-street parking, 5.73 per lot
GRAND TOTAL:	**377 Grand Total** of houses and multi-family units

Home / Apartment Designs

Harvest Gardens is currently reviewing a variety of home designs with 3 or 4 bedrooms, 2 bathrooms with open floor plans – both single and two story homes. A variety of sizes of homes may include small cottage homes with 1300-1500 sq. feet, medium sized homes with 1500-2000 sq. feet and the largest homes with approximately 2500+ sq. feet. Different house fronts will allow for variation in designs so they will not look like the exact same house or floor plan. Interior packages come in 4 or 5 different color schemes. Harvest Garden Homestead is targeting 'workforce housing' with price points between upper $200k to low $400k keeping within area income levels. A small number of apartments/townhomes are planned for those individuals not ready or interested in home ownership but still want to participate and enjoy the farming environment.

Shared Greenspace (aka ‘Pocket Parks’)

Since lots are 30, 40 and 50 feet wide, we have added ‘open green-space’ around the main garden and between each row of homes. Almost all homes have a back facing patio area that is open to the green space throughout the neighborhood.



Community Center/Retail Space

The long-term vision of the development includes some form of 'farm focused' retail space that could take the form of a farmers' market, home farm store and farm-to-table restaurant. The plan includes a second story to the retail area for rentable community meeting space and to host special events. Many homes will need to be sold before this space is designed and built. In the interim we envision a seasonal farmers market stand.

CSA Program

Community Supported Agriculture (CSA) Rather than purchasing food at the store, you can become a "member" of the farm by paying for a share of produce at the beginning of the season. In return for your membership, you receive a weekly share of seasonal fruits and vegetables. By becoming a member of the CSA, your family is a shareholder with an essential stake in the farm.

Community Garden/Rent Your Garden Spot

Community gardens grow healthy food and help develop strong neighborhoods. Gardening can be an enriching experience to help families and individuals learn sustainable practices, understand their local climate and support their own food supply.

Community gardens do much more than just grow fresh, healthy produce. They bring people together across age, experiences, as well as cultural and economic barriers. They unify neighborhoods, improve our health and add beauty to our environment.

Harvest Gardens is devoted to teaching people how to grow their own food using best practices. Rentable raised bed growing spaces will be available to residents of the Agri-hood. We will offer 'How To" garden workshops to help people learn about the benefits and rewards of growing food and gardening.

Smart Home Technology

Harvest Garden Homestead will feature also 'Smart Home Technology' which is the use of devices in the home that connect via a network, most commonly a local LAN or the internet.

Smart home technology allows users to control and monitor their connected home devices from Smart home apps, smartphones, or other networked devices. Security, energy, lighting, windows, garage door, appliances and more!

Other Amenities

Other special amenities include: kids playground area, open fields, walking trails, community gathering areas (i.e. fire pit, gazebos).

Special Events

Harvest Garden Homestead will host several annual and seasonal events to encourage residents to participate and attract others interested in learning more about Harvest Gardens Homestead development.

Events may include: Farm-to-table dinners, wine tasting events, food preparation or canning events, harvesting style events such as pumpkin patch, strawberry socials and possibly a Farm Camp for grade-school aged children.

In Summary

Agrihood Vision – A planned community designed around a working farm that adds to the value of daily living and provides a direct connection to the value of growing food.

Layout & Design Concept - A layout of homes and multi-family housing units that are surround by open green spaces, gardens and special amenities that add value to the neighborhood and community.

Home Designs – A variety of popular floor plans that most working-families desire and have varying fronts that will add character to the community.

Shared Greenspace (aka 'Pocket Parks') – Harvest Gardens will feature over 10 acres of shared green space, walking trails, gathering areas, and amenities.

Community Center/Retail Space – The future vision includes a community center featuring farm focused retail space; such as a farmers market, farm to table restaurant and farm style home store. A second story to the facility could include rentable meeting space. Interim plans include a seasonal 'farmers market' stand until a facility can be built.

CSA Program – As an added benefit to living in the community, a weekly box of food can be purchased for a small fee with all proceeds going back to support farming on the property.

Community Garden/Rent Your Garden Spot – Another great benefit will be the ability to participate in learning and growing your own food by renting space within the community garden and attending classes and seminars on 'how to grow, cultivate and harvest' your own food.

Smart Home Technology - Smart home technology will be a special feature which allows users to control and monitor their connected home devices from Smart home apps, smartphones, or other networked devices. Such things like security, energy, lighting, windows, garage door, appliances - all via smart home technology.

Amenities - Other special amenities may include a kids playground area, open fields, walking trails, community gathering areas (i.e. fire pit, gazebos).

Special Events - Harvest Garden Homestead will host several annual and seasonal events to encourage residents to participate and attract others interested in learning more about Harvest Gardens Homestead.

Exhibit M: DSL Wetland Determination

Oregon
Kate Brown, Governor

Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279
(503) 986-5200
FAX (503) 378-4844
www.oregon.gov/dsl

August 28, 2019

GRC Land Holdings, LLC
Attn: Joann Agee
PO Box 427
Donald, OR 97020

Re: WD # 2019-0278 **Approved**
Wetland Delineation Report for Harvest Gardens;
Marion County; T4W R1W S17 TL 2600 (Portion);
T4W R1W S20 TL 300 (Portion);

Dear Ms. Agee:

The Department of State Lands has reviewed the wetland delineation report prepared by AKS Engineering & Forestry, LLC for the site referenced above. Please note that the study area includes only a portion of the tax lots described above (see the attached maps). Based upon the information presented in the report, and additional information submitted upon request, we concur with the waterway boundaries as mapped in revised Figure 5 of the report. Please replace all copies of the preliminary wetland map with this final Department-approved map.

Within the study area one waterway (Drainage 1) was identified. Drainage 1 is piped beneath the study area and is only subject to the permit requirements of the state Removal-Fill Law should relocation of the piped drainage be proposed. Under current regulations, a state permit is required for cumulative fill or annual excavation of 50 cubic yards or more in wetlands or below the ordinary high-water line (OHWL) of the waterway (or the 2-year recurrence interval flood elevation if OHWL cannot be determined).

This concurrence is for purposes of the state Removal-Fill Law only. We recommend that you attach a copy of this concurrence letter to any subsequent state permit application to speed application review. Federal or local permit requirements may apply as well. The U.S. Army Corps of Engineers will determine jurisdiction under the Clean Water Act, which may require submittal of a complete Wetland Delineation Report.

Please be advised that state law establishes a preference for avoidance of wetland impacts. Because measures to avoid and minimize wetland impacts may include reconfiguring parcel layout and size or development design, we recommend that you

work with Department staff on appropriate site design before completing the city or county land use approval process.

This concurrence is based on information provided to the agency. The jurisdictional determination is valid for five years from the date of this letter unless new information necessitates a revision. Circumstances under which the Department may change a determination are found in OAR 141-090-0045 (available on our web site or upon request). In addition, laws enacted by the legislature and/or rules adopted by the Department may result in a change in jurisdiction; individuals and applicants are subject to the regulations that are in effect at the time of the removal-fill activity or complete permit application. The applicant, landowner, or agent may submit a request for reconsideration of this determination in writing within six months of the date of this letter.

Thank you for having the site evaluated. If you have any questions, please contact the Jurisdiction Coordinator for Marion County, Daniel Evans, at (503) 986-5271

Sincerely,

Peter Ryan
Digitally signed by Peter Ryan
Date: 2019.08.28 08:10:53 -07'00'

Peter Ryan, PWS
Aquatic Resource Specialist

Enclosures

ec: Stacey Reed, AKS Engineering & Forestry, LLC
Marion County Planning Department
Kinsey Friesen, Corps of Engineers
Mike DeBlasi, DSL

WETLAND DELINEATION / DETERMINATION REPORT COVER FORM

This form must be included with any wetland delineation report submitted to the Department of State Lands for review and approval. A wetland delineation report submittal is not "complete" unless the fully completed and signed report cover form and the required fee are submitted. Attach this form to the front of an unbound report or include a hard copy of the completed form with a CD/DVD that includes a single PDF file of the report cover form and report (minimum 300 dpi resolution) and submit to: **Oregon Department of State Lands, 775 Summer Street NE, Suite 100, Salem, OR 97301-1279.** A single PDF attachment of the completed cover from and report may be e-mailed to **Wetland_Delineation@dsl.state.or.us**. For submittal of PDF files larger than 10 MB, e-mail instructions on how to access the file from your ftp or other file sharing website. Fees can be paid by check or credit card. Make the check payable to the Oregon Department of State Lands. To pay the fee by credit card, call 503-986-5200.

☐ Applicant ☒ Owner Name, Firm and Address: GRC Land Holdings, LLC Attn: Joann Agee PO Box 427 Donald OR 97020 RECEIVED MAY 13 2019	Business phone # 503-678-5525 Mobile phone # (optional) **503-703-9066** E-mail: mmader@gkmachine.com
☐ Authorized Legal Agent, Name and Address: RECEIVED $ 454.00 DEPARTMENT OF STATE LANDS #32055	Business phone # Mobile phone # E-mail:

I either own the property described below or I have legal authority to allow access to the property. I authorize the Department to access the property for the purpose of confirming the information in the report, after prior notification to the primary contact.

Typed/Printed Name: **Joann Agee** Signature: Joann Agee

Date: **5/7/2019** Special instructions regarding site access: NA

Project and Site Information (using decimal degree format for lat/long., enter centroid of site or start & end points of linear project)

Project Name: Harvest Gardens	Latitude: 45.~~13624~~ 216939 Longitude: -122.~~50918~~ 934925
Proposed Use: Residential Development	Tax Map # 4 1W 17 Tax Lot(s) Portion of 2600
	Tax Map # 4 1W 20 Tax Lot(s) Portions of 300 and 2600
Project Street Address (or other descriptive location): Donald Road, east of Brentwood Court.	Tax Map # Tax Lot(s)
	Township 4N Range 1W Section 17 & 20 QQ
City: Donald County: Marion	Waterway: N/A River Mile:

Wetland Delineation Information

Wetland Consultant Name, Firm and Address: Stacey Reed, PWS AKS Engineering & Forestry, LLC 12965 SW Herman Rd, Ste 100 Tualatin, OR 97062	Phone # (503) 563-6151 Mobile phone # E-mail: staceyr@aks-eng.com

The information and conclusions on this form and in the attached report are true and correct to the best of my knowledge.

Consultant Signature: Stacey Reed Date: 5/8/19

Primary Contact for report review and site access is ☒ Consultant ☐ Applicant/Owner ☐ Authorized Agent

Wetland/Waters Present? ☐ Yes ☒ No | Study Area size: 8.48 acres | Total Wetland Acreage: None

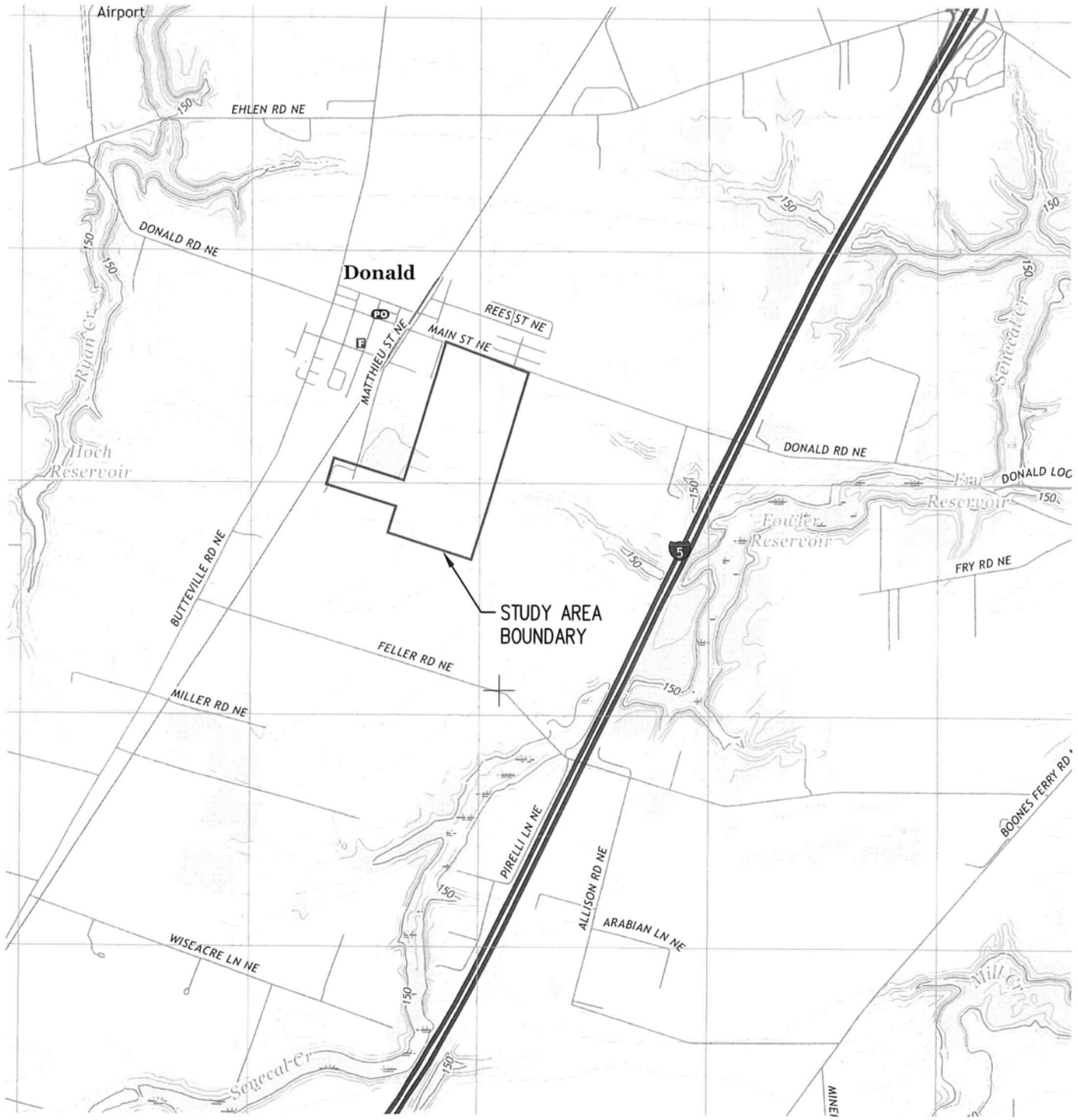
Check Box Below if Applicable:	**Fees:**
☐ R-F permit application submitted	☒ Fee payment submitted $ 454
☐ Mitigation bank site	☐ Fee ($100) for resubmittal of rejected report
☐ Wetland restoration/enhancement project (not mitigation)	☐ No fee for request for reissuance of an expired report
☐ Industrial Land Certification Program Site	
☐ Reissuance of a recently expired delineation Previous DSL # Expiration date ____	

Other Information:	Y	N	
Has previous delineation/application been made on parcel?	☐	☒	If known, previous DSL #
Does LWI, if any, show wetland or waters on parcel?	☐	☒	

For Office Use Only

DSL Reviewer: DE	Fee Paid Date: 5/13/19	DSL WD # 2019-0278
Date Delineation Received: 5/13/19	DSL Project #	DSL Site #
Scanned: ☐ Final Scan: ☐	DSL WN #	DSL App. #

P#78172



USGS 7.5' TOPOGRAPHIC SERIES
QUADRANGLE: WOODBURN, OR (2017)

N

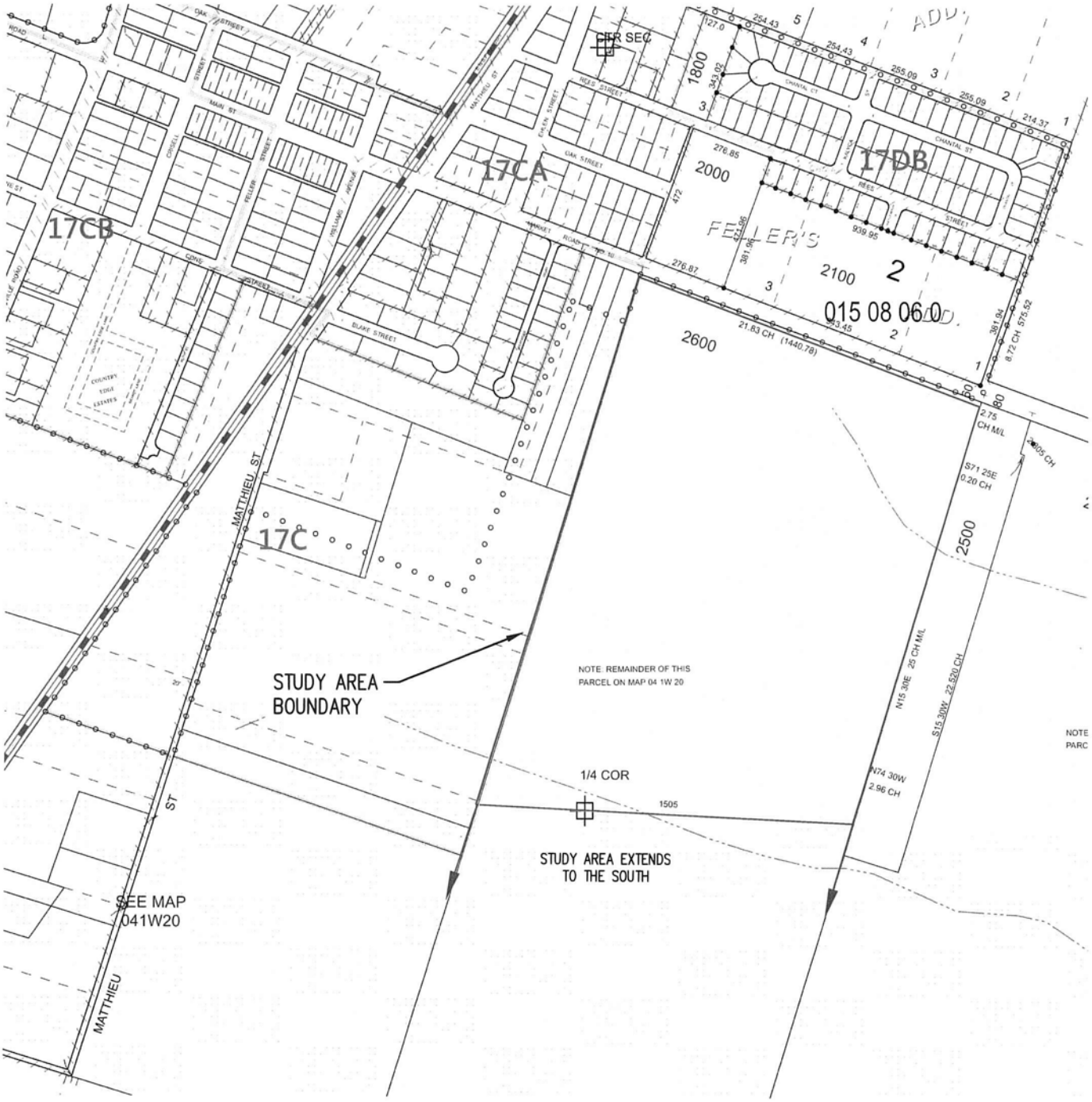
SCALE: 1"= 2000 FEET

2000 0 800 1200 1600 2000

DATE: 04/02/2019

USGS VICINITY MAP HARVEST GARDENS WETLAND DETERMINATION REPORT	FIGURE 1
AKS ENGINEERING & FORESTRY, LLC 12965 SW HERMAN RD SUITE 100 TUALATIN, OR 97062 www.aks-eng.com PHONE: 503.563.6151 FAX: 503.563.6152	DRWN: SAS CHKD: SAR AKS JOB: 6732

DWG: 6732 NRA BACKGROUND FIGURES | FIGURE 1



N

SCALE: 1"= 500 FEET

500 0 200 300 400 500

MARION COUNTY
PORTION OF TAX LOT 2600
MAP 04 1W 17

DATE: 04/02/2019

TAX MAP (MAP 04 1W 17)
HARVEST GARDENS WETLAND DETERMINATION REPORT

FIGURE **2A**

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD SUITE 100
TUALATIN, OR 97062 www.aks-eng.com
PHONE: 503.563.6151 FAX: 503.563.6152

DRWN: SAS
CHKD: SAR
AKS JOB: 6732

MARION COUNTY
PORTIONS OF TAX LOT 300
AND 2600
TAX MAP 04 1W 20

DATE: 04/02/2019

TAX MAP (MAP 04 1W 20)
HARVEST GARDENS WETLAND DETERMINATION REPORT

FIGURE **2B**

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD SUITE 100
TUALATIN, OR 97062 www.aks-eng.com
PHONE: 503.563.6151 FAX: 503.563.6152

DRWN: SAS
CHKD: SAR
AKS JOB: 6732

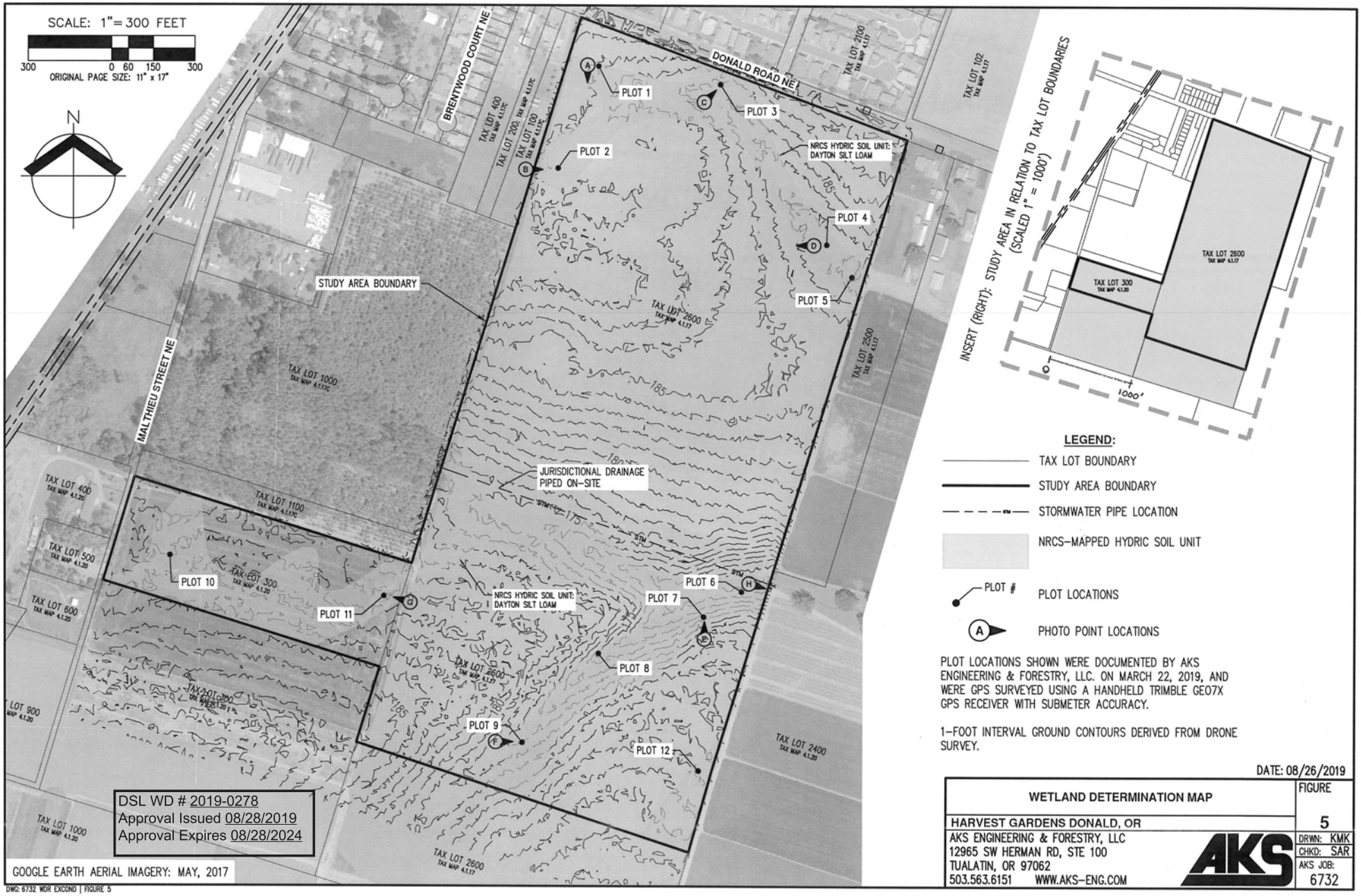
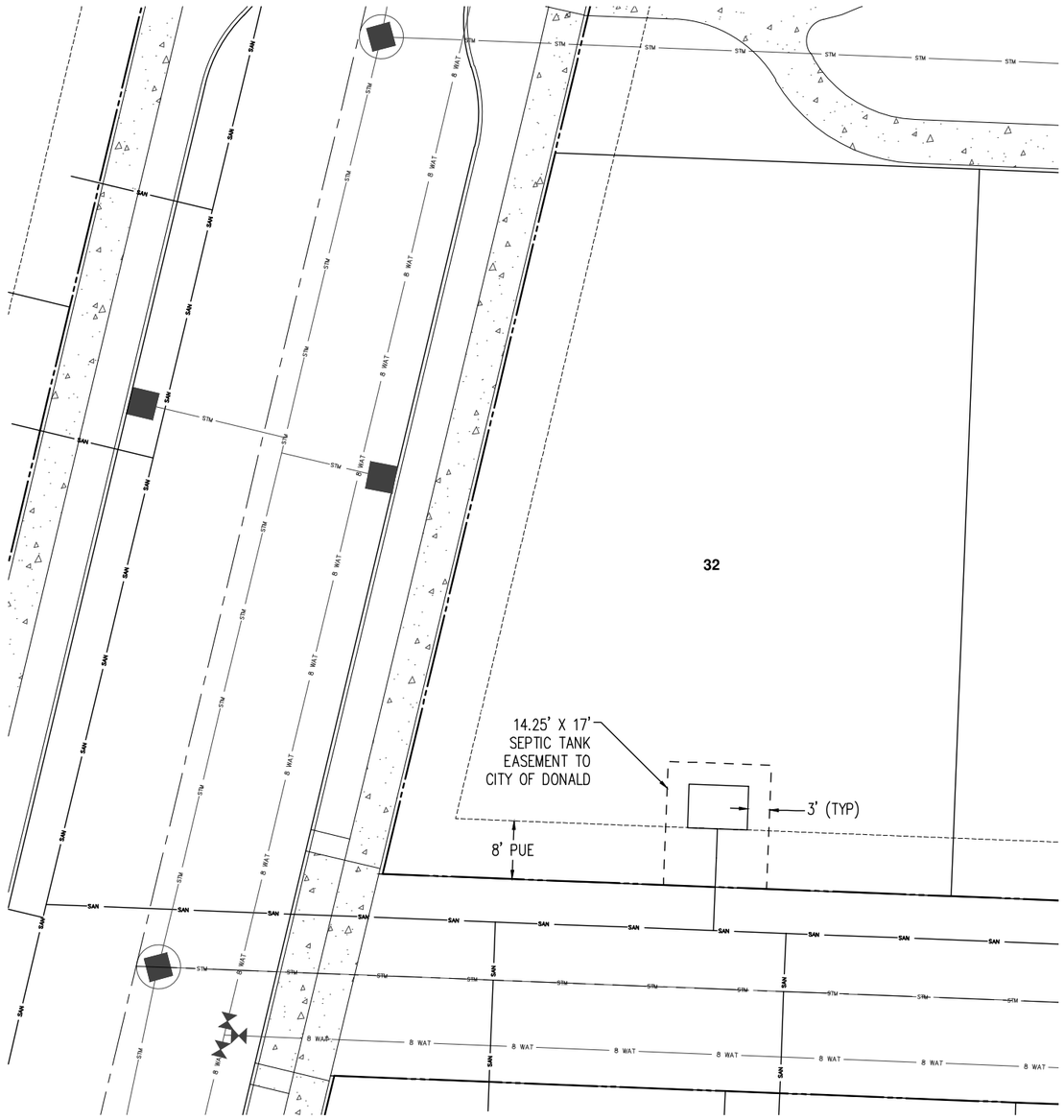
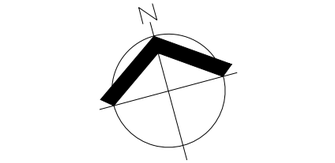

SCALE: 1"= 300 FEET
300 0 60 150 300
ORIGINAL PAGE SIZE: 11" x 17"
N
BRENTWOOD COURT NE
DONALD ROAD NE
MALTHIEU STREET NE
STUDY AREA BOUNDARY
JURISDICTIONAL DRAINAGE PIPED ON-SITE
NRCS HYDRIC SOIL UNIT: DAYTON SILT LOAM
PLOT 1
PLOT 2
PLOT 3
PLOT 4
PLOT 5
PLOT 6
PLOT 7
PLOT 8
PLOT 9
PLOT 10
PLOT 11
PLOT 12
TAX LOT 1000
TAX LOT 1100
TAX LOT 2600
TAX LOT 2500
TAX LOT 2400
TAX LOT 2100
TAX LOT 102
TAX LOT 400
TAX LOT 200
TAX LOT 100
TAX LOT 300
TAX LOT 500
TAX LOT 600
TAX LOT 900
DSL WD # 2019-0278
Approval Issued 08/28/2019
Approval Expires 08/28/2024
GOOGLE EARTH AERIAL IMAGERY: MAY, 2017
INSERT (RIGHT): STUDY AREA IN RELATION TO TAX LOT BOUNDARIES
(SCALED 1" = 1000')
0
1000'
LEGEND:
TAX LOT BOUNDARY
STUDY AREA BOUNDARY
STORMWATER PIPE LOCATION
NRCS-MAPPED HYDRIC SOIL UNIT
PLOT # PLOT LOCATIONS
PHOTO POINT LOCATIONS
PLOT LOCATIONS SHOWN WERE DOCUMENTED BY AKS ENGINEERING & FORESTRY, LLC. ON MARCH 22, 2019, AND WERE GPS SURVEYED USING A HANDHELD TRIMBLE GEO7X GPS RECEIVER WITH SUBMETER ACCURACY.
1-FOOT INTERVAL GROUND CONTOURS DERIVED FROM DRONE SURVEY.
DATE: 08/26/2019
WETLAND DETERMINATION MAP
FIGURE 5
HARVEST GARDENS DONALD, OR
AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151 WWW.AKS-ENG.COM
AKS
DRWN: KMK
CHKD: SAR
AKS JOB: 6732
DWG: 6732 WDR EXCOND | FIGURE 5

Exhibit N: Septic Tank Detail





SCALE: 1"= 20 FEET

20 0 4 10 20

DATE: 6/1/2020

TYPICAL LOT SEPTIC TANK LAYOUT	EXHIBIT A
HARVEST GARDENS	
AKS ENGINEERING & FORESTRY, LLC 12965 SW HERMAN RD, STE 100 TUALATIN, OR 97062 503.563.6151 WWW.AKS-ENG.COM	DRWN: JMS CHKD: AHH AKS JOB: 6732

DWG: 6732 STEP SYSTEM EXHIBIT | B