

**UMATILLA CITY COUNCIL
REPORT AND DECISION
FOR
PLAN AMENDMENT PA-3-20**

DATE OF HEARING: July 20, 2021

REPORT PREPARED BY: Jacob Foutz, Associate Planner

I. GENERAL INFORMATION AND FACTS

Applicant: Cleaver Land, LLC, 78757 Westland Rd, Hermiston, OR 97838

Land Use Review: A Zone Change application.

II. NATURE OF REQUEST AND GENERAL FACTS

The applicant, Cleaver Land, LLC, is requesting approval of a Zone Change that would rezone 294 acres of Single-Family Residential designation to Light Industrial. The proposed zoning designation of Light Industrial will support the types of uses – data centers, warehousing and light manufacturing – outlined in the Economic Opportunities Analysis completed by Johnson Economics that clearly indicates that the City of Umatilla needs large lot industrial parcels. The applicant also submitted an Annexation and UGB applications with the desired outcome to have approximately 450 acres of land planned and zoned for industrial use. Current use of the property is agricultural. Crops under circle pivot irrigation regularly in rotation are potatoes, onions, corn, and grass seed. Improvements to the property include circle pivot irrigation systems and a general use storage building.

Applicants Intended Outcomes of Application Process:

The applicant is working with the City of Umatilla to achieve approval of three applications – an Urban Growth Boundary (UGB) expansion, an Annexation, and a Zone Change – with the desired outcome to have some 450 acres of available land planned and zoned for industrial use. The UGB expansion will add about 150 acres to the UGB; the Annexation will add those same acres within the City Limits; and those actions combined with a Zone Change will add about 450 acres to the industrial land supply. The proposed zoning designation of Light Industrial will support the types of uses – data centers, warehousing and light manufacturing – outlined in the Economic Opportunities Analysis completed by Johnson Economics that indicates that the City of Umatilla is in need of large lot industrial parcels. On page 43 of the Economic Opportunities Analysis it states, “For industrial users, there is an estimated deficit of sites of some sizes. Most notably there is a deficit of suitable large industrial sites, and a deficit of small industrial sites.” This statement is expanded on pages 44 and 45 providing more definition to the needs. At the top of page 45 the report states, “Given the projected short-term growth, and prospective long-term growth in this industry [data centers], Johnson Economics estimates a need for at least two sites of 100+ acres meeting serviceability requirements for data center or large manufacturing users, and at least two sites site of 50+ acres.” Johnson Economics also states on page 41 the following,

“...this does not address the more specific site needs from specific categories of employment land users. Some of the forecasted growth includes employers who may have specific site needs and preferences that are not reflected in the available buildable inventory, even though *in total* the available parcels sum to a significant amount. In particular, there is forecasted demand for more suitable large-lot industrial sites while relatively few of these sites were found in the inventory.” The Johnson Economics provided Economic Opportunities Analysis, while using acreage ranges to discuss needs, does acknowledge that needs for large lots over 100 acres might easily mean upwards of 200 acres for any single user. Examples are a data center request at more than 120 acres and the Walmart Distribution Center at 190 acres. This would also be applicable to the range of 50 to 99.9 acres which could result in users needing 65 acres or 92 acres, an example being the FedEx freight distribution facility at 62.5 acres.

This suite of applications seeks to add 450 acres to the industrial land inventory for the City of Umatilla, meeting this need with the ability to also meet future needs for smaller lot or clustered industrial development which is also identified as a need. The Johnson Economics report on page 45 states the following about small lots, “There is also a projected need from small industrial firms for smaller sites. It is also common for these types of users to also be accommodated in multi-tenant industrial buildings on larger sites.”

The zone change component of this suite of applications does propose to rezone approximately 294 acres from Residential to Industrial. In 2019 the City of Umatilla completed a Goal 10 update that included a buildable lands inventory and a Housing Strategies Report (2019) that indicates an overabundance of residential land. Removal of 294 acres of residential land from the inventory does not negatively impact the land supply for residential development in the 20-year planning period, leaving a continuing surplus of approximately 750 acres.

III. ANALYSIS

The criteria applicable to this request are shown in underlined text and the responses are shown in standard text. All of the following criteria must be satisfied in order for this request to be approved.

City of Umatilla Title 10 Zoning Chapter 14 Administrative Provisions Section 10-14-4: APPLICATION provides the following requirements.

A permit application may only be initiated by the record property owner or contract purchaser, the City Council, or the Planning Commission. The City will not accept an application without the signed authorization from all record owners.

Applicants Response: Included with this application package is the required form signed by the record owner.

Conclusion: This application was initiated and signed by the record owner.

A. All permit applications shall be submitted on a form provided by the City, along with all necessary supporting documentation and information sufficient to demonstrate compliance with all applicable approval criteria and standards, and the appropriate fee. The applicant has the burden of demonstrating, with evidence, that all approval criteria and standards are, or can be, met.

Applicants Response: The City of Umatilla required application is included along with narratives with responses discussing how the applicant has or can meet the requirements. Also included are the attachments referenced throughout.

Conclusion: The included application and narratives meet the above criterion.

B. A complete application includes all the materials listed in this Section and any specific information requested for a particular permit. The City Administrator may waive the submission of any of the materials if not deemed to be applicable to the specific review sought. Likewise, within thirty (30) days of submission of the application, the City Administrator may require additional information beyond that listed in this subsection, such as a traffic report or other study prepared by an appropriate expert. The applicant is responsible for the completeness and accuracy of the application and all supporting documentation.

Applicants Response: Submitted to the City of Umatilla are the narratives which includes responses providing evidence of the applicant's ability to meet the criteria, the required application form, the City of Umatilla Economic Opportunities Analysis dated November 2019 and other attachments in support of this request.

Conclusion: The application has been deemed complete.

1. A completed City application form that includes:

- a. An accurate legal description, tax account number(s), map number, and street location of all properties that are the subject of the application.*
- b. Name, address, telephone number, and authorized signature(s) of all record property owners or contract owners, and the name, address, and telephone number of the applicant, if different from the property owner(s).*

Applicants Response: The required applications, including this information and required signatures, is included with these narratives.

Conclusion: The application has been deemed complete.

2. A complete list of all City permit approvals sought by the applicant in this application.

Applicants Response: The applicant is requesting an urban growth boundary expansion, annexation of that same property, and a change in zoning of the subject property, proposing to apply a Comprehensive Plan and Zoning designation of M1 Light Industrial. No specific developments are proposed at this time.

Conclusion: The application has been deemed complete.

3. A complete and detailed narrative describing the proposed development, existing site conditions, public facilities and services, natural features including wetlands and steep slopes, a discussion of the approval criteria and standards for all permits explaining how the criteria and standards are, or can be, met, and any other information indicated by the City at the pre-application conference as being required.

Applicants Response: The applicant is requesting concurrently an urban growth boundary expansion, an annexation of that same property, and a change in Comprehensive Plan and Zoning designation to Light Industrial of the subject site. Provided to the City of Umatilla are the necessary applications signed by the landowner, narratives in support of each application, and various attachments that support the requests which includes the 2019 Economic Opportunities Analysis.

Conclusion: The application has been deemed complete.

4. A site plan or plans and a vicinity map, drawn to scale. The site plan shall include at least the following features, along with any other information necessary to understand the proposal:

- a. Dimensions of the site and all structures, existing and proposed.
- b. Existing conditions, including topography and any other physical features such as vegetation, wetlands, watercourses, slopes, etc.
- c. Rights of way abutting the site, whether public or private, and access to the site.
- d. Locations and sizes of all public utilities, existing and proposed, on and in the vicinity of the site.
- e. Locations, dimensions, and purposes of all recorded easements.
- f. Size of areas (in square feet) and percentages of the total site area devoted to structures, parking, landscaping, open space, dedication of right of way, and any other proposed feature.
- g. Proposed landscaping plan, including size, species, and location of plants or other elements.
- h. Parking plan.
- i. Detail of screening and fencing.
- j. Exterior lighting, including location, type, height, and areas of illumination.
- k. Service areas for trash collection, mail delivery, etc.

Applicants Response: Included with these applications are vicinity maps that include the identified features currently in place and a conceptual layout of proposed uses (see the Umatilla Industrial Area Utility Technical Memorandum for representation of the potential future development of the subject property). There is no proposed development with this request for a change in zoning. Future development components such as landscaping, parking, fences, lighting and service areas are difficult to locate with certainty. Those features would be evaluated under the Light Industrial M1 zoning at the time of development. Both the Umatilla Industrial Area Utility Technical Memorandum and the Traffic Impact Analysis provide evidence that industrial development is feasible and can be accomplished safely.

Conclusion: There is no proposed development with this request for a change in zoning. A site plan is not required for a change in zoning.

5. The applicant shall provide the City with up to twenty (20) copies of all reports, plans, site plans, and other documents required by this Section. The number of copies will be determined at the pre-application conference. One copy of all plans and maps reduced to

eight and one-half inches by eleven inches (8 1/2" x 11") or eleven inches by seventeen inches (11" x 17"), and suitable for reproduction.

Applicants Response: The applicant has provided to the City of Umatilla the required and requested components in support of these applications for an urban growth boundary expansion, annexation, and change of zoning.

Conclusion: The application is deemed complete.

6. All required application fees.

Applicants Response: The applicant has provided to the City of Umatilla the required application fees in support of these applications for an urban growth boundary expansion, annexation, and a change of zoning.

Conclusion: All required application fees have been received.

City of Umatilla Title 10 Zoning Chapter 13 Other Permits and Actions Section 10-14-4: AMENDMENTS TO THE ZONING TEXT OR MAP provides the following requirements.

A. Type IV Procedure: Amendments to the zoning title text or Official Map are considered a Type IV procedure. A Map change may be legislative or quasi-judicial, depending on the number of properties and area involved. A text change is always a legislative decision.

Applicants Response: This is a single owner application for a change in zoning and can be considered as a quasi-judicial request.

Conclusion: This application has been processed as both quasi-judicial as well as legislative. At the base level it is a legislative application because of the map change, but due to the specificity of where it is located it has also been processed using the quasi-judicial process. Both methods have been applied in the application making it a “quasi-judicial legislative decision”. The Planning Commission will make a recommendation to the City Council and not make the final decision.

B. Initiation of Application: An application may be initiated by a property owner or authorized agent, the Planning Commission, or the City Council.

Applicants Response: The landowner is the applicant for this change in zoning (and other related actions).

Conclusion: The property owner submitted the application for a change in zoning.

C. Narrative, Identification Required: An application shall include a narrative that demonstrates compliance with the approval criteria and a site and vicinity map identifying the property and adjacent properties.

Applicants Response: This serves to meet the narrative requirement.

Conclusion: A sufficient narrative was submitted for this application.

D. Approval Criteria: An amendment to this Title or Official Map shall comply with the following criteria:

1. The proposed designation is consistent with and supports the purposes of the portions of the City's Comprehensive Plan not proposed for amendment, or circumstances have changed to justify a change in the Comprehensive Plan.

Applicants Response: Since the City of Umatilla initially adopted the Comprehensive Plan and Zoning Ordinance several changes have taken place that should be considered when reviewing this application – the Oregon Department of Transportation, in cooperation with the Federal Highway Administration, has built Interstate 82 and in October 2019 the City of Umatilla completed an Economic Opportunities Analysis revealing a need for additional large lot industrial land. This request seeks to amend the Comprehensive Plan and Zoning designation to Light Industrial on approximately 450 acres of land to meet that need for large lot industrial lands at a location that has easy access to Interstate 82.

Conclusion: This application is consistent with and supports the City of Umatilla's Comprehensive Plan not proposed for amendment. PA-1-20 will amend the Comprehensive plan to adopt the EOA. This request is consistent with the EOA.

2. The proposed change will not affect the land supply for the existing zoning designation as related to projected need for the particular land use.

Applicants Response: A portion of the subject property is concurrently being added to the urban growth boundary, with approximately 300 acres of residential land being proposed to be converted. Based upon the included Housing and Residential Land Needs Assessment, adopted by the City of Umatilla in 2019, there is a significant oversupply of residential land specific to single family residential use. This proposed change in zoning from Residential to Industrial would reduce that need, but not below the 20-year planning horizon required to be included in an inventory under Oregon law. There would still be approximately 750 acres of overabundance in the inventory.

Conclusion: Based on the 2019 Housing Strategies Report, adopted by the City of Umatilla as part of a Goal 10 update, there is an overabundance of land zoned for single family residential development. The Housing and Residential Land Need Assessment (HNA) found that the City currently has an 873 acres surplus of residential lands in our single-family residential zone. All of the land proposed to be rezoned is currently zoned single family residential and the City would retain a 550+ acres surplus in the single-family zone, and a 750+ acre surplus of residential lands in general. The needed inventory of residential lands will not be negatively affected by the approval of this application. The proposed change will affect the land supply but not reduce it below the 20-year planning horizon required to be included in an inventory under Oregon law.

3. The proposed designation will not negatively impact existing or planned public facilities and services.

Applicants Response: The City of Umatilla evaluated the subject property for delivery of public services – potable water, sanitary sewer, potable water storage and industrial wastewater – and has determined that services can be provided to support the types of large lot industrial uses being proposed (data centers, warehousing and light manufacturing). The Umatilla Industrial Area Utility Technical Memorandum, dated March 9, 2020, is attached to support this conclusion.

Conclusion: Public facilities and services will be able to be provided to the subject site according to The Umatilla Industrial Area Utility Technical Memorandum.

4. The site is suitable for the proposed use, considering the topography, adjacent streets, access, size of the site, availability of public facilities, and any other pertinent physical features.

Applicants Response: The site is mostly flat with significant frontage along Powerline Road, providing access to a minor arterial with direct access to Interstate 82. There is a portion of the 450-acre site that is limited by steep slopes on the eastern edge as the property slopes to Interstate-82. Depending on how development proceeds internal streets could be considered to limit impacts to Powerline Road and facilitate development of the 450-acre site. Based on earlier responses public facilities are or can be available and have the capacity to serve the types of proposed uses.

Conclusion: There is no proposed use at this time. The proposed rezone is to meet the need for large lot industrial sites. The submitted documents show it is feasible to provide services to the site.

5. Other sites in the City or the vicinity are unsuitable for the proposed use. In other words, ownership and desire to develop a particular use in themselves provide insufficient rationale for changing a zoning designation that does not support the interests of the City as a whole.

Applicants Response: The companion application for an urban growth boundary expansion includes significant discussion that addresses this criterion, specifically the discussion around study areas and the alternatives analysis. The applicant has concluded in that application that this location is the best, and possibly only, location that could accommodate large lot industrial opportunities.

Conclusion: PA-2-20 addresses how other sites are considered and shown to not meet the needs of a location that could accommodate large lot industrial opportunities. As part of the UGB analysis no other sites were identified that could accommodate the need for large lot industrial.

The City of Umatilla Rezone Application poses the following additional questions when a rezone is requested.

Explain why this particular parcel(s) of property should be rezoned as opposed to utilizing existing zoned property for proposed use.

Applicants Response: The October 2019 Economic Opportunities Analysis discusses the need for additional large lot industrial land. That need, with the access the subject property has to Powerline Road and Interstate 82, creates a location that can create employment opportunity within the City of Umatilla with limited impacts. The alternatives analysis in the Urban Growth Boundary application concludes that this location is best, and possibly only site, suited to the identified needs.

Conclusion: The applicants above response is sufficient for the purposes of the question.

What is the land use plan designation for this property on the Comprehensive Plan map?

Applicants Response: A portion is not zoned currently by the City of Umatilla as it is part of the companion request for an urban growth boundary expansion and annexation. Its current zoning is Exclusive Farm Use. The balance is designated and zoned for single family residential uses.

Conclusion: The applicants above response is sufficient for the purposes of the question.

If there is a conflict between the plan map and the desired zone, how can a change be justified?

Applicants Response: There are two considerations in resolving any conflict. First the October 2019 Economic Opportunities Analysis discusses a lack of land for large lot industrial uses. The focus of potential uses for the subject property is data centers, warehousing and light manufacturing, meeting the outlined needs. The second consideration is that the reduction of land zoned for residential purposes will not negatively impact the 20-year supply of residential land based on the analysis in the Housing Strategies Report (2019).

Conclusion: The applicants above response is sufficient for the purposes of the question.

What policies or facts in the Comprehensive Plan and/or Zoning Code relate to use of the property after the zone is changed?

Applicants Response: The City of Umatilla is in the process of updating the Comprehensive Plan relative to Goal 9 with the intent of adopting the Economic Opportunities Analysis, which includes findings supportive of this application to create large lot industrial opportunities. New policies that are suggested for adoption would be applicable to future development.

The Development Code, specifically Title 10 Zoning, would have several factors that would relate to the use of the subject property after these applications have been approved and are in place. Within the Industrial Districts of Chapter 5, the Light Industrial Uses Permitted and Conditional Uses Permitted lists would define those allowable uses; the Development Standards would outline a variety of development criteria and would require screening and a variety of dimensional standards. Other provisions of the Zoning Ordinance would be applicable including Chapter 9 Off-Street Parking and Loading, Chapter 11 Supplementary Provisions and Chapter 13 Other Permits and Actions. All these provisions would be applied under the requirements of Chapter 14 Administrative Provisions.

Conclusion: The applicants above response is sufficient for the purposes of the question. Goal 9

updates can be found in PA-1-20.

Explain how the surrounding property is zoned.

Applicants Response: The property to the north will retain its residential zoning, most of which is zoned R1 Single Family Residential. To the south and west, land outside the urban growth boundary is zoned Exclusive Farm Use with zoning south of Interstate 82 a combination of 20 and 40-acre Exclusive Farm Use designations. This application is not proposing changes to those areas or current designations.

Conclusion: The applicants above response is sufficient for the purposes of the question.

Explain how this same property is used at present.

Applicants Response: The subject property is currently farmed with circle pivot irrigation improvements in place. That use would continue until such time that a development opportunity is identified.

Conclusion: The applicants above response is sufficient for the purposes of the question.

If the zone of your property is changed, explain how any permitted use of that district will be compatible with the surrounding property.

Applicants Response: Light Industrial zoning, with a focus on data centers, warehousing and light manufacturing, located along Powerline Road with access to Interstate 82 within a mile or so to the south allows for employment and economic opportunities with limited impacts to residential uses to the north along Powerline Road and downtown activities in the core of the City of Umatilla. Traffic along Powerline Road will increase over time based on the Traffic Impact Analysis (J-U-B Engineers, May 2020). However, that same Traffic Impact Analysis also found that the change in zoning from residential to industrial decreased future traffic volumes at buildout as traffic impacts are lower for the industrial uses proposed when compared to residential uses. The proposed industrial activities are compatible with the agricultural uses to the west and south of the subject property; the potential development of food processing would be allowable under current exclusive farm use zoning to the west and south. This proposal would create an opportunity for that type of development with the support of city services that otherwise would not be available. The anticipated activities, as outlined in the October 2019 Economic Opportunities Analysis, do not tend to have associated negative impacts such as noxious odors, steam or other discharges. Landscaping requirements of the Light Industrial use zone would provide vegetative or other barriers to residential activities to the north.

Conclusion: Any potential development would mitigate any negative effects by enforcing standards through a Site Plan Review. There is no reason to believe that a light industrial zoning designation would not be compatible with the surrounding property.

Have any changes taken place which would make the zone change appropriate now rather than at an earlier date? You may consider such things as development of surrounding properties or similarly zoned property, new streets, sewer or water lines, and so forth. Please explain more fully.

Applicants Response: The release of the Economic Opportunities Analysis in October 2019 is a significant input into the decision to consider this zone change. Recent increases in residential development along Powerline Road and in the McNary area also provide evidence that the City of Umatilla is growing, which provides additional workforce that can reasonably lead to more interest from companies seeking new development opportunities. Also, to be considered is the effort to provide public services to the Umatilla Army Depot property further to the south, with proposed improvements to be installed along Powerline Road, creating possible synergy around economic development.

Conclusion: The Economic Opportunities Analysis completed in October 2019 identified new needs that were not known or identified at an earlier date.

Additional Information to be Furnished by Applicant:

Evidence that applicant is owner or purchaser of the property or has written permission from the owner to file the application.

Applicants Response: The application form is signed by the property owner.

Conclusion: The applicants above response is sufficient for the purposes of the criterion.

Two copies of plans and specifications, drawn to scale, showing the actual shape and dimensions of the lot to be built upon; the sizes and locations on the lot of existing and proposed structures; the intended use of each structure, the number of families, if any, to be accommodated thereon; the relationship of the property to the surrounding area, the location of any existing highways, streets, easements and public utilities.

Applicants Response: The applicant has provided the application forms, this narrative and the required maps and exhibits to the City of Umatilla as requested.

Conclusion: The City has received the required application forms, narrative, maps, and exhibits.

Portions of Oregon Revised Statute 227.175 concerned with applications to local governments for a permit or zone change are applicable. Much of ORS 227. 175 has already been incorporated into the City of Umatilla Zoning Ordinance and is implemented through a variety of measures including notice provisions and hearing procedures.

227.175 Application for permit or zone change; fees; consolidated procedure; hearing; approval criteria; decision without hearing.

(1) When required or authorized by a city, an owner of land may apply in writing to the hearings officer, or such other person as the city council designates, for a permit or zone change, upon such forms and in such a manner as the city council prescribes. The governing body shall establish fees charged for processing permits at an amount no more than the actual or average cost of providing that service.

Applicants Response: The applicant is submitting three applications, this one for the change in

zoning, on the forms prescribed, paying the required fees, and providing this narrative addressing these and the other requirements in both Oregon law and the law of the City of Umatilla. The two companion applications are for an urban growth boundary expansion and an annexation of the same property.

Conclusion: The correct forms and fees have been submitted to the City of Umatilla as required by the City of Umatilla City Council.

(2) The governing body of the city shall establish a consolidated procedure by which an applicant may apply at one time for all permits or zone changes needed for a development project. The consolidated procedure shall be subject to the time limitations set out in ORS 227.178. The consolidated procedure shall be available for use at the option of the applicant no later than the time of the first periodic review of the comprehensive plan and land use regulations.

Applicants Response: The applicant is using this provided opportunity to apply for an urban growth boundary expansion, annexation, and change in zoning in a consolidated process. The urban growth boundary expansion does require co-adoption by Umatilla County.

Conclusion: The established procedure in the JMA has been and will continue to be followed. The City will submit subsequent application to the County for co-adoption.

(3) Except as provided in subsection (10) of this section, the hearings officer shall hold at least one public hearing on the application.

Applicants Response: The applicant understands that these actions will be heard by the Planning Commission and the City Council as they are legislative in nature.

Conclusion: The City of Umatilla Planning Commission will hold a hearing on this and the other applications on August 25, 2020. The City of Umatilla City Council will hold a hearing on this and the other applications on September 15, 2020.

(4)

(a) A city may not approve an application unless the proposed development of land would be in compliance with the comprehensive plan for the city and other applicable land use regulation or ordinance provisions. The approval may include such conditions as are authorized by ORS 227.215 or any city legislation.

(b)

(A) A city may not deny an application for a housing development located within the urban growth boundary if the development complies with clear and objective standards, including clear and objective design standards contained in the city comprehensive plan or land use regulations.

(B) This paragraph does not apply to:

(i) Applications or permits for residential development in areas described in ORS 197.307 (5); or

(ii) Applications or permits reviewed under an alternative approval process adopted under ORS 197.307 (6).

(c) A city may not condition an application for a housing development on a reduction in

density if:

(A) The density applied for is at or below the authorized density level under the local land use regulations; and

(B) At least 75 percent of the floor area applied for is reserved for housing.

(d) A city may not condition an application for a housing development on a reduction in height if:

(A) The height applied for is at or below the authorized height level under the local land use regulations;

(B) At least 75 percent of the floor area applied for is reserved for housing; and

(C) Reducing the height has the effect of reducing the authorized density level under local land use regulations.

(e) Notwithstanding paragraphs (c) and (d) of this subsection, a city may condition an application for a housing development on a reduction in density or height only if the reduction is necessary to resolve a health, safety or habitability issue or to comply with a protective measure adopted pursuant to a statewide land use planning goal.

Notwithstanding ORS 197.350, the city must adopt findings supported by substantial evidence demonstrating the necessity of the reduction.

(f) As used in this subsection:

(A) "Authorized density level" means the maximum number of lots or dwelling units or the maximum floor area ratio that is permitted under local land use regulations.

(B) "Authorized height level" means the maximum height of a structure that is permitted under local land use regulations.

(C) "Habitability" means being in compliance with the applicable provisions of the state building code under ORS chapter 455 and the rules adopted thereunder.

Applicants Response: The applicant has, primarily through this application narrative and the urban growth boundary narrative, provided evidence that the City of Umatilla Comprehensive Plan is considered and can be met when this request is approved. There are no housing developments requested as part of this application.

Conclusion: As found in this narrative and the UGB narrative, there is evidence that the City of Umatilla Comprehensive Plan is considered and can be met.

(5) Hearings under this section may be held only after notice to the applicant and other interested persons and shall otherwise be conducted in conformance with the provisions of ORS 197.763.

Applicants Response: The applicant supports compliance with required notice provisions and meeting the needs of Statewide Planning Goal 1 Citizen Involvement.

Conclusion: The City of Umatilla has sent notice to the required recipients in conformance with the provisions ORS 197.763.

(6) Notice of a public hearing on a zone use application shall be provided to the owner of an airport, defined by the Oregon Department of Aviation as a "public use airport" if:

(a) The name and address of the airport owner has been provided by the Oregon Department of Aviation to the city planning authority; and

(b) The property subject to the zone use hearing is:

(A) Within 5,000 feet of the side or end of a runway of an airport determined by the Oregon Department of Aviation to be a “visual airport”; or

(B) Within 10,000 feet of the side or end of the runway of an airport determined by the Oregon Department of Aviation to be an “instrument airport.”

Applicants Response: The applicant is not aware of any airports within the identified distance of the subject property. To the east the Hermiston Airport and to the west the Boardman Airport are both several miles away, neither within 10,000 feet. There is a farm-based gravel airstrip to the west and south of the subject site that would function as a “visual airport” but does not further meet the definition of an airport.

Conclusion: There are no airports within 10,000 feet of the subject property.

(7) Notwithstanding the provisions of subsection (6) of this section, notice of a zone use hearing need only be provided as set forth in subsection (6) of this section if the permit or zone change would only allow a structure less than 35 feet in height and the property is located outside of the runway “approach surface” as defined by the Oregon Department of Aviation.

Applicants Response: This is not applicable.

Conclusion: The above criterion is not applicable.

(8) If an application would change the zone of property that includes all or part of a mobile home or manufactured dwelling park as defined in ORS 446.003, the governing body shall give written notice by first class mail to each existing mailing address for tenants of the mobile home or manufactured dwelling park at least 20 days but not more than 40 days before the date of the first hearing on the application. The governing body may require an applicant for such a zone change to pay the costs of such notice.

Applicants Response: No mobile homes or manufactured dwelling park is located on the subject property.

Conclusion: The above criterion is not applicable.

(9) The failure of a tenant or an airport owner to receive a notice which was mailed shall not invalidate any zone change.

Applicants Response: No tenants are on the property and no airports are adjacent to the subject property.

Conclusion: The above criterion is not applicable.

(10)

(a)

(A) The hearings officer or such other person as the governing body designates may approve or deny an application for a permit without a hearing if the hearings officer or other designated person gives notice of the decision and provides an

opportunity for any person who is adversely affected or aggrieved, or who is entitled to notice under paragraph (c) of this subsection, to file an appeal.

(B) Written notice of the decision shall be mailed to those persons described in paragraph (c) of this subsection.

(C) Notice under this subsection shall comply with ORS 197.763 (3)(a), (c), (g) and (h) and shall describe the nature of the decision. In addition, the notice shall state that any person who is adversely affected or aggrieved or who is entitled to written notice under paragraph (c) of this subsection may appeal the decision by filing a written appeal in the manner and within the time period provided in the city's land use regulations. A city may not establish an appeal period that is less than 12 days from the date the written notice of decision required by this subsection was mailed. The notice shall state that the decision will not become final until the period for filing a local appeal has expired. The notice also shall state that a person who is mailed written notice of the decision cannot appeal the decision directly to the Land Use Board of Appeals under ORS 197.830.

(D) An appeal from a hearings officer's decision made without hearing under this subsection shall be to the planning commission or governing body of the city. An appeal from such other person as the governing body designates shall be to a hearings officer, the planning commission or the governing body. In either case, the appeal shall be to a de novo hearing.

(E) The de novo hearing required by subparagraph (D) of this paragraph shall be the initial evidentiary hearing required under ORS 197.763 as the basis for an appeal to the Land Use Board of Appeals. At the de novo hearing:

(i) The applicant and other parties shall have the same opportunity to present testimony, arguments and evidence as they would have had in a hearing under subsection (3) of this section before the decision;

(ii) The presentation of testimony, arguments and evidence shall not be limited to issues raised in a notice of appeal; and

(iii) The decision maker shall consider all relevant testimony, arguments and evidence that are accepted at the hearing.

(b) If a local government provides only a notice of the opportunity to request a hearing, the local government may charge a fee for the initial hearing. The maximum fee for an initial hearing shall be the cost to the local government of preparing for and conducting the appeal, or \$250, whichever is less. If an appellant prevails at the hearing or upon subsequent appeal, the fee for the initial hearing shall be refunded. The fee allowed in this paragraph shall not apply to appeals made by neighborhood or community organizations recognized by the governing body and whose boundaries include the site.

(c)

(A) Notice of a decision under paragraph (a) of this subsection shall be provided to the applicant and to the owners of record of property on the most recent property tax assessment roll where such property is located:

(i) Within 100 feet of the property that is the subject of the notice when the subject property is wholly or in part within an urban growth boundary;

(ii) Within 250 feet of the property that is the subject of the notice when the subject property is outside an urban growth boundary and not within a farm or forest zone; or

(iii) Within 750 feet of the property that is the subject of the notice when the subject property is within a farm or forest zone.

(B) Notice shall also be provided to any neighborhood or community organization recognized by the governing body and whose boundaries include the site.

(C) At the discretion of the applicant, the local government also shall provide notice to the Department of Land Conservation and Development.

Applicants Response: The applicant is anticipating that the City of Umatilla will hold a public hearing to consider this and the associated applications to be considered.

Conclusion: The City of Umatilla Planning Commission will hold a hearing on this and the other applications on August 25, 2020. The City of Umatilla City Council will hold a hearing on this and the other applications on July 20, 2021.

(11) A decision described in ORS 227.160 (2)(b) shall:

(a) Be entered in a registry available to the public setting forth:

(A) The street address or other easily understood geographic reference to the subject property;

(B) The date of the decision; and

(C) A description of the decision made.

(b) Be subject to the jurisdiction of the Land Use Board of Appeals in the same manner as a limited land use decision.

(c) Be subject to the appeal period described in ORS 197.830 (5)(b).

Applicants Response: The applicant is aware of these requirements and supports city staff providing such notice as required by Oregon law and provisions of the City of Umatilla Development Code.

Conclusion: Notice has been sent as required by Oregon law and provisions of the City of Umatilla Development Code.

(12) At the option of the applicant, the local government shall provide notice of the decision described in ORS 227.160 (2)(b) in the manner required by ORS 197.763 (2), in which case an appeal to the board shall be filed within 21 days of the decision. The notice shall include an explanation of appeal rights.

Applicants Response: The applicant is aware of these requirements.

Conclusion: The applicants above response is sufficient for the purposes of the criterion.

(13) Notwithstanding other requirements of this section, limited land use decisions shall be subject to the requirements set forth in ORS 197.195 and 197.828.

Applicants Response: The applicant would provide that this is a legislative decision, subject to those requirements in both Oregon law and the City of Umatilla Development Code.

Conclusion: The applicants above response is sufficient for the purposes of the question.

Applicants Conclusion:

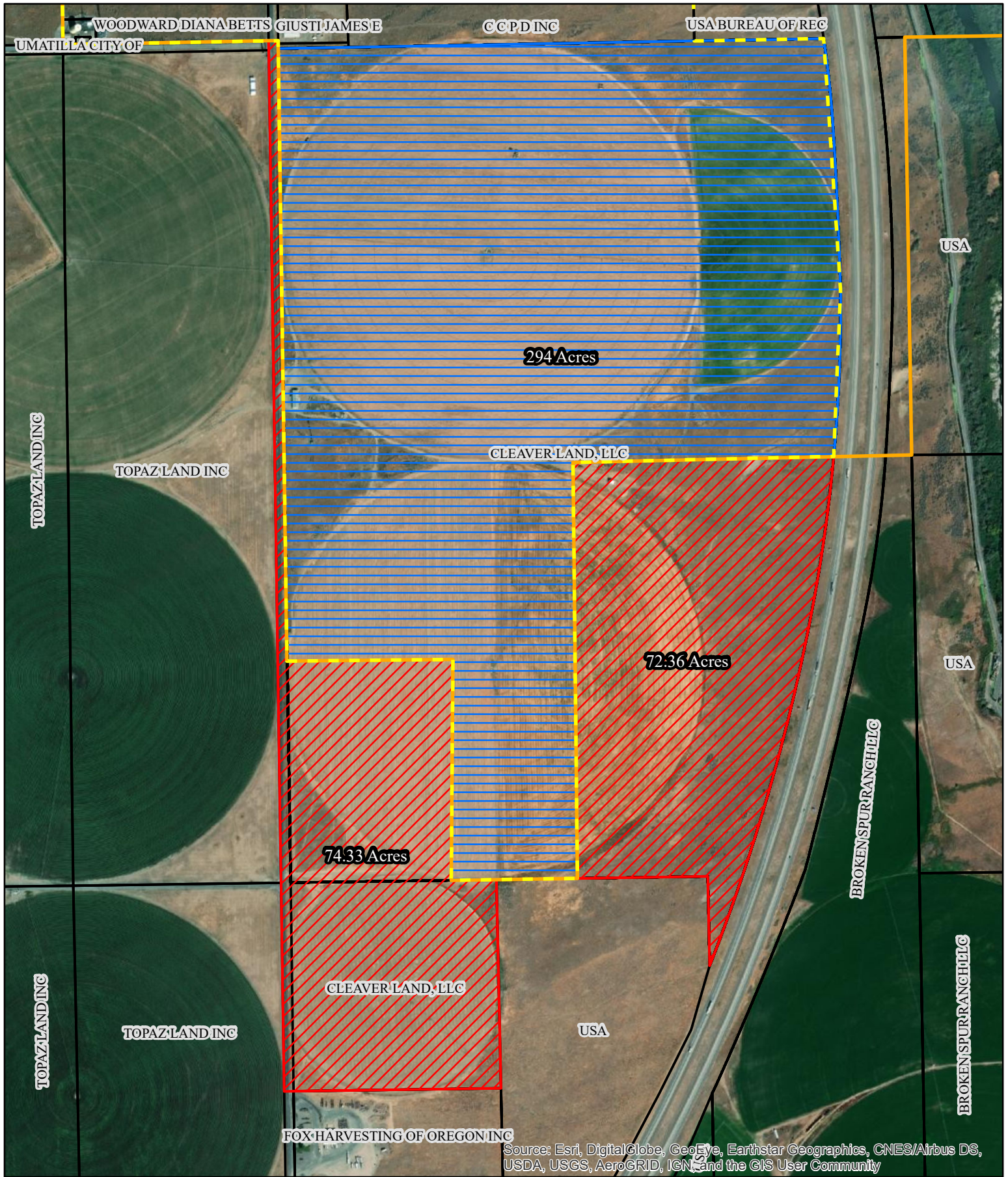
In conclusion the applicant encourages the Planning Commission and City Council to approve this request for a change in Comprehensive Plan and Zoning designation to Light Industrial on the subject property, as a part of the package of requests that also include an urban growth boundary expansion and annexation of a portion of the subject property. Evidence has been provided in the Economic Opportunities Analysis (dated October 2019) that large lot industrial land is needed. Further the J-U-B Engineers report, Umatilla Industrial Area Utility Technical Memorandum, dated March 9, 2020, provides evidence that the area can be served with the necessary services to allow industrial development. It should also be noted that the change from Residential to Industrial for the subject approximately 300 acres does not negatively impact the land inventory for residential uses. The Housing and Residential Land Needs Assessment (2019) identifies an overabundance of residential land of over 1,000 acres. When this action is concluded there will still be an overabundance of approximately 750-acres. For discussion about traffic impacts and the Traffic Impact Study, please see the Urban Growth Boundary Expansion application which evaluates the criteria of both Umatilla County and the City of Umatilla. An evaluation of the 14 Statewide Planning Goals can also be found in that application and are also appropriate to be considered here as well. Those portions of the Urban Growth Boundary Expansion application are incorporated by this reference.

IV. SUMMARY AND RECOMMENDATION

The applicant, Cleaver Land LLC, is proposing to amend the City of Umatilla Comprehensive Plan. Evidence has been provided in the form of the Economic Opportunities Analysis, Umatilla Industrial Area Utility Technical Memorandum, and Traffic Impact Study to support this and the associated requests. These documents show a clear need for large lot industrial land and indicated that need can be met with city services and without impacts to the transportation system that cannot be mitigated. The request appears to meet all of the applicable criteria and standards for this type of request. Therefore, based on the information in Sections I and II of this report, and the above criteria, findings of fact and conclusions addressed in Section III, the Umatilla City Council approves Plan Amendment (PA-3-20).






VI. EXHIBITS

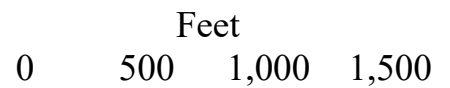
Exhibit A - Draft Map Change
Exhibit B - Economic Opportunity Analysis
Exhibit C - Umatilla Industrial Area Utility Technical Memorandum
Exhibit D - Traffic Impact Study



CLEAVER LAND REZONE SITE PLAN

Legend

-  New Light Industrial Add By UGB Expansion
-  Proposed Plan/Map Amendment Area
-  City Limits
-  Urban Growth Boundary
-  Tax Lots (3/23/20)



Map should be used for reference purposes only.
Not survey grade or for legal use.

Exhibit A - Draft Map Change

Exhibit B - Economic Opportunity Analysis



ECONOMIC OPPORTUNITIES ANALYSIS (OREGON STATEWIDE PLANNING GOAL 9)

Prepared For:
The City of Umatilla, Oregon

October 2019



Acknowledgments

Johnson Economics prepared this report for the City of Umatilla. Johnson Economics and the City of Umatilla thank the many people who helped to develop this document.

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I. INTRODUCTION

This report introduces analytical research presenting an Economic Opportunities Analysis (EOA) for the City of Umatilla, Oregon.

Cities are required to periodically reconcile estimates of future employment land demand with existing inventories of vacant and redevelopable employment land within their Urban Growth Boundary (UGB). The principal purpose of the analysis is to provide an adequate land supply for economic development and employment growth. The intent is to conduct this through a linkage of planning for an adequate land supply to infrastructure planning, community involvement and coordination among local governments and the state.

To this end, this report is organized into six primary sections:

- **Economic Trends:** Overview of national, state and local economic trends affecting Umatilla County and the city of Umatilla, including population projections, employment growth and a demographic profile.
- **Target Industries:** Analysis of key industry typologies the City should consider targeting as economic opportunities over the planning period.
- **Employment Land Needs:** Examines projected demand for industrial and commercial land based on anticipated employment growth rates by sector.
- **Capacity:** Summarizes the City's inventory of vacant and redevelopable industrial and commercial land (employment land) within the City of Umatilla's UGB.
- **Reconciliation:** Compares short- and long-term demand for employment land to the existing land inventory to determine the adequacy and appropriateness of capacity over a five and twenty-year horizon.
- **Economic Development Potential and Conclusions:** Summary of findings and policy implications.

This analysis reflects changes in employment, land supply, and macro-economic trends since the city of Umatilla last reviewed local economic development policies.

II. ECONOMIC TRENDS

This report section summarizes long and intermediate-term trends at the national, state, and local level that will influence economic conditions in Umatilla over the 20-year planning period. This section is intended to provide an economic context for growth projections and establish a socioeconomic profile of the community. This report’s national evaluation has a focus on potential changes in structural socioeconomic conditions both nationally and globally. Our localized analysis considers local growth trends, demographics, and economic performance.

NATIONAL TRENDS

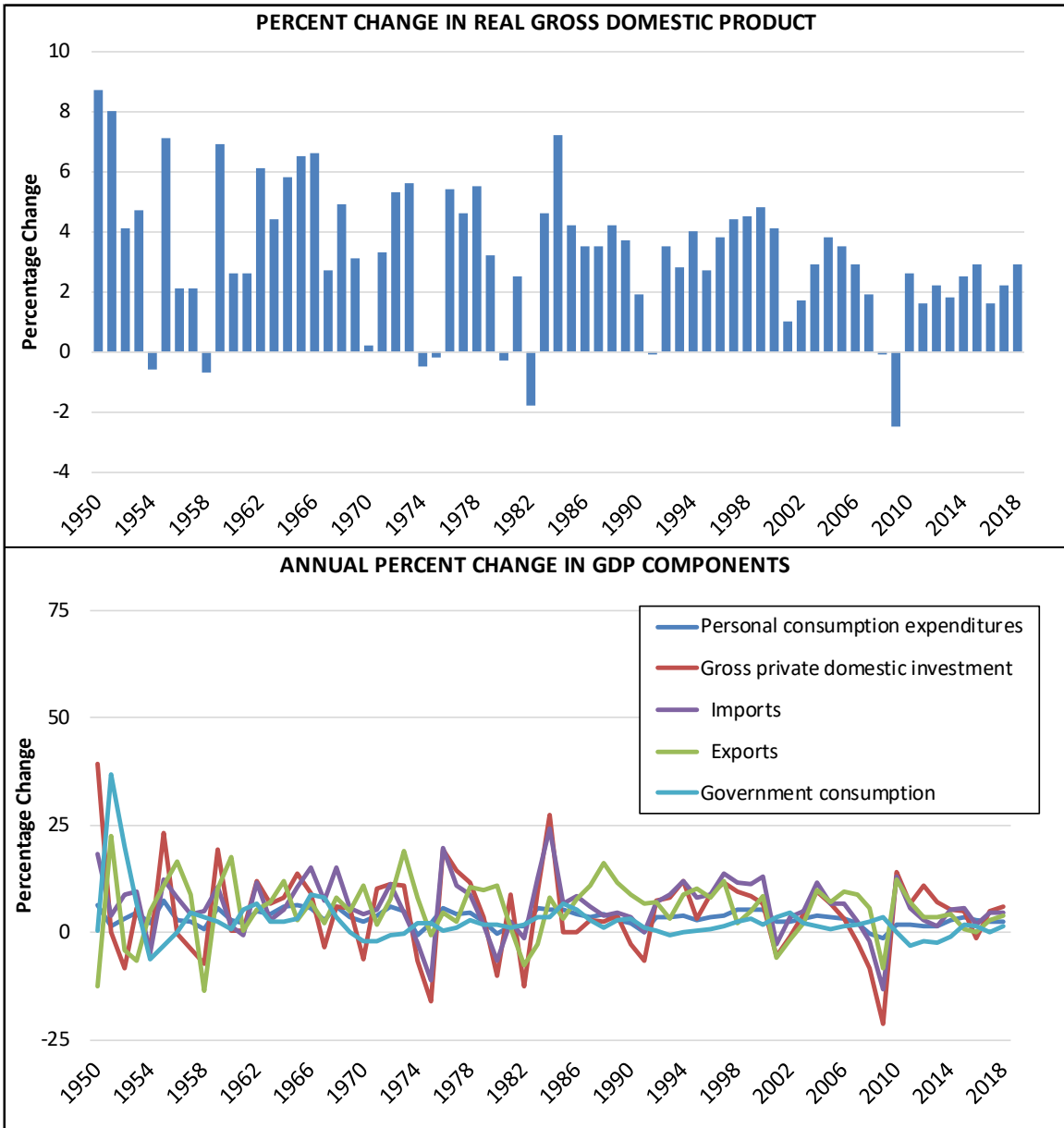
The long-term trend indicates that the United States economy has settled into a moderate growth trajectory at around 2.0% per year, after growing at above 4.0% per year during the 1960s and above 3.0% per year between 1970 and 2000. While the overall growth pace is moderating, there has been a shift within the economy from consumption of goods to consumption of services, especially services oriented around personal wellbeing (health, private education, finance). This reflects increasing levels of wealth and discretionary income in the population. Growth in fixed investment (equipment and structures) and government defense spending is also moderating – making manufactured goods a less significant part of the economy.

Increasing international trade led to strong growth in imports during the 1990s and 2000s, partly due to U.S. firms offshoring operations to lower-cost markets. Exports also grew over the period, but at a slower pace. The offshoring trend has partially reversed in the current decade, due to rising costs and greater awareness of cultural barriers and various associated risks. Greater emphasis on leaner and more agile supply chains, combined with demand for customized products and rapid delivery, has also contributed to growth in domestic production. This impact has been greatest in auto manufacturing. Despite this “reshoring” trend, imports from Asia continue to grow at a faster clip than domestic manufacturing.

The most commonly used measure of economic prosperity is real gross domestic product (GDP) per capita. Real GDP per capita is essentially a measure of national wealth considered on an individual basis, and the increased purchasing power of the population translates into greater investment in health care, education, housing, leisure, and many other sectors. U.S. real GDP per capita remains stable. Over the last century, the average annual growth rate has been 1.8%, despite considerable shifts in economic and social conditions—a finding that suggests long-term economic growth is more closely related to broad trends, such as population growth and investment in physical and human capital, than temporary economic fluctuations, like the recent recession and government policy.

The “Great Recession” officially spurred six consecutive quarters of negative economic growth in 2008 and early 2009. The depth and duration of this downturn was the most pronounced since World War II. The current expansion cycle has been sustained yet the pace of growth is modest to date. Credit markets have been more stringent, businesses are more cautious, and housing construction has yet to emerge as a driving catalyst.

FIGURE 2.01: NATIONAL GROSS DOMESTIC PRODUCT TRENDS

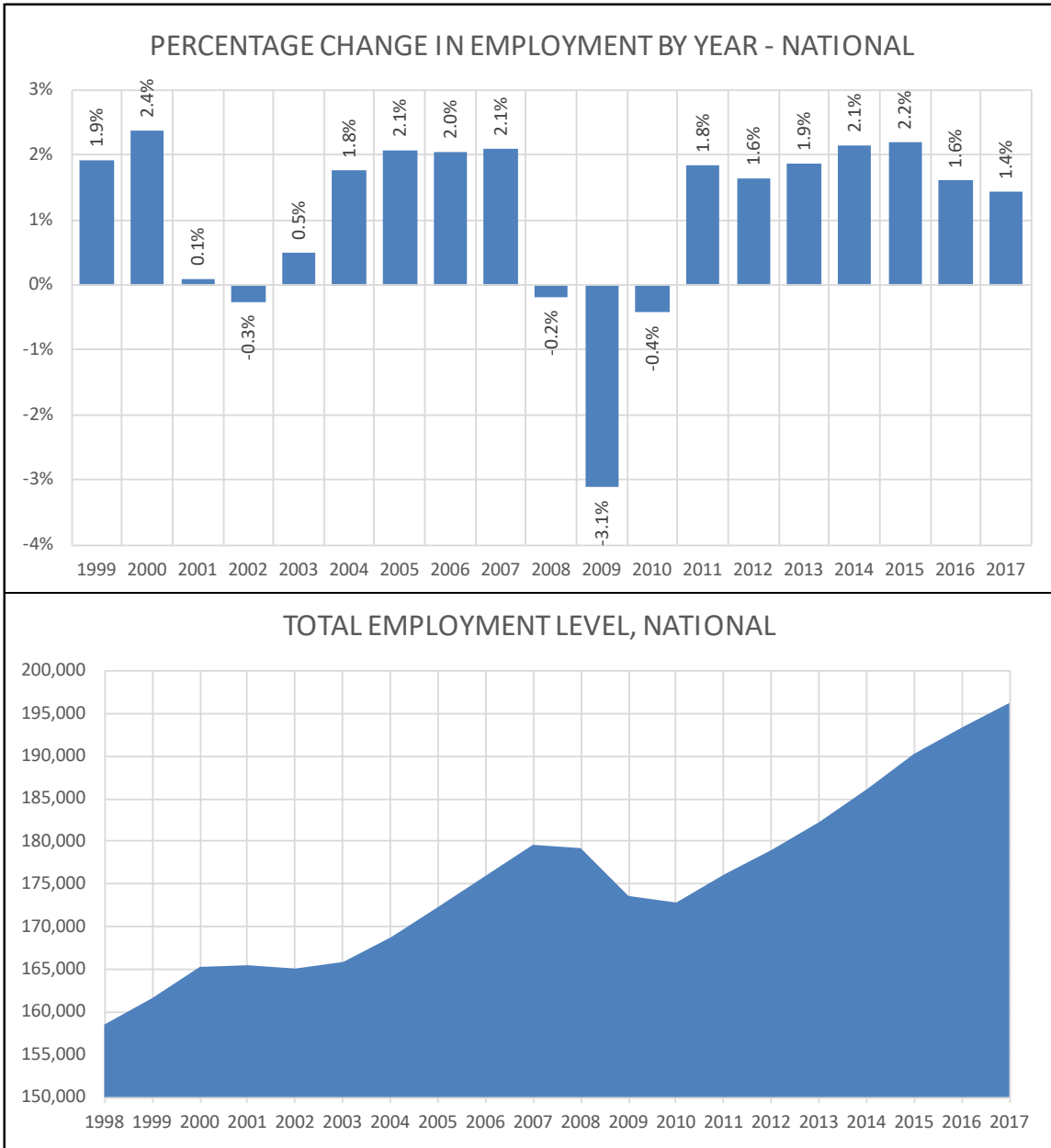


SOURCE: US Bureau of Economic Analysis

Overall, national economic output has seen a notable moderation in growth over the past two decades, with most of the current business cycle hovering around 2.0% growth per year. Economic forecasters generally expect a cyclical moderation over the 2020-23 period, reflecting downward pressures from the maturing of our decade-long economic expansion. Potential GDP growth, which measures the GDP growth that can be sustained at a constant rate of inflation, indicates future long-term growth will remain around 2.0% per year. In the near-term, considerable economic uncertainty exists due to global trade and currency conflicts among the US and many of its traditional trading partners.

The expansion in GDP has been reflected in employment growth, which has ranged between 1.4% and 2.2% in the current expansion cycle. Preliminary estimates indicate an acceleration in the rate of GDP as well as employment growth in 2018. While overall trends have been positive for almost a decade, there will likely be two to three downturns at the national level over the next twenty years.

FIGURE 2.02: NATIONAL EMPLOYMENT TRENDS



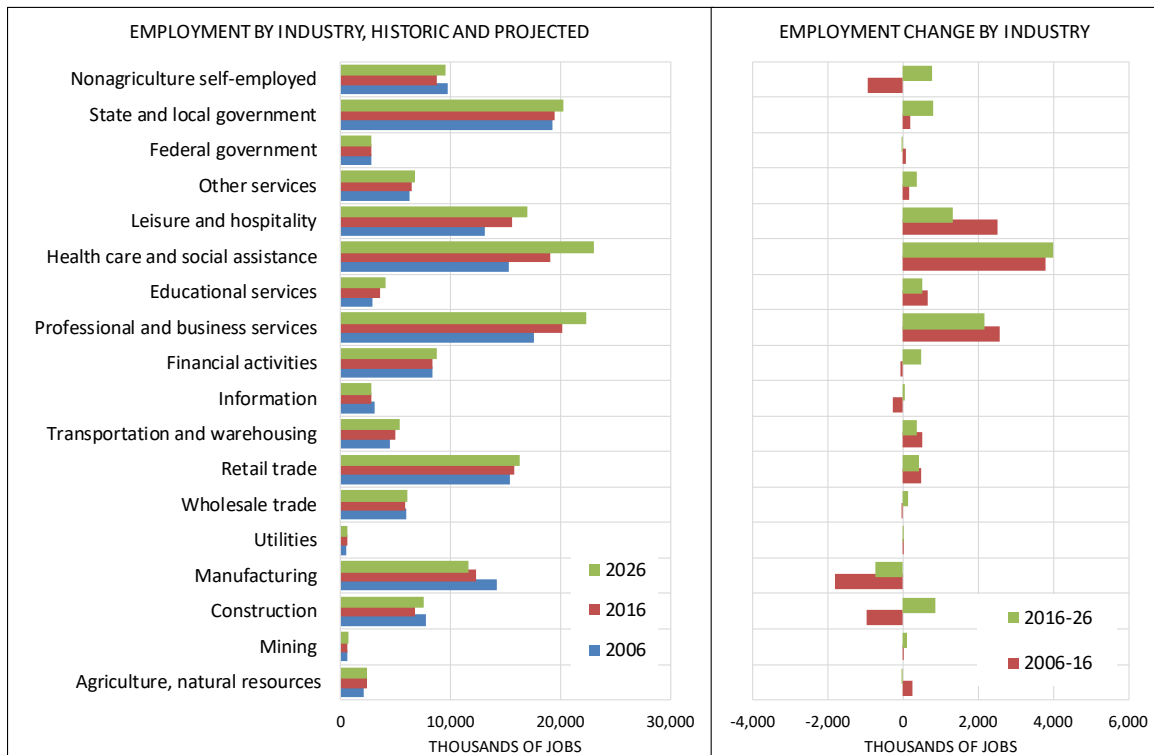
SOURCE: US Bureau of Economic Analysis

A few additional trends have significant implications for the industrial real estate market: E-commerce is rapidly taking market share from brick-and-mortar retailers, approaching 10% of all retail sales. This has caused a shift in storage needs from retail stores to warehouses and distribution centers. At the same time,

automation is causing a consolidation within the warehousing and distribution industry, leading to increasing reliance on larger third-party operators capable of making heavy investments in capital and expertise. Automation is also impacting the manufacturing industry, though to a lesser extent and primarily among larger industry leaders. Finally, changes in the use of electronic devices and growth in online services are causing a shift in the tech sector, from hardware manufacturing to software development.

Due to limited growth in demand for domestic goods and competition from low-cost markets, the U.S. manufacturing sector has lost one-third of its jobs since its peak in the late 1970s, with its share of total employment falling from 24% to 8%. With a strong dollar relative to the currencies of key trading partners, there remains significant headwinds for manufacturers that export a considerable level of product. Sectors seeing significant expansion over the prior decade include health care, professional and business services, and leisure and hospitality. Projections call for all major sectors except for manufacturing and federal government will see growth over the coming decade.

FIGURE 2.03: NATIONAL EMPLOYMENT GROWTH BY SECTOR, HISTORIC AND PROJECTED



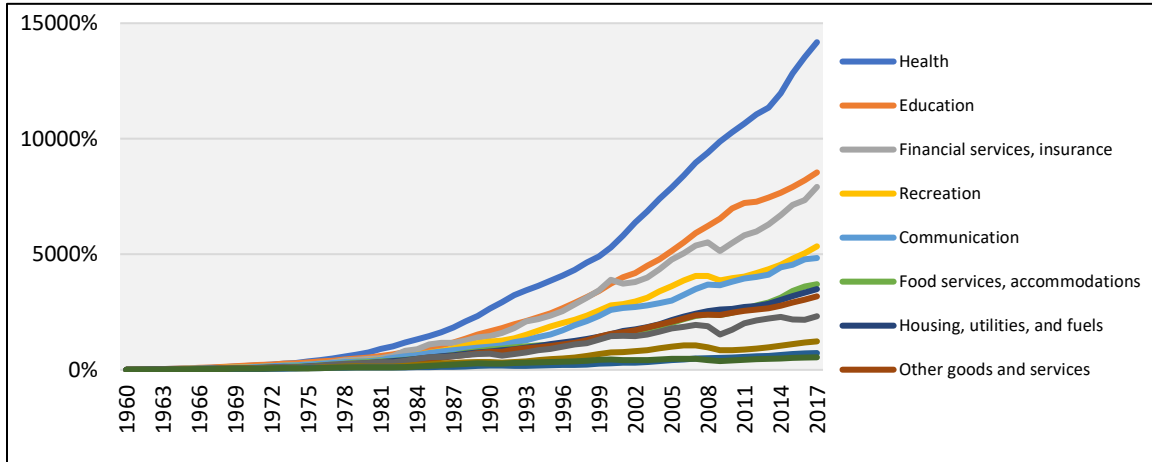
SOURCE: US Bureau of Economic Analysis

Recent trends and current forecasts reflect a shift from a goods economy, featuring manufacturing and natural resources, towards a service economy, which emphasizes technological innovation, research, and design.

Consumer spending accounts for more than two-thirds of the U.S. economy, therefore changing spending patterns dictate much of the shifts in the economy. The post-war era has been marked by increasing wealth and discretionary spending, which has shifted spending away from necessities and led households to buy goods and services that used to be produced in-house. The strongest spending growth over recent decades

has come in categories that represent investments in personal wellbeing, with healthcare/health products at the top of the list, followed by private education and financial services. Categories that represent more short-term enjoyment, like recreation, food services, and accommodations, occupy the middle segment, while necessities like groceries, clothing, transportation, and housing have seen only moderate growth. Spending on health is expected to continue to increase strongly over the coming decades as the baby boomer cohort ages.

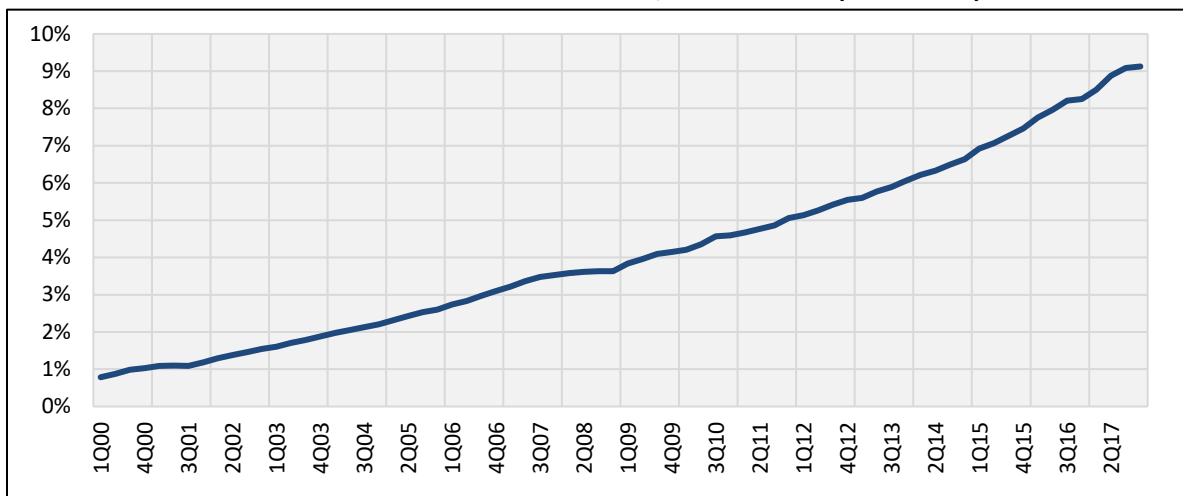
FIGURE 2.04: CONSUMER SPENDING GROWTH SINCE 1960, BY CATEGORY, UNITED STATES (1960-2017)



SOURCE: U.S. Bureau of Economic Analysis, JOHNSON ECONOMICS

The most dramatic spending shift in the context of real estate in recent times is the growth in online shopping, which has reduced the overall need for brick-and-mortar space, especially from retailers selling physical goods, while increasing the need for warehousing and distribution space. Online retailing accounted for an estimated 10% of all retail spending in 2018, at around \$500 billion in annual sales on a national level. Since the last recession, the segment has grown by around 15% per year, and it is currently taking market share from brick-and-mortar stores at a rate of nearly one percentage point annually.

FIGURE 2.05: ONLINE RETAIL MARKET SHARE, UNITED STATES (2000-2017)

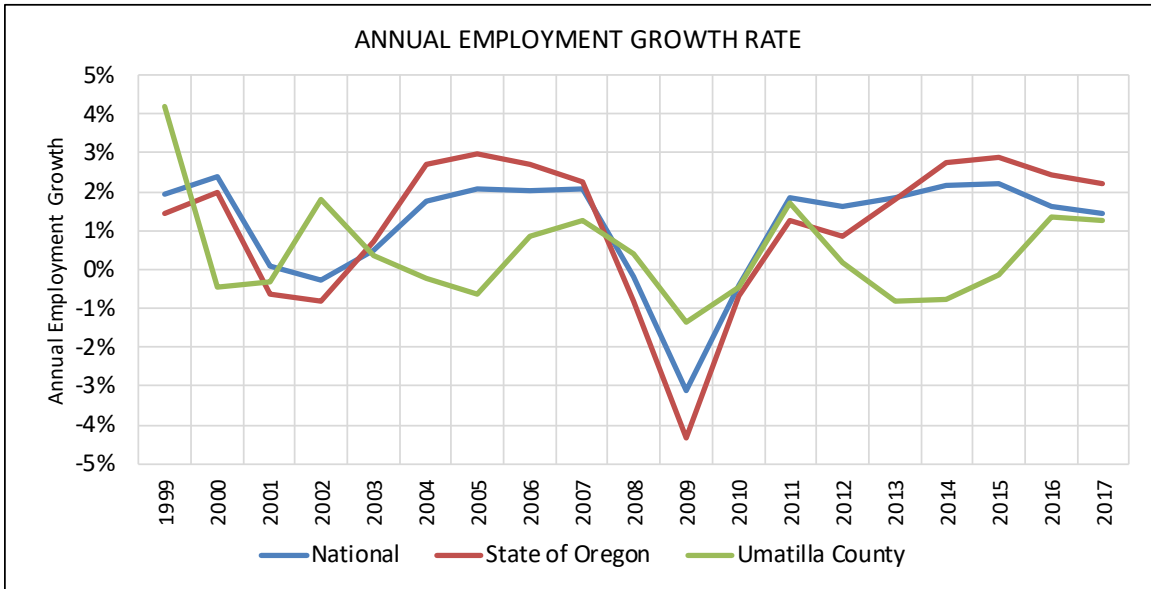


SOURCE: U.S. Bureau of Economic Analysis, JOHNSON ECONOMICS

UMATILLA COUNTY & CITY OF UMATILLA ECONOMIC TRENDS

The annual rate of employment growth in Umatilla County has mirrored the broad national and statewide trends. However, after the emerging from the recession in 2008/2009, the county again experienced job losses until 2016. In recent years, county employment has been growing at roughly 1% per year.

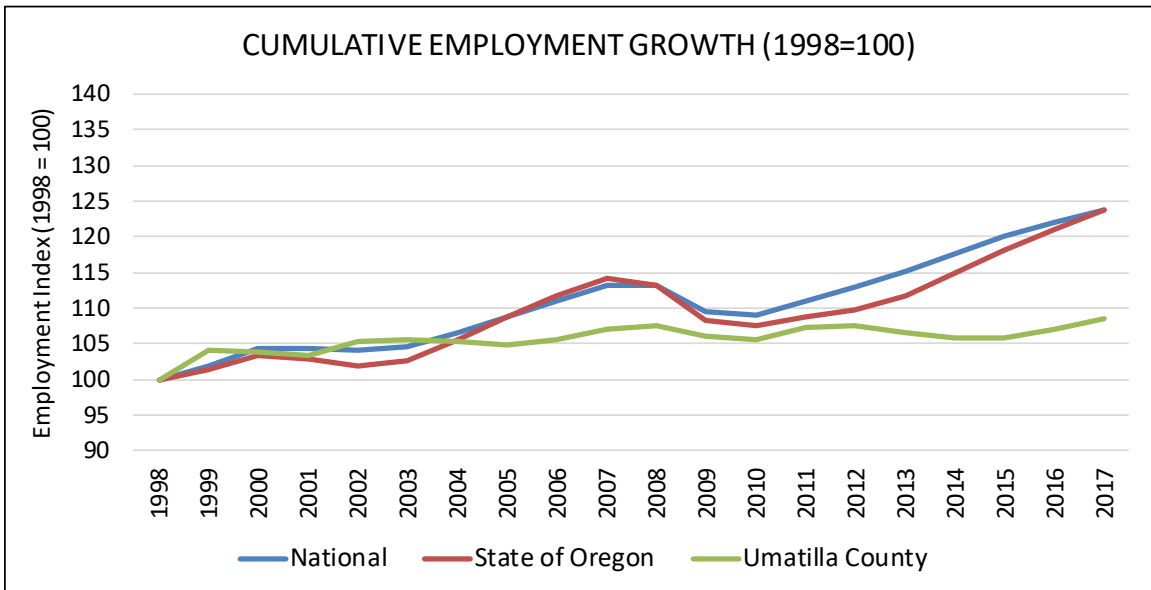
FIGURE 2.06: COMPARISON OF ANNUAL EMPLOYMENT GROWTH RATES



SOURCE: U.S. Bureau of Economic Analysis, JOHNSON ECONOMICS

On a cumulative basis Umatilla County has fallen behind the national and statewide averages, with the employment base up less than 10% over the last twenty years.

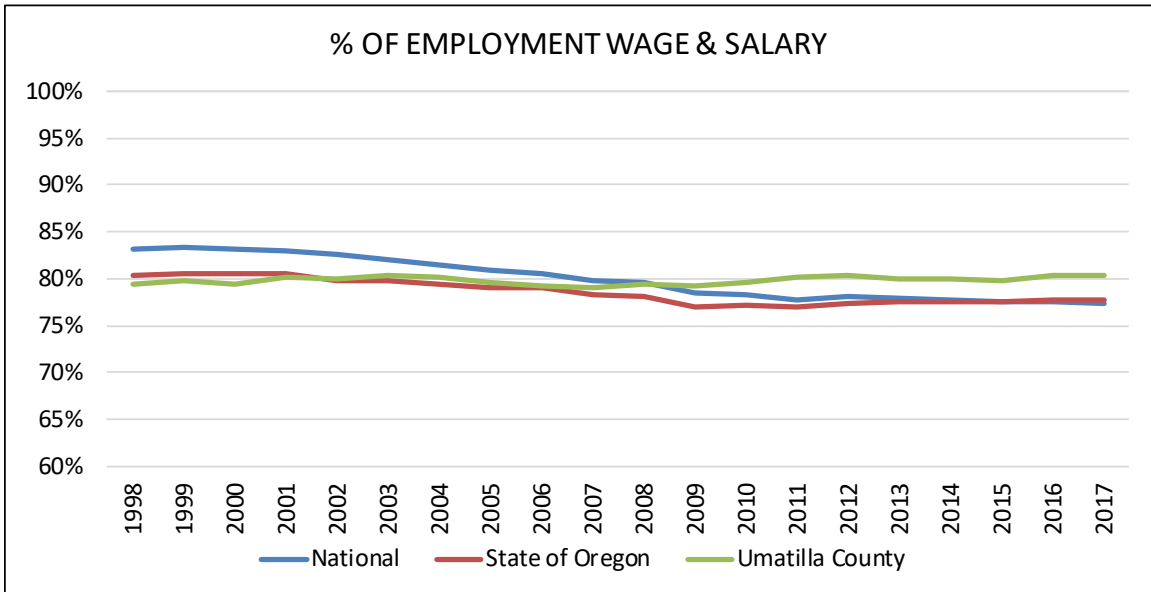
FIGURE 2.07: CUMULATIVE EMPLOYMENT GROWTH



SOURCE: U.S. Bureau of Economic Analysis, JOHNSON ECONOMICS

The employment base in Umatilla County has a somewhat lower share of self-employed than the national and state averages, with wage and salary employment accounting for roughly 80% of overall estimated employment in the county. This compares to rates approaching 78% statewide as well as nationally.

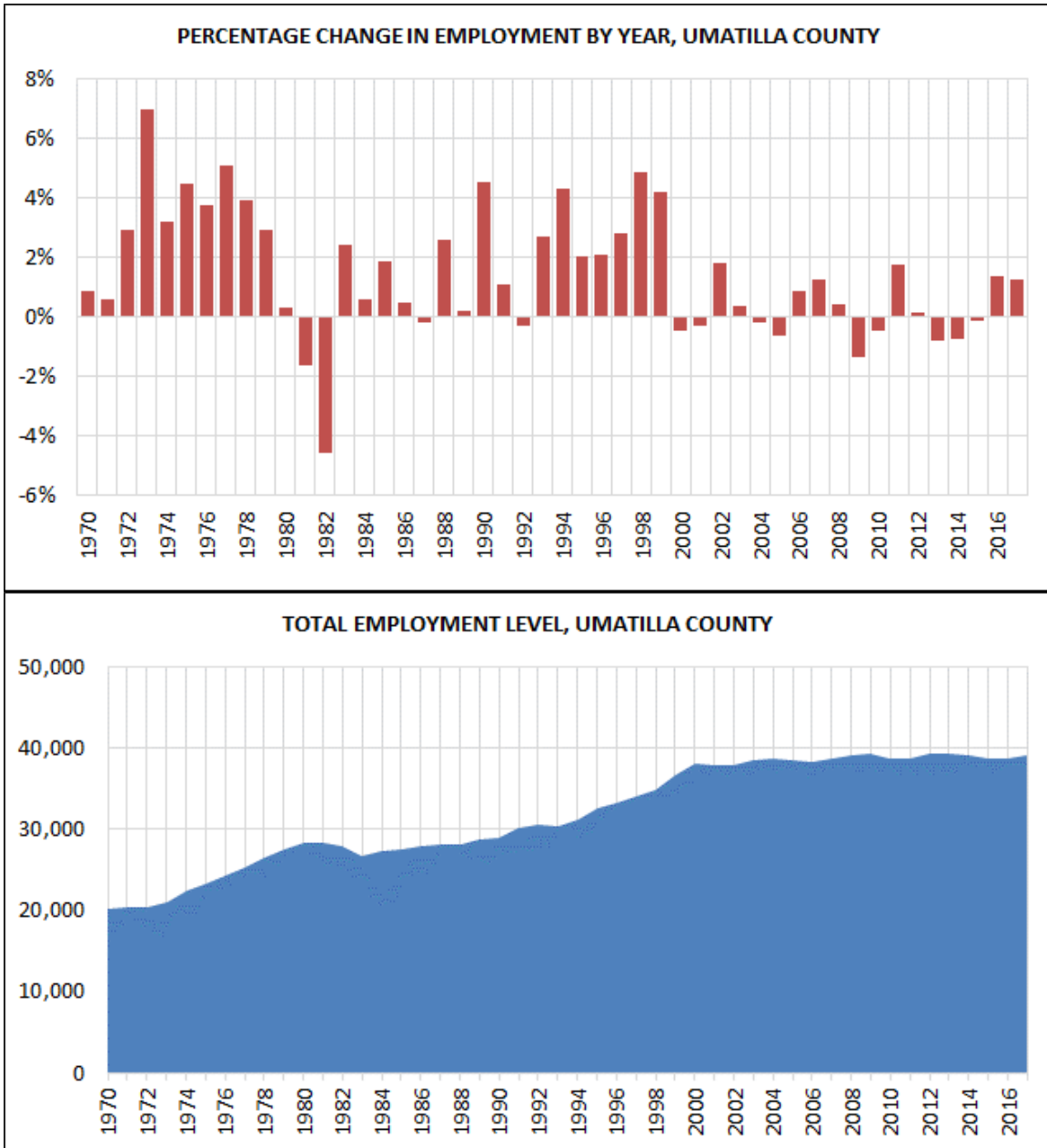
FIGURE 2.08: % OF TOTAL EMPLOYMENT REPRESENTED BY WAGE & SALARY



SOURCE: U.S. Bureau of Economic Analysis, JOHNSON ECONOMICS

Umatilla County’s employment base has been relatively stable since 2000, with the economic expansion adding a notable number of new jobs since 2016. The local employment level is at an all-time high, with average employment levels approaching 40,000 in 2017. However, this level does not greatly exceed the employment level seen in 2008 prior to the outset of the recession.

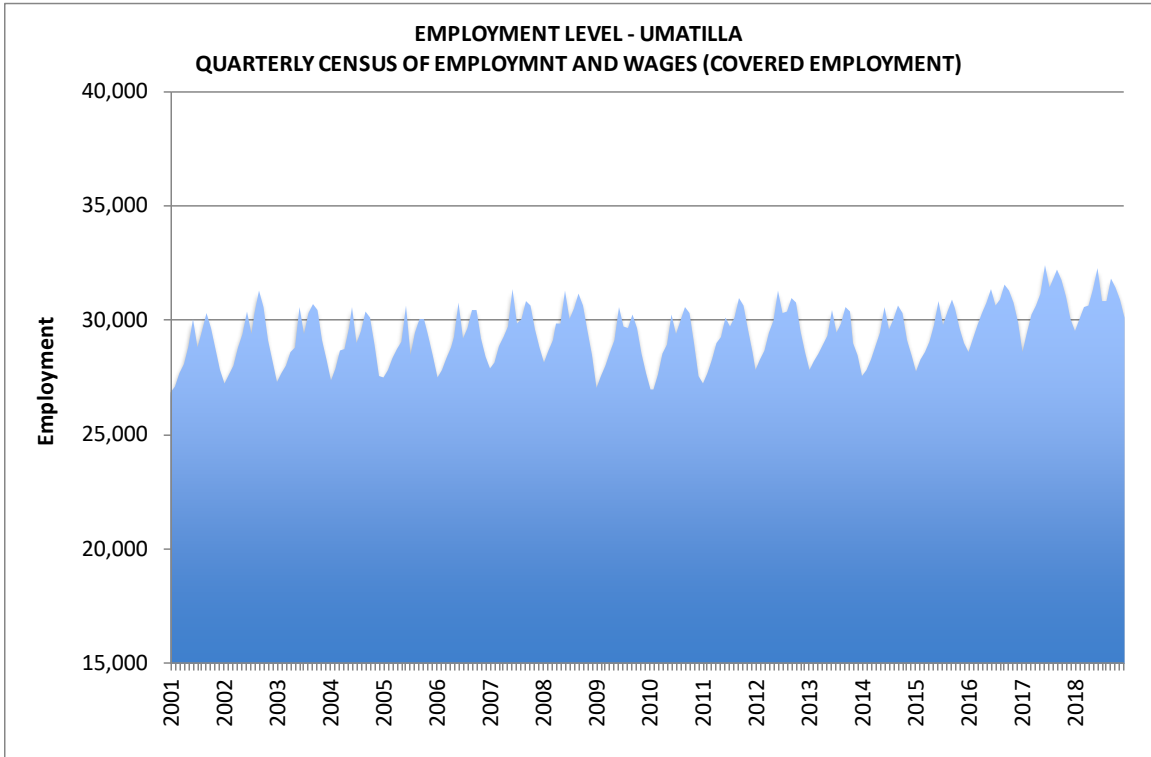
FIGURE 2.09: UMATILLA COUNTY EMPLOYMENT TRENDS



SOURCE: U.S. Bureau of Economic Analysis

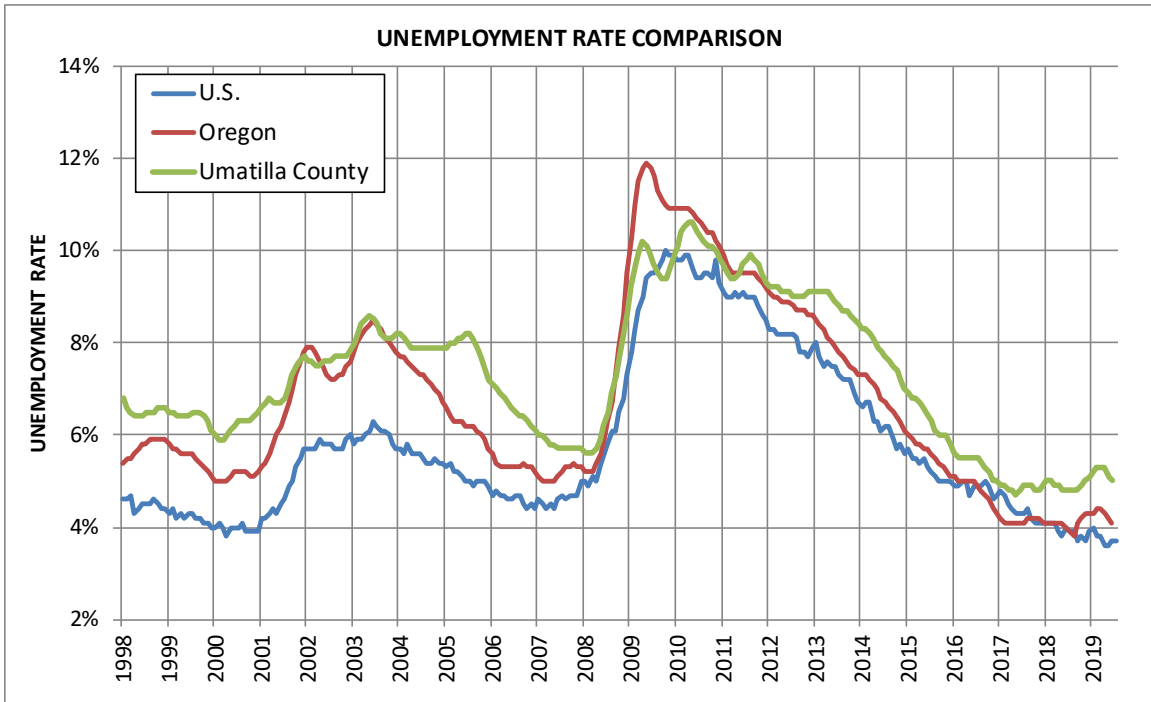
The local employment profile is highly seasonal, reflecting the area’s relatively high proportion of agricultural employment.

FIGURE 2.10: UMATILLA COUNTY EMPLOYMENT LEVEL BY MONTH



SOURCE: U.S. Bureau of Economic Analysis, JOHNSON ECONOMICS

FIGURE 2.11: UNEMPLOYMENT RATE TRENDS

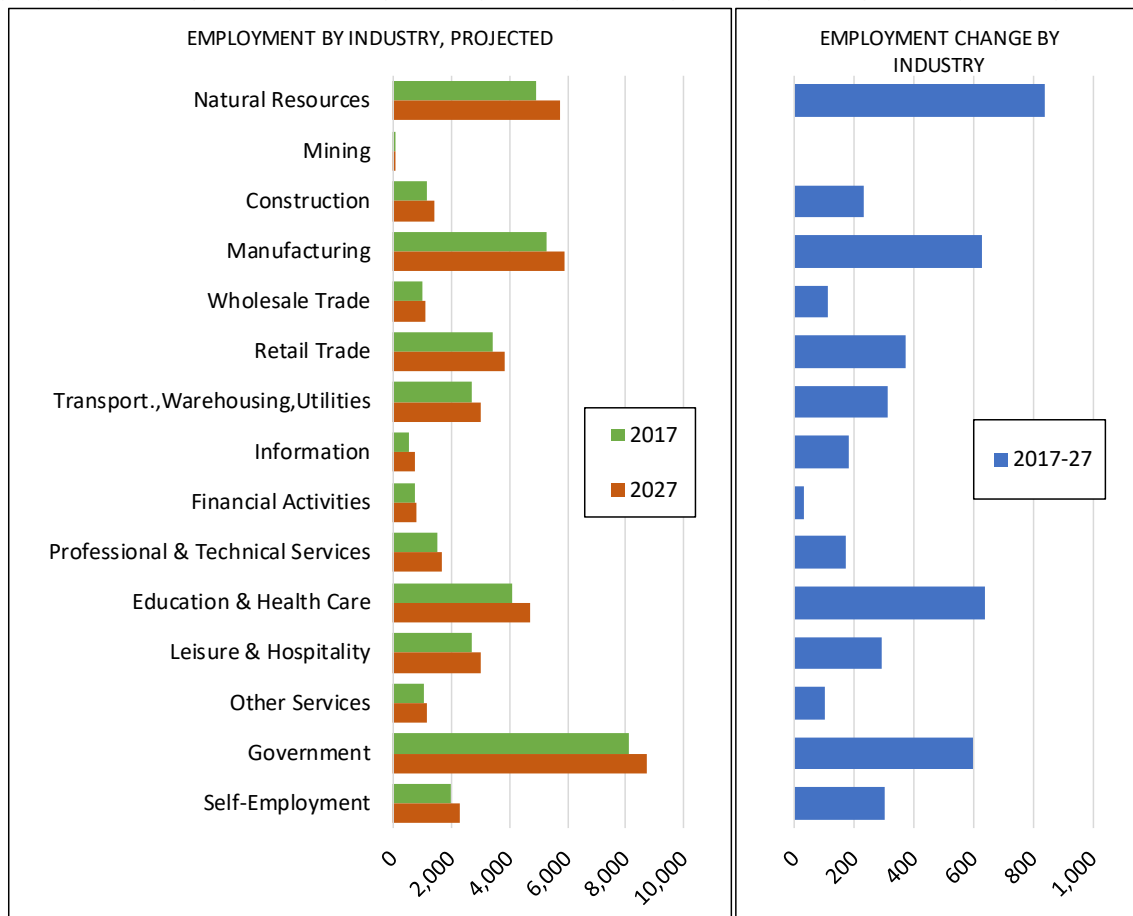


SOURCE: U.S. Bureau of Economic Analysis, JOHNSON ECONOMICS

The economic expansion has facilitated a commensurate drop in the unemployment rate, with Umatilla County following the national and statewide patterns. Tight labor market conditions are likely to limit growth potential in the future both locally and nationally. The local area’s ability to attract and retain workforce will be critical to sustaining economic growth going forward. In mid-2019, the countywide unemployment rate had fallen to a healthy 5%, slightly higher than the statewide rate of 4%.

According to the Oregon Employment Department, most industries are forecast to expand at a modest rate over the next decade in the broader area (Morrow and Umatilla Counties). On an absolute basis, the greatest gains are forecast in professional and business services, leisure and hospitality, and construction. On a rate of growth basis, the most rapid expansion is expected in the natural resources, manufacturing, government, and education and health services sectors.

FIGURE 2.12: PROJECTED EMPLOYMENT GROWTH BY SECTOR, MORROW & UMATILLA COUNTIES

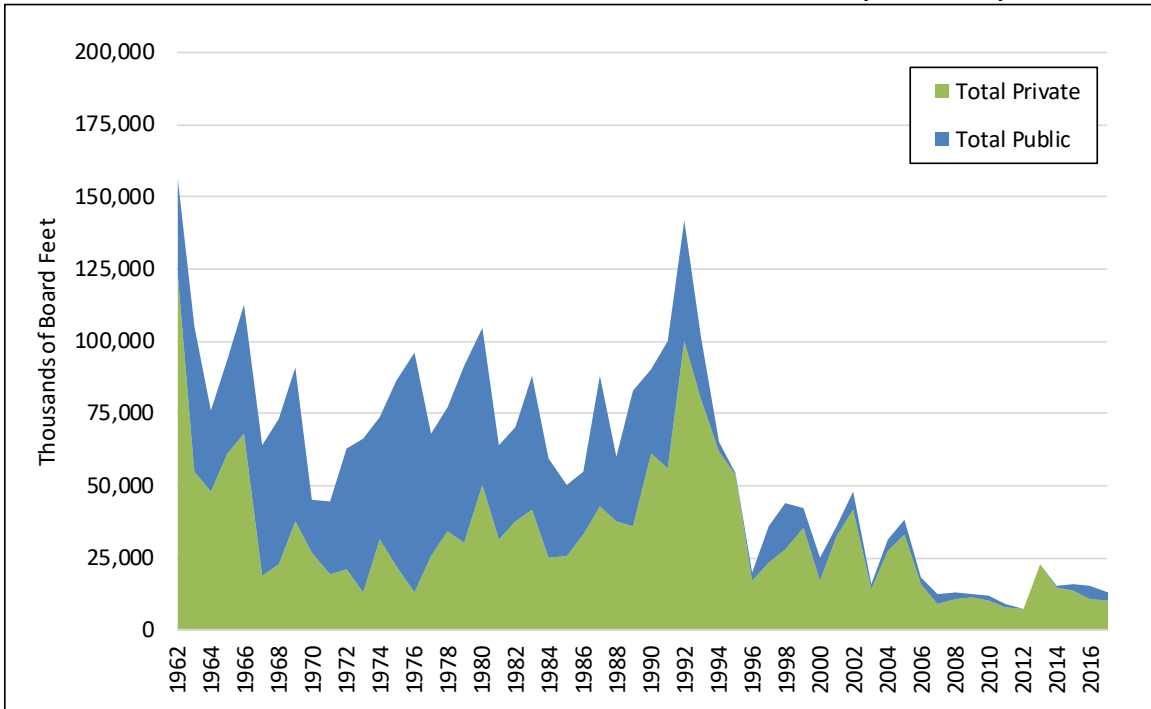


SOURCE: State of Oregon Employment Department

Like much of eastern and central Oregon, the forestry industry has seen a sharp decline in production, which is largely attributable to declines in production from public lands since 1993 (Figure 2.13). The broader region has been actively pursuing new and ongoing opportunities in the industry, including small diameter timber, biomass, and engineered wood products. Forestry is a smaller factor in communities along the river

gorge, such as Umatilla, however timber activity to the south can create some opportunities in wood manufacturing and shipping.

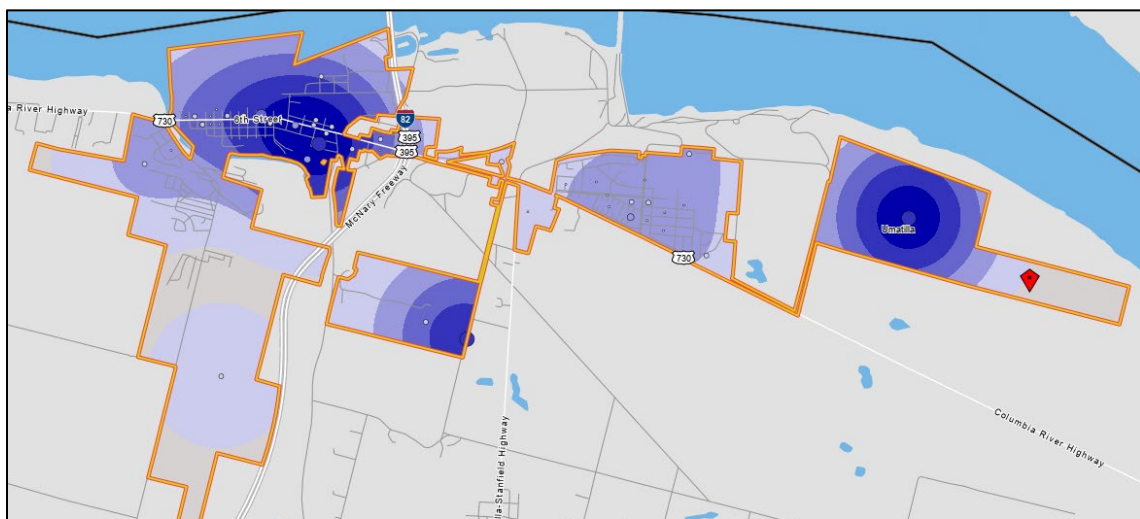
FIGURE 2.13: ANNUAL TIMBER PRODUCTION IN UMATILLA COUNTY (1962-2017)



SOURCE: Oregon Department of Forestry

Employment in Umatilla County is concentrated in the Hermiston/Umatilla corridor, as well as in the Pendleton area. Employment in the city of Umatilla is concentrated in the downtown area, in the area of the correctional facility and Port properties, and along Lind Road (Figure 2.14).

FIGURE 2.14: DISTRIBUTION OF EMPLOYMENT, CITY OF UMATILLA CITY, 2017



SOURCE: Census Bureau, LEHD Data

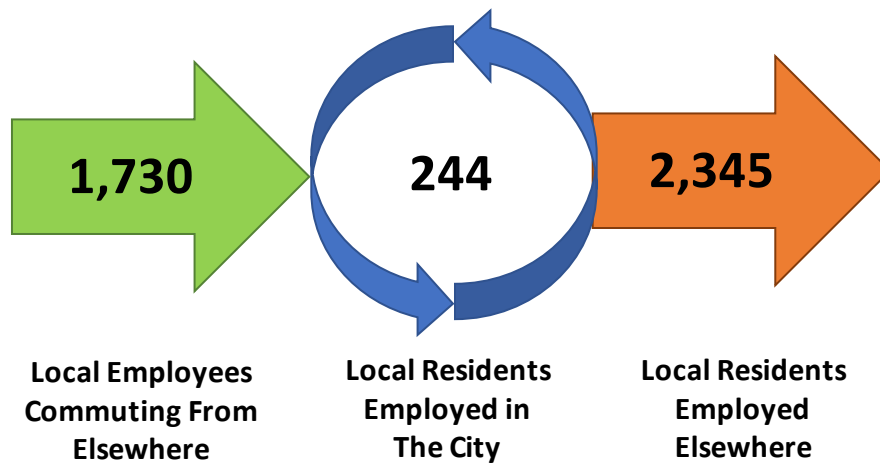
Commuting

Residents and employees commute broadly within Umatilla County and beyond. In the City of Umatilla, the local workforce was estimated at roughly 2,589 in 2017, of which 2,345 (90%) travelled outside of the city for employment while an estimated 244 both lived and worked within the city limits (Figure 2.15).

At the same time, an estimated 1,730 workers commuted into the city for employment, making up over 85% of the local job base of roughly 1,975. (These figures include covered employment and do not capture all forms of self-employment or contracting. Therefore, these figures are best used as an imprecise indicator of the overall pattern.)

This pattern is familiar to many communities across the state, but the extent to which local residents commute elsewhere for employment, and residents of other communities commute in for local jobs, seems somewhat starker in the case of Umatilla.

FIGURE 2.15: NET INFLOW-OUTFLOW OF EMPLOYEES, CITY OF UMATILLA, 2017



SOURCE: Census Bureau, LEHD Data

Commuting patterns are an important element in the local economy. They are indicative of the labor shed from which companies can draw workers, the extent to which job creation translates into increased demand for housing, goods, and services, and the overall balance of population and employment in the community.

Income and age demographics of the workforce commuting into and out of Umatilla are similar (Figure 2.16).

FIGURE 2.16: NET INFLOW-OUTFLOW DETAIL, CITY OF UMATILLA, 2017

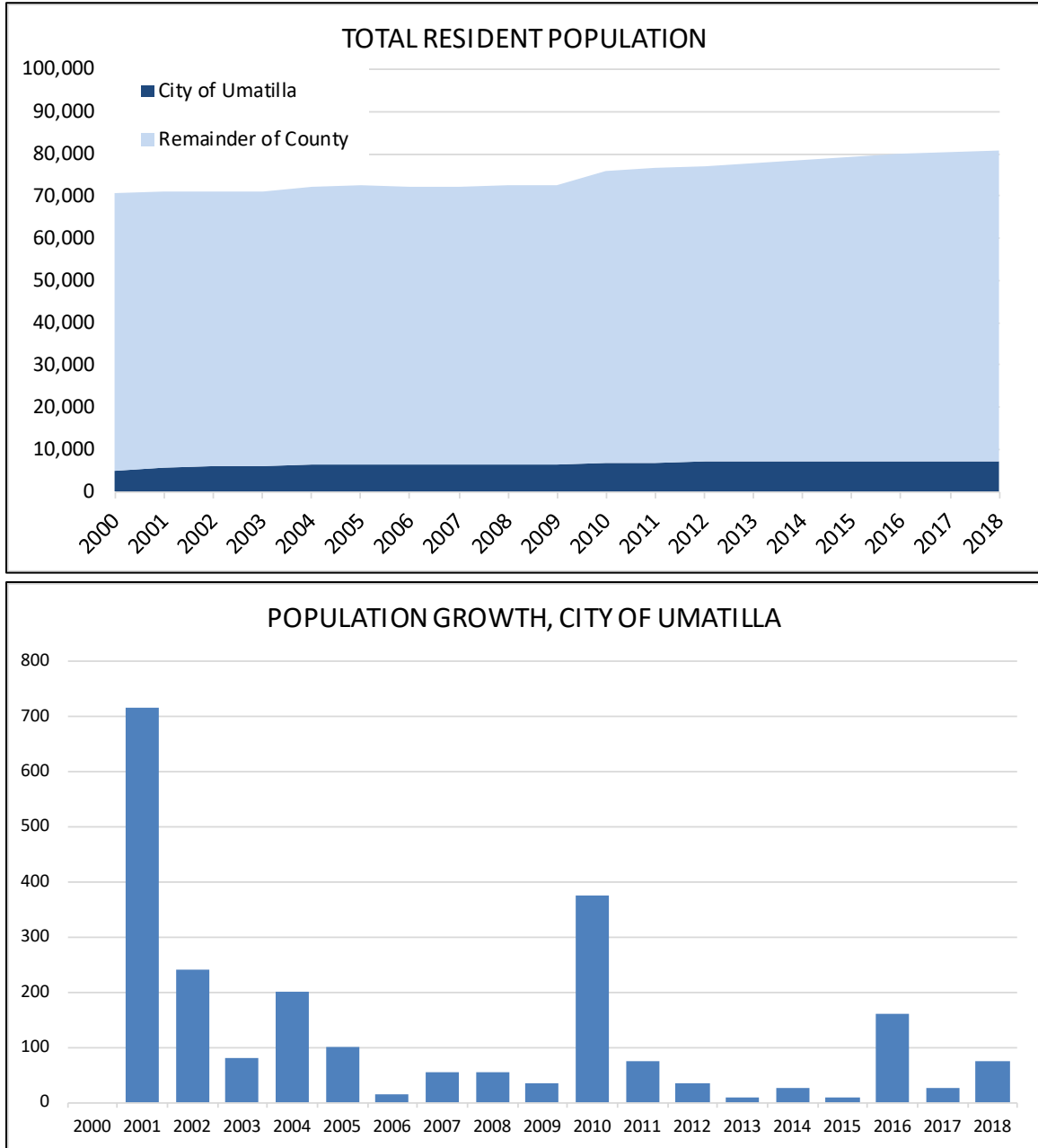
	Umatilla		Umatilla County	
	2017		2017	
	Count	Share	Count	Share
Selection Area Labor Market Size (Primary Jobs)				
Employed in the Selection Area	1,974	100.0%	31,226	100.0%
Living in the Selection Area	2,589	131.2%	31,621	101.3%
Net Job Inflow (+) or Outflow (-)	(615)	-	(395)	-
In-Area Labor Force Efficiency (Primary Jobs)				
Living in the Selection Area	2,589	100.0%	31,621	100.0%
Living and Employed in the Selection Area	244	9.4%	21,396	67.7%
Living in the Selection Area but Employed Outside	2,345	90.6%	10,225	32.3%
In-Area Employment Efficiency (Primary Jobs)				
Employed in the Selection Area	1,974	100.0%	31,226	100.0%
Employed and Living in the Selection Area	244	12.4%	21,396	68.5%
Employed in the Selection Area but Living Outside	1,730	87.6%	9,830	31.5%
Outflow Job Characteristics (Primary Jobs)				
External Jobs Filled by Residents	2,345	100.0%	10,225	100.0%
Workers Aged 29 or younger	570	24.3%	2,445	23.9%
Workers Aged 30 to 54	1,192	50.8%	5,222	51.1%
Workers Aged 55 or older	583	24.9%	2,558	25.0%
Workers Earning \$1,250 per month or less	443	18.9%	2,301	22.5%
Workers Earning \$1,251 to \$3,333 per month	1,010	43.1%	3,820	37.4%
Workers Earning More than \$3,333 per month	892	38.0%	4,104	40.1%
Workers in the "Goods Producing" Industry Class	835	35.6%	3,119	30.5%
Workers in the "Trade, Transportation, and Utilities" Industry Class	578	24.6%	2,235	21.9%
Workers in the "All Other Services" Industry Class	932	39.7%	4,871	47.6%
Inflow Job Characteristics (Primary Jobs)				
Internal Jobs Filled by Outside Workers	1,730	100.0%	9,830	100.0%
Workers Aged 29 or younger	318	18.4%	2,325	23.7%
Workers Aged 30 to 54	970	56.1%	5,078	51.7%
Workers Aged 55 or older	442	25.5%	2,427	24.7%
Workers Earning \$1,250 per month or less	372	21.5%	2,262	23.0%
Workers Earning \$1,251 to \$3,333 per month	594	34.3%	3,953	40.2%
Workers Earning More than \$3,333 per month	764	44.2%	3,615	36.8%
Workers in the "Goods Producing" Industry Class	715	41.3%	2,600	26.4%
Workers in the "Trade, Transportation, and Utilities" Industry Class	143	8.3%	2,683	27.3%
Workers in the "All Other Services" Industry Class	872	50.4%	4,547	46.3%
Interior Flow Job Characteristics (Primary Jobs)				
Internal Jobs Filled by Residents	244	100.0%	21,396	100.0%
Workers Aged 29 or younger	58	23.8%	4,975	23.3%
Workers Aged 30 to 54	128	52.5%	11,242	52.5%
Workers Aged 55 or older	58	23.8%	5,179	24.2%
Workers Earning \$1,250 per month or less	63	25.8%	4,566	21.3%
Workers Earning \$1,251 to \$3,333 per month	99	40.6%	9,214	43.1%
Workers Earning More than \$3,333 per month	82	33.6%	7,616	35.6%
Workers in the "Goods Producing" Industry Class	78	32.0%	5,105	23.9%
Workers in the "Trade, Transportation, and Utilities" Industry Class	26	10.7%	3,882	18.1%
Workers in the "All Other Services" Industry Class	140	57.4%	12,409	58.0%

SOURCE: US Census Bureau, LEHD Origin-Destination Employment Statistics

Population and Workforce

The population base in Umatilla County and Umatilla have grown at a rate of slightly under 1% since 2010, according to the Population Research Center at Portland State University. The growth rate is estimated to have increased in more recent years and is projected to accelerate over the coming 20-year period. The City of Umatilla had an estimated population of 7,320 in 2018, or 9% of the Umatilla County total of nearly 81,000 people.

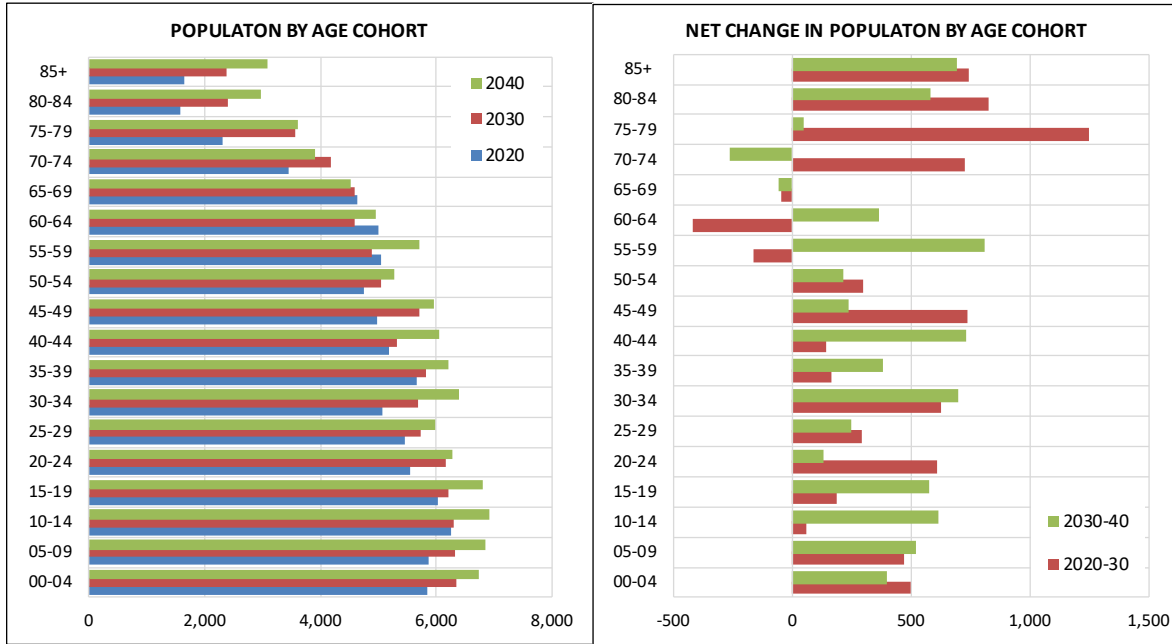
FIGURE 2.17: HISTORIC POPULATION TRENDS, UMATILLA COUNTY AND CITY OF UMATILLA



SOURCE: Population Research Center, Portland State University

The composition of the population base is expected to become generally older. The trend is most pronounced for residents over 75 years of age, but modest growth is also anticipated in age categories that are traditionally in the workforce.

FIGURE 2.18: HISTORIC AND PROJECTED DISTRIBUTION OF POPULATION BY AGE COHORT, UMATILLA COUNTY



SOURCE: Population Research Center, Portland State University

Race and Ethnicity: The population of Umatilla County is estimated to be 85% white and 15% minority or bi-racial, a very similar minority share as Oregon. The County is estimated to have a higher share of Native Americans, and a somewhat lower share of Black and Asian residents. Latinos are estimated to make up 26% of the county population, compared to 13% statewide.

FIGURE 2.19: DISTRIBUTION OF POPULATION BY RACE & ETHNICITY, UMATILLA COUNTY

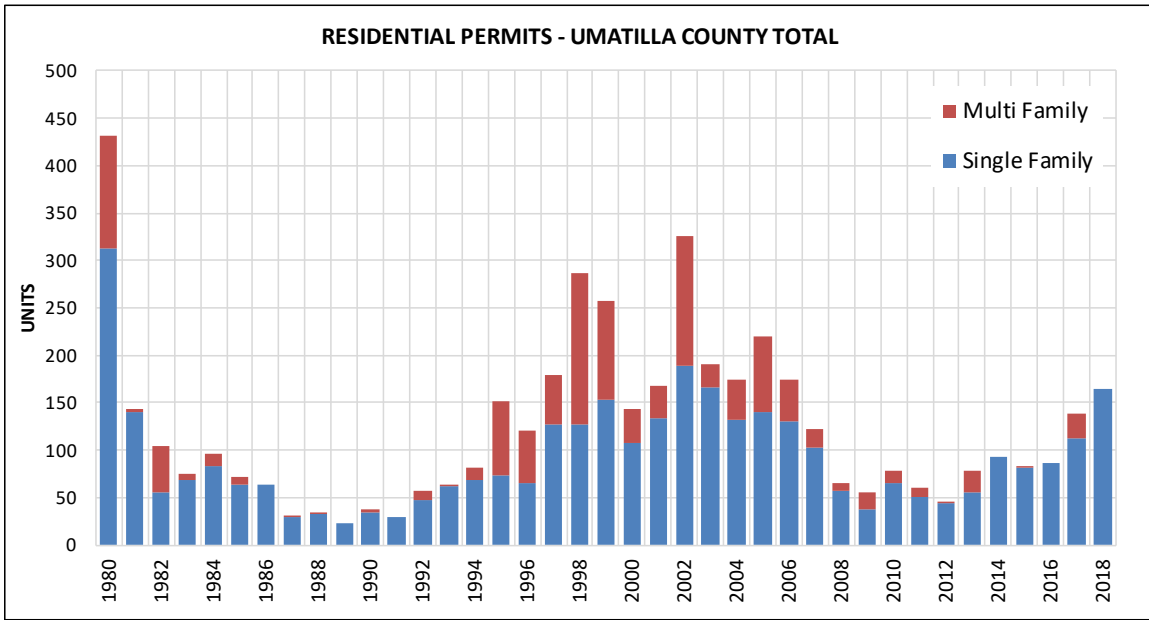
Distribution of Population	Umatilla County				Oregon			
	2000	2017	Change	Share	2000	2017	Change	Share
Total:	70,548	80,500	14%	100%	3,421,399	4,025,127	18%	100%
White	57,852	68,585	19%	85%	2,961,623	3,416,776	15%	85%
Black	582	626	8%	1%	55,662	76,347	37%	2%
Native American	2,375	2,514	6%	3%	45,211	45,332	0%	1%
Asian	530	635	20%	1%	101,350	166,351	64%	4%
Hawaiian or Pac. Islander	124	140	13%	0%	7,976	15,157	90%	0%
Other Race	7,529	4,263	-43%	5%	144,832	121,000	-16%	3%
Two or More Races	1,556	3,738	140%	5%	104,745	184,164	76%	5%
Latino (of any race)	11,366	20,917	84%	26%	275,314	509,507	85%	13%

SOURCE: Census (Tables QT-P3, B02001, B03002) Population Research Center, Portland State University

* 2017 Total county population is based on PSU 2017 estimate, applying the distribution of race and ethnicity from 2017 ACS.

With steady growth in population, residential permits in Umatilla County have averaged 137 per year since 2000, with the majority being single-family homes. After experiencing some multi-family development prior to the 2008 recession, permitting has been slow for the past decade.

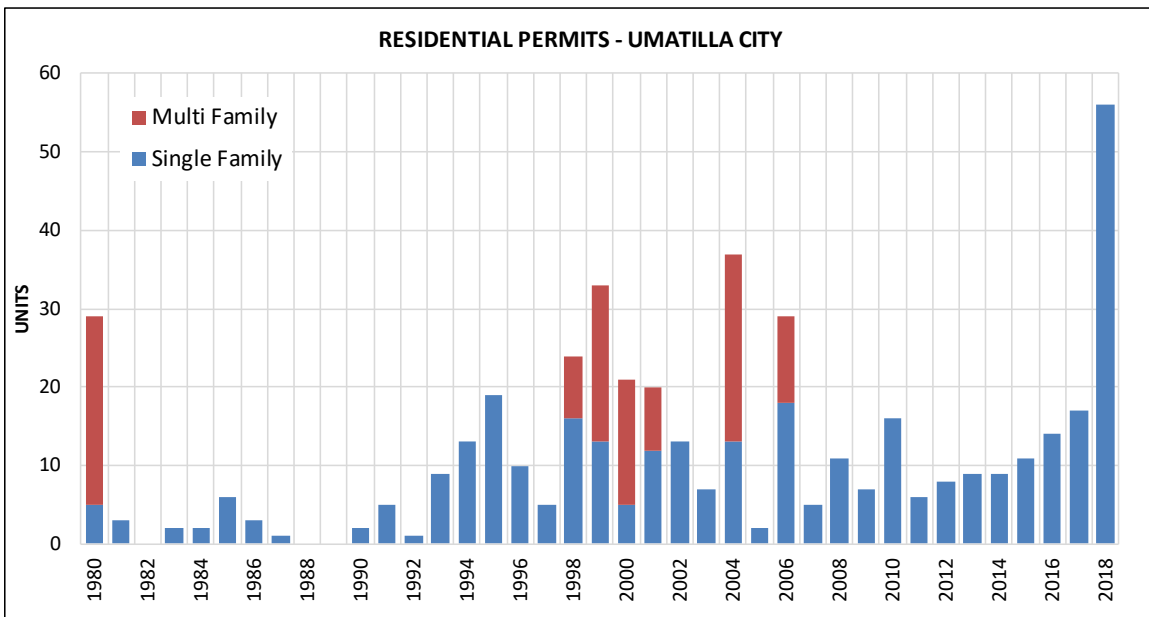
FIGURE 2.20: HISTORIC AND PROJECTED RESIDENTIAL PERMITS, UMATILLA COUNTY



SOURCE: HUD

The city of Umatilla has accounted for roughly 12% of the total county residential permits since 2000. Nearly 300 units have been permitted since 2000, with 20% being multi-family units permitted prior to 2008.

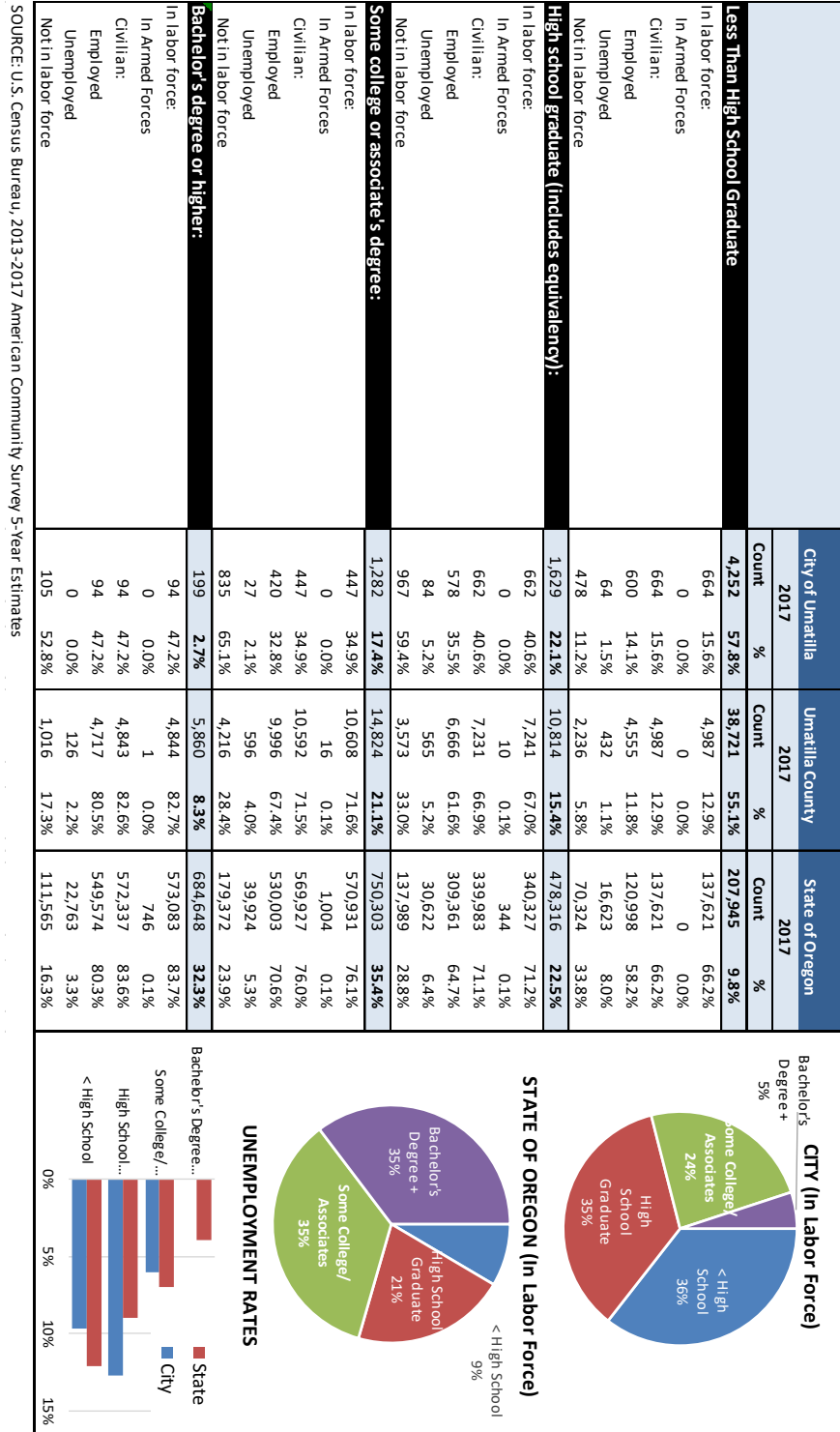
FIGURE 2.21: HISTORIC AND PROJECTED RESIDENTIAL PERMITS, CITY OF UMATILLA



SOURCE: HUD

The educational attainment level of the local workforce is lower in the city and county as the statewide profile. Residents of working age are more likely to have a high-school education, and less likely to have a college degree.

FIGURE 2.23: EDUCATIONAL ATTAINMENT PROFILE BY EMPLOYMENT STATUS, 2017



SOURCE: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

III. TARGET INDUSTRY ANALYSIS

This element of the Economic Opportunities Analysis uses analytical tools to assess the economic landscape in Umatilla and Umatilla County. The objective of this process is to identify a range of industry types that can be considered targeted economic opportunities over the 20-year planning period.

A range of analytical tools to assess the local and regional economic landscape are used to determine the industry typologies the City should consider targeting over the planning period. Where possible, we look to identify the sectors that are likely to drive growth in current and subsequent cycles.

ECONOMIC SPECIALIZATION

The most common analytical tool to evaluate economic specialization is a location quotient (LQ) analysis. This metric compares the concentration of employment in an industry at the local level to a larger geography. All industry categories are assumed to have a quotient of 1.0 on the national level, and a locality’s quotient indicates if the local share of employment in each industry is greater or less than the share seen nationwide. For instance, a quotient of 2.0 indicates that locally, that industry represents twice the share of total employment as seen nationwide. A quotient of 0.5 indicates that the local industry has half the expected employment.

We completed a location quotient analysis for Umatilla County, which compares the distribution of local employment relative to national averages, as well as average annual wage levels by industry (Figure 3.1). The most over-represented industries were natural resources and mining, manufacturing and government.

FIGURE 3.1: INDUSTRY SECTOR SPECIALIZATION BY MAJOR INDUSTRY, UMATILLA COUNTY, 2018¹

Industry	Annual Establishments	Avg. Annual Employment	Total Annual Wages	Avg. Annual Wages	Employment Loc. Quotient
1011 Natural resources and mining	193	3,386	\$111,161,727	\$32,832	8.3
1012 Construction	193	1,176	\$61,441,498	\$52,265	0.8
1013 Manufacturing	74	3,415	\$139,497,112	\$40,849	1.3
1021 Trade, transportation, and utilities	402	6,341	\$260,936,079	\$41,149	1.1
1022 Information	23	175	\$7,251,966	\$41,479	0.3
1023 Financial activities	153	698	\$32,889,517	\$47,137	0.4
1024 Professional and business services	201	1,403	\$55,157,349	\$39,319	0.3
1025 Education and health services	218	3,778	\$159,564,205	\$42,233	0.8
1026 Leisure and hospitality	211	2,578	\$44,250,408	\$17,166	0.8
1027 Other services	421	999	\$26,607,848	\$26,634	1.1
Federal Government	32	485	\$36,873,687	\$76,002	0.8
State Government	44	1,391	\$90,039,107	\$64,730	1.4
Local Government	104	5,047	\$216,324,995	\$42,861	1.7
Total	2,269	30,872	\$1,241,995,498	\$40,231	

SOURCE: Bureau of Labor Statistics

¹ QCEW Data, Annual Average 2018 Data

In terms of total employment, the largest sectors are government, transportation/warehousing/utilities, education and health services, and manufacturing. Natural resources (agriculture and forestry, and support services to these industries) as well as leisure and hospitality (tourism-related industry) are also major employment sectors in the county.

Figure 3.2 shows a more detailed analysis of the top 20 local industry subsectors in the county, as ranked by their LQ. The LQ shows that agricultural subsectors have the highest share of employment in comparison to nationwide averages, but also food manufacturing and wood product manufacturing. Various transportation and distribution-related industries are also well represented, as are utilities. Nursing and residential care, construction, and retailers are some of the subsectors rounding out the list.

The average wage LQ (right column) is an indicator of how much local wages paid in these industries are paid relative to the total wages in that industry typical across the nation. For instance, the agricultural and forestry subsector in Umatilla County represents 28.5 times the share of total wages paid as would be expected by looking at the national average.

FIGURE 3.2: INDUSTRY SECTOR SPECIALIZATION BY DETAILED INDUSTRY, UMATILLA COUNTY, 2018

Rank	NAICS	Description	Employment	Emp. L.Q.	Average Wage	Total Wages L.Q.
1	115	Agriculture and forestry support activities	1,685	20.6	\$32,950	28.5
2	111	Crop production	1,393	12.0	\$31,030	15.6
3	311	Food manufacturing	1,711	5.0	\$41,909	6.2
4	112	Animal production and aquaculture	237	4.2	\$38,318	5.9
5	321	Wood product manufacturing	357	4.2	\$44,516	5.8
6	814	Private households	235	3.9	\$18,252	3.8
7	484	Truck transportation	789	2.5	\$60,964	4.1
8	447	Gasoline stations	450	2.3	\$19,028	2.8
9	485	Transit and ground passenger transportation	151	1.5	\$23,353	1.4
10	221	Utilities	170	1.5	\$109,579	2.1
11	623	Nursing and residential care facilities	985	1.4	\$28,869	1.8
12	236	Construction of buildings	422	1.2	\$52,518	1.4
13	452	General merchandise stores	787	1.2	\$26,238	1.8
14	441	Motor vehicle and parts dealers	484	1.1	\$46,121	1.5
15	813	Membership associations and organizations	331	1.1	\$22,670	0.8
16	811	Repair and maintenance	295	1.1	\$34,824	1.2
17	445	Food and beverage stores	684	1.1	\$24,680	1.5
18	424	Merchant wholesalers, nondurable goods	449	1.0	\$56,184	1.1
19	312	Beverage and tobacco product manufacturing	54	0.9	\$24,687	0.6
20	562	Waste management and remediation services	85	0.9	\$45,727	1.0

SOURCE: Bureau of Labor Statistics

Sectors such as local government, education, health care and retail trade, are industries that are driven by serving a local population. The county also has a significant amount of employment in export or “traded sector” industries that send their products beyond the county, and thus bring new dollars into the region. These industries include manufacturing, utilities, and data centers.

ECONOMIC DRIVERS

The identification of the economic drivers of a local or regional economy is critical in informing the character and nature of future employment, and by extension land demand over a planning cycle. To this end, we employ a shift-share analysis of the local economy emerging out of the current expansion cycle².

A shift-share analysis measures local effect of economic performance within an industry or occupation. The process considers local economic performance in the context of national economic trends—indicating the extent to which local growth can be attributed to unique regional competitiveness or simply growth in line with broader trends.

For example, assume that Widget Manufacturing is growing at a 1.5% rate locally, about the same rate as the local economy. On the surface we would consider the Widget Manufacturing industry to be healthy and contributing soundly to local economic expansion. However, consider also that Widget Manufacturing is booming across the country, growing at a robust 4% annually. In this context, local widget manufacturers are struggling, and some local or regional condition is stifling economic opportunities.

We can generally classify industries, groups of industries, or clusters into four groups:

- **Growing, Outperforming:** Industries that are growing locally at a rate faster than the national average. These industries have local characteristics leading them to be particularly competitive.
- **Growing, Underperforming:** Industries that are growing locally but slower than the national average. These industries generally have a sound foundation, but some local factor is limiting growth.
- **Contracting, Outperforming:** Industries that are declining locally but slower than the national average. These industries have structural issues that are impacting growth industry wide. However, local firms are leveraging some local or regional factor that is making them more competitive than other firms on average.
- **Contracting, Underperforming:** Industries that are declining locally at a rate faster than the national average. These industries have structural issues that are impacting growth industry wide. However, some local or regional factor is making it increasingly tough on local firms.

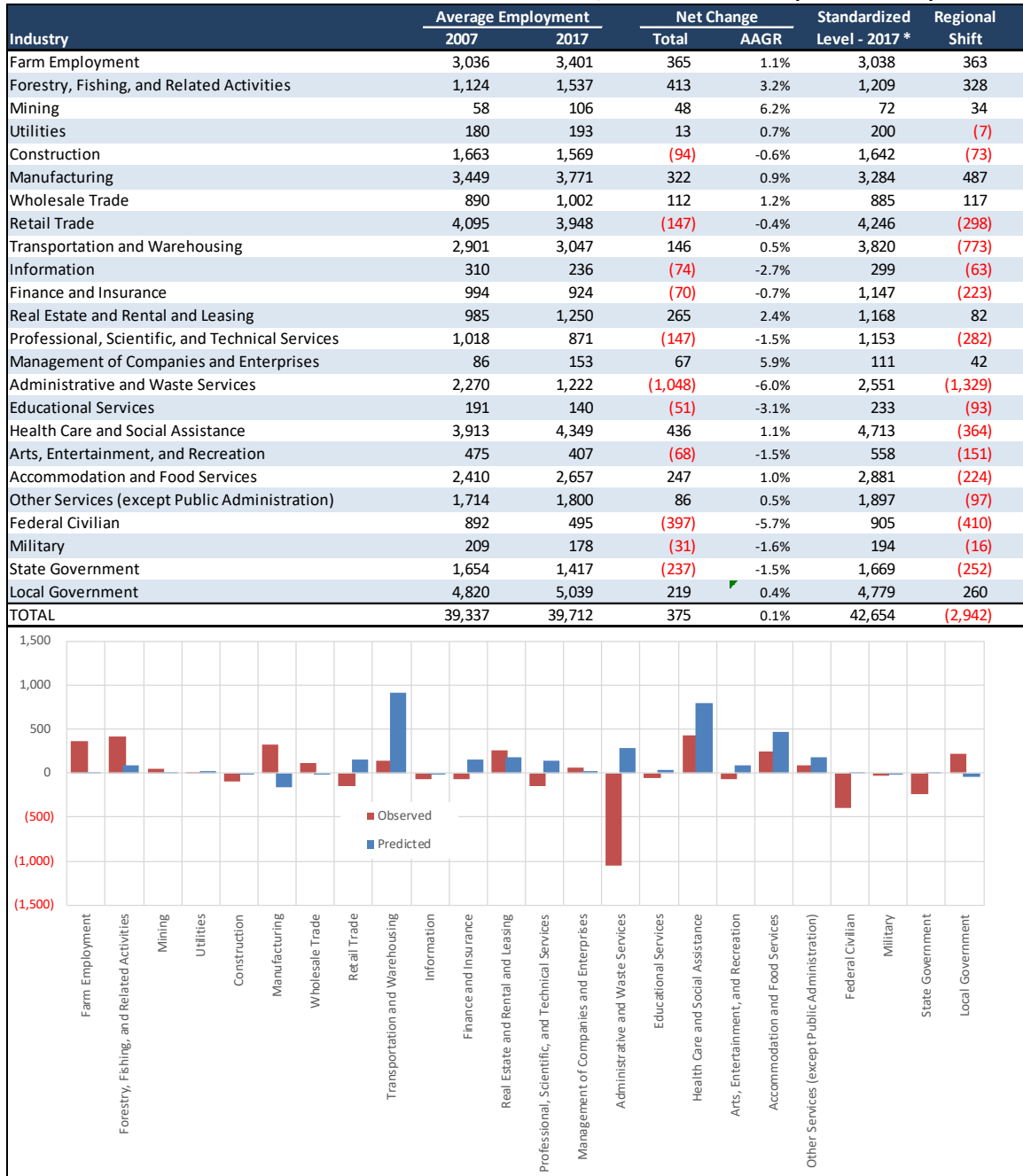
We evaluated the average annual growth rate by industry from 2008 through 2017 for Umatilla County relative to the national rate. The observed local change was compared to a standardized level reflecting what would be expected if the local industry grew at a rate consistent with national rates for that industry.

As shown in Figure 3.3, only a few industries showed growth in excess of national rates. These include manufacturing, natural resources industries, real estate rental and leasing, and wholesale trade.

² Measured from the trough of recent recession to 2017, the most recent period available for local employment data.

It is also known that in the last few years, Umatilla County has added significant employment and investment in the data center industry. This employment is not yet reflected in the most recent QCEW data (2017) of covered employment where it would appear under the “Information” sector. It is known that this industry has experienced significant and rapid growth in the county and the city of Umatilla itself. (This target industry is discussed more in the following section.)

FIGURE 3.3: INDUSTRY SECTOR SHIFT SHARE ANALYSIS, UMATILLA COUNTY (2008 – 2017)



* Employment level in each industry had it grown at the same rate as its counterparts at the national level over the same period.

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis

ECONOMIC DEVELOPMENT ASSETS

In this section, we summarize some of the key economic development assets of the city and the area, which will shape the nature of economic growth in the foreseeable future.

1. *Abundance of Energy & Water*

Availability of quality power will continue to increase regional competitiveness over the long-term. This provides an advantage when pursuing users requiring large power sources, including data center investments, as well as durable goods manufacturing. While much of the local power production is exported outside of the region, there is substantial loss in transmission. Average electrical rates in Oregon are 23% below national levels, but higher than those in Washington or Idaho.

2. *Transportation Linkages*

Along with abundant affordable power, transportation linkages are arguably the region's best asset. The city of Umatilla is positioned near one of only five confluences of major interstates in Oregon and is the only one outside of the Willamette Valley. The City is also located at the border with Washington State, with the next nearest bridge crossings of the Columbia located 50 miles north, or 80 miles to the west. Further, the Port terminals and regional rail linkages provide access to world-wide shipping networks, particularly for the region's agricultural products.

3. *Amenity Values*

Amenity values are encompassed in the concept of livability. Amenity values are often characterized in the field of Economics and Economic Geography because amenity values have real economic impacts on attracting residents, employers and workforce to an area. The Columbia Basin has abundant natural amenities, with scenery and proximity to nature and recreational activities. However, the region is lacking in some urban amenities given the size of its communities.

4. *Proximity to a Large Well-Educated Workforce*

While the local workforce is underrepresented in higher skilled laborers, regional economic growth can tap into a large population base with above average training levels. Both Umatilla (15.6%) and Morrow Counties (10.7%) have lower rates of persons aged 25 and older holding bachelor's degrees than the State of Oregon (29.0%). In Benton County, the ratio is 27.7% while the State of Washington ratio is 31.4%.³ Benton and Franklin Counties in Washington combine for 42,000 adults with an Associate Degree or better. The size and commuting patterns of the greater region, allows for large new employers to draw sufficient workforce from beyond the immediate community if needed.

5. *Flat, Developable Land*

The study area has a diversity of potentially available land to accommodate a range of uses and intensity of uses. This diversity can expand regional marketability and offers the flexibility to plan uses meeting specific site criteria. Within the State of Oregon, there are very limited opportunities for large-lot industrial development. The region's potential supply of large sites can provide a strong competitive advantage, if it is made available. While the land in the county may be hypothetically suitable however, the right amount, location, and sizes of development sites for different employers may not be currently available within the Urban Growth Boundary. The suitability of buildable land in Umatilla is discussed elsewhere in this report.

³ 2010 Census

6. Economic Development Support & Partnerships

The region benefits from an aggressive and well-organized economic development climate. The Port Districts have had noted economic development success and local communities have undertaken countless initiatives to improve economic competitiveness. The Confederated Tribes of the Umatilla Indian Reservation also is an active participant in regional economic development efforts. The end result has been a region that has significantly outperformed non-metropolitan areas of the State over the last decade in terms of economic growth.

TARGET INDUSTRY CLUSTERS

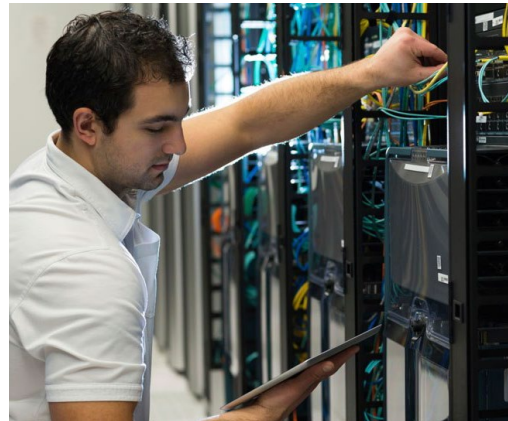
This section discusses potential target industries for the City of Umatilla based on the community's historical strengths and advantages, established economic development goals, and discussion of community priorities through this process. These are industries where the city might focus efforts to grow local business and attract new businesses. At the end of this section is a more detailed glossary of potential community partners for economic development.

Data Centers/ Cloud Storage Services

The City of Umatilla, along with other locations in Umatilla and Morrow Counties has quickly grown as a hub for large, very-high investment data center users who seek ready access to ample inexpensive power and water, as well as large suitable development sites.

These types of industrial land users make very large capital investments in facilities and equipment. They can employ hundreds of people at each site and pay wages far above the average income for the area.

This sector is a major target industry identified by the community. There are currently nine major data centers located in the Columbia Basin, demonstrating the suitability and desirability of the area and its infrastructure. The nation's largest tech companies continue to express interest in locating new data center and cloud-computing facilities in the area, and in Umatilla specifically. There have been recent real-world opportunities to recruit these types of businesses to Umatilla if suitable sites are available.



Cluster Strengths

- Proximity to abundant and inexpensive power and water sources
- Excellent fiber optic telecom connectivity
- Suitability of land for large, flat industrial sites
- Establishment of successful examples and building of skilled workforce in this sector
- Strong economic development support from local and regional partners

Cluster Challenges

- Limited supply of appropriately large, shovel-ready development sites, within the UGB
- Need to continually recruit and grow trained workforce and supply workforce housing.

Potential Opportunities

- Recruitment of additional data center facilities
- Ensure sufficient adequately-sized shovel-ready industrial parcels within UGB and/or City limits

- Partnerships with local education sector to train and recruit additional workforce

Manufacturing (Traditional and Advanced)

Manufacturing is typically a highly desirable sector, which creates considerable value, pays good wages, and often exports the bulk of its output. The manufacturing sector currently accounts for a relatively small share of the current employment base in the city of Umatilla but is targeted by the community as a potential growth sector in the future.



Umatilla has been home to food, wood and metals product manufacturers. Going forward, these will remain good opportunities for growth taking advantage of available industrial lands, power and water resources. These export industries also benefit from the ample transportation connections and shipping options in the area.

Advanced manufacturing is also expected to be an increasing opportunity. In general, this refers to modern manufacturers who use advanced technologies such as robots and software to increase productivity and make traditional methods more efficient. Like data centers, these manufacturers also benefit from ample power and their facilities may rely on significant mechanization. Despite the automation, these industries typically require a sizable trained workforce to run the advanced processes.

Manufacturing firms can be a full range of sizes with differing land needs from small sites to very large. Potential large-site manufacturers have made inquiries in the Umatilla area.

Cluster Strengths

- Proximity to abundant and inexpensive power and water sources
- Existing food and wood products industries with workforce expertise.
- Available and serviced land supply of smaller and medium sites

Cluster Challenges

- Limited supply of larger shovel-ready development sites, for largest manufacturers
- Need to continually recruit and grow trained workforce and supply workforce housing.

Potential Manufacturing Opportunities

- Food products/value-added specialty foods
- Advanced agricultural technology, such as robotics, precision tools, indoor-growing technology
- Specialty river recreation or other recreation equipment
- Drones and robotics
- Recruitment of other large-lot, large-power users

Tourism and Retail

Umatilla has physical and locational attributes that make recreation and hospitality an attractive target sector. The city offers access to the river and recreation and has plans to redevelop the marina to encourage more visitors, concessions, tours and related activity. Regional outdoor recreation includes camping, hiking,

hunting, fishing, and rafting. Major regional draws such as the Pendleton Round Up and tribal gaming also provide an opportunity to market to new visitors.

Tourism growth can be mutually reinforcing with new business development along the city's main downtown corridor of 6th Street, and elsewhere in the community. While retail trade is typically viewed as a function of growth in local population and buying power, developing a strong retail trade base in an area helps limit spending from leaking out of the market, retaining dollars in the local economy.

The amenities that tourism traffic supports are also largely consistent with what is desirable to local residents. Quality retail, restaurant, recreation, and hospitality businesses make a community an attractive place to live and work. Studies have shown that tourism-related supportive uses have a positive impact on housing values and attract residents and businesses alike. This is a growing phenomenon in the context of emerging consumer preferences observed across Millennial and Boomer generations. Attraction of these types of businesses would offer Umatilla the opportunity to raise its amenity profile.



Cluster Strengths

- Recreational amenities, river location
- Location on freeway, at state border
- Historic Oldtown site
- Investment in trails, and outdoor and recreation events

Cluster Challenges

- Need to raise awareness/visibility beyond the region

Cluster Opportunities

- Drawing visitors from other regional attractions
- Improved access use of the marina/river

Transportation, Warehousing and Distribution

Currently, Transportation & Warehousing is among the largest sectors in the county. The location quotient analysis indicated that the study area's concentration in truck transportation is more than two and a half times the national average. The region has succeeded in attracting and retaining large transportation firms, including three firms with 100-249 employees and two additional firms with more than 250 employees.

The reason for the emergence of this industry cluster is intuitively clear. The area's geographic position and transportation linkages afford a reasonable (distribution) drive-time from major population centers throughout the Northwest, Northern California, British Columbia, and the Western Mountain States. Other regional attributes include a refrigerator cargo dock on the Columbia River, fiber optic telecommunications, and the location of the Union Pacific switching station.

The area's strong transportation access and multi-modal opportunities makes it ideal for transportation and warehousing uses. Umatilla County has successfully attracted multiple large distribution centers, including a Walmart Distribution Center and Fed Ex Freight distribution facility. One or more such distribution facilities are a viable target recruitment for Umatilla City, if appropriate sites are available.

Cluster Strengths

- Multi-modal transportation connections, confluence of two freeways
- Port/rail access

Cluster Challenges

- Need for additional large, shovel-ready sites near the freeway and within the UGB

Cluster Opportunities

- Distribution centers
- Central hub for transportation/freight/logistics businesses

Health Care

Demand for health services tends to follow demographic trends. The local population and workforce are projected to continue growing at a strong rate. At the same time, a major segment of the population will be aging in place, increasing the demand for health services and continuing care. The following are key industry trends:

- Emphasis on leveraging cost advantages.
- Strong growth in utilization of mobile health systems, software, and access to information.
- Emerging care models including smaller, distributed clinics (i.e. Zoomcare).
- Video or phone appointments.
- An estimated 5% to 8% of Boomers will age in multi-family retirement and care facilities.



The community has identified a need for more local health services located in Umatilla for the local households, many of whom currently travel to Hermiston or beyond for needed health care. Needed services include urgent care, additional clinics, dental care and other specialists. As the population grows, there should be increasing opportunities for health care providers to locate in the community to serve the local population.

Cluster Strengths

- Growth and aging of population will support health services.
- Dedicated service area.
- Identified need and captive market.

Cluster Weakness

- Sector is concentrated in Hermiston.

Cluster Opportunities

- Development of expanded and/or new medical office clusters
- Expansion of training offerings for nurses and other medical professionals.

IV. FORECAST OF EMPLOYMENT AND LAND NEED

CITY OF UMATILLA EMPLOYMENT FORECASTS

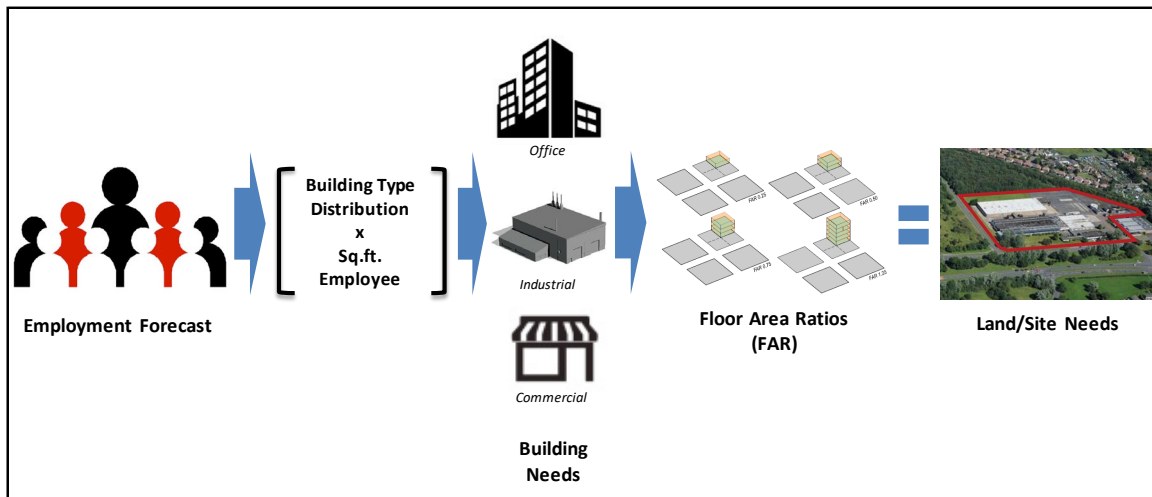
Goal 9 requires that jurisdictions plan for a 20-year supply of commercial and industrial capacity. Because employment capacity is the physical space necessary to accommodate new workers in the production of goods and services, employment needs forecasts typically begin with a forecast of employment growth in the community. The previous analysis of economic trends and targeted industries set the context for these estimates. This analysis translates those influences into estimates of employment growth by broad industry. Forecasts are produced at the sector or subsector level (depending on available information) and are subsequently aggregated to two-digit NAICS sectors. Estimates in this analysis are intended for long-range land planning purposes and are not designed to predict or respond to business cycle fluctuation.

The projections in this analysis are built on an estimate of employment in 2019, the commencement year for the planning period. Employment growth will come as the result of net-expansion of businesses in the community, new business formation, or the relocation/recruitment of new firms. Forecast scenarios consider a range of factors influencing growth. Long-range forecasts typically rely on a macroeconomic context for growth. Inflections in business cycles or the impact of a major shift in employment (i.e. a major unknown recruitment) are not considered.

Overview of Employment Forecast Methodology

Our methodology starts with employment forecasts by major commercial and industrial sector. Forecasted employment is allocated to building type, and a space demand is a function of the assumed square footage per employee ratio multiplied by projected change. The need for space is then converted into land and site needs based on assumed development densities using floor area ratios (FARs).

FIGURE 4.01: CONVERSION OF EMPLOYMENT FORECAST TO LAND NEED FORECAST - METHODOLOGY



Source: Johnson Economics

The first step of the analysis is to update covered employment to the 2019 base year. Our City of Umatilla Quarterly Census of Employment and Wages (QCEW) dataset provides covered employment by industry

through 2017. To update these estimates, we use observed industry specific growth rates for the region between 2017 and 2019.

The second step in the analysis is to convert “covered”⁴ employment to “total” employment. Covered employment only accounts for a share of overall employment in the economy. Specifically, it does not consider sole proprietors or some contracted workers. Covered employment was converted to total employment based on observed ratios at the national level derived from the Bureau of Economic Analysis from 2010 through 2017.

The differential is the most significant in construction, professional, and administrative services. The adjusted 2019 total non-farm employment base for the City of Umatilla is an estimated 1,968 jobs.

FIGURE 4.02: UPDATE TO 2019 BASELINE AND CONVERSION OF COVERED TO TOTAL EMPLOYMENT

Major Industry Sector	QCEW Employment			Total Emp. Conversion ²	2019 Estimate
	2017 Employment	'17-'19 County Δ ¹	2019 Estimate		
Construction	172	1.8%	178	73.5%	243
Manufacturing	59	1.1%	60	97.6%	62
Wholesale Trade	88	1.0%	90	97.3%	92
Retail Trade	145	1.0%	148	94.4%	157
T.W.U.	93	1.1%	95	91.3%	104
Information*	0	2.9%	200	94.7%	211
Finance & Insurance	8	0.4%	8	91.6%	9
Real Estate	11	0.4%	11	91.6%	12
Professional & Technical Services	9	1.1%	9	88.5%	10
Administration Services	20	1.1%	20	88.5%	23
Education	215	1.5%	221	94.5%	234
Health Care	126	1.5%	130	94.5%	137
Leisure & Hospitality	79	1.0%	81	94.4%	85
Other Services	45	0.9%	46	82.7%	55
Government	525	0.7%	533	100.0%	533
TOTAL	1,595	7.1%	1,830	93.0%	1,968

¹ Forecasted AAGR from 2017-2024 for Umatilla County. Oregon Employment Department

² Bureau of Economic Analysis. Calculated as an eight-year average between 2010 and 2017

T.W.U. = Transportation, Warehousing, and Utilities

*Information sector: Employment in 2019 is estimated from local sources

Source: Johnson Economics, Oregon Employment Department, BEA

Scenario 1: Safe Harbor Forecast

The Goal 9 statute does not have a required method for employment forecasting. However, OAR 660-024-0040(9)(a) outlines several safe harbor methods, which are intended to provide jurisdictions a methodological approach that will not be challenged. The most applicable for Umatilla County jurisdictions is 660-024-0040(9)(a)(B), which recommends reliance on the adopted projected population growth rate as determined by the Portland State University Population Research Center. This method applies the projected

⁴ The Department of Labor’s Quarterly Census of Employment and Wages (QCEW) tracks employment data through state employment departments. Employment in the QCEW survey is limited to firms with employees that are “covered” by unemployment insurance.

population growth rate to the 2019 Umatilla County base, essentially reflecting that employment growth is expected to keep track with population growth. For individual industries, the projected growth rate is based on the most recent regional forecast (2017-2027) published by the Oregon Employment Department for Morrow and Umatilla Counties.

This method results in an average annual growth rate of 1.7%, with total job growth of 805 jobs over the forecast period when applied to the employment profile in Umatilla.

Scenario 2: Alternative Employment Forecast

A second prepared forecast scenario was influenced by the research and analysis conducted in the EOA. This scenario formulates an employment growth trajectory based on identified trends, the growth outlook for targeted industries, and input from the project advisory committee. Further, the alternative scenario recognizes that the city's policy direction has influence over realized growth in targeted sectors. This scenario considers the influence of known or anticipated development over a near and medium-term horizon. The following identified factors that are expected to influence growth informed the forecast

Target Industries – The key industries that the community has identified for targeted growth and focused economic development efforts. Known real-world business interest and location scouting from industries have also been considered. The most significant changes were to reflect targeted growth in the information (data centers) and transportation & warehousing (distribution centers).

Power, Water and Fiber Resources – Umatilla has excellent infrastructure resources that have proven attractive to large, high-investment industrial users such as data centers.

Location - Umatilla's location within the region will influence the mix of employment uses it can attract. Transportation, labor shed, recreation, and livability are some key locational factors.

Household Growth - Growth in many sectors, including retail, hospitality, banking, and real estate, is a direct function of population and households in a community.

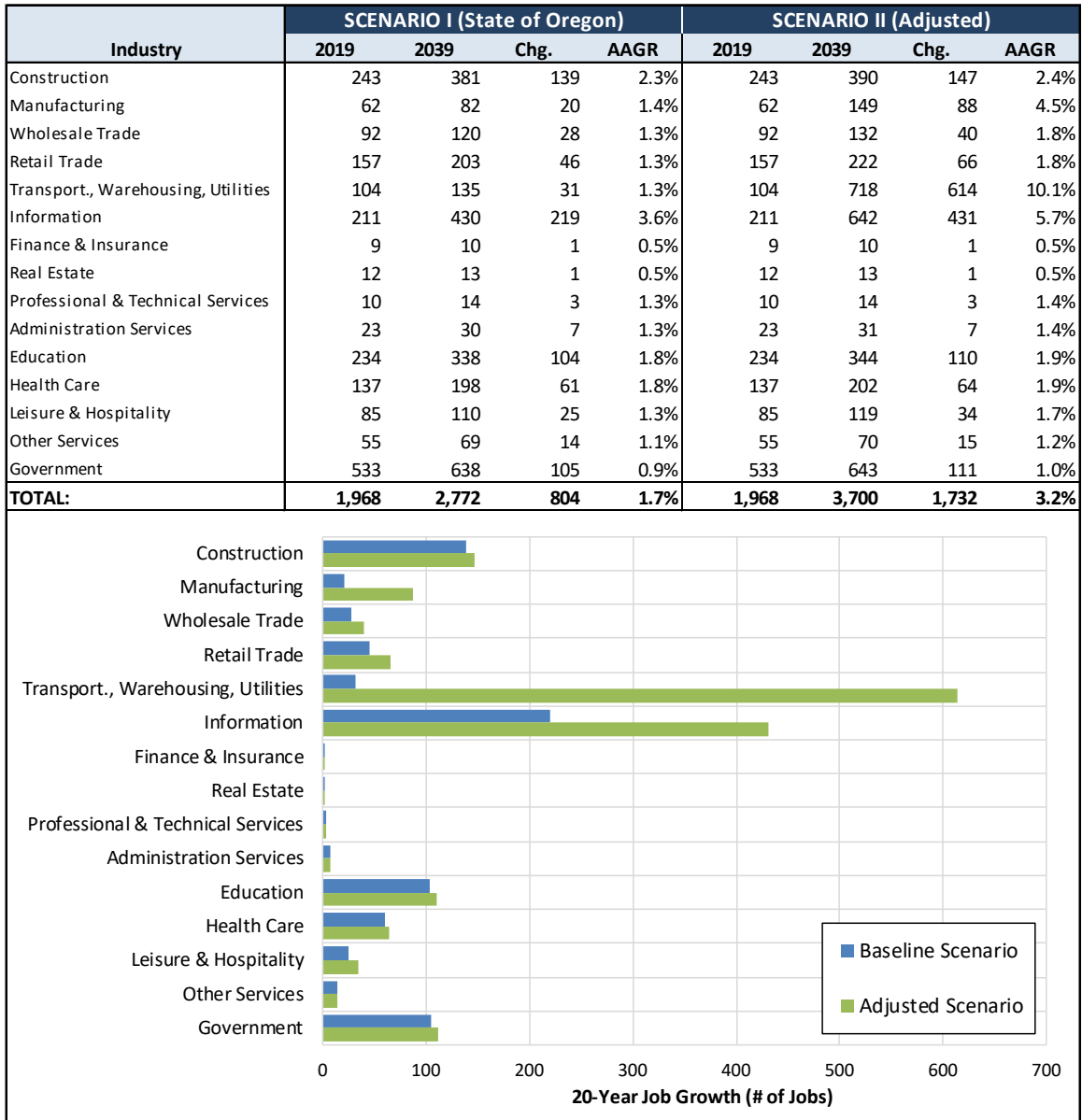
Taken together, the 20-year forecast in this scenario projects 3.2% average annual growth. Our outlook for growth in information, manufacturing, transportation and distribution, retail, and leisure & hospitality is more optimistic than macroeconomic forecasts indicate—reflecting the area's recent strength in these sectors.

Summary of Employment Forecast Scenarios

The two forecast scenarios in this analysis range from 1.7% to 3.1% average annual growth. Job growth estimates range from roughly 805 to 1,730 jobs. The first scenario is useful in creating a baseline understanding of macroeconomic growth prospects. These are common and broadly accepted approaches when looking at large geographic regions.

However, forecasts grounded in broad-based economic variables do not account for the realities of local businesses and trends among evolving industries. The second scenario is meant to reflect these unique circumstances along with local economic development goals. Any long-term forecast is inherently uncertain and should be updated on a regular basis to reflect more current information.

FIGURE 4.03: COMPARISON OF ALTERNATIVE FORECASTS, CITY OF UMATILLA



Source: Johnson Economics, Oregon Employment Department, BEA

FIGURE 4.04: SUMMARY OF PROJECTION SCENARIOS, CITY OF UMATILLA (5-YEAR INCREMENTS)

Industry	Overall Employment					Net Change by Period				Total 19-39
	2019	2024	2029	2034	2039	19-24	24-29	29-34	34-39	
SCENARIO 1 (State of Oregon)										
Construction	243	272	304	341	381	29	32	36	41	139
Manufacturing	62	66	71	77	82	5	5	5	6	20
Wholesale Trade	92	99	105	112	120	6	7	7	8	28
Retail Trade	157	167	178	190	203	10	11	12	13	46
Transport, Warehousing, Utilities	104	111	119	127	135	7	8	8	9	31
Information	211	252	302	360	430	41	49	59	70	219
Finance & Insurance	9	9	9	9	10	0	0	0	0	1
Real Estate	12	12	13	13	13	0	0	0	0	1
Professional & Technical Services	10	11	12	13	14	1	1	1	1	3
Administration Services	23	25	26	28	30	2	2	2	2	7
Education	234	257	281	308	338	22	25	27	30	104
Health Care	137	150	165	181	198	13	14	16	17	61
Leisure & Hospitality	85	91	97	103	110	6	6	6	7	25
Other Services	55	59	62	65	69	3	3	4	4	14
Government	533	557	583	610	638	25	26	27	28	105
TOTAL:	1,968	2,138	2,327	2,537	2,772	170	189	210	234	804
SCENARIO 2 (Modified)										
Construction	243	273	308	346	390	31	34	39	44	147
Manufacturing	62	77	96	120	149	15	19	24	30	88
Wholesale Trade	92	101	110	121	132	9	9	10	11	40
Retail Trade	157	171	187	204	222	14	16	17	19	66
Transport, Warehousing, Utilities	104	169	273	443	718	65	105	170	275	614
Information	211	279	368	486	642	68	89	118	156	431
Finance & Insurance	9	9	9	10	10	0	0	0	0	1
Real Estate	12	12	13	13	13	0	0	0	0	1
Professional & Technical Services	10	11	12	13	14	1	1	1	1	3
Administration Services	23	25	27	28	31	2	2	2	2	7
Education	234	258	284	313	344	24	26	29	32	110
Health Care	137	151	166	183	202	14	15	17	18	64
Leisure & Hospitality	85	93	101	110	119	7	8	9	10	34
Other Services	55	59	62	66	70	3	4	4	4	15
Government	533	558	585	614	643	26	27	28	30	111
TOTAL:	1,968	2,246	2,602	3,069	3,700	278	356	467	631	1,732

Source: Johnson Economics, Oregon Employment Department, BEA

EMPLOYMENT LAND NEED FORECAST – CITY OF UMATILLA

The next step in our analysis is to convert projections of employment into forecasts of land demand over the planning period. The generally accepted methodology for this conversion begins by allocating employment by sector into a distribution of building typologies that typically house those economic activities. As an example, insurance agents commonly locate in a traditional office space, usually along commercial corridors. However, a percentage of these firms locate in commercial retail space adjacent to retail anchors. Cross tabulating this distribution provides an estimate of employment in each typology.

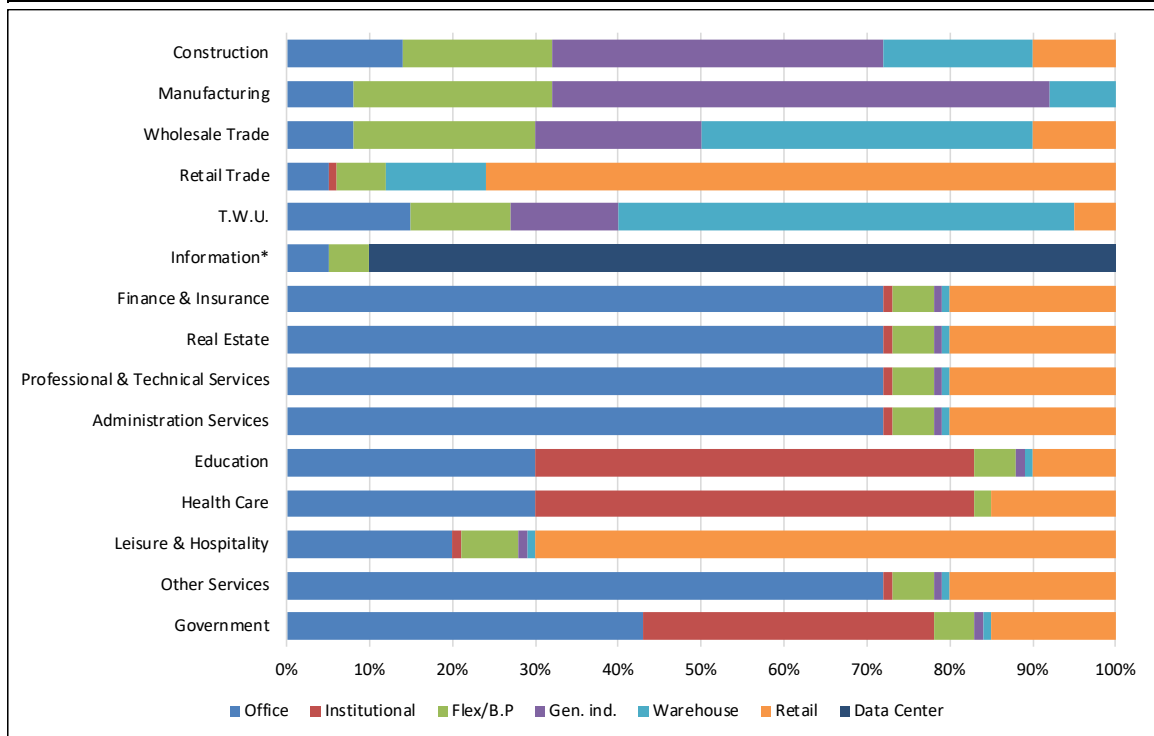
The next step converts employment into space using estimates of the typical square footage exhibited within each typology. Adjusting for market clearing vacancy we arrive at an estimate of total space demand for each building type. Finally, we can consider the physical characteristics of individual building types and the amount of land they typically require for development. The site utilization metric commonly used is referred to as a “floor area ratio” or FAR. For example, assume a 25,000-square foot general industrial building requires approximately two acres to accommodate its structure, setbacks, parking, and necessary yard/storage space. This building would have an FAR. of roughly 0.29. Demand for space is then converted to net acres using a standard FAR for each development form.

Land Demand Analysis (Adjusted Forecast)

To demonstrate the methodology used, this report will develop land need estimates in a step-by-step process, clearly presenting underlying assumptions. In this analytical step we allocate employment growth into standard building typologies. The building typology matrix represents the share of sectoral employment that locates across various building types.

FIGURE 4.05: DISTRIBUTION OF EMPLOYMENT BY SPACE TYPE, CITY OF UMATILLA

Industry Sector	20-year Job Forecast		BUILDING TYPE MATRIX						
	Number	AAGR	Office	Institutional	Flex/B.P	Gen. ind.	Warehouse	Data Center	Retail
Construction	147	2.3%	14%	0%	18%	40%	18%	0%	10%
Manufacturing	88	1.4%	8%	0%	24%	60%	8%	0%	0%
Wholesale Trade	40	1.3%	5%	0%	5%	10%	75%	0%	5%
Retail Trade	66	1.3%	5%	1%	6%	0%	12%	0%	76%
Transport, Warehousing, Utilities	614	1.3%	15%	0%	12%	13%	55%	0%	5%
Information	431	3.6%	5%	0%	5%	0%	0%	90%	0%
Finance & Insurance	1	0.5%	72%	1%	5%	1%	1%	0%	20%
Real Estate	1	0.5%	72%	1%	5%	1%	1%	0%	20%
Professional & Technical Services	3	1.3%	72%	1%	5%	1%	1%	0%	20%
Administration Services	7	1.3%	72%	1%	5%	1%	1%	0%	20%
Education	110	1.8%	30%	53%	5%	1%	1%	0%	10%
Health Care	64	1.8%	30%	53%	2%	0%	0%	0%	15%
Leisure & Hospitality	34	1.3%	20%	1%	7%	1%	1%	0%	70%
Other Services	15	1.1%	72%	1%	5%	1%	1%	0%	20%
Government	111	0.9%	43%	35%	5%	1%	1%	0%	15%
TOTAL	1,732	1.7%	16%	8%	10%	11%	24%	22%	9%



Source: Johnson Economics, Oregon Employment Department

Under the employment forecast scenario, employment housed in data center, office, retail, and general industrial space accounts for the greatest share of growth.

FIGURE 4.06: NET CHANGE IN EMPLOYMENT ALLOCATED BY BUILDING TYPE, CITY OF UMATILLA – 2019-2039

Industry Sector	20-year Job Forecast		NET CHANGE IN EMPLOYMENT BY BUILDING TYPE - 2019-2039							Total
	Number	AAGR	Office	Institutional	Flex/B.P	Gen. Ind.	Warehouse	Data Center	Retail	
Construction	147	2.3%	21	0	27	59	27	0	15	147
Manufacturing	88	1.4%	7	0	21	53	7	0	0	88
Wholesale Trade	40	1.3%	2	0	2	4	30	0	2	40
Retail Trade	66	1.3%	3	1	4	0	8	0	50	66
Transport., Warehousing, Utilities	614	1.3%	92	0	74	80	338	0	31	614
Information	431	3.6%	22	0	22	0	0	388	0	431
Finance & Insurance	1	0.5%	1	0	0	0	0	0	0	1
Real Estate	1	0.5%	1	0	0	0	0	0	0	1
Professional & Technical Services	3	1.3%	2	0	0	0	0	0	1	3
Administration Services	7	1.3%	5	0	0	0	0	0	1	7
Education	110	1.8%	33	58	5	1	1	0	11	110
Health Care	64	1.8%	19	34	1	0	0	0	10	64
Leisure & Hospitality	34	1.3%	7	0	2	0	0	0	24	34
Other Services	15	1.1%	11	0	1	0	0	0	3	15
Government	111	0.9%	48	39	6	1	1	0	17	111
TOTAL	1,732	1.7%	273	132	165	198	412	388	164	1,732

Source: Johnson Economics, Oregon Employment Department

Employment growth estimates by building type are then converted into demand for physical space. This conversion assumes the typical space needed per employee on average. This step also assumes a market clearing vacancy rate, acknowledging that equilibrium in real estate markets is not 0% vacancy. We assume a 10% vacancy rate for office, retail, and flex uses, as these forms have high rates of speculative multi-tenant usage. A 5% rate is used for general industrial, warehouse, and data centers—these uses have higher rates of owner occupancy that lead to lower overall vacancy. Institutional uses are assumed to have no vacancy.

The demand for space is converted into an associated demand for acreage using an assumed Floor Area Ratio (FAR). The combined space and FAR assumptions further provide estimates indicative of job densities, determined on a per net-developable acre basis.

FIGURE 4.07: NET ACRES REQUIRED BY BUILDING TYPOLOGY

ADJUSTED SCENARIO	DEMAND BY GENERAL USE TYPOLOGY, 2019-2039							Total
	Office	Institutional	Flex/B.P	Gen. Ind.	Warehouse	Data Center	Retail	
Employment Growth	273	132	165	198	412	388	164	1,732
Avg. SF Per Employee	350	600	990	600	1,850	8,000	500	2,542
Demand for Space (SF)	95,600	79,400	163,100	118,900	761,900	3,101,100	81,900	4,401,900
Floor Area Ratio (FAR)	0.35	0.35	0.30	0.30	0.35	0.35	0.25	0.32
Market Vacancy	10.0%	10.0%	10.0%	5.0%	5.0%	5.0%	10.0%	5.6%
Implied Density (Jobs/Acre)	39.2	22.9	11.9	20.7	7.8	1.8	19.6	5.6
Net Acres Required	7.0	5.8	13.9	9.6	52.6	214.1	8.4	311.3

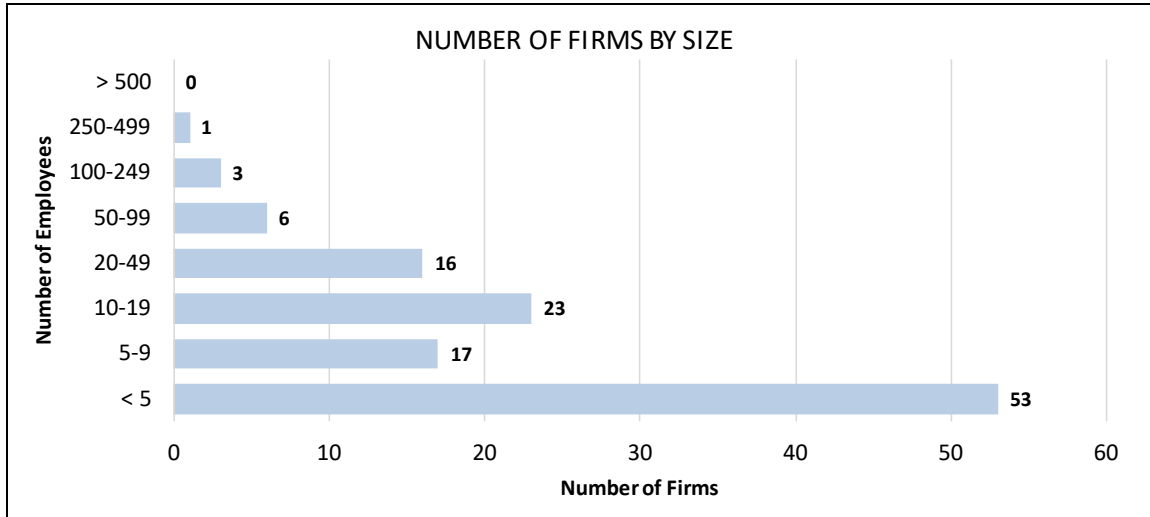
Source: Johnson Economics, Oregon Employment Department

Commercial office and retail densities are 39 and 20 jobs per acre, respectively. Industrial uses range from 21 jobs per acre for general industrial to 8 jobs per acre for warehouse/distribution to as few as 2 jobs per acre for data center users. The projected 1,730 job expansion in the local employment base would require an estimated 311 net acres of employment land to house.

EMPLOYMENT LAND NEED FORECAST – NEEDED SITE SIZES

The local employment base is largely dominated by small firms of 10 or fewer employees, with four employers currently accounting for more than 100 employees and one accounting for more than 250 (Figure 4.08).

FIGURE 4.08: DISTRIBUTION OF CURRENT FIRMS BY SIZE, UMATILLA OREGON



Source: Johnson Economics, Oregon Employment Department

Figure 4.09 presents the projected need for new commercial and industrial sites based on the industry growth projections presented above. These site needs are an estimate of future needs to aid comparison to available supply (see following Section.)

FIGURE 4.09: ESTIMATED SITE NEEDS (ACRES) OF FUTURE EMPLOYERS, UMATILLA OREGON

LAND USE	0 TO .9 acres	1 to 4.9 acres	5 to 9.9 acres	10 to 19.9 acres	20 to 29.9 acres	30 to 49.9 acres	50 to 99.9 acres	100+ acres	TOTAL
Office	10	1	0	0	0	0	0	0	11
Institutional	2	2	0	0	0	0	0	0	4
Retail	5	2	0	0	0	0	0	0	7
Commercial:	17	5	0	0	0	0	0	0	22
Flex/B.P	3	2	1	0	0	0	0	0	6
Gen. Ind.	5	3	1	0	0	0	0	0	9
Warehouse	2	3	2	0	0	0	1	0	8
Data Center	0	0	0	0	0	0	1	2	3
Industrial:	10	8	4	0	0	0	2	2	26
TOTAL:	27	13	4	0	0	0	2	2	48

Source: Johnson Economics, Oregon Employment Department

The estimates presented in Figure 4.09 are based on the average firm sizes of businesses in the different industry subsectors in Umatilla County. *However, economic development and job growth are dynamic, and this estimate of site needs is unlikely to match actual future needs exactly. Communities should maintain flexibility and ensure a supply of a variety of site types with short-term availability, as allowed through the Goal 9 EOA process.*

Local and regional employment trends in Umatilla and Morrow Counties support the likely ability to continue to recruit larger users such as data centers and larger manufacturers going forward. At the same time, there will be a continued demand for real estate space and sites of all size to accommodate the full range of employers across sectors.

Additional Considerations in Land Demand

Beyond a consideration of gross acreage, there is a significantly broader range of site characteristics that industries would require to accommodate future growth. We summarize some key findings here:

- Industrial buildings are generally more susceptible to slope constraints due to larger building footprints. For a site to be competitive for most industrial uses, a 5% slope is the maximum for development sites. Office and commercial uses are generally smaller and more vertical, allowing for slopes up to 15%.
- Most industries require some direct access to a major transportation route, particularly manufacturing and distribution industries that move goods throughout the region and beyond. A distance of 10-to-20 miles to a major interstate is generally acceptable for most manufacturing activities, but distribution activities require five miles or less and generally prefer a direct interstate linkage. Visibility and access are highly important to most commercial activities and site location with both attributes from a major commercial arterial is commonly required.
- Access and capacity for water, power, gas, and sewer infrastructure is more important to industrial than commercial operations. Water/sewer lines of up to 10" are commonly required for large manufacturers. Appendix A details utility infrastructure requirements by typology.
- Fiber telecommunications networks are likely to be increasingly required in site selection criteria for most commercial office and manufacturing industries. Medical, high-tech, creative office, research & development, and most professional service industries will prefer or require strong fiber access in the coming business cycles.

Section VI and Appendix A of this report discuss industry-specific site requirements in greater detail.

V. CURRENT EMPLOYMENT LAND SUPPLY

BUILDABLE LAND INVENTORY

The inventory of employment land provides a snapshot of the currently local capacity to accommodate more business and jobs. This current available land will be compared to the forecasted need for new land over the 20-year planning period.

Employment land includes land zoned for industrial, retail or other commercial use (i.e. office), and may also include mixed-use zoning that allows for employment uses. This inventory includes vacant parcels with the proper zoning, as well as “redevelopable” parcels. (The methodology used in this analysis is described in detail below.)

Methodology

The Buildable Lands Inventory (BLI) used in this analysis is based on tax account data from the County, supplemented with data from the State of Oregon. The data was provided in Geographic Information Systems (GIS) compatible format, providing information on land use, parcel size and other relevant data categories on the taxlot level. Zoning information was also provided by the City.

The tax account data was used to identify vacant and redevelopable parcels in the city and its UGB. Environmental constraints including wetlands, floodplain and steep slopes that might impact developability were also considered. The identified candidate parcels were then further screened and refined by Johnson Economics.

In keeping with State requirements, the BLI includes an assessment of vacant buildable lands and redevelopable parcels. This analysis applied the “safe harbor” assumptions allowed under state rules to determine the infill potential of developed parcels (OAR 660-024-0050):

FIGURE 5.01: SUMMARY OF EMPLOYMENT BUILDABLE LAND INVENTORY METHODOLOGY



Appendix B provides an in-depth summary of the Buildable Lands Inventory, including methodology and mapping of the identified parcels of employment land. The results are summarized below.

FIGURE 5.02: SUMMARY OF EMPLOYMENT BUILDABLE LAND INVENTORY (UMATILLA)

ZONE	VACANT		REDEVELOPABLE		TOTAL	
	Parcels	Acreage	Parcels	Acreage	Parcels	Acreage
C-1	4	8.5	2	1.0	6	9.5
DC	11	2.2	3	0.4	14	2.6
DT	8	1.4	0	0.0	8	1.4
GC	6	10.0	2	3.6	8	13.5
MC	3	4.1	0	0.0	3	4.1
NC	3	31.4	0	0.0	3	31.4
Commercial Total:	35	57.6	7	4.9	42	62.5
M1	6	23.5	5	27.6	11	51.1
M2	16	247.9	3	16.8	19	264.7
Industrial Total:	22	271.3	8	44.5	30	315.8
TOTAL:	57	328.9	15	49.4	72	378.3

Source: Umatilla County, Umatilla, Johnson Economics LLC

The inventory identifies over 378 acres of vacant or potentially redevelopable land in both commercial and industrial zones. A smaller share is in the Commercial zones, while the majority has Industrial zoning. 80% of the sites are identified as “vacant”, and 20% are potential “redevelopment” sites.

FIGURE 5.03: SUMMARY OF EMPLOYMENT BUILDABLE LAND INVENTORY, BY PARCEL SIZE (UMATILLA)

ZONE	0 TO .99 acres		1 to 4.99 acres		5 to 9.99 acres		10 to 19.99 acres		20 to 29.99 acres		30 to 49.99 acres		50+ acres		TOTALS	
	# of Parcels	Acreage	# of Parcels	Acreage	# of Parcels	Acreage	# of Parcels	Acreage	# of Parcels	Acreage	# of Parcels	Acreage	# of Parcels	Acreage	# of Parcels	Acreage
C-1	4	2.2	1	1.9	1	5.5	0	0.0	0	0.0	0	0.0	0	0.0	6	9.5
DC	14	2.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	14	2.6
DT	8	1.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	8	1.4
GC	2	1.7	3	5.0	1	6.9	0	0.0	0	0.0	0	0.0	0	0.0	6	13.5
MC	1	0.7	2	3.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	4.1
NC	0	0.0	0	0.0	2	13.4	1	18.0	0	0.0	0	0.0	0	0.0	3	31.4
<i>Commercial Total:</i>	<i>29</i>	<i>8.6</i>	<i>6</i>	<i>10.2</i>	<i>4</i>	<i>25.8</i>	<i>1</i>	<i>18.0</i>	<i>0</i>	<i>0.0</i>	<i>0</i>	<i>0.0</i>	<i>0</i>	<i>0.0</i>	<i>40</i>	<i>62.5</i>
M1	0	0.0	8	20.7	2	13.4	1	17.0	0	0.0	0	0.0	0	0.0	11	51.1
M2	0	0.0	3	10.3	6	39.7	4	53.3	0	0.0	0	0.0	1	161.4	14	264.7
<i>Industrial Total:</i>	<i>0</i>	<i>0.0</i>	<i>11</i>	<i>31.0</i>	<i>8</i>	<i>53.2</i>	<i>5</i>	<i>70.3</i>	<i>0</i>	<i>0.0</i>	<i>0</i>	<i>0.0</i>	<i>1</i>	<i>161.4</i>	<i>25</i>	<i>315.8</i>
TOTAL:	29	8.6	17	41.2	12	78.9	6	88.2	0	0.0	0	0.0	1	161.4	65	378.3

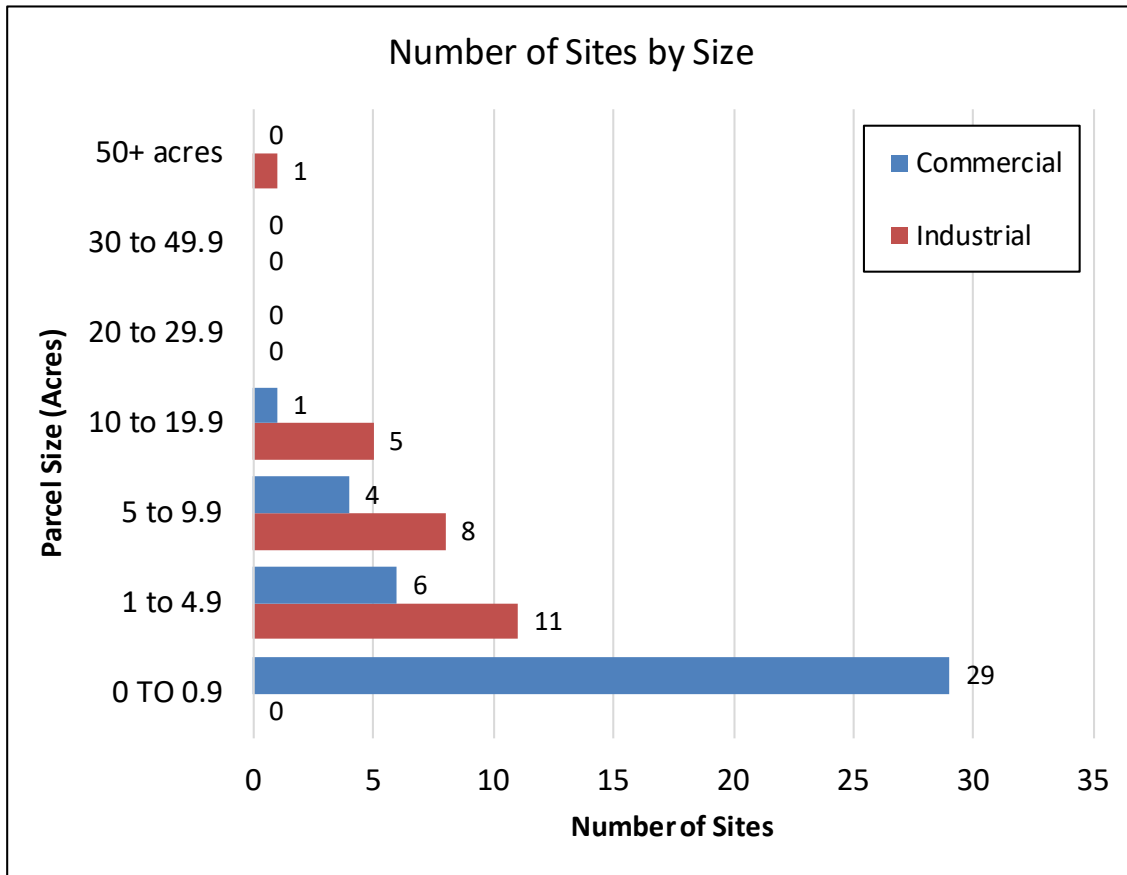
Source: Umatilla County, Umatilla, Johnson Economics LLC

Figure 5.03 presents the inventory broken down by the size of parcels. Most of the buildable unconstrained parcels identified are smaller than 20 acres, with the largest share of commercial parcels being smaller than

one acre in size. The largest share of industrial parcels (over one third) are between one and five acres. There is one large industrial parcel of roughly 160 acres located at the Port.

The following chart provides a visual presentation of the site-size data.

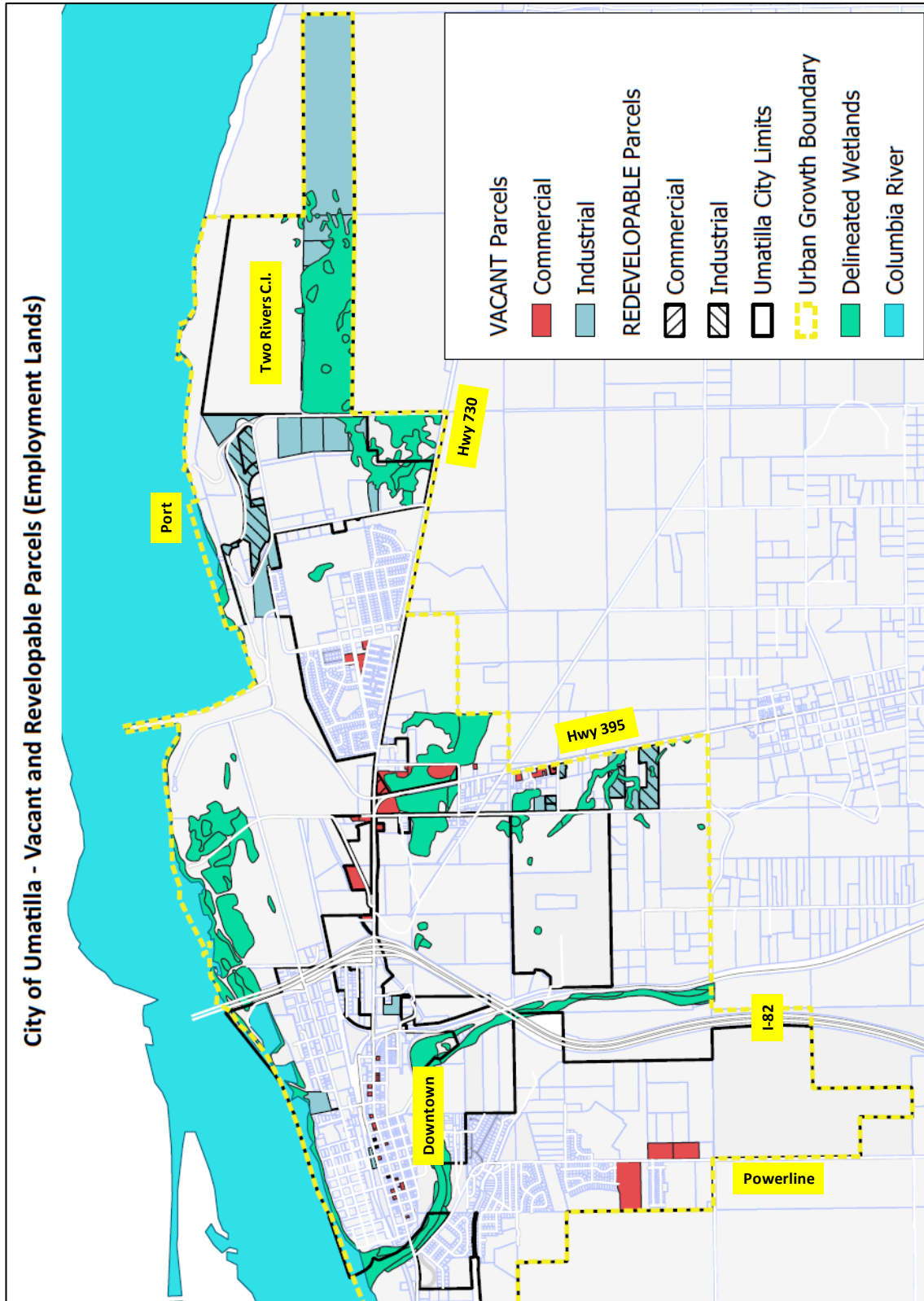
FIGURE 5.04: SUMMARY OF EMPLOYMENT BUILDABLE LAND INVENTORY, BY PARCEL SIZE (UMATILLA)



Source: Umatilla County, Umatilla, Johnson Economics LLC

The following figure shows a map of the Buildable Land Inventory for commercial and industrial parcels. Wetland constraints are highlighted to show how they hamper some of nominally vacant land supply. Where wetlands constrain a parcel, these parcels may be partially or wholly discounted from the inventory.

FIGURE 5.05: MAP OF EMPLOYMENT BUILDABLE LAND INVENTORY (UMATILLA)



Source: Umatilla County, State of Oregon, Johnson Economics LLC

BUILDABLE LAND INVENTORY VS. 20-YEAR LAND NEED

The inventory of employment land provides a snapshot of the currently local capacity to accommodate more business and jobs. This current available land is compared to the forecasted need for new land over the 20-year planning period, generated in a previous step of this project (Section IV).

The estimate of future land need is presented below. A total need for 309 net acres was identified across a range of building types.

FIGURE 5.06: SUMMARY OF FORECASTED 20-YEAR LAND NEED BY BUILDING TYPOLOGY (UMATILLA)

ADJUSTED SCENARIO	DEMAND BY GENERAL USE TYPOLOGY, 2019-2039							Total
	Office	Institutional	Flex/B.P	Gen. Ind.	Warehouse	Data Center	Retail	
Employment Growth	273	132	165	198	412	388	164	1,732
Avg. SF Per Employee	350	600	990	600	1,850	8,000	500	2,542
Demand for Space (SF)	95,600	79,400	163,100	118,900	761,900	3,101,100	81,900	4,401,900
Floor Area Ratio (FAR)	0.35	0.35	0.30	0.30	0.35	0.35	0.25	0.32
Market Vacancy	10.0%	10.0%	10.0%	5.0%	5.0%	5.0%	10.0%	5.6%
Implied Density (Jobs/Acre)	39.2	22.9	11.9	20.7	7.8	1.8	19.6	5.6
Net Acres Required	7.0	5.8	13.9	9.6	52.6	214.1	8.4	311.3

Source: Oregon Employment Department, Umatilla, Johnson Economics LLC

There is a total projected 20-year need for 309 acres of buildable employment land in industrial and commercial zones. Roughly 90% of this projected need is for uses most appropriate to industrial zones (Flex, General Industrial, Warehouse, and Data Center), while the remainder is for uses most appropriate for commercial zones (Office, Retail, Institutional).

Conclusion

This combined identified need (311 acres) is less than the 378 acres of combined buildable employment land noted in Figure 5.02. **It is important to remember that the different categories of employment land are not (necessarily) substitutable.** For instance, a shortage of 10 acres of commercial land, and a surplus of 10 acres of industrial land do not cancel each other.

Also, this does not address the more specific site needs from specific categories of employment land users. **Some of the forecasted growth includes employers who may have specific site needs and preferences that are not reflected in the available buildable inventory, even though *in total* the available parcels sum to a significant amount.**

In particular, there is forecasted demand for more suitable large-lot industrial sites while relatively few of these sites were found in the inventory. This is discussed in greater detail below.

VI. EMPLOYER SITE NEEDS VS. BUILDABLE LAND SUPPLY

This section compares the more specific site requirements of projected future commercial and industrial users with the specific inventory of prospective employment sites identified within the UGB. Oregon Administrative Rules requires a determination of 20-year employment land need, as well as a determination of need for suitable, readily serviceable land to meet short-term demand.

The following definitions from OAR 660-009-005 are relevant to this discussion:

(2) "Development Constraints" means factors that temporarily or permanently limit or prevent the use of land for economic development. Development constraints include, but are not limited to, wetlands, environmentally sensitive areas such as habitat, environmental contamination, slope, topography, cultural and archeological resources, infrastructure deficiencies, parcel fragmentation, or natural hazard areas....

(10) "Short-term Supply of Land" means suitable land that is ready for construction within one year of an application for a building permit or request for service extension. Engineering feasibility is sufficient to qualify land for the short-term supply of land. Funding availability is not required. "Competitive Short-term Supply" means the short-term supply of land provides a range of site sizes and locations to accommodate the market needs of a variety of industrial and other employment uses.

(11) "Site Characteristics" means the attributes of a site necessary for a particular industrial or other employment use to operate. Site characteristics include, but are not limited to, a minimum acreage or site configuration including shape and topography, visibility, specific types or levels of public facilities, services or energy infrastructure, or proximity to a particular transportation or freight facility such as rail, marine ports and airports, multimodal freight or transshipment facilities, and major transportation routes.

(12) "Suitable" means serviceable land designated for industrial or other employment use that provides, or can be expected to provide the appropriate site characteristics for the proposed

As noted in the previous section, the Buildable Land Inventory was screened for major constraints, including current development, floodways, wetlands, steep slopes, and federal ownership. The remaining parcels in the inventory may be buildable but may not meet the specific site requirements of certain users. Others may be part of the long-term supply, but not be well-suited for the short-term supply.

Estimated 20-Year Site Needs vs. Current Supply

The following figures re-present the findings of estimated need and current supply of sites by size, as presented in the preceding sections. Note that the estimate of future needs is approximate, as economic growth is dynamic and difficult to predict. Communities should maintain flexibility and ensure a supply of a variety of site types with short-term availability, as allowed through the Goal 9 EOA process.

As Figure 6.01 presents there is currently estimated to be a sufficient supply of commercial (retail/office/institutional) parcels to meet the projected demand. Most of the demand is estimated to be from employers seeking relatively small sites of five acres or less. Due to higher employment density for commercial uses, some of these may still have sizable workforces, despite smaller sites.

For industrial users, there is an estimated deficit of sites of some sizes. Most notably there is a deficit of suitable large industrial sites, and a deficit of small industrial sites.

**FIGURE 6.01: SUMMARY OF FORECASTED 20-YEAR SITE NEED VS. SITE SUPPLY
BY LAND USE AND SITE SIZE (ACRES), UMATILLA**

Estimated 20-year Site NEED

LAND USE	0 TO .9 acres	1 to 4.9 acres	5 to 9.9 acres	10 to 19.9 acres	20 to 29.9 acres	30 to 49.9 acres	50 to 99.9 acres	100+ acres	TOTAL
Office	10	1	0	0	0	0	0	0	11
Institutional	2	2	0	0	0	0	0	0	4
Retail	5	2	0	0	0	0	0	0	7
Commercial:	17	5	0	0	0	0	0	0	22
Flex/B.P	3	2	1	0	0	0	0	0	6
Gen. Ind.	5	3	1	0	0	0	0	0	9
Warehouse	2	3	2	0	0	0	1	0	8
Data Center	0	0	0	0	0	0	1	2	3
Industrial:	10	8	4	0	0	0	2	2	26
TOTAL:	27	13	4	0	0	0	2	2	48

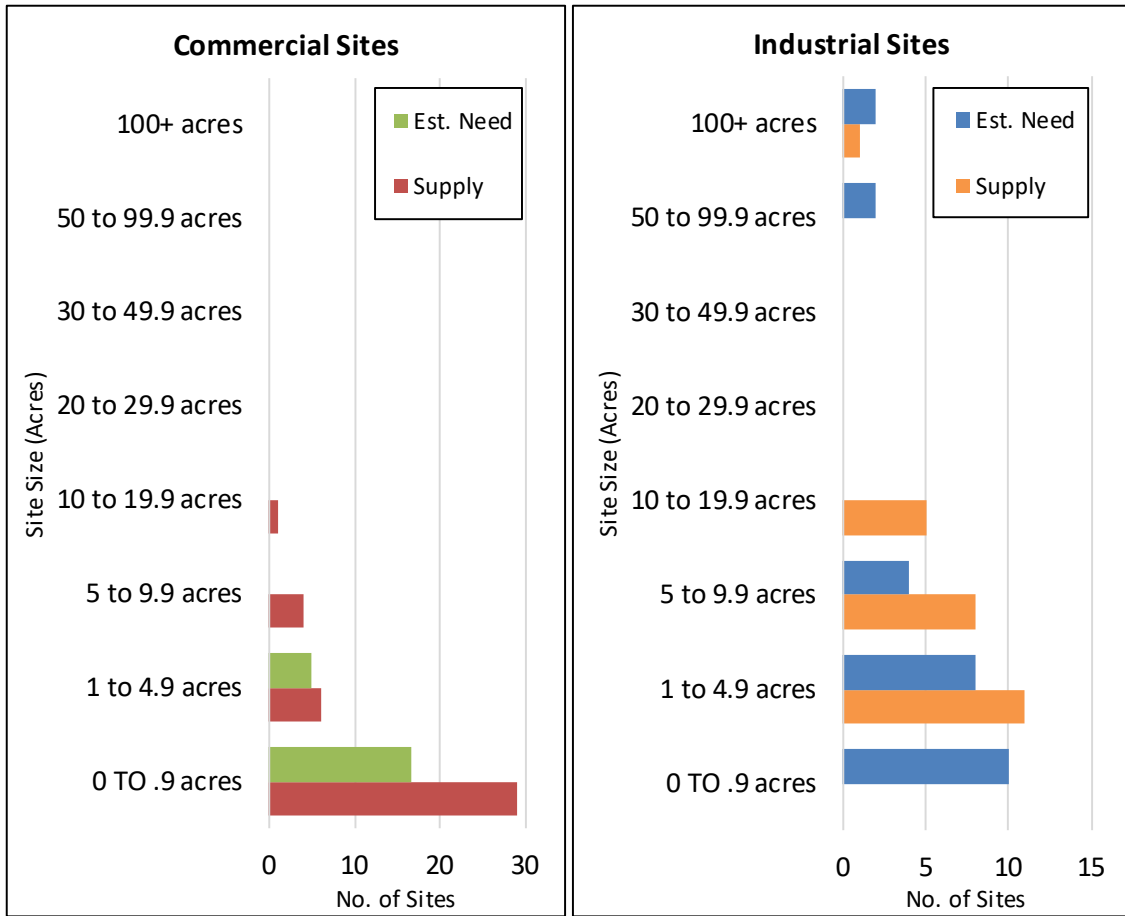
Estimated Employment Land SUPPLY (BLI)

LAND USE	0 TO .9 acres	1 to 4.9 acres	5 to 9.9 acres	10 to 19.9 acres	20 to 29.9 acres	30 to 49.9 acres	50 to 99.9 acres	100+ acres	TOTAL
C-1	4	1	1	0	0	0	0	0	6
DC	14	0	0	0	0	0	0	0	14
DT	8	0	0	0	0	0	0	0	8
GC	2	3	1	0	0	0	0	0	6
MC	1	2	0	0	0	0	0	0	3
NC	0	0	2	1	0	0	0	0	3
Commercial:	29	6	4	1	0	0	0	0	40
M1	0	8	2	1	0	0	0	0	11
M2	0	3	6	4	0	0	0	1	14
Industrial:	0	11	8	5	0	0	0	1	25
TOTAL:	29	17	12	6	0	0	0	1	65

Source: Oregon Employment Department, Umatilla, Johnson Economics LLC

Figure 6.02 presents the same data in chart form.

**FIGURE 6.02: SUMMARY OF FORECASTED 20-YEAR SITE NEED VS. SITE SUPPLY
BY LAND USE AND SITE SIZE (ACRES), UMATILLA**



Source: Oregon Employment Department, Umatilla, Johnson Economics LLC

Identified Industrial Site Deficits

Large Lot: The specific site deficits identified are for large industrial parcels. This finding is the result of strong projected growth in the information sector, and specifically data centers and cloud computing facilities. The Umatilla and Morrow County regions are now established centers for these facilities in Oregon due to a confluence of available infrastructure and workforce that have attracted these employers over the past decade. These facilities represent huge capital investments and offer high average wages for the region. There are known prospective opportunities to attract more of these facilities in the Umatilla area, which are excellent candidates for a ready short-term supply of suitable sites.

As outlined in the matrix of site requirements presented in Appendix A, these users seek large-lot industrial land with excellent power, water, and fiber access. These facilities have thus far used sites of 30 to over 100 acres. These users have stated a preference for very large sites in order to allow for future expansion. The most recent data center development in Umatilla sought a 120-acre site.

Given the projected short-term growth, and prospective long-term growth in this industry, Johnson Economics estimates a need for at least two sites of 100+ acres meeting serviceability requirements for data center or large manufacturing users, and at least two sites of 50+ acres.

In addition, there is a need for an additional large site or sites for potential distribution facilities. This is an identified target industry based on local economic goals, and the Umatilla area provides strong advantages for this type of facility based on its location at the connection of two interstate freeways.

Distribution centers require large sites for warehousing and truck staging, with ready freeway or major highway access for the receiving and shipping of large volumes of goods. For example, the nearby Walmart Distribution Center uses a 190-acre site, while the Fed Ex Freight distribution facility uses a 62.5-acre site. The currently available industrial sites are generally too limited in size and most are too distant from the freeway to serve as suitable candidates for this use.

Small Lot: There is also a projected future need from small industrial firms for smaller sites. It is also common for these types of users to also be accommodated in multi-tenant industrial buildings on larger sites. Given the supply of industrial sites in the 5- to 20-acre range that can be subdivided or built with multi-tenant space, it may be less critical to designate new land for these small users at this time. However, policies which facilitate availability of space for small industrial firms within current zones may be warranted.

APPENDIX A: SITE REQUIREMENTS

The following series of tables summarize key site requirements for a range of prospective tenant types.⁵

CRITERIA		PROFILE	A	B	C	D	E	F	G	H	I	J
		Computer & Electronic Manufacturing (High-Tech R&D)	Software & Media	Multi-Tenant Office	Food Processing	Other Manufacturing	Life/Bioscience R&D Campus	Wholesaling	Retail	Data Center	Incubator	
GENERAL REQUIREMENTS		Use is permitted outright, located in UGB or equivalent and outside flood plain; and site (NCDA) does not contain contaminants, wetlands, protected species, or cultural resources or has mitigation plan(s) that can be implemented in 180 days or less.										
PHYSICAL SITE												
1	TOTAL SITE SIZE* Competitive Acreage**	5 - 100+	5 - 15	5 - 20	5 - 25+	5 - 50+	20 - 100+	10 - 100+	5 - 20	10 - 100+	5 - 25+	
2	COMPETITIVE SLOPE: Maximum Slope	0 - 5%	0 - 7%	0 - 7%	0 - 5%	0 - 5%	0 - 7%	0 - 3%	0 - 7%	0 - 7%	0 - 5%	
TRANSPORTATION												
3	TRIP GENERATION: Average Daily Trips per Acre	40 - 60	80 - 200 ₁	120 - 240 ₂	50 - 60	40 - 50	60 - 150	50 - 60 ₃	400 - 500 ₄	20 - 30	40 - 50	
4	MILES TO INTERSTATE OR FREIGHT ROUTE: Miles	w/in 10	w/in 5	w/in 5	w/in 30	w/in 20	w/in 5	w/in 5	w/in 5	w/in 30	N/A	
5	MILES TO FREQUENT TRANSIT SERVICE (15 MIN OR LESS) Miles	0.6	0.5	0.8	< 0.1	0.2	0.1	0.3	< 0.1	0.1	< 0.1	
6	RAILROAD ACCESS: Dependency	Preferred	Not Required	Not Required	Preferred	Preferred	Preferred	Preferred	Preferred	Avoid	Avoid	N/A
7	PROXIMITY TO MARINE PORT: Dependency	Preferred	Not Required	Not Required	Preferred	Preferred	Preferred	Preferred	Preferred	Not Required	Not Required	N/A
8	PROXIMITY TO INTERNATIONAL/REGIONAL AIRPORT: Dependency	Competitive	Required	Preferred	Preferred	Preferred	Required	Not Required	Not Required	Competitive	N/A	
	Distance (Miles)	This criteria cannot be met in Eastern Oregon										

⁵ Business Oregon, Mackenzie.

PROFILE		A	B	C	D	E	F	G	H	I	J	
		Computer & Electronic Manufacturing (High-Tech R&D)	Software & Media	Multi-Tenant Office	Food Processing	Other Manufacturing	Life/Bioscience R&D Campus	Wholesaling	Retail	Data Center	Incubator	
CRITERIA												
UTILITIES												
9	WATER:	Min. Line Size (Inches/Dmtr)	12" - 16"	6" - 8"	8" - 10"	12" - 16"	6" - 10"	8" - 12"	6" - 10"	8" - 12"	16"	4" - 8"
		Min. Fire Line Size (Inches/Dmtr)	12" - 18"	8" - 10"	8" - 12"	10" - 12"	8" - 10"	8" - 12"	8" - 10"	8" - 12"	10"-12"	6" (or alternate source)
		High Pressure Water Dependency	Required	Not Required	Not Required	Required	Not Required	Preferred	Not Required	Not Required	Required	Not Required
		Flow (Gallons per Day per Acre)	5,200	1,200	1,500	3,150	1,850	2,450	1,200	1,800 _s	50 - 200 ⁺	1,200
10	SEWER:	Min. Service Line Size (Inches/Dmtr)	12" - 18"	6" - 8"	8" - 10"	10" - 12"	6" - 8"	10" - 12"	6" - 8"	6" - 10"	8" - 10"	4" - 6" (or on-site source)
		Flow (Gallons per Day per Acre)	4,700	1,000	2,000	2,600	1,700	2,000	1,000	1,500 _s	1,000 [±]	1,000
11	NATURAL GAS:	Preferred Min. Service Line Size (Inches/Dmtr)	6"	4"	4"	4"	4"	6"	4"	4" - 6"	4"	N/A
		On Site	Competitive	Preferred	Competitive	Preferred	Competitive	Competitive	Preferred	Competitive	Preferred	Preferred
12	ELECTRICITY:	Minimum Service Demand	4 - 6 MW	1 - 2 MW	0.5 - 1 MW	2 - 6 MW	0.5 MW	2 - 6 MW	0.5 MW	0.5 - 1 MW	5 - 25 MW	1 MW
		Close Proximity to Substation	Competitive	Competitive	Preferred	Not Required	Preferred	Competitive	Not Required	Preferred	Required, could be on site	Not Required
		Redundancy Dependency	Preferred	Preferred	Preferred	Not Required	Not Required	Competitive	Not Required	Preferred	Required	Not Required
13	TELECOMMUNICATIONS:	Major Communications Dependency	Required	Required	Required	Preferred	Required	Required	Preferred	Required	Required	Preferred
		Route Diversity Dependency	Required	Required	Required	Not Required	Not Required	Required	Preferred	Preferred	Required	Not Required
		Fiber Optic Dependency	Required	Required	Required	Preferred	Preferred	Required	Competitive	Preferred	Required	Not Required

PROFILE	A	B	C	D	E	F	G	H	I	J
	Computer & Electronic Manufacturing (High-Tech R&D)	Software & Media	Multi-Tenant Office	Food Processing	Other Manufacturing	Life/Bioscience R&D Campus	Wholesaling	Retail	Data Center	Incubator
14 SPECIAL CONSIDERATIONS:	<p>Acreage allotment includes expansion space (often an exercisable option). Very high utility demands in one or more areas common. Sensitive to vibration from nearby uses.</p>	<p>1: Research & Development @ 80 ADTs per acre on the low end, estimated 200 ADTs per acre for general office on the high end.</p> <p>Location specific.</p>	<p>2: Range represents FAR 0.25 - 0.5 of office uses</p> <p>Location to other cluster industries.</p>	<p>May require high volume/supply of water and sanitary sewer treatment. Often needs substantial storage/yard space for input storage. Onsite water pre-treatment needed in many instances.</p>	<p>Adequate distance from sensitive land uses (residential, parks) necessary. Moderate demand for water and sewer. Higher demand for electricity, gas, and telecom.</p>	<p>High diversity of facilities within business parks. R&D facilities benefit from close proximity to higher education facilities. Moderate demand on all infrastructure systems.</p>	<p>3: General warehousing rates</p>	<p>4: Based on discount warehouse @ 0.25 FAR</p> <p>5: Dependent on use, i.e., brewery vs. restaurant</p> <p>Location to cluster industries.</p>	<p>Site size differs due to land cost and availability. Urban-area centers may require 10-20 acres, while E. Oregon centers will typically use larger sites. Also the trend is towards increasing site size as cloud storage needs continue to increase. Power delivery, water supply, and security are critical. Surrounding environment (vibration, air quality, etc.) is crucial. May require high volume/supply of water and sanitary sewer treatment.</p>	<p>Often established by municipalities and have symbiotic relationships with colleges and/or universities.</p>

Terms:

More Critical ↑	'Required' factors are seen as mandatory in a vast majority of cases and have become industry standards.
	'Competitive' significantly increases marketability and is <i>highly recommended by Business Oregon</i> . May also be linked to financing in order to enhance the potential reuse of the asset in case of default.
Less Critical	'Preferred' increases the feasibility of the subject property and its future reuse. Other factors may, however, prove more critical.
	'Not Required' does not apply for this industry and/or criteria.
	'Avoid' factors act as deterrents to businesses in these industries because of negative impacts.
*Total Site: Building footprint, including buffers, setbacks, parking, mitigation, and expansion space.	
**Competitive Acreage: Acreage that would meet the site selection requirements of the majority of industries in this sector.	
† Data Center Water Requirements: Water requirement is reported as gallons per MWh to more closely align with the Data Center industry standard reporting of Water Usage Effectiveness (WUE).	
‡ Data Center Sewer Requirements: Sewer requirement is reported as 200% of the domestic usage at the Data Center facility. Water and sewer requirements for Data Centers are highly variable based on new technologies and should be reviewed on a case-by-case basis for specific development requirements.	

The 14 site requirements listed on the matrix provide a basis for establishing a profile of the physical and other site needs of the identified industry. The site requirements are intended to address the typical needs of each of the industry categories, and it is recognized that there will likely be unique or non-typical needs of a specific user that will need to be evaluated by on a case-by-case basis.

The following describes a few general requirements that apply to *all* industry type categories under consideration and then an overview of the 14 site requirements listed on the matrix.

General Requirements:

- The underlying zoning on the site must allow the use outright within the identified category. For example, no zone change, conditional use and/or similar land use review is necessary. Many jurisdictions typically require a design or development review which is acceptable, since the timeframe for obtaining such design-related approvals will be addressed in the State's rating system.
- The site under consideration must be located geographically within a UGB.
- The site is not located within a 100-year floodplain as mapped by FEMA, although sites with approved FEMA map amendments (e.g., LOMA & LOMR) are acceptable.
- The net contiguous developable area (NCDA) of the site does not include hazardous contaminants as verified by a Level 1 Environmental Report, or a Level 2 Report that has received a No Further Action approval from DEQ; or existing wetlands or other natural features which are regulated at the State, Federal or local level; or federally endangered species.
- The NCDA does not contain any cultural or historical resources that have been identified for protection at the State, Federal or local level.
- The NCDA does not have mitigation plans that can be implemented in 180 days or less.

Site Requirements:

1. **Total Site Size:** The site size is taken to mean the size of the building footprint and includes buffers, setbacks, parking, mitigation, and expansion space.
2. **Competitive Slope:** Most industrial uses require relatively large building footprints that do not accommodate steps in floor slabs, and sloping topography will require extensive excavation and retaining systems that increase development cost over flat sites. The figures given are the preferred maximum average slope across the developable portion of the site, recognizing that sites with additional area outside the building, or developments with multiple building pads, generally will have lower slope earthwork costs than sites with limited space outside the building footprint.
3. **Trip Generation:** Sites are frequently limited by a jurisdiction to a specified total number of vehicle trips entering and exiting the site. This site requirement is an estimate of the minimum number of average daily trips per acre (based on the range of building coverage) that should be available for each of the industrial categories based on the Institute of Traffic Engineers (ITE) Manual-Ninth Edition. The following table lists the ITE codes used to estimate average trips for the industry profiles represented in the matrix.

4. **Miles to Interstate or Freight Route:** With few exceptions, access to major freeways or freight routes is critical for the movement of goods. This site requirement indicates the typical maximum range of distance, in miles, from the site to the freeway or highway access. The roadways/intersections between the site and freeway/highway must generally operate at a level of service 'D' or better in accordance with the Highway Capacity Manual methodologies and general engineering standards.
5. **Miles to Frequent Transit Service:** Businesses located walking distance (within one-quarter of a mile) to a bus stop that is serviced by a frequent bus line enjoy a competitive advantage over others that are more limited in transportation access options.⁶
6. **Railroad Access:** The need for access to railroad for the movement of goods within each industrial category is dependent upon individual users, so the site requirements are identified as either "Preferred," "Not Required," or "Avoid" in some cases where the presence of rail may be considered a deterrent to business.
7. **Proximity to Marine Port:** The need for access to a marine port for the movement of goods within each industrial category is dependent upon individual users.
8. **Proximity to International/Regional Airport:** The need for access to a regional airport for the movement of goods or business travel within each industrial category is dependent upon individual users.
9. **Availability of Water:** This requirement indicates the minimum sizes of domestic water and fire lines immediately available to the site. In certain rural cases, a comparable supply from an on-site water system (i.e., well or reservoir with available water rights) may be acceptable. In addition to lines sizes, preference for high-pressure water capabilities and average flow demand in gallons per day is specified for each industry type.
10. **Availability of Sanitary Sewer:** This requirement indicates the minimum size of public sanitary sewer service line immediately available to the site. In certain rural cases, an on-site subsurface system providing a comparable level of service may be acceptable. Sewer flow requirements were determined by calculating a percentage of the water flow for each industry type.
11. **Natural Gas:** This requirement indicates the minimum size natural gas line that is immediately available to the site. It is assumed that the pressure demand for all industry categories is 40-60 psi.
12. **Electricity:** This requirement indicates the minimum electrical demand readily available to each industry and where proximity to a substation and redundancy dependency rank on the continuum of less critical to more critical. Estimated demand is based on review of existing usage from local utility providers, referencing industrial NAICS codes for the various profiles.
13. **Telecommunications:** This requirement indicates whether the availability of telecommunication systems are readily available, and where major commercial capacity, route diversity and fiber optic lines rank on the continuum of less critical to more critical. All sites are assumed to have a T-1 line readily available.

INDUSTRY PROFILES

The following provides supplemental information for the attached Industrial Development Profile Matrix. The preceding matrix identifies 10 industry type categories (labeled A-J on the matrix) and 14 "site needs" which will assist in evaluating selected sites using the criteria of a given industry type.

⁶ We have defined "frequent bus line" as one with service occurring in no longer than 15 minute intervals.

The industry categories have been established based primarily on Business Oregon information (including input from various state agencies). Due to the wide range and constantly evolving characteristics of uses, borderline and/or non-typical applications will likely arise and will be evaluated on a case-by-case basis. It should be noted that certain industry types might have unique requirements, such as proximity to an international airport, which may require an additional category. It should also be noted that the industry types represent the primary use of the industry, and exclude secondary/accessory uses (e.g., training facilities, etc.) at this

A: Food Processing

a) Description:

Generally, this category includes industries that manufacture or process foods and beverages for human or animal consumption. Although this category has similar siting characteristics as Other Manufacturing, the unique needs associated with food processing, such as high-volume water and/or pressure demand, warrant this separate category. Broadly, there are two types of food processing categories:

- (1) raw materials; and
- (2) assembling.

Additionally, there is a packaging and warehousing component to these facilities.

b) Representative Industry Types:

- Production foods/goods (e.g., bakeries)
- Fruits and vegetables
- Breweries and wineries
- Dairy
- Bottling/beverages

c) Representative Companies:

- Ajinomoto (Portland)
- Beaverton Foods Inc. (Hillsboro)
- Cabroso (Medford)
- Rogue Creamery
- Hermiston Foods (Hermiston)
- Nancy's Yogurt (Eugene)
- Reser's Foods (Beaverton)
- Norpac (Salem and Stayton)
- Tillamook Dairy (Tillamook)
- Coca Cola bottling (statewide)
- Pepsi bottling (statewide)
- Full Sail Brewing (Hood River)
- Hood River Juice Company (Hood River)

B: Other Manufacturing

a) Description:

This category is intended to include industries that utilize relatively less intensive manufacturing processes, more assembly activities, and direct transfer to wholesale and domestic consumers. Typically, these facilities are freestanding, devoted to a single use, and emphasize manufacturing space over office space. Generally, these non-high-tech industries may be located on individual sites or in business/industrial parks and have less effect on surrounding uses. This category also includes some industrial service uses that are engaged in serving other businesses, such as an industrial laundry facility.

b) Representative Industry Types:

- Electronic assembly support

- Wood products
 - Automobile products
 - Steel/metals
 - Building materials fabrication and processing
- c) *Representative Companies:*
- Warn Industries (Clackamas)
 - JV Northwest (Canby)
 - Hartung Glass (Wilsonville)
 - Oregon Iron Works (Clackamas)
 - Daimler Trucks North America (Portland)
 - Maxim Integrated (Beaverton and Hillsboro)
 - Oregon Steel Mills (Portland)

C: Wholesaling

- a) *Description:*
 The wholesale industry comprises companies involved in wholesaling merchandise and other goods such as mining, agriculture, manufacturing, and certain information industries. This industry typically represents an intermediate step in the production and distribution of goods and merchandise, as wholesalers generally sell goods intended for resale by a retailer. In some cases, users and customers may purchase these goods directly from a wholesaler with a retailer.
- b) *Representative Industry Types:*
- Automobile and Other Motor Vehicle Merchant Wholesalers
 - Furniture Merchant Wholesalers
 - Office Equipment Merchant Wholesalers
 - Hardware Merchant Wholesalers
 - Farm and Garden Machinery and Equipment Merchant Wholesalers
 - Sporting and Recreational Goods and Supplies Merchant Wholesalers
- c) *Representative Companies:*
- Cascade Wholesale Hardware
 - Costco Wholesale
 - Pearlier Auto Wholesale

D: Retail

- b) *Description:*
 This industry contains businesses that sell merchandise, largely without any transformation of the good, with services largely being ancillary to the sale of said merchandise. The businesses usually receive goods from wholesalers, and typically do not transform the good before its final sale to the user or customer. There are sixty-nine subsectors of retail trade, some of which are reflected in the bulleted list below.
- c) *Representative Industry Types:*
- Specialty food/grocery
 - Coffee shops/cafes
 - Theater/recreation/entertainment
 - Brew pub/wine or bottle shops
 - Full service local restaurants
 - Food car pods
 - Bookstores and boutiques
 - Wellness and spa services
 - Hotel & hospitality
 - Niche manufacturing (bike, bakery, outdoor, etc.)

d) *Representative Companies:*

- New Seasons
- Dutch Bros. Coffee
- McMenamins Cornelius Pass Roadhouse
- P.F. Chang's
- Barnes & Noble
- Align Wellness Center
- Embassy Suites
- Orenco Station Cyclery

E: Incubator

a) *Description:*

This industry type is often established by local municipalities and has a symbiotic relationship with colleges and universities within the vicinity. Business incubators are designed to help new and small businesses in the start-up and early growth phases of development, through providing a flexible combination of business development tools, facilities and resources, and personal contacts.

b) *Representative Industry Types:*

- Not applicable for this industry type, as the incubators serve as cultivating space for several uses to grow in their nascent business stages.

c) *Representative Examples:*

- Launch Pad Baker City
- Microenterprise Investors Program of Oregon (Portland)
- BESThq (Beaverton)
- Forge Portland
- WeWork (Portland)

F: Data Center

a) *Description:*

Data centers are classified under NAICS 5182: Data Processing, Hosting, and Related Services. We consider them separately from other "information and software" activities because the land and utility needs are far different. Over the just the last five years, unprecedented growth in demand for data hosting has developed an entirely new segment of the industrial landscape in Oregon attracted to a generally temperate climate, low overall disaster risk, low utility rates from renewable sources, and abundant water.

The growth outlook for data center siting is strong, as high growth rates for streaming, software as a service (SaaS), and cloud data and processing across the industry creates an accelerating need for hosting services. Global data center demand is expected to grow threefold over just the next five years.⁷ Key areas like the Columbia Basin, Central Oregon and Hillsboro compete for these industrial users.

b) *Representative Companies:*

- Vadata
- Google
- Apple
- Facebook
- ViaWest
- Adobe

⁷ Cisco Global Cloud Index (2015).

Appendix B: Buildable Land Inventory

MEMORANDUM

To: Tamra Mabbott, Community Development Director
Technical Advisory Committee

From: Johnson Economics

Subject: Economic Opportunities Analysis, City of Umatilla, OR
Inventory of Buildable Employment Lands

INTRODUCTION

This memo summarizes an interim step in the Economic Opportunities Analysis. The inventory of employment land provides a snapshot of the currently local capacity to accommodate more business and jobs. This current available land will be compared to the forecasted need for new land over the 20-year planning period.

Employment land includes land zoned for industrial, retail or other commercial use (i.e. office), and may also include mixed-use zoning that allows for employment uses. This inventory includes vacant parcels with the proper zoning, as well as “redevelopable” parcels. (The methodology used in this analysis is described in detail below.)

For planning purposes, this type of inventory is often called a Buildable Lands Inventory (BLI).

METHODOLOGY

The Buildable Lands Inventory (BLI) used in this analysis is based on tax account data, zoning and other key mapping information provided by the City of Umatilla, Umatilla County, and the state. The data was provided in Geographic Information Systems (GIS) compatible format, providing information on land use, parcel size and other relevant data categories on the taxlot level.

The tax account data was used to identify vacant and redevelopable parcels in Umatilla with their Urban Growth Boundary (UGB). The identified candidate parcels were then further screened and refined by JOHNSON ECONOMICS.

In keeping with State requirements, the BLI includes an assessment of vacant buildable lands and redevelopable parcels. This analysis applied the “safe harbor” assumptions allowed under state rules to determine the infill potential of developed parcels (OAR 660-024-0050).

The Buildable Lands Inventory relied on the following sources:

- Umatilla County Geographic Information System (GIS) data
- DLCDC GIS data
- Google Earth
- Assessment of environmental constraints
- City staff input



Appendix B

- Advisory Committee input
- Site visits

Identification of Vacant Parcels

JOHNSON ECONOMICS used the most recent available tax account data from Umatilla County to identify those parcels located in appropriate commercial or industrial zones and determine whether they are developed or undeveloped. The County supplied taxlot data in GIS format. Johnson Economics applied the following steps to further refine the Buildable Lands Inventory:

- 1) Isolate the taxlots located within Umatilla's UGB. The shapefile contains data on the individual property tax accounts associated with each taxlot in the county.
- 2) Using zoning layers, isolate those taxlots that are located in appropriate employment zones, including industrial and commercial areas.
- 3) Through a combination of parsing individual taxlot data and aerial map surveying, develop preliminary list of qualified vacant parcels. For this preliminary analysis, all vacant lots were included regardless of size.
- 4) Using staff and advisory committee feedback, additional GIS data and surveying, and site visits, the vacant inventory was further refined to remove anomalies or misidentified parcels.

Identification of Redevelopable Parcels

In order to identify those developed parcels which might accommodate additional development, JOHNSON ECONOMICS applied the so-called "safe harbor" provisions of the Oregon Administrative Rules, which provide cities a systematic means to estimate the development capacity of larger parcels with a limited amount of existing development:

OAR 660-024-0050

Land Inventory and Response to Deficiency

...

- (3) As safe harbors when inventorying land to accommodate industrial and other employment needs, a local government may assume that a lot of parcel is vacant if it is:
 - (a) Equal to or larger than one-half acre, if the lot or parcel does not contain a permanent building;
 - or
 - (b) Equal to or larger than five acres, if less than one-half acre of the lot or parcel is occupied by a permanent building.

Source: Oregon Administrative Rules, 660-024

Using GIS data, the above criteria were applied to the developed parcels in Umatilla in order to identify those developed parcels which are prospective candidates for infill development or redevelopment.

The Buildable Lands Inventory of Employment Lands was prepared following the preceding steps by JOHNSON ECONOMICS LLC. The findings are presented below with additional discussion.



Appendix B

BUILDABLE LANDS INVENTORY – EMPLOYMENT LANDS

The methodology as described above finds an existing buildable employment lands inventory as follows in Umatilla:

1. UMATILLA

FIGURE 1: SUMMARY OF EMPLOYMENT BUILDABLE LAND INVENTORY (UMATILLA)

ZONE	VACANT		REDEVELOPABLE		TOTAL	
	Parcels	Acreage	Parcels	Acreage	Parcels	Acreage
C-1	4	8.5	2	1.0	6	9.5
DC	11	2.2	3	0.4	14	2.6
DT	8	1.4	0	0.0	8	1.4
GC	6	10.0	2	3.6	8	13.5
MC	3	4.1	0	0.0	3	4.1
NC	3	31.4	0	0.0	3	31.4
Commercial Total:	35	57.6	7	4.9	42	62.5
M1	6	23.5	5	27.6	11	51.1
M2	16	247.9	3	16.8	19	264.7
Industrial Total:	22	271.3	8	44.5	30	315.8
TOTAL:	57	328.9	15	49.4	72	378.3

Source: Umatilla County, State of Oregon, Johnson Economics LLC

The inventory identifies 378 acres of vacant or potentially redevelopable land in the commercial and industrial zones. 87% of the acreage is identified as “vacant”, and 13% in potential “redevelopment” sites. Roughly 62.5 of the acres are in commercial zones, while nearly 316 acres are industrial.

FIGURE 2: SUMMARY OF EMPLOYMENT BUILDABLE LAND INVENTORY, BY PARCEL SIZE (UMATILLA)

ZONE	0 TO .99 acres		1 to 4.99 acres		5 to 9.99 acres		10 to 19.99 acres		20 to 29.99 acres		30 to 49.99 acres		50+ acres		TOTALS	
	# of Parcels	Acreage	# of Parcels	Acreage	# of Parcels	Acreage	# of Parcels	Acreage	# of Parcels	Acreage	# of Parcels	Acreage	# of Parcels	Acreage	# of Parcels	Acreage
C-1	4	2.2	1	1.9	1	5.5	0	0.0	0	0.0	0	0.0	0	0.0	6	9.5
DC	14	2.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	14	2.6
DT	8	1.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	8	1.4
GC	2	1.7	3	5.0	1	6.9	0	0.0	0	0.0	0	0.0	0	0.0	6	13.5
MC	1	0.7	2	3.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	4.1
NC	0	0.0	0	0.0	2	13.4	1	18.0	0	0.0	0	0.0	0	0.0	3	31.4
Commercial Total:	29	8.6	6	10.2	4	25.8	1	18.0	0	0.0	0	0.0	0	0.0	40	62.5
M1	0	0.0	8	20.7	2	13.4	1	17.0	0	0.0	0	0.0	0	0.0	11	51.1
M2	0	0.0	3	10.3	6	39.7	4	53.3	0	0.0	0	0.0	1	161.4	14	264.7
Industrial Total:	0	0.0	11	31.0	8	53.2	5	70.3	0	0.0	0	0.0	1	161.4	25	315.8
TOTAL:	29	8.6	17	41.2	12	78.9	6	88.2	0	0.0	0	0.0	1	161.4	65	378.3

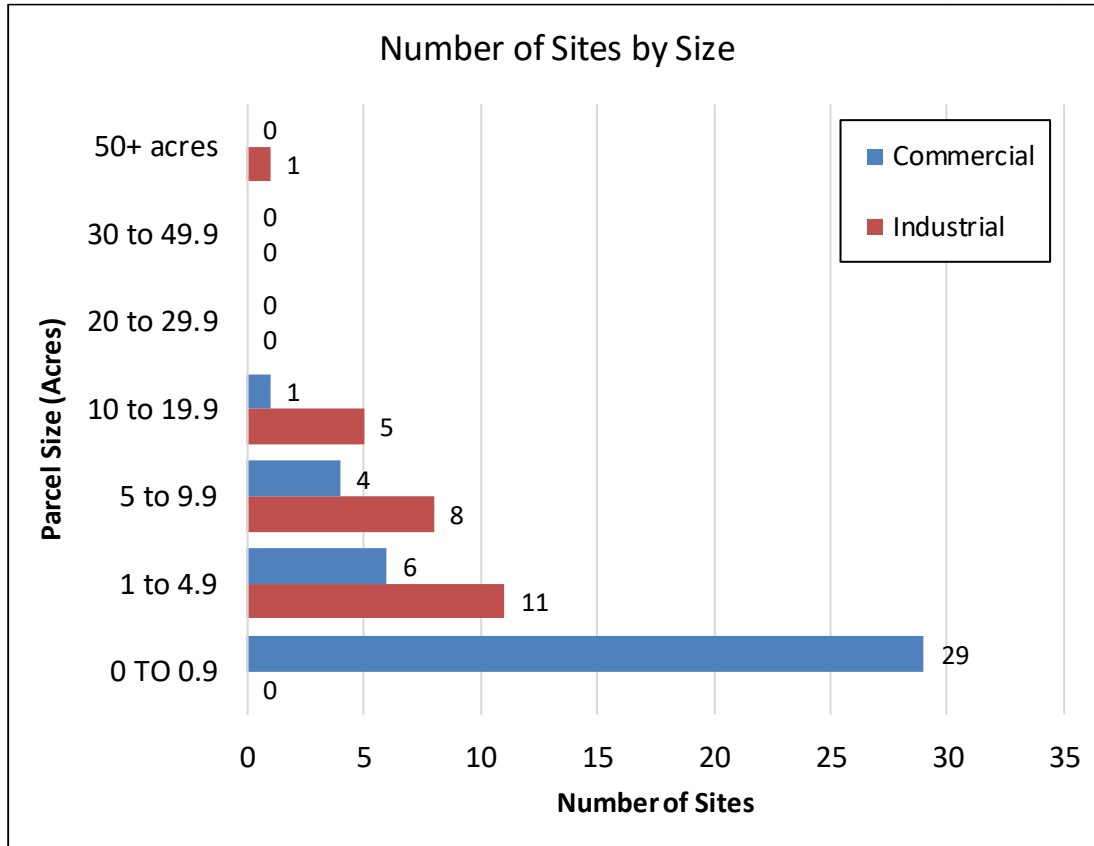
Source: Umatilla County, State of Oregon, Johnson Economics LLC



Appendix B

Figure 2 presents the inventory broken down by the size of parcels. The distribution is weighted towards smaller parcels, with few unconstrained parcels over 20 acres in size. Figure 3 presents the same data in chart form.

FIGURE 3: SUMMARY OF EMPLOYMENT BUILDABLE LAND INVENTORY, BY PARCEL SIZE (UMATILLA)



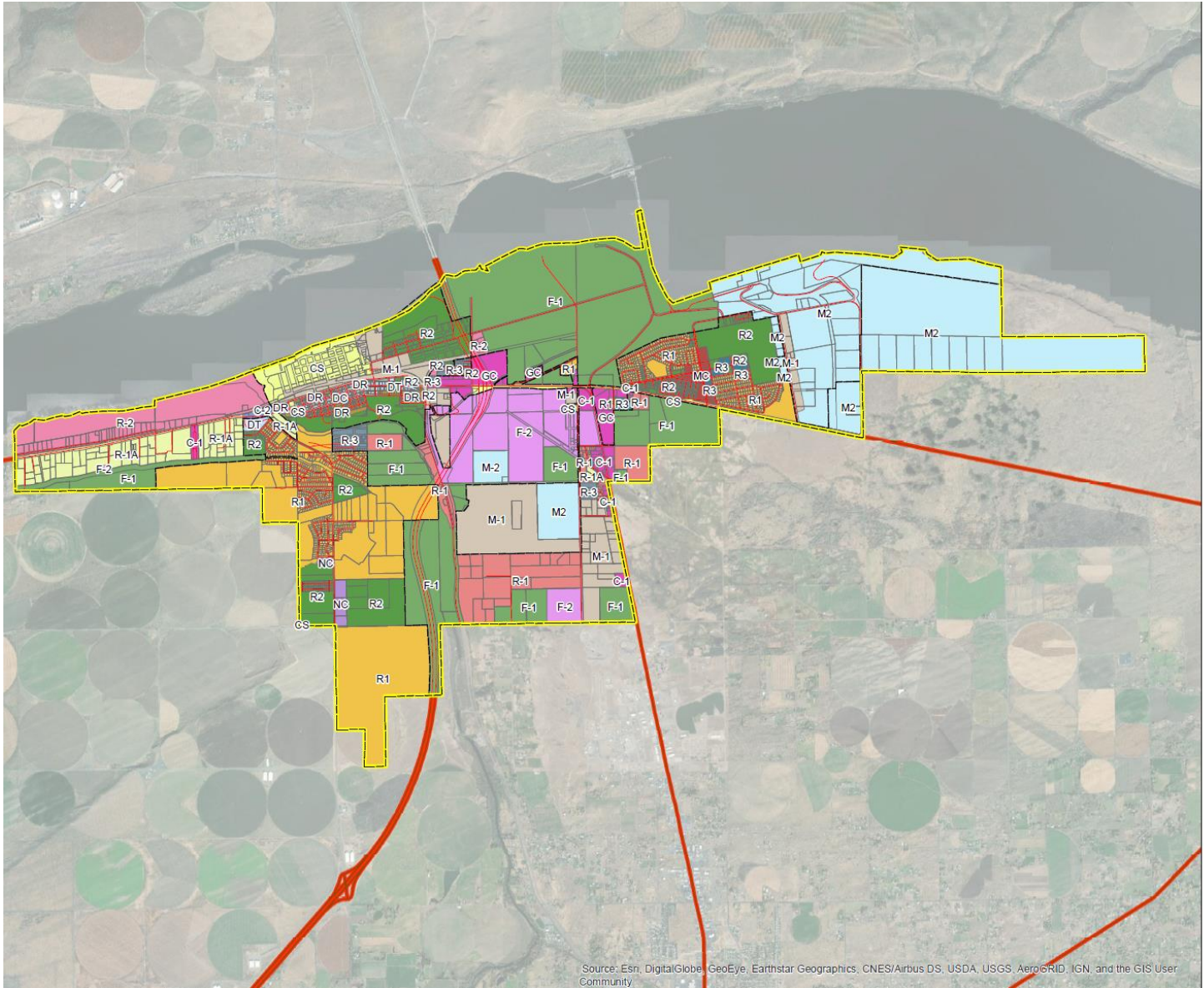
Source: Umatilla County, State of Oregon, Johnson Economics LLC

The following set of maps presents the Buildable Land Inventory and some reference information. The maps include:

- Figure 4: City Zoning Map
- Figure 5: Constrained Lands
- Figure 6: Buildable Employment Lands

Appendix B: Buildable Land Inventory

FIGURE 5: ZONING MAP, UMATILLA



West Umatilla Cities Buildable Lands Inventory

City of Umatilla:

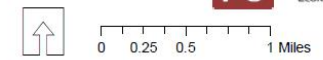
Zoning

- Streets
- Taxlot
- City Limits
- Umatilla_UGB

Zone

- Agricultural Residential, R-1
- Community Services, CS
- Downtown Commercial, DC
- Downtown Residential, DR
- Downtown Transitional, DT
- Exclusive Farm Use, F-1
- General Commercial, C-1, GC
- General Rural, F-2
- Heavy Industrial, M-2
- Light Industrial, M-1
- McNary Center Commercial, MC
- Medium Density Residential, R2
- Multi-Family Residential, R3
- Neighborhood Commercial, NC
- Single-Family Residential, R1
- Suburban Residential, R-2
- Tourist Commercial, C-2
- Two Acre Residential, R-1A
- Urban Residential, R-3

Prepared by:
Angelo Planning Group
Date: 01/15/19



Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl

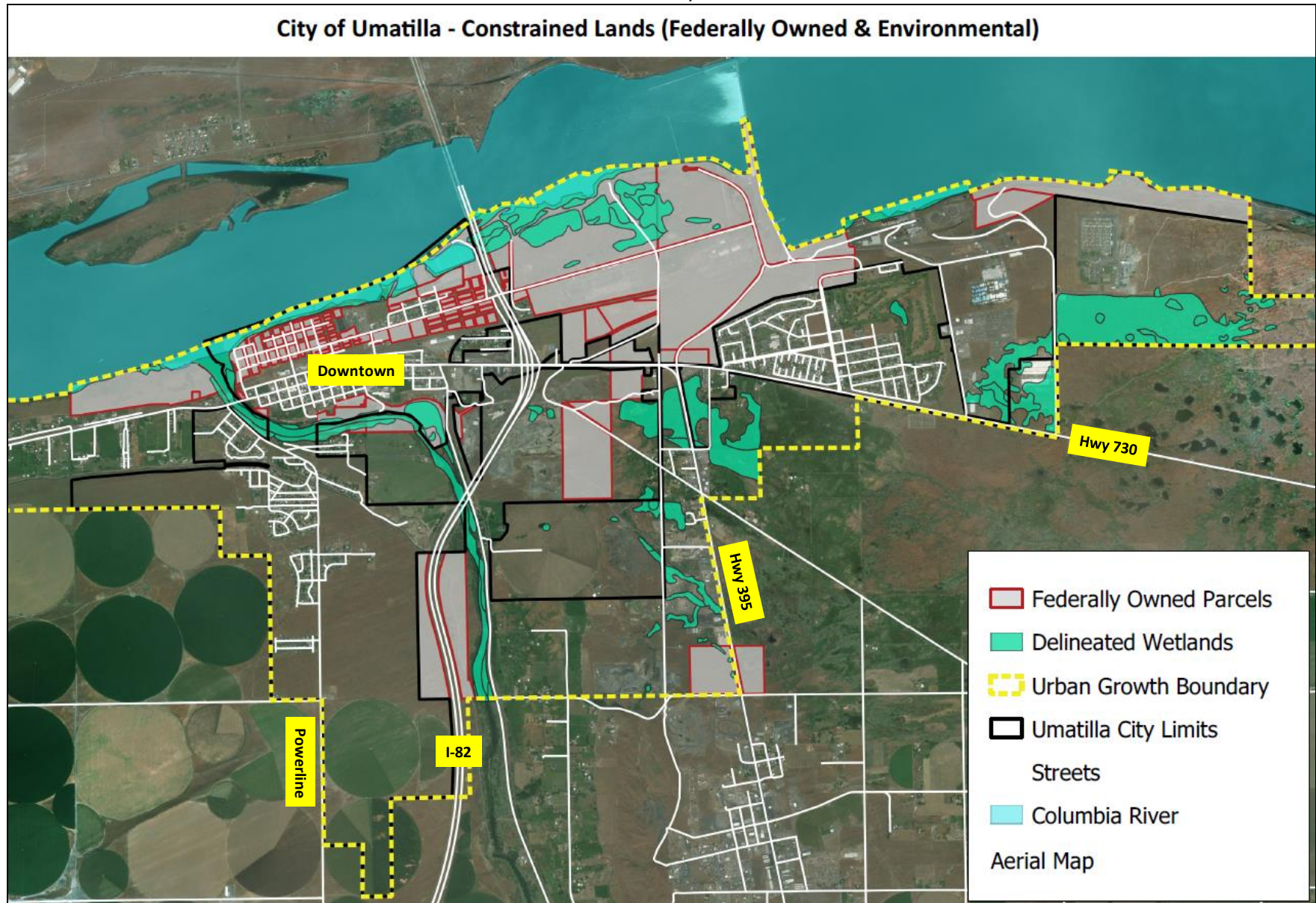
This map is intended for informational purposes only. While this map represents the best data available at the time of publication, APG makes no claims, representations, or warranties as to its accuracy or completeness. Metadata available upon request.

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Source: Angelo Planning Group (2019)



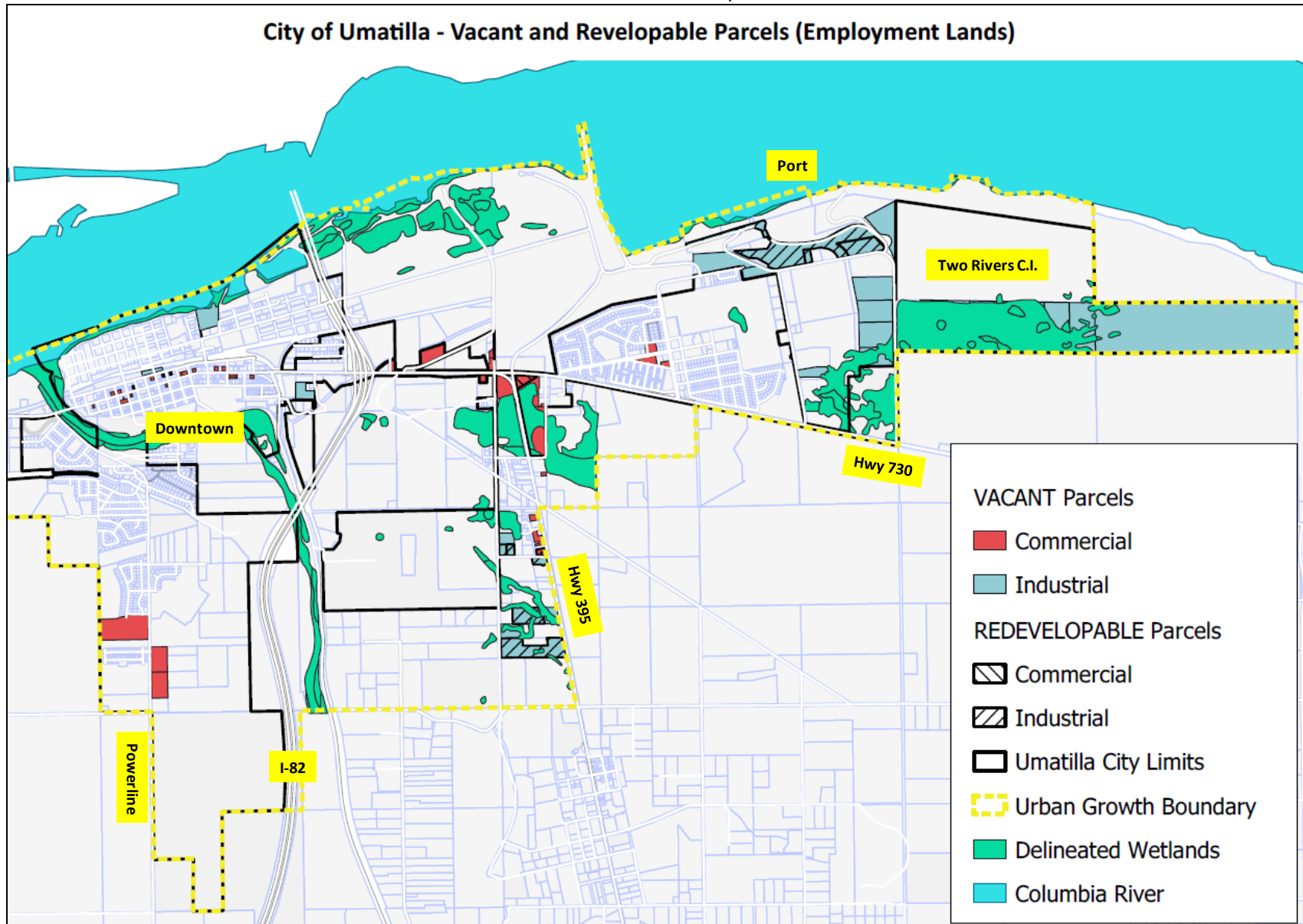
FIGURE 6: CONSTRAINED LAND, UMATILLA



Source: Umatilla County, State of Oregon, Johnson Economics LLC



FIGURE 7: BUILDABLE EMPLOYMENT LANDS, UMATILLA



Source: Umatilla County, State of Oregon, Johnson Economics LLC

Exhibit C - Umatilla Industrial Area Utility Technical Memorandum



THE
LANGDON
GROUP



GATEWAY
MAPPING
INC.

OTHER J-U-B COMPANIES

DATE: 3/9/2020
TO: Dave Stockdale, City Manager
City of Umatilla
CC: Scott Coleman, Public Works Director
Melissa Ince, Finance Director
FROM: Shae Talley, PE
Tirzah Eyre, EIT
SUBJECT: Umatilla Industrial Area Utility Technical Memorandum



1 INTRODUCTION & BACKGROUND

1.1 Introduction

The City of Umatilla is currently evaluating the feasibility of providing utility service to an industrial area of interest near the Southwest Boundary of the City. This study area is bordered to the west by County Road 1225 and to the east by Interstate 82 as shown in Figure 1 in Appendix A. City staff have developed a list of infrastructure projects that would be necessary for industrial development of this area including potable water, water storage, sanitary sewer, and industrial wastewater.

In general, utility improvements required to meet existing and future demands are developed through Master Plans; however, the City requires an immediate, preliminary review to assist City staff with ongoing land negotiations and stakeholder discussions. This technical memorandum will summarize the review and provide preliminary cost opinions for each infrastructure project specified by the City.

The infrastructure projects analyzed are as follows:

- Potable Water Main Extension to Serve the Subject Property
- Sanitary Sewer Main Extension to Serve the Subject Property
- Potable Water Storage Improvements – Coyote Reservoir Expansion required to Serve the Subject Property
- Industrial Wastewater (IWW) Treatment and Disposal Alternatives
 - Industrial Wastewater Collected and Conveyed to the Wastewater Treatment Plant (WWTP)
 - Non-Contact Cooling Tower Industrial Wastewater
 - Alternative 1 - Land Apply to Farmland
 - Alternative 2 - Store and Land Apply to Residential Areas

This technical memorandum is for City use only and does not discuss recommended alternatives, other necessary upgrades to the existing system¹, an implementation plan, nor a schedule, as these items will be included as part of future planning efforts. Future efforts include development of a Water Master Plan and Wastewater Facility Plan in accordance with state guidelines to further develop the improvements outlined in this tech memo. The proposed planning documents will further vet and quantify existing and future water demands and wastewater flows; identify system deficiencies; plan for system expansions; develop improvement alternatives and select a recommended alternative; develop planning level cost estimates; and outline an implementation plan for sustainable management of the City's public utilities.

1.2 Study Area

The study area is comprised of approximately 450 acres. For the purposes of this study, the west boundary of the study area is delineated by County Road 1225; the north boundary of the study area is delineated by County Road 1226; the east boundary is delineated by Interstate 82; and the south boundary is delineated by County Road 1225 and Interstate 82. Figure 1 in Appendix A depicts the overall study area.

2 PLANNING CRITERIA

The evaluation of infrastructure projects was completed at a planning level of detail. The assumptions and design criteria used herein were developed by J-U-B and City staff and should be reviewed and refined during future planning and design efforts.

2.1 Planning Assumptions and Design Criteria

2.1.1 Land Use

Currently, land within the study area is used for agricultural purposes. The City of Umatilla has indicated this land, falling within the future UGB, will be rezoned to light industrial. Based on City input, it is assumed for planning purposes that the study area will be comprised of a single 100-acre data center facility, one 60-acre small food processing facility, and two 40-acre packaging/manufacturing facilities at full buildout. All four facilities are considered light industrial.

2.1.2 Demands and Flows

Buildout demands and flows represent the peak demands and flows anticipated in the system when the study area is fully developed. All undeveloped land around the study area was assumed to remain undeveloped; as such, demands and flows were not considered for this area. As the current study area land use is agricultural, there is no historical data for light industrial facilities within this area. Demands for each lot were determined based on the type of proposed facility and experience gained from analysis of similar sized industries. It was assumed that the data center will remain in operation 24 hours a day while other industries will only operate 8 hours a day.

¹ Well withdraw increased and delivery capacity to subject property area, for example (not inclusive).

The data center will have both potable water and industrial water demands supplied by the City of Umatilla. Potable demands were determined using Oregon Administrative Rule (OAR) 340-071-0220 Table 2 Quantities of Sewage Flows, as given by the State of Oregon Department of Environmental Quality in their publication Onsite Wastewater Treatment Systems, and assuming the data center has 350 employees on site, as estimated by City staff. Industrial demands were estimated to be 1.2 million gallons per day (MGD) based on PDX63 data center campus information provided by data center personnel.

The data center will have both sanitary sewer and industrial wastewater flows. Sanitary sewer flows were determined using the OAR 340-071-0220 Table 2 factory flow and assuming the data center has 350 employees on site as estimated by City staff. Industrial wastewater flows were estimated to be 440,000 gallons per day (gpd) based on PDX63 data center campus information provided by data center personnel.

All other industries were assumed to have 20 employees onsite per lot and have potable water demands corresponding to OAR 340-071-0220 Table 2. Industrial water demands were assumed to be 1,100 gallons per acre day (GPAD) as determined from the 2018 Umatilla Beneficial Reuse Feasibility Analysis (BRFA) report. Sanitary sewer flows were assumed to be equal to potable water flows and industrial wastewater flows were assumed to be equal to industrial water flows.

For long-term planning purposes, the water demands and wastewater flow assumptions above were also applied to 880 acres of proposed light industrial land at the Army Depot site to adequately size the study area infrastructure that will one day serve the Army Depot. Future water and wastewater infrastructure to serve the Army Depot area were not analyzed. No analysis of infrastructure outside of the study area was performed. It is recommended the City develop a Water Master Plan and Wastewater Facility Plan in accordance with state guidelines to develop the possible infrastructure, such as piping and lift stations, to serve the Army Depot.

The demands and flows above represent the estimated average day demand (ADD) and estimated average day flow (ADF), respectively. To identify the maximum day demand (MDD) and peak hourly demand (PHD), demand peaking factors were assumed based on data from the 2008 Water Master Plan (WMP) and industry values in similarly sized cities. Sanitary and industrial sewer flows only require a peak hourly flow (PHF). A flow peaking factor equivalent to the PDD peaking factor was assumed based on the principle that demand inflows are equal to outflows. The following relationships were used to obtain MDD, PHD, and PHF:

$$\text{MDD} = 1.6 * \text{ADD}$$

$$\text{PHD} = 3.0 * \text{ADD}$$

$$\text{PHF} = 3.0 * \text{ADF}$$

Fire flows were also considered for the MDD scenario. It was assumed that the data center would have fire flows of 2,500 gpm for 2 hours and all light industrial lots would have fire flows of 3,000 gpm for 3 hours. These assumptions were based on the 2018 Umatilla BRFA.

A summary of the assumed demands is given in the following table.

Table 1 - Demands

Facility Type	Number of Lots	Total Water Demand (gpm)			Sanitary Sewer Flows (gpm)		Industrial Wastewater Flows (gpm)	
		ADD	MDD	PHD	ADF	PHF	ADF	PHF
Data Center Noncontact RO Reject	1	546	874	1639	26	77	191 25	573 76
Food Processing	1	139	222	417	2	4	138	413
Packaging/Manufacturing	2	93	149	279	2	4	92	275
Army Depot Industrial	35	59	95	178	2	4	58	174

* Total Water Demand includes both industrial and potable demands.

2.1.3 Manning's "n"

The roughness factor is used in the Manning's formula below to relate flow in a gravity pipe (Q) with the cross-sectional area of the flow (A), hydraulic radius of the flow (R), and the pipe slope (S_o).

$$Q = \frac{1.49AR^{2/3}}{S_o^{1/2}}$$

Typical "n" values range from 0.009 for very smooth glass or new plastic to greater than 0.016 for unfinished concrete. Sanitary sewer pipes, however, develop a slime layer on any pipe material in contact with sewage which provides a relatively consistent roughness regardless of material. To account for this, it was assumed that a Manning's "n" of 0.013 would be used regardless of pipe material and size.

2.1.4 Hazen-Williams "C" Coefficient

The "C" coefficient is used in the Hazen-Williams formula below to relate flow in a pressurized pipe (Q) with the cross-sectional area of the flow (A), hydraulic radius of the flow (R), and the slope of the energy grade line (S).

$$Q = 1.318CAR^{0.63}S^{0.54}$$

Typical "C" values range from 60 for rough, aged pipes to 150 for smooth, new pipes. It was assumed that a Hazen-Williams "C" value of 150 would be used regardless of pipe material as all pipes will be constructed new.

2.1.5 Pipe Sizing Methodology

Pipes were sized using two different methodologies depending on whether the pipe would be gravity fed or pressurized.

2.1.5.1 Gravity Pipe

All gravity pipes were sized using the Manning's formula and the maximum depth of flow/diameter of pipe (d/D) indicator. This indicates how much of the pipe capacity is being used. When the calculated flow in a pipe reaches the point where the d/D ratio is greater than the maximum design d/D ratio, the pipe diameter is increased. Buildout flows were used to size the proposed pipes.

A graduated scale for maximum d/D, dependent on the size of the pipe, was used and is given in the table below. This allows for a larger safety factor for smaller pipes where variations in land use and extensions of the service area can have large impacts on the available capacity of

the system. Larger pipes have a smaller safety factor because variations in land use tend to balance out over the larger area served by the system. Pipes smaller than 8 inches in diameter were not considered for this analysis and are not recommended as they are more difficult to maintain.

Table 2 – Depth over Diameter Ratios for Design Pipes

Size	d/D	Resultant Safety Factor
8"	0.50	2.00
10"	0.55	1.71
12"	0.60	1.49
15"	0.65	1.32
≥ 18"	0.75	1.10

2.1.5.2 Pressurized Pipe

Pressurized potable water pipes were sized using the Hazen-Williams formula and the minimum allowable pressure criteria. Per Oregon Health Authority (OHA) OAR 333-061-0025, potable water mains must not have a pressure less than 20 psi at any given time. Two scenarios were evaluated for system pressures: MDD + Fire Flow and PDD. Pipe sizes were initially assumed to be 8-inch diameter pipe and were upsized as necessary to meet OHA pressure requirements.

Pressurized irrigation water pipes were sized using the Hazen-Williams formula, the minimum allowable pressure criteria, and the maximum allowable velocity criteria. Per a 2008 publication by IRZ Consulting titled Irrigation Practices in the Umatilla and Morrow County Area, pressurized irrigation pipes must not have a pressure less than 50 psi at any given time. It is also considered good engineering practice to have pipe velocities below five feet per second. All irrigation pipe was analyzed under ADD and PHD scenarios. Pipe sizes were initially assumed to be 4-inch diameter pipe and were upsized as necessary to meet pressure and velocity requirements.

Sanitary and industrial force mains were sized using the Hazen-Williams formula and the maximum allowable velocity criteria. Pipe velocities are not to exceed 8 feet per second (fps) per the State of Oregon Department of Environmental Quality in Oregon Standards for Design and Construction of Wastewater Pump Stations. Pipe sizes were initially assumed to be 8-inch diameter pipe and were upsized as necessary to meet velocity requirements.

3 WATER

The City is evaluating the feasibility of providing potable and industrial water to the study area. Analysis of the proposed infrastructure did not include evaluating existing water system capacity, existing well capacity, existing pumping capacity, system storage needs, and water rights availability. The existing system capacity should be analyzed with future master planning efforts to determine if any portion of the system needs to be upsized to accommodate the study area demands.

3.1 Proposed Water Supply Infrastructure

3.1.1 Water Main Extension

The existing potable water main will be extended south along County Road 1225 until the end of the Cleaver Land. A stub will be provided at the intersection of the Cleaver Land and County Road 1225 to facilitate the anticipated Army Depot industrial area connection. The extension is sized to meet both potable and industrial water demands from the study area and the future Army Depot industrial lots to the southwest.

Water demands for the study area were determined by applying a gallon per capita per day (GPCD) demand for potable needs and a gallon per acre per day (GPAD) demand for industrial needs. Specific values for GPCD and GPAD demands are given in section 2.1.2 above.

The potential buildout water demand was calculated by multiplying the land area by the assumed GPAD unit demand for industrial needs and by multiplying the assumed number of employees by the assumed GPCD unit demand for potable needs. This calculation resulted in a gallon per day (GPD) value. The data center demand did not need to be converted to a per day value since it was already given as such. Gallons per minute (gpm) was determined from GPD. These average day demands (ADD) were converted to maximum day demands (MDD) and peak hourly demands (PHD) using the peaking factors in section 2.1.2 above. The total demands for each scenario are given in Table 1 above.

Pipe size was determined for the preliminary layout using the Hazen-Williams equation. The value for the Hazen-Williams “C” coefficient is described in section 2.1.4. Resulting pipe size is shown in Figure 2 of Appendix A. It should be noted that the stub at the intersection of the Cleaver Land and County Road 1225 will need to be 16-inch pipe. Estimated costs for the water main extension are in Appendix B. It was assumed the City would utilize the existing right of way or acquire a utility easement while possessing the land therefore no easement acquisition cost was included in the estimate. The existing system capacity and condition was not analyzed therefore the cost estimate does not include costs for upsizing the existing system.

3.1.2 Coyote Reservoir Expansion

The 2008 WMP recommended a second Coyote Reservoir. As directed by the City, the second reservoir was upsized and assumed adequate to serve the study area. The second Coyote Reservoir was reviewed for probable cost for inclusion in this analysis. No analysis was completed to determine capacity needs, reservoir type, location, and sizing. It is assumed that improvements will be similar to those described in Chapter 4 of the 2008 WMP. Per the City’s request, this evaluation assumed a 1-million-gallon tank instead of the 750,000-gallon tank described in the 2008 WMP. The City also requested only a ground level reservoir be considered and to disregard the elevated reservoir alternative proposed in the 2008 WMP.

Costs for a steel, ground level reservoir and appurtenances were based on costs from comparable projects by using a dollar per gallon amount. Estimated costs for the water storage expansion are in Appendix B. It should be noted that this evaluation did not analyze existing well capacities, water rights, nor booster station capabilities.

4 SANITARY SEWER

The City is evaluating the feasibility of providing sanitary sewer service to the study area. Only new infrastructure was included in the analysis. The existing sanitary sewer system and wastewater treatment plant capacity and condition were not analyzed. The existing infrastructure should be analyzed with the future master planning efforts to determine if any portion of the system needs to be upsized to accommodate the study area flows.

4.1 Sanitary Sewer Main Extension

Due to the topography of the study area, it is not possible to serve the study area with only gravity sanitary sewer. The highest elevation is at the northwest corner of the study area and the land slopes steeply from that point east towards Interstate 82. Adverse slopes as high as 24% would cause a gravity conveyance pipe to be too deep for conventional construction techniques; therefore, a wastewater pumping system is needed to convey flow to the existing collection system. All industrial lots will gravity flow to a lift station which will pump sanitary sewer flows west to County Road 1225 then north to County Road 1226 then west connecting to the existing manhole at the intersection of County Road 1225 and Dark Canyon Road as shown in Figure 3. The lift station and sanitary sewer pipes are sized to meet sanitary and “dirty” (typical strength) industrial sewer demands from industrial lots within the study area. Army Depot industrial lots will be served by a separate lift station on the Army Depot property and this lift station was not included in this analysis.

Sanitary sewer demands for the study area were determined by applying a gallon per capita day per (GPCD) demand as described above for each worker. Industrial sanitary sewer demands were estimated using a gallon per acre per day (GPAD) demand for industrial sanitary sewer flows that will be connected to the sanitary sewer system. Specific values for GPCD and GPAD demands are given in section 2.1.2 above.

It should be noted that domestic sanitary sewer flows are the only flows from the data center that will be incorporated into the sanitary sewer system. Other data center waste streams, such as Reverse Osmosis (RO) reject water, are assumed to be managed onsite by the industrial user (e.g. by evaporation).

The majority of the industrial wastewater will be non-contact cooling tower industrial wastewater from the data center. Non-contact cooling tower industrial wastewater is considered “clean” or low-strength and does not require treatment; therefore, “clean” IWW will be collected and disposed of separately as described in section 5.

Potential buildout flows were calculated by multiplying the land area by the assumed GPAD unit demand for industrial needs and by multiplying the assumed number of employees by the assumed GPCD unit demand for sanitary sewer needs. This calculation resulted in a gallon per day (GPD) value. Gallons per minute (gpm) was determined from GPD. The total flows are given in Table 1 above.

The lift station was placed at the lowest elevation on the southeast corner of the proposed data center property. The lift station was sized to accommodate 110 % of the buildout flows from the study area which is approximately 1,157 gpm. This is desirable to reduce the chance of

overloading the lift station. All lots are served from the back and gravity flow to the lift station. The food processor is served by the 12-inch gravity pipe. The data center and two packaging/manufacturing facilities are served by the 15-inch gravity pipe as shown in Figure 3. A force main will then carry flows west to County Road 1225 and then north to the existing sanitary sewer system. It is important to note that everything east of the lift station will not be able to be served due to steep slopes. Further analysis should take place as part of future planning studies to identify the best location for the lift station.

Pipe sizes were determined for the preliminary layout using Manning's equation. Values for Manning's "n" coefficient and d/D ratios are described in sections 2.1.3 and 2.1.5, respectively. Resulting pipe sizes are shown in Figure 3 in Appendix A. Estimated costs for the water main extension are included with the estimated costs for the sanitary sewer main extension in Appendix B. It was assumed the City would acquire an easement while possessing the land therefore no easement acquisition cost is included in the estimate. While no analysis of the existing system was performed, it is expected that the connection between the larger diameter, proposed sanitary sewer piping and the smaller diameter, existing piping will create a bottleneck. This will require all downstream infrastructure, possibly including the wastewater treatment plant, to be upsized to accommodate the study area flows. The cost estimate does not include costs for upsizing the existing system.

5 INDUSTRIAL WASTEWATER

The City is evaluating the feasibility of providing industrial wastewater service to the study area. Each industrial user has different expected industrial wastewater needs. As such, different collection and treatment options were analyzed for the different types of industrial wastewater.

5.1 Standard Industrial Wastewater – Pretreat IWW Onsite and Convey to WWTP

Standard industrial wastewater, also referred to as "dirty" (typical strength) industrial wastewater, is all water that has come into contact with contaminants during use and requires treatment. Industrial wastewater is often high-strength as compared to typical sanitary sewer flows. These flows must be properly treated to meet federal and state pretreatment requirements before they can be discharged. For the study area and Army Depot property, it is assumed all industrial lots will be required to pretreat their industrial wastewater to typical sanitary sewer strengths before they can discharge to the sanitary sewer system. Once discharged, study area industrial flows will be carried to the existing wastewater treatment plant (WWTP) for treatment and disposal as described in section 4. Due to topography, a separate lift station at the Army Depot property is expected to be needed to collect flows from the Army Depot and pump the wastewater to the existing system. There is the possibility of constructing an industrial wastewater treatment plant (IWWTP) on the Army Depot property. After construction, all industrial wastewater flows will be carried to the IWWTP and not to the existing WWTP. Analysis and cost estimation of an IWWTP and its collection system was not performed. No analysis of the existing sanitary sewer system or WWTP capacities were performed. Infrastructure needs for the Army Depot, including the additional lift station, were not evaluated and should be analyzed in future master planning efforts.

5.2 “Clean” Industrial Wastewater (IWW) Alternatives

Industrial wastewater from the data center noncontact cooling tower is considered “clean” as it was kept within a closed system and did not come into contact with chemical or biological contaminants during use. Due to the low-strength nature of these flows, no treatment is necessary before discharging. Additionally, this “clean” IWW can be used for irrigation. Samples taken from a similar data center campus in Umatilla showed that total dissolved solids (TDS) levels were well below the 450 mg/L maximum for irrigation reuse therefore it was assumed that no dilution of the “clean” wastewater would be needed.

5.2.1 Alternative 1 – Land Application to Farmland

This alternative involves land applying the “clean” industrial wastewater to farmland just north of the industrial parcels during the irrigation season. The City will need to develop a contract with a nearby farmer and discharge the “clean” wastewater to the farmer’s irrigation system. At the time of this report, no conversations have been had with farmers regarding taking the water for irrigation. As the project is pursued and landowners are engaged, the alignment should be adjusted as necessary to convey IWW flow to the desired landowner and tie into existing piping. An irrigation water balance was calculated using the expected non-contact cooling IWW flow and typical values for alfalfa irrigation demand, rain, evaporation and temperature. The expected annual IWW flow of 48 million gallons would need approximately 50 acres of irrigated alfalfa (at 42.25 inches of irrigation per year) to dispose of the water. Since some IWW is produced when irrigation demand is low, about three million gallons of storage is needed. If storage is not constructed, about 60 acres of irrigated alfalfa would be needed to receive the IWW during periods of low irrigation demand; however, supplemental irrigation water would be needed to meet irrigation demands during peak irrigation season. It was assumed that all supplemental water would be provided by the farmer and that the farmer would take IWW flows at all times. Graphs of the irrigation water balance on 50 acres and 60 acres are shown in Figure 4 and Figure 5, respectively, in Appendix A. For cost estimation purposes, it was assumed storage would not be constructed and additional irrigation water would be provided by the farmer as needed. Calculations are shown in Appendix C.

Piping will be provided to convey the wastewater from the property line of the data center north to the farmland along County Road 1225. Pumps required for conveyance are assumed to be provided by the data center. All collection and distribution piping, equipment, and appurtenances on either the data center property or farmland is the responsibility of the respective landowners and was not evaluated or estimated.

Pipe size was determined for the preliminary layout using the Hazen-Williams formula. The values for the Hazen-Williams “C” coefficient is described in section 2.1.4. The resulting pipe size is shown in Figure 6 in Appendix A. Estimated costs for this alternative are included in Appendix B.

5.2.2 Alternative 2 – Storage and Land Application to Residential Irrigation

This alternative involves storing the data center non-contact cooling wastewater in a storage facility and providing residential irrigation to nearby neighborhoods north of the study area. This will require a new storage facility and booster station to provide system pressurization.

Residential area lawns, perfectly maintained, have an estimated irrigation demand of 47.2 inches. For this analysis, it was estimated that the public would only be about 50% reliable resulting in an assumed irrigation demand of 23.6 inches per irrigation season.

As before, an irrigation water balance was calculated using the expected non-contact cooling IWW flow and typical values for lawn irrigation demand, rain, evaporation, and temperature. The expected annual IWW flow of 48 million gallons would need about 94 acres of irrigated lawn (at 23.6 inches of irrigation per year) to dispose of the water and 6.5 million gallons of storage to hold IWW when flow is greater than expected irrigation use. If the public is more efficient, less acreage and storage would be needed; however, a buffer is recommended. It is important to note that there are currently not enough residential neighborhoods between the Study Area and Pine Tree Avenue to fully utilize the expected annual IWW flow. However, the City has several residential developments planned for the area adjacent to County Road 1225/Powerline Road between the Study Area and Pine Tree Avenue. It is assumed the new developments would provide the additional 81 acres needed to dispose of all the IWW flow and would require supplemental irrigation water when fully built out. If this alternative is selected, an additional method for disposing of the remaining IWW flows may be needed if sufficient residential lawn area is not available. A graph of the irrigation water balance on 94 acres is shown in Figure 7 in Appendix A. Calculations are shown in Appendix C.

Piping will be provided on County Road 1225 to convey the wastewater from the property line of the data center to the residential neighborhoods. This pipe was determined to be 8-inch diameter and was included in the cost estimate. All collection and distribution piping, equipment, and appurtenances on the data center property and in residential neighborhoods is the responsibility of the respective land owners and was not evaluated or estimated.

The 6.5 MG storage facility would be needed to store excess “clean” industrial wastewater during the middle of the irrigation season when wastewater flows are greater than residential irrigation demands. Stored water will be irrigated when irrigation demand exceeds IWW production toward the end of the season. It was assumed that storage would be located adjacent to County Road 1225 on the data center property. The data center would be responsible for providing their own piping and pumping to the storage facility therefore costs for such were not estimated. A booster station would be needed to pump water from the storage facility to the residential neighborhoods. Booster station costs were based on flow and no evaluation of booster station pumps, piping, and appurtenances was performed.

Supplemental irrigation water is needed for the residential lawns during the beginning of the irrigation season and, if residents are more efficient than 50%, during the rest of the season. It was assumed residents would use potable water for additional irrigation from the City system. The two systems cannot be directly connected. It was assumed that the proposed potable water main extension discussed in section 3 would provide supplement irrigation via a connection to the proposed storage facility with a backflow prevention device. The infrastructure needed for this alternative was included in the cost estimate. The existing water rights, supplemental irrigation storage, and pumping capacities were not analyzed as part of this improvement. Other supplemental irrigation water options available to the City include utilizing the water right from the acquired study area land and utilizing the existing surface

water right from the Columbia River. It is recommended that these alternatives be analyzed in depth during future master planning efforts.

Pipe size was determined for the preliminary layout using the Hazen-Williams equation. The values for the Hazen-Williams “C” coefficient is described in section 2.1.4. The resulting pipe size is shown in Figure 8 in Appendix A. Estimated costs for this alternative are included in Appendix B.

6 REFERENCES

- Anderson-Perry & Associates, Inc. (2008). *City of Umatilla, Oregon Water System Master Plan*. La Grande.
- IRZ Consulting, LLC (2008). *Irrigation Practices in the Umatilla and Morrow County Area*. Hermiston.
- J-U-B Engineers, Inc. (2018). *City of Umatilla, Beneficial Reuse Feasibility Analysis*. La Grande. OAR 333-061-0025.
OAR 340-071-0220.
- State of Oregon Department of Environmental Quality (2001). *Oregon Standards for Design and Construction of Wastewater Pump Stations*. Portland.
- State of Oregon Department of Environmental Quality (2014). *Onsite Wastewater Treatment Systems*. Portland.

Appendix A – Figures

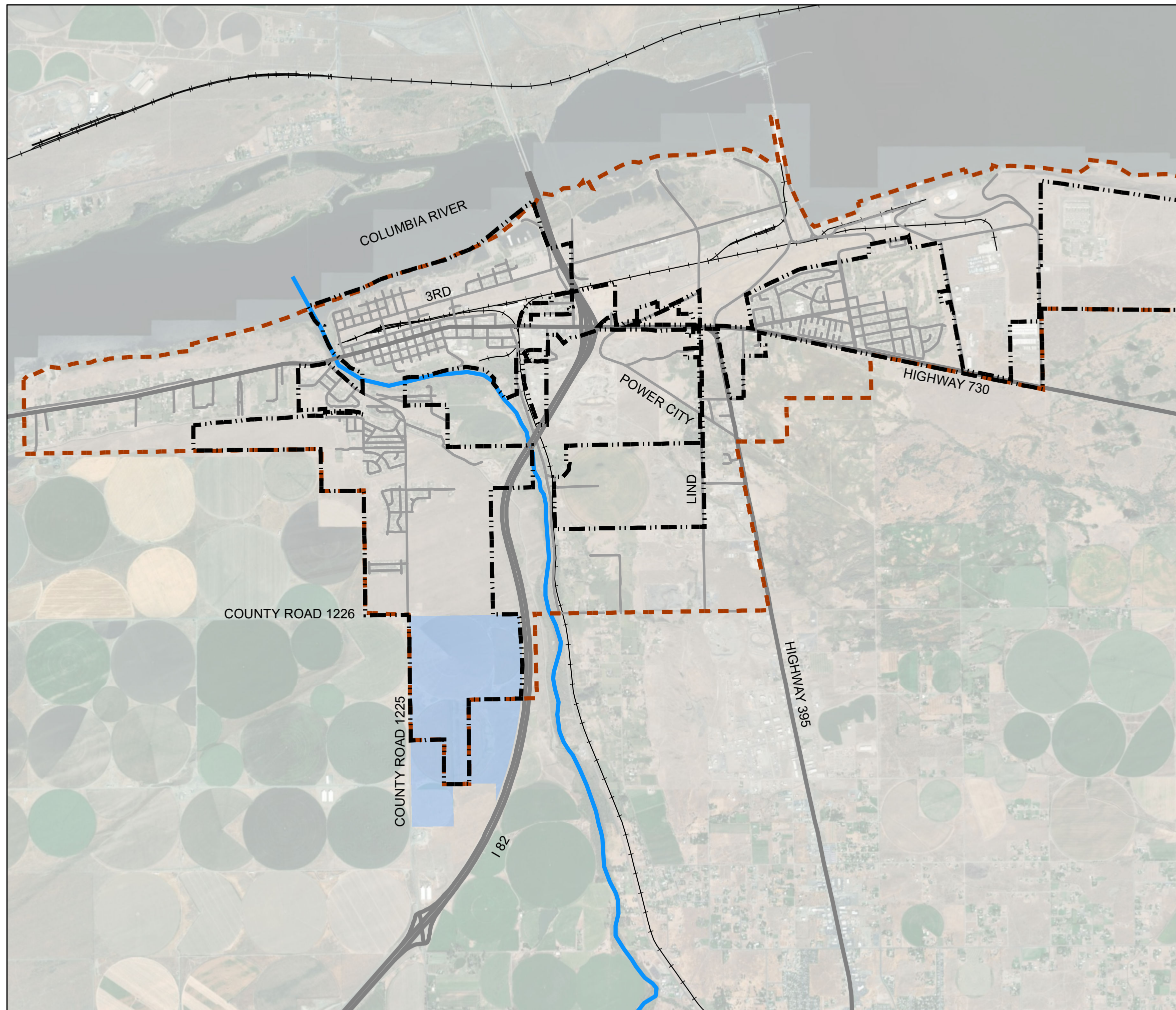


Figure 1

Study Area

Legend

- City Limits
- Urban Growth Boundary
- Major Streets
- Highway/Interstate
- Railroad
- Umatilla River
- Study Area



Not to scale



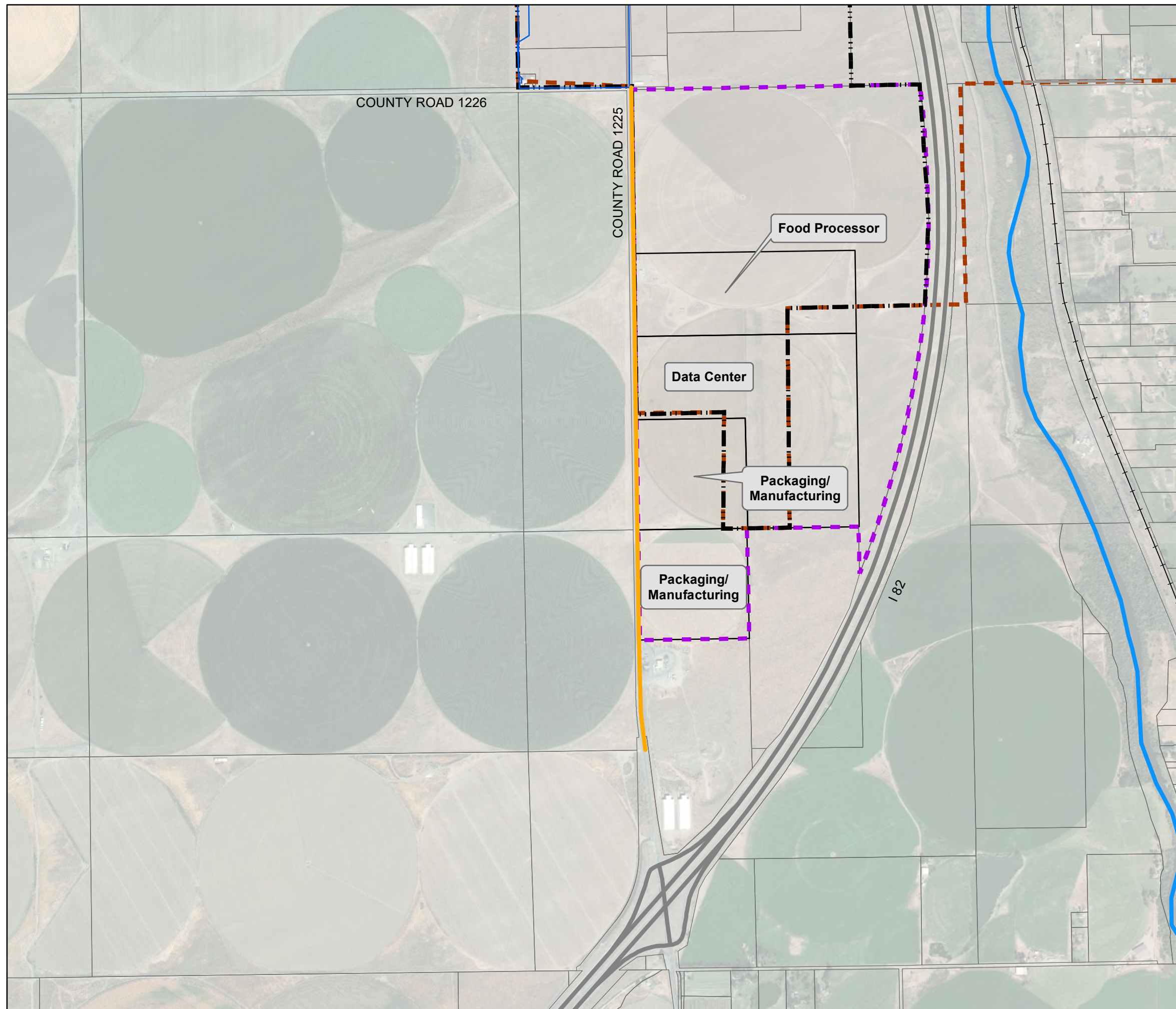
Date: Dec 24, 2019





Figure 2

Potable Water



Legend

- City Limits
- Urban Growth Boundary
- Study Area
- Assumed Lot Boundaries
- Parcel Boundaries
- Major Streets
- Highway/Interstate
- Railroad
- Umatilla River
- Existing Potable Water Main
- Proposed Water Main Pipe**
- 16-inch

Not to scale



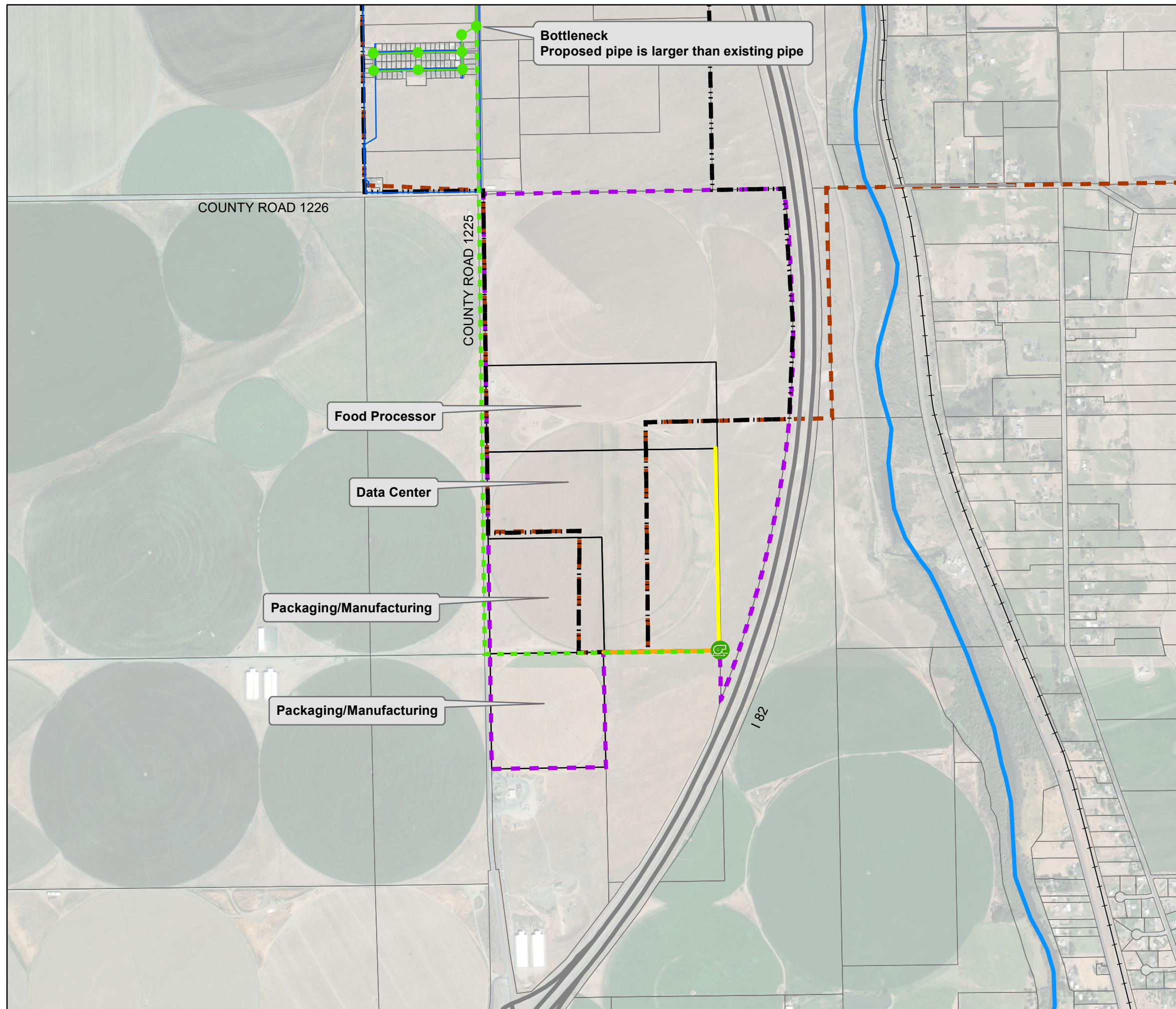
Date: Dec 24, 2019





Figure 3

Sanitary Sewer



Legend

- City Limits
- Urban Growth Boundary
- Study Area
- Assumed Lot Boundaries
- Parcel Boundaries
- Major Streets
- Highway/Interstate
- Railroad
- Umatilla River
- Existing Potable Water Main
- Existing Sanitary Sewer Main
- Existing Sanitary Sewer Manhole
- Lift Station

Proposed Sanitary Sewer Pipe

- 12-inch Forcemain
- 12-inch Gravity Pipe
- 15-inch Gravity Pipe

Not to scale



Date: Dec 24, 2019



Figure 4

Umatilla Water Balance
47.9 MG IWW/yr,
Annual Irrigation Demand: 42.2 in/yr
Land Acreage: 50 Acres
Storage: 2.9 Million Gallons

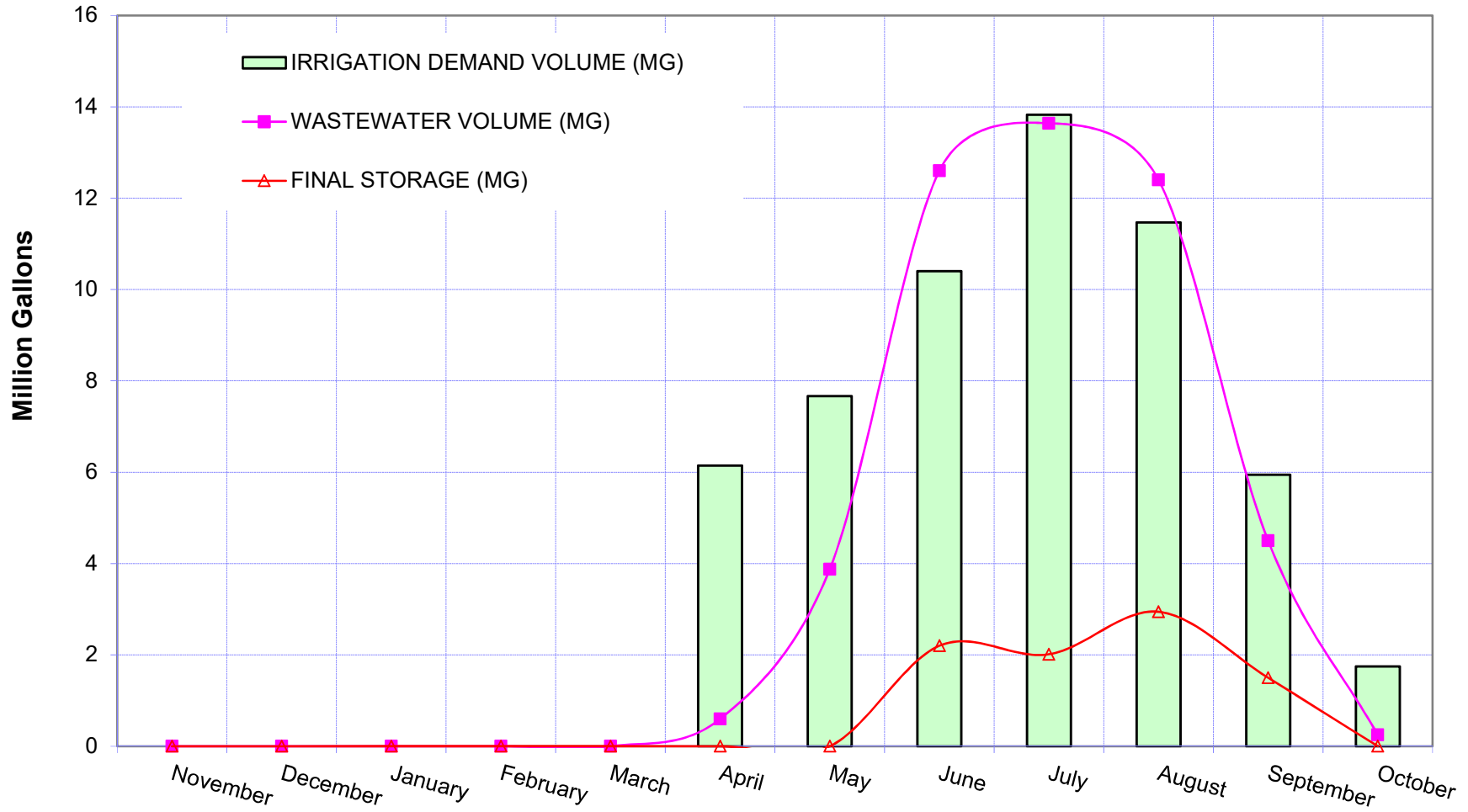


Figure 5

Umatilla Water Balance
47.9 MG IWW/yr,
Annual Irrigation Demand: 42.2 in/yr
Land Acreage: 60 Acres
Storage: ZERO Million Gallons

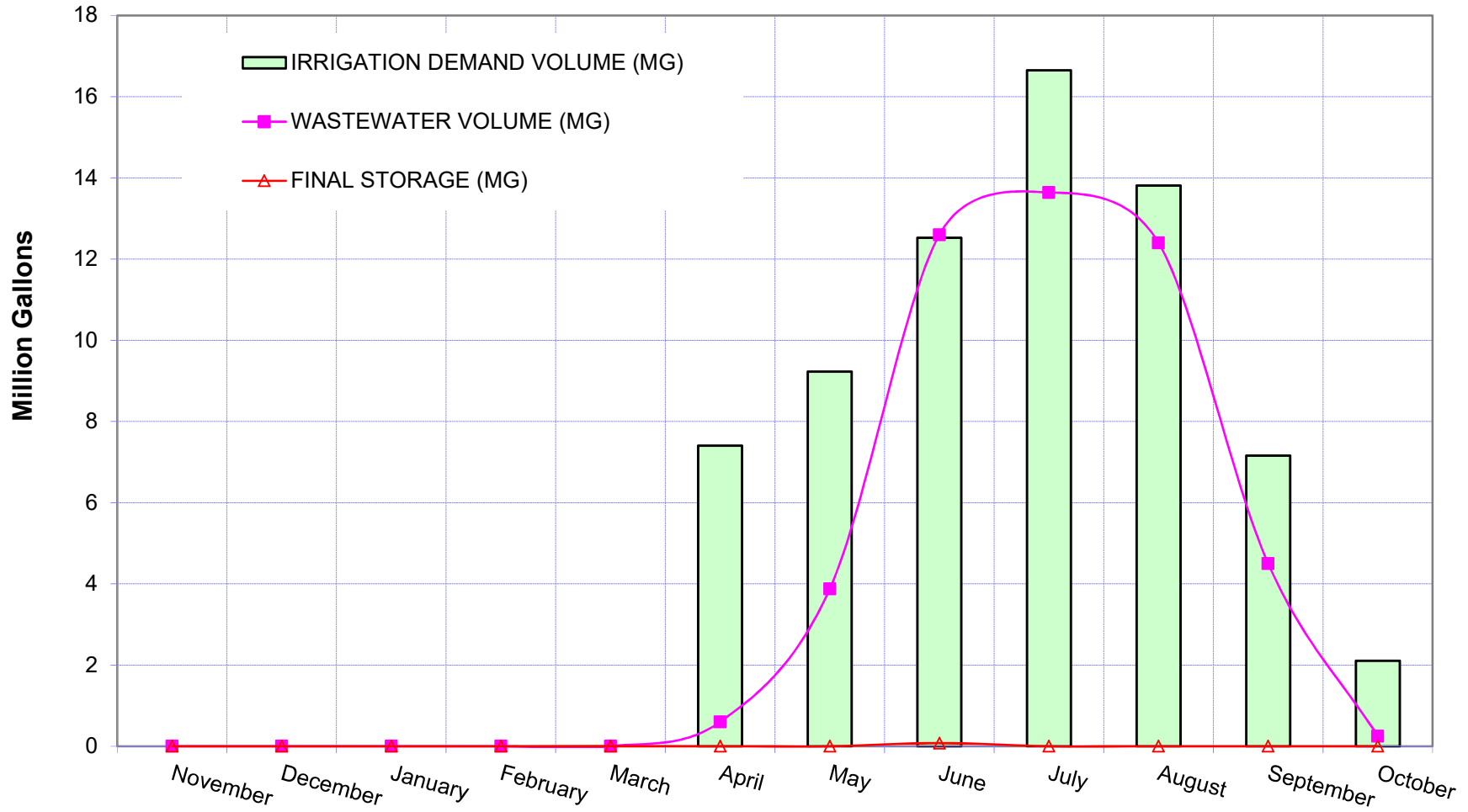







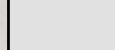







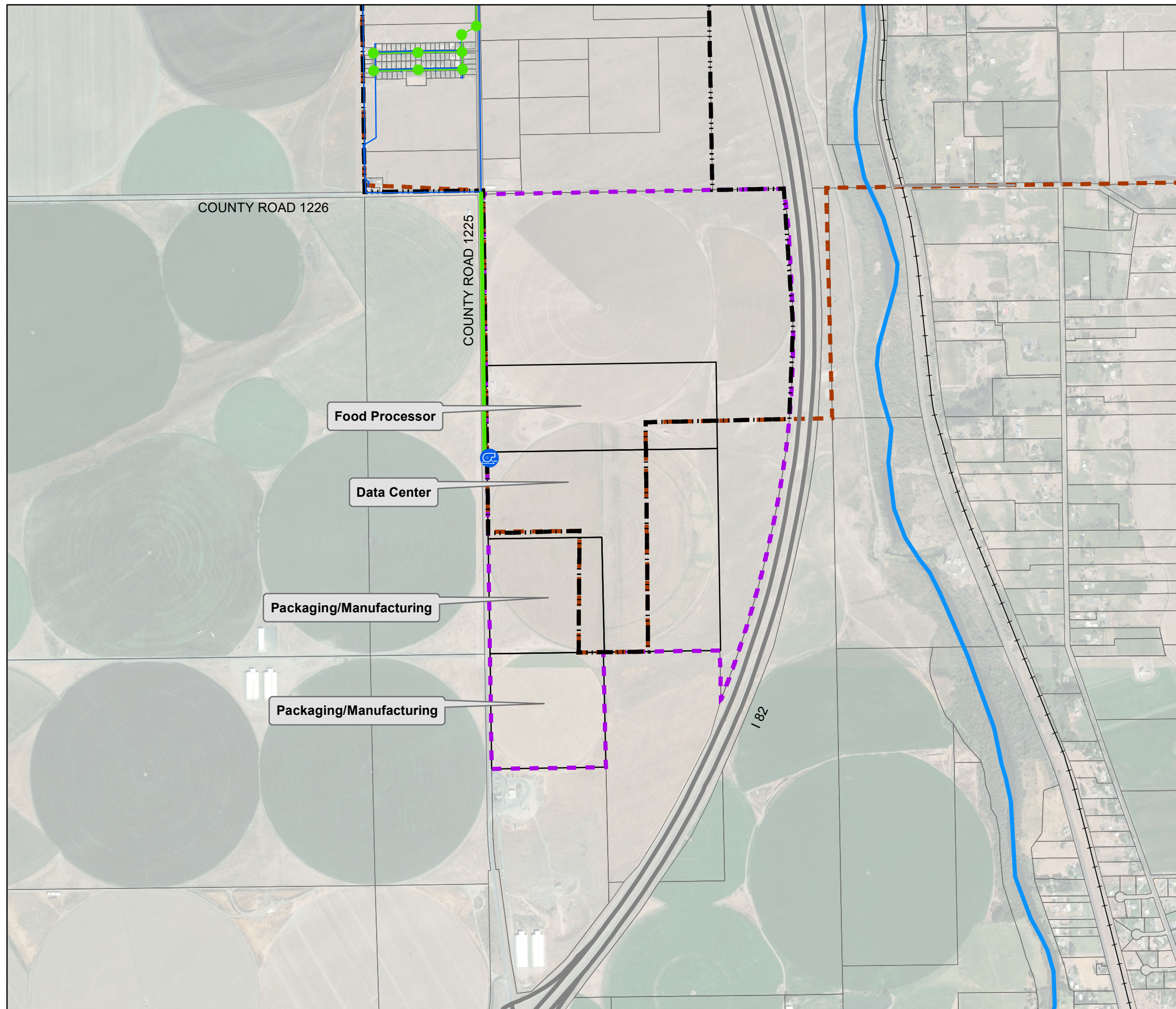


Figure 6

Industrial Wastewater Alternative 1

Legend

-  City Limits
-  Urban Growth Boundary
-  Study Area
-  Assumed Lot Boundaries
-  Parcel Boundaries
-  Major Streets
-  Highway/Interstate
-  Railroad
-  Umatilla River
-  Existing Potable Water Main
-  Existing Sanitary Sewer Main
-  Existing Sanitary Sewer Manhole
-  Booster Station
- Proposed Industrial Wastewater Pipe**
-  10-Inch



Not to scale



Date: Jan 8, 2020



Figure 7

Umatilla Water Balance = 48 MG per Year IWW
Annual Irrigation Demand: 23.6 inches (50%)
Land Acreage: 94 Acres
Storage: 6.5 MG

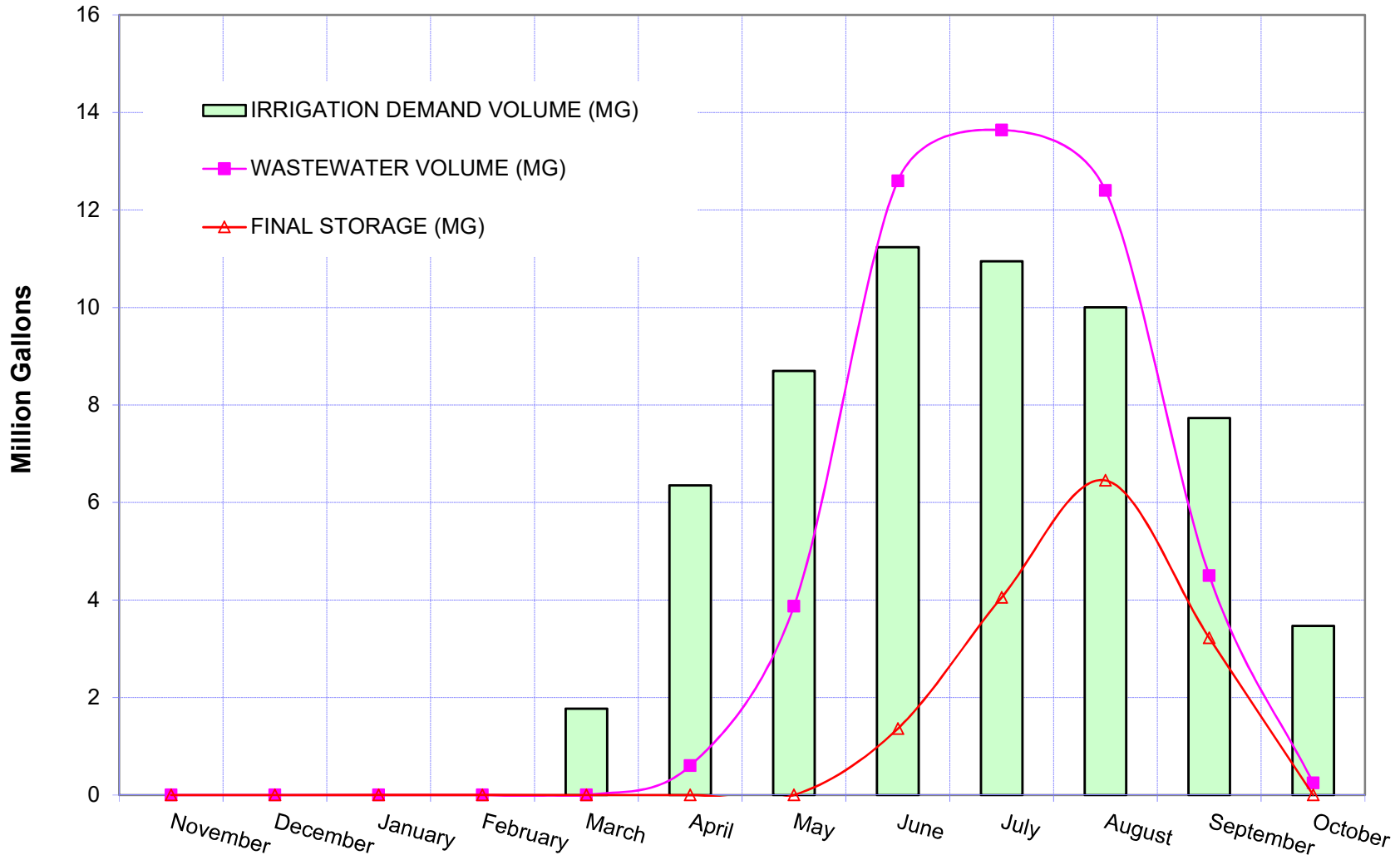




Figure 8

Industrial Wastewater Alternative 2

Legend

- City Limits
- Urban Growth Boundary
- Study Area
- Assumed Lot Boundaries
- Parcel Boundaries
- Major Streets
- Highway/Interstate
- Railroad
- Umatilla River
- Existing Potable Water Main
- Existing Sanitary Sewer Main
- Existing Sanitary Sewer Manhole
- Storage Lagoon
- Booster Station

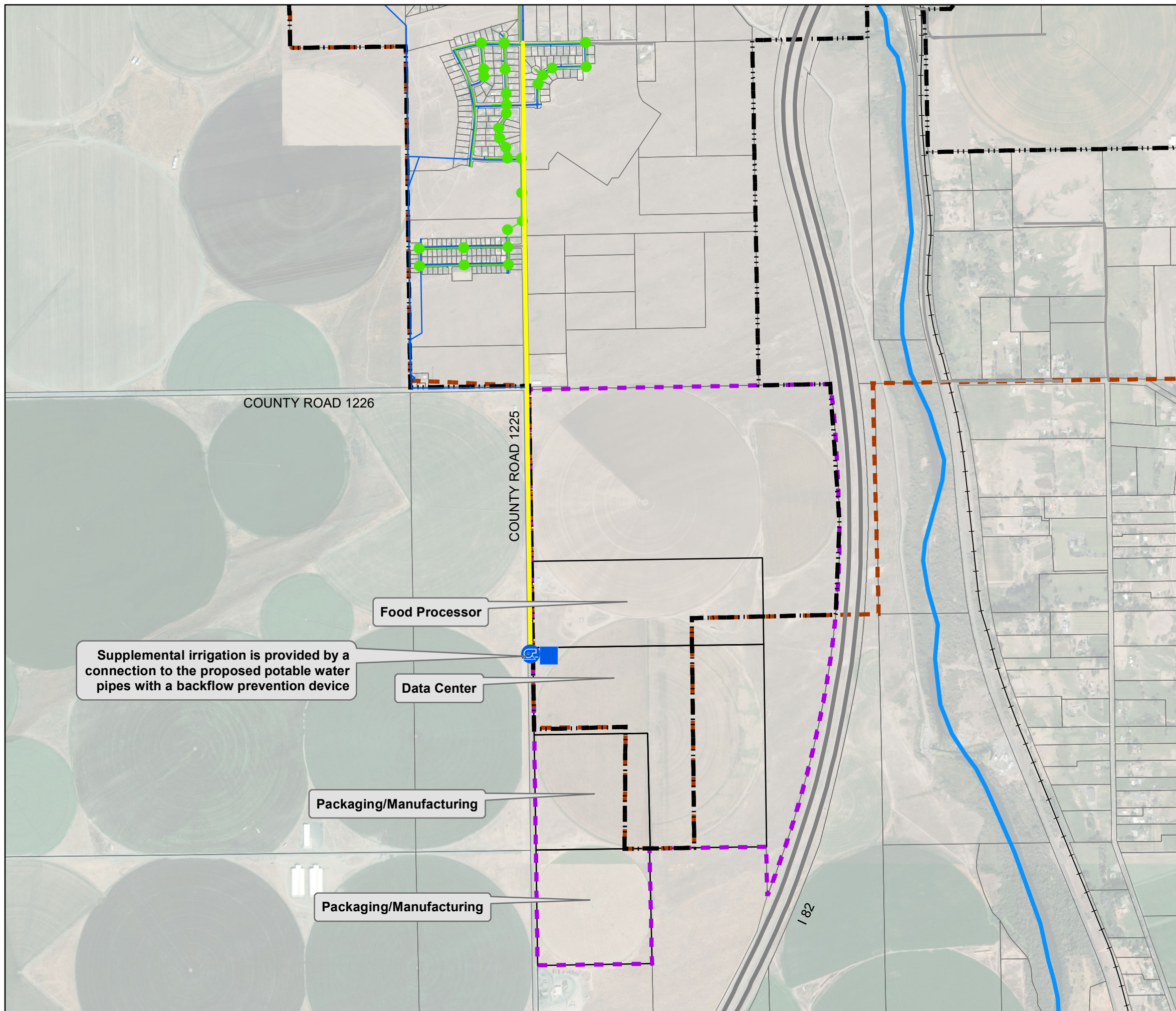
Proposed Industrial Wastewater Pipe

- 8-Inch

Not to scale



Date: Mar 4, 2020



Appendix B – Preliminary Cost Opinions

**Domestic Water and Sewer Conveyance Systems
PLANNING LEVEL ESTIMATE
Industrial Area Utility Tech Memo**



Item No.	Item Description	Unit	Quantity	Adjusted Bid Prices	
				Unit Price (\$)	Amount (\$) ¹
	Mobilization ²	LS	1	\$201,600	\$201,600
	Traffic Control ³	LS	1	\$34,000	\$34,000
	Potable Water				
	16 Inch C900 PVC Pipe ⁴	LF	7,930	\$107	\$848,510
	Sanitary Sewer				
	12 Inch ASTM D3034 PVC Pipe, 5'-10' Depth ⁵	LF	2,060	\$40	\$82,400
	12 Inch ASTM D3034 PVC Pipe, 10'-15' Depth ⁵	LF	590	\$48	\$28,320
	15 Inch ASTM D3034 PVC Pipe, 10'-15' Depth ⁵	LF	300	\$59	\$17,700
	15 Inch ASTM D3034 PVC Pipe, 15'-20' Depth ⁵	LF	180	\$68	\$12,240
	15 Inch ASTM D3034 PVC Pipe, 20'-25' Depth ⁵	LF	430	\$76	\$32,680
	15 Inch ASTM D3034 PVC Pipe, 25'-30' Depth ⁵	LF	260	\$83	\$21,580
	48 Inch Manholes, 5-10 Feet	EA	8	\$4,000	\$32,000
	48 Inch Manholes, 10-15 Feet	EA	3	\$4,500	\$13,500
	48 Inch Manholes, 15-20 Feet	EA	1	\$6,000	\$6,000
	60 Inch Manholes, 20-25 Feet	EA	2	\$8,500	\$17,000
	60 Inch Manholes, 25-30 Feet	EA	1	\$13,500	\$13,500
	12 Inch C-900 PVC Forcemain ⁶	LF	9,900	\$55	\$544,500
	Access Road ⁷	TON	250	\$35	\$8,750
	Lift Station ⁸	LS	1	\$800,000	\$800,000
SUBTOTAL 1				\$2,720,000	
CONSTRUCTION CONTINGENCY ⁹				35%	\$952,000
SUBTOTAL 2				\$3,670,000	
ENGINEERING AND CONSTRUCTION ADMINISTRATION ¹⁰				20%	\$734,000
ENVIRONMENTAL AND CULTURAL ¹¹				5%	\$183,500
TOPOGRAPHIC, BOUNDARY, AND UTILITY SURVEY ¹²				1%	\$36,700
LEGAL AND CITY ADMINISTRATIVE ¹³				2%	\$73,400
CONSTRUCTION SURVEY ¹⁴				1%	\$36,700
TOTAL IMPROVEMENT COST¹⁵				\$4,700,000	

¹ Cost estimates are provided in 2020 dollars. All dollar amounts are rounded for planning purposes.

² Mobilization includes the contractor's administrative and direct expenses to mobilize equipment, materials, and labor to the project site.

³ Traffic control includes all labor, material, and equipment expenses associated with safely moving traffic through the work zone including signage, flagging, temporary barriers, temporary pavement markings, and lane delineators.

⁴ Pipe cost includes the cost of all equipment, material, and labor for pipe installation, excavation, bedding, backfill, earthwork, compaction, valves, fittings, fire hydrants, and restoration to existing conditions.

⁵ Pipe cost includes the cost of equipment, materials, and labor of trench excavation, pipe bedding, piping, backfill, compaction, and restoration to existing conditions.

⁶ Pipe cost includes the cost of equipment, materials, and labor of trench excavation, pipe bedding, piping, restrained joints, air valves, pressure cleanouts, backfill, compaction, and restoration to existing conditions.

⁷ Access road costs include the costs of all work associated with construction of the access road including earthwork, gravel, and restoration.

⁸ Lift station cost includes the cost of equipment, materials, and labor of sitework, yard piping, submersible lift station, precast structures, and electrical and controls.

⁹ A contingency of 35 percent was used due to the high degree of unknown factors. Assumes AACEI Class 4.

¹⁰ Engineering and Construction Administration includes all administrative and direct expenses to develop plans, specifications, and an engineer's estimate for

¹¹ Environmental and Cultural includes all expenses associated with environmental or cultural studies and procedures.

¹² Topographic, Boundary, and Utility Survey includes all labor, equipment, and travel expenses to obtain existing survey information for planning and design purposes.

¹³ Legal and City Administration includes all expenses associated with financial and legal oversight by the City.

¹⁴ Construction survey includes all expenses, including labor and equipment, to conduct construction staking and construction verification/quality control checks.

¹⁵ The Total Improvement Cost reflects an estimate of potential overall project costs based on preliminary estimates, and should not be considered an actual cost or encompassing all scenarios and circumstances.

**Water Project - Coyote Reservoir and Booster Station Upgrades
PLANNING LEVEL ESTIMATE
Industrial Area Utility Tech Memo**



Item No.	Item Description	Unit	Quantity	Adjusted Bid Prices	
				Unit Price (\$)	Amount (\$) ¹
1	Mobilization ²	LS	1	\$67,000	\$67,000
2	Land Acquisition ³	LS	1	\$75,000	\$75,000
3	Site Work ⁴	LS	1	\$33,000	\$33,000
4	1 MG Steel Reservoir ⁵	LS	1	\$673,000	\$673,000
5	PAX Mixing System ⁶	LS	1	\$57,000	\$57,000
SUBTOTAL 1				\$910,000	
CONSTRUCTION CONTINGENCY ⁷				35%	\$318,500
SUBTOTAL 2				\$1,230,000	
ENGINEERING AND CONSTRUCTION ADMINISTRATION ⁸				20%	\$246,000
ENVIRONMENTAL AND CULTURAL ⁹				5%	\$61,500
TOPOGRAPHIC, BOUNDARY, AND UTILITY SURVEY ¹⁰				1%	\$12,300
LEGAL AND CITY ADMINISTRATIVE ¹¹				2%	\$24,600
CONSTRUCTION SURVEY ¹²				1%	\$12,300
TOTAL IMPROVEMENT COST¹³				\$1,600,000	

¹ Cost estimates are provided in 2020 dollars. All dollar amounts are rounded for planning purposes.

² Mobilization includes the contractor's administrative and direct expenses to mobilize equipment, materials, and labor to the project site.

³ Land acquisition includes the cost of obtaining additional land to construct the proposed improvements. Assume each site requiring land acquisition is half an acre in size.

⁴ Site work includes the cost of excavation, grading, backfill, compaction, base rock, fencing, and site piping.

⁵ Reservoir costs include the costs of all work associated with reservoir construction including all materials, labor, equipment to construct the reservoir, foundation, and yard piping.

⁶ PAX mixing system includes the costs of the mixer, shipping and handling, start-up, and training.

⁷ A contingency of 35 percent was used due to the high degree of unknown factors. Assumes AACEI Class 4.

⁸ Engineering and Construction Administration includes all administrative and direct expenses to develop plans, specifications, and an engineer's estimate for construction.

⁹ Environmental and Cultural includes all expenses associated with environmental or cultural studies and procedures.

¹⁰ Topographic, Boundary, and Utility Survey includes all labor, equipment, and travel expenses to obtain existing survey information for planning and design purposes.

¹¹ Legal and City Administration includes all expenses associated with financial and legal oversight by the City.

¹² Construction survey includes all expenses, including labor and equipment, to conduct construction staking and construction verification/quality control checks.

¹³ The Total Improvement Cost reflects an estimate of potential overall project costs based on preliminary estimates, and should not be considered an actual cost or encompassing all scenarios and circumstances. This does not reflect the cost of all pipes and services which will increase the overall cost.

**Industrial Wastewater Conveyance Systems - Alternative 1
PLANNING LEVEL ESTIMATE
Industrial Area Utility Tech Memo**



Item No.	Item Description	Unit	Quantity	Adjusted Bid Prices	
				Unit Price (\$)	Amount (\$) ¹
	Mobilization ²	LS	1	\$8,000	\$8,000
	Traffic Control ³	LS	1	\$9,000	\$9,000
	10 Inch C900 PVC Pipe ⁴	LF	3,100	\$29	\$89,900
SUBTOTAL 1				\$110,000	
CONSTRUCTION CONTINGENCY ⁵				35%	\$38,500
SUBTOTAL 2				\$150,000	
ENGINEERING AND CONSTRUCTION ADMINISTRATION ⁶				20%	\$30,000
ENVIRONMENTAL AND CULTURAL ⁷				10%	\$15,000
TOPOGRAPHIC, BOUNDARY, AND UTILITY SURVEY ⁸				1%	\$1,500
LEGAL AND CITY ADMINISTRATIVE ⁹				2%	\$3,000
CONSTRUCTION SURVEY ¹⁰				1%	\$1,500
TOTAL IMPROVEMENT COST¹¹				\$200,000	

¹ Cost estimates are provided in 2020 dollars. All dollar amounts are rounded for planning purposes.

² Mobilization includes the contractor's administrative and direct expenses to mobilize equipment, materials, and labor to the project site.

³ Traffic control includes all labor, material, and equipment expenses associated with safely moving traffic through the work zone including signage, flagging, temporary barriers, temporary pavement markings, and lane delineators.

⁴ Pipe cost includes the cost of all pipe, pipe installation, earthwork, compaction, valves, fittings, fire hydrants, pavement repair, and restoration associated with the project. Farmer to provide distribution piping.

⁵ A contingency of 35 percent was used due to the high degree of unknown factors. Assumes AACEI Class 4.

⁶ Engineering and Construction Administration includes all administrative and direct expenses to develop plans, specifications, and an engineer's estimate for

⁷ Environmental and Cultural includes all expenses associated with environmental or cultural studies and procedures.

⁸ Topographic, Boundary, and Utility Survey includes all labor, equipment, and travel expenses to obtain existing survey information for planning and design purposes.

⁹ Legal and City Administration includes all expenses associated with financial and legal oversight by the City.

¹⁰ Construction survey includes all expenses, including labor and equipment, to conduct construction staking and construction verification/quality control checks.

¹¹ The Total Improvement Cost reflects an estimate of potential overall project costs based on preliminary estimates, and should not be considered an actual cost or encompassing all scenarios and circumstances.

**Industrial Wastewater Conveyance Systems - Alternative 2
PLANNING LEVEL ESTIMATE
Industrial Area Utility Tech Memo**



Item No.	Item Description	Unit	Quantity	Adjusted Bid Prices	
				Unit Price (\$)	Amount (\$) ¹
	Mobilization ²	LS	1	\$156,000	\$156,000
	Traffic Control ³	LS	1	\$10,000	\$10,000
	8 Inch C900 PVC Pipe ⁴	LF	7,050	\$21	\$148,050
	6.5 MG Lagoon ⁵	LS	1	\$1,700,000	\$1,700,000.00
	Booster Station ⁶	LS	1	\$90,000	\$90,000
SUBTOTAL 1				\$2,100,000	
CONSTRUCTION CONTINGENCY ⁷				35%	\$735,000
SUBTOTAL 2				\$2,840,000	
ENGINEERING AND CONSTRUCTION ADMINISTRATION ⁸				20%	\$568,000
ENVIRONMENTAL AND CULTURAL ⁹				3%	\$85,200
TOPOGRAPHIC, BOUNDARY, AND UTILITY SURVEY ¹⁰				1%	\$28,400
LEGAL AND CITY ADMINISTRATIVE ¹¹				2%	\$56,800
CONSTRUCTION SURVEY ¹²				1%	\$28,400
TOTAL IMPROVEMENT COST¹³				\$3,600,000	

¹ Cost estimates are provided in 2020 dollars. All dollar amounts are rounded for planning purposes.

² Mobilization includes the contractor's administrative and direct expenses to mobilize equipment, materials, and labor to the project site.

³ Traffic control includes all labor, material, and equipment expenses associated with safely moving traffic through the work zone including signage, flagging, temporary barriers, temporary pavement markings, and lane delineators.

⁴ Pipe cost includes the cost of all pipe, pipe installation, earthwork, compaction, valves, fittings, fire hydrants, pavement repair, and restoration associated with the project. City to provide neighborhood distribution piping.

⁵ Lagoon costs include the costs of all work associated with lagoon construction including the cost of earthwork, compaction, HDPE lining, perimeter road, perimeter fencing, water level gauges, and piping. No land acquisition costs are needed as the City will own this property prior to construction.

⁶ Booster pump station costs include the costs of all work associated with construction of the booster pump station including, booster pumps, site work, building construction, yard piping, electrical and controls, and HVAC system.

⁷ A contingency of 35 percent was used due to the high degree of unknown factors. Assumes AACEI Class 4.

⁸ Engineering and Construction Administration includes all administrative and direct expenses to develop plans, specifications, and an engineer's estimate for

⁹ Environmental and Cultural includes all expenses associated with environmental or cultural studies and procedures.

¹⁰ Topographic, Boundary, and Utility Survey includes all labor, equipment, and travel expenses to obtain existing survey information for planning and design purposes.

¹¹ Legal and City Administration includes all expenses associated with financial and legal oversight by the City.

¹² Construction survey includes all expenses, including labor and equipment, to conduct construction staking and construction verification/quality control checks.

¹³ The Total Improvement Cost reflects an estimate of potential overall project costs based on preliminary estimates, and should not be considered an actual cost or encompassing all scenarios and circumstances.

Appendix C – Calculations

POWERLINE ROAD, UMATILLA OR

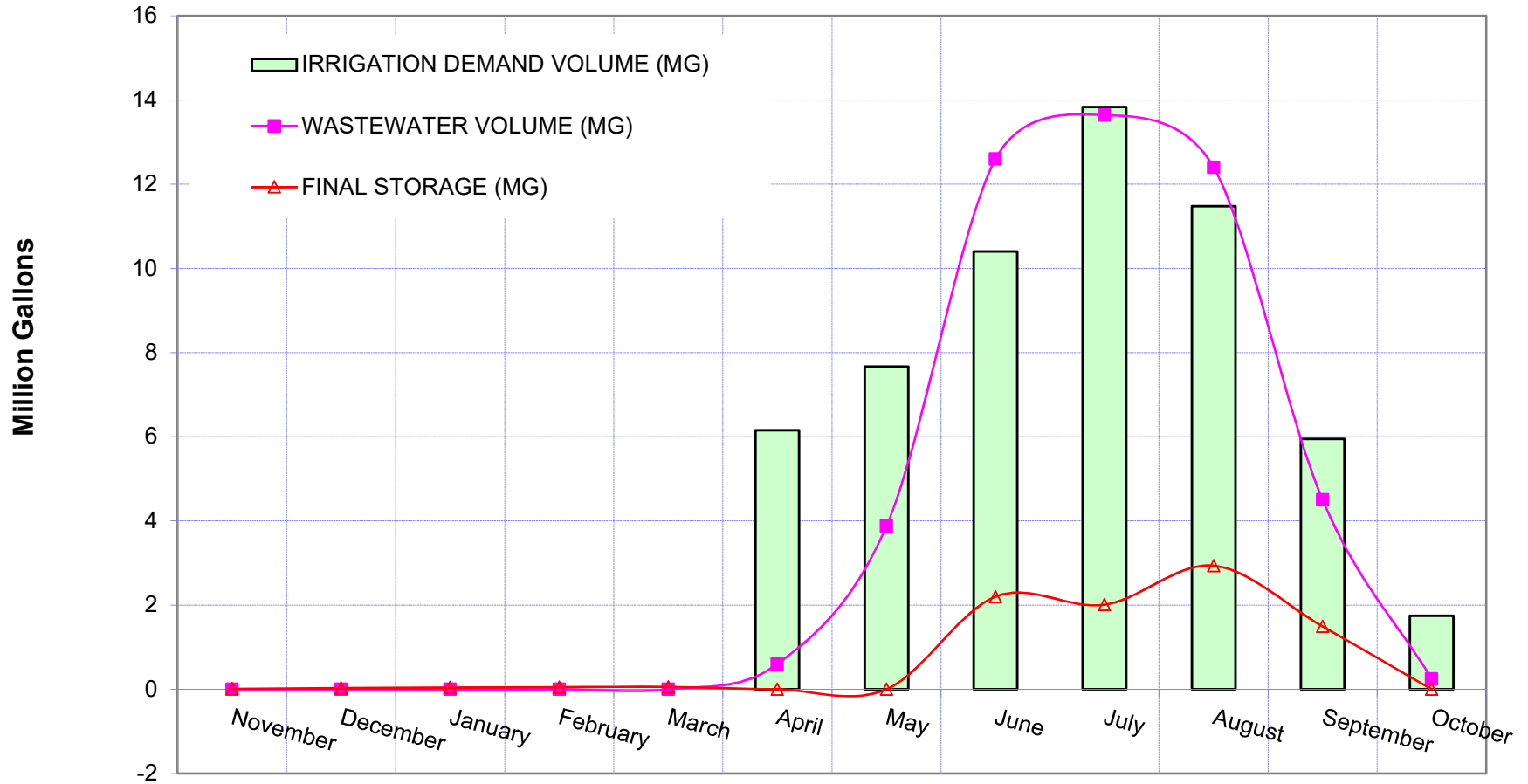
WATER BALANCE

Annual Irrigation Demand 57.23 inches

IWW INFLOW 47.86 MG

Area Irrigated 49.86 Acres

Storage 2.9 MG



POWERLINE ROAD, UMATILLA OR
Flow 0.223 MGD Summer Average

Annual Irrigation Demand 57.23 inches
Storage 2.9 MG

Area Filled 49.26 Acres
Flow 0.13 MGD Annual Average

0.0

STORAGE LAGOON W/ LAND APPLICATION ON ALFALFA DURING GROWING SEASON

DRAFT WORKING DOCUMENT: 12/19/2019

AVG ANN WASTEWATER DESIGN FLOW, MGD.....	0.13	REQ'D IRRIGATION AREA (AC).....	50
RAIN CATCHMENT AREA (AC).....	0.40 Acres of Storage Ponds	AVERAGE IRRIGATION REDUCTION	1.00 To reduce the average demand to
POND PERIMETER RUNOFF FRACTION.....	1.00	IRRIGATION EFFICIENCY (DECIMAL FRACT).....	1.00 This increased the irrigation demand
POND EVAP AREA AT ZERO STOR (AC).....	0.40	PRECIP/AVG PRECIP RATIO.....	1.00 This increases the average precipitation
POND EVAP AREA ADD PER UNIT STOR (AC/MG).....	0.033	EVAPORATION / AVE EVAPORATION RATION.....	1.00 This reduces the average evaporation
		KNOW AVERAGE FLOW / DESIGN FLOW.....	1.00 This increased the flow to the future

Flow Ratio

PARAMETER

	11	12	1	2	3	4	5	6	7	8	9	10	TOTAL
INPUT DATA	November	December	January	February	March	April	May	June	July	August	September	October	
MONTHLY FLOW RATIOS	0.00	0.00	0.00	0.00	0.00	0.02	0.13	0.42	0.44	0.40	0.15	0.01	
MONTHLY FLOWS (MGD)	0.00	0.00	0.00	0.00	0.00	0.02	0.13	0.42	0.44	0.40	0.15	0.01	0.1303 Annual Avg. Daily Flow (MGD)
GIVEN INFLOW-OUTFLOW (MG)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
AVG PAN EVAP (IN)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	- Average Annual Pan Evaporation
AVG PRECIP (IN)	1.14	1.32	1.23	0.85	0.67	0.79	0.69	0.50	0.22	0.29	0.39	0.60	8.69 Average Annual Precipitation
MONTHLY AVE. TEMP.	42.00	34.70	34.20	38.70	46.00	52.70	60.50	67.70	74.60	73.10	73.10	52.40	Degrees F

CALCULATIONS

DAYS IN MONTH	30.0	31.0	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	
BEGINNING STORAGE (MG)	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	2.2	2.0	2.9	1.5	
WASTEWATER FLOW (MGD)	0.00	0.00	0.00	0.00	0.00	0.02	0.13	0.42	0.44	0.40	0.15	0.01	4.0 Million Gallons per Month
WASTEWATER VOLUME (MG)	0.0	0.0	0.0	0.0	0.0	0.6	3.9	12.6	13.6	12.4	4.5	0.2	47.9 Million Gallon Per Year
PAN COEFFICIENT	0.89	0.96	0.96	0.93	0.85	0.80	0.72	0.66	0.59	0.60	0.60	0.80	
POND EVAP (IN)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	- Design Annual Evaporation
EVAPORATION AREA (AC)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	
EVAPORATION VOL (MG)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	- Evaporation Volume
PRECIPITATION (IN)	1.1	1.3	1.2	0.9	0.7	0.8	0.7	0.5	0.2	0.3	0.4	0.6	8.7 Designed Annual Precipitation
PRECIPITATION VOL (MG)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1 Precip Volume
RAIN YET TO FALL (IN)	8.7	7.6	6.2	5.0	4.2	3.5	2.7	2.0	1.5	1.3	1.0	0.6	
AVG. MONTHLY Pdef (IN)	0.0	0.0	0.0	0.0	0.0	4.5	5.7	7.7	10.2	8.5	4.4	1.3	42.24 Average Annual Pdef
Vadose Zone Storage (IN)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	- Inches Stored in The Vadose Zone
MODELED IRRIG DEMAND (IN)	0.0	0.0	0.0	0.0	0.0	4.5	5.7	7.7	10.2	8.5	4.4	1.3	42.24 Designed Annual Irrigation Demand
IRRIGATION DEMAND VOLUME (MG)	0.0	0.0	0.0	0.0	0.0	6.2	7.7	10.4	13.8	11.5	5.9	1.7	57.2 Irrigation Demand (MG)
REUSE WATER IRRIGATED	0.0	0.0	0.0	0.0	0.0	0.7	3.9	10.4	13.8	11.5	5.9	1.7	48.0 Volume Reuse water Irrigated (MG)
STORAGE GAIN (MG)	0.0	0.0	0.0	0.0	0.0	-5.5	-3.8	2.2	-0.2	0.9	-1.4	-1.5	
FINAL STORAGE (MG)	0.0	0.0	0.0	0.0	0.1	0.0	0.0	2.2	2.0	2.9	1.5	0.0	

ANNUAL INFLOW SUMMARY (MG)

WASTEWATER.....	47.9
PRECIPITATION.....	0.1
GIVEN INFLOWS-OUTFLOWS.....	0.0
TOTAL	48.0

ANNUAL OUTFLOW SUMMARY (MG)

POND EVAPORATION.....	0.0
POND PERCOLATION.....	0.0
IRRIGATION.....	48.0
TOTAL	48.0

OVERALL BALANCE

TOTAL INFLOW-OUTFLOW (MG).....	0.0
MAX. REQ'D STORAGE (MG).....	2.94
MAX. REQ'D STORAGE (ACFT)	9.0
MAX. DEPTH (FT)	25.0
SURFACE AREA (AC)	1.2
SURFACE AREA (SF)	54,330
SQUARE DIM (FT)	233

Acres Needed, vertical walls 0.4
Storage Catchment Area Large Enough

POWERLINE ROAD, UMATILLA OR

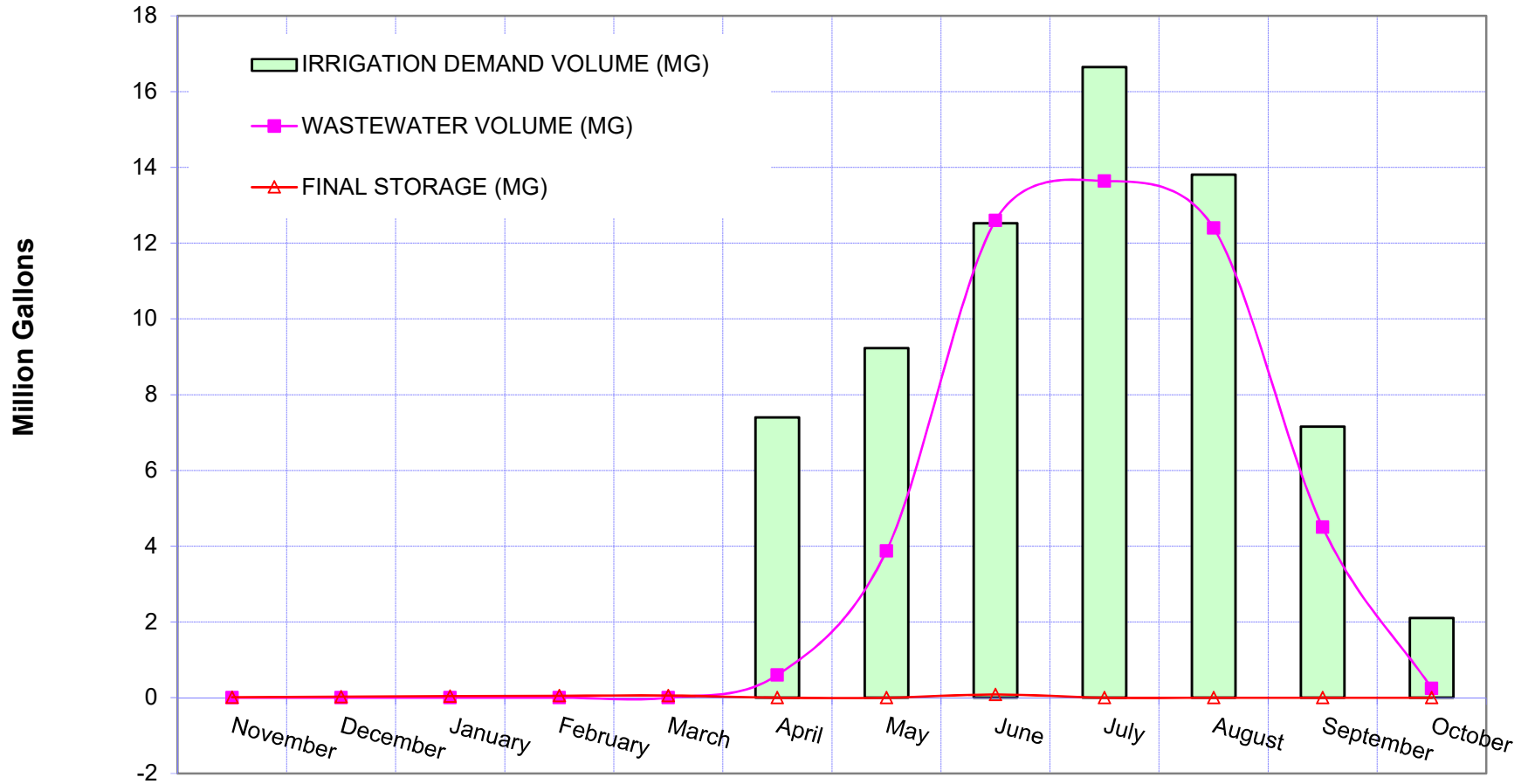
WATER BALANCE

Annual Irrigation Demand 68.87 inches

IWW INFLOW 47.86 MG

Area Irrigated 60 Acres

Storage 0.1 MG



POWERLINE ROAD, UMATILLA OR
Flow 0.223 MGD Summer Average

Annual Irrigation Demand 68.87 inches
Storage 0.1 MG

Area Filled 60 Acres
powerline road W/ALFALFA 67.86 MG

0.0

STORAGE LAGOON W/ LAND APPLICATION ON ALFALFA DURING GROWING SEASON

DRAFT WORKING DOCUMENT: 12/19/2019

AVG ANN WASTEWATER DESIGN FLOW, MGD	0.13	REQ'D IRRIGATION AREA (AC)	60
RAIN CATCHMENT AREA (AC).....	0.40 Acres of Storage Ponds	AVERAGE IRRIGATION REDUCTION	1.00 To reduce the average demand to
POND PERIMETER RUNOFF FRACTION.....	1.00	IRRIGATION EFFICIENCY (DECIMAL FRACT).....	1.00 This increased the irrigation demand
POND EVAP AREA AT ZERO STOR (AC).....	0.40	PRECIP/AVG PRECIP RATIO.....	1.00 This increases the average precipitation
POND EVAP AREA ADD PER UNIT STOR (AC/MG).....	0.033	EVAPORATION / AVE EVAPORATION RATION.....	1.00 This reduces the average evaporation
		Flow Ratio KNOW AVERAGE FLOW / DESIGN FLOW.....	1.00 This increased the flow to the future

PARAMETER

	11	12	1	2	3	4	5	6	7	8	9	10	TOTAL
INPUT DATA	November	December	January	February	March	April	May	June	July	August	September	October	
MONTHLY FLOW RATIOS	0.00	0.00	0.00	0.00	0.00	0.02	0.13	0.42	0.44	0.40	0.15	0.01	
MONTHLY FLOWS (MGD)	0.00	0.00	0.00	0.00	0.00	0.02	0.13	0.42	0.44	0.40	0.15	0.01	0.1303 Annual Avg. Daily Flow (MGD)
GIVEN INFLOW-OUTFLOW (MG)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
AVG PAN EVAP (IN)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	- Average Annual Pan Evaporation
AVG PRECIP (IN)	1.14	1.32	1.23	0.85	0.67	0.79	0.69	0.50	0.22	0.29	0.39	0.60	8.69 Average Annual Precipitation
MONTHLY AVE. TEMP.	42.00	34.70	34.20	38.70	46.00	52.70	60.50	67.70	74.60	73.10	73.10	52.40	Degrees F

CALCULATIONS

DAYS IN MONTH	30.0	31.0	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	
BEGINNING STORAGE (MG)	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	
WASTEWATER FLOW (MGD)	0.00	0.00	0.00	0.00	0.00	0.02	0.13	0.42	0.44	0.40	0.15	0.01	4.0 Million Gallons per Month
WASTEWATER VOLUME (MG)	0.0	0.0	0.0	0.0	0.0	0.6	3.9	12.6	13.6	12.4	4.5	0.2	47.9 Million Gallon Per Year
PAN COEFFICIENT	0.89	0.96	0.96	0.93	0.85	0.80	0.72	0.66	0.59	0.60	0.60	0.80	
POND EVAP (IN)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	- Design Annual Evaporation
EVAPORATION AREA (AC)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
EVAPORATION VOL (MG)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	- Evaporation Volume
PRECIPITATION (IN)	1.1	1.3	1.2	0.9	0.7	0.8	0.7	0.5	0.2	0.3	0.4	0.6	8.7 Designed Annual Precipitation
PRECIPITATION VOL (MG)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1 Precip Volume
RAIN YET TO FALL (IN)	8.7	7.6	6.2	5.0	4.2	3.5	2.7	2.0	1.5	1.3	1.0	0.6	
AVG. MONTHLY Pdef (IN)	0.0	0.0	0.0	0.0	0.0	4.5	5.7	7.7	10.2	8.5	4.4	1.3	42.24 Average Annual Pdef
Vadose Zone Storage (IN)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	- Inches Stored in The Vadose Zone
MODELED IRRIG DEMAND (IN)	0.0	0.0	0.0	0.0	0.0	4.5	5.7	7.7	10.2	8.5	4.4	1.3	42.24 Designed Annual Irrigation Demand
IRRIGATION DEMAND VOLUME (MG)	0.0	0.0	0.0	0.0	0.0	7.4	9.2	12.5	16.6	13.8	7.2	2.1	68.9 Irrigation Demand (MG)
REUSE WATER IRRIGATED	0.0	0.0	0.0	0.0	0.0	0.7	3.9	12.5	13.7	12.4	4.5	0.3	48.0 Volume Reuse water Irrigated (MG)
STORAGE GAIN (MG)	0.0	0.0	0.0	0.0	0.0	-6.8	-5.3	0.1	-3.0	-1.4	-2.7	-1.8	
FINAL STORAGE (MG)	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	

ANNUAL INFLOW SUMMARY (MG)

WASTEWATER.....	47.9
PRECIPITATION.....	0.1
GIVEN INFLOWS-OUTFLOWS.....	0.0
TOTAL	48.0

ANNUAL OUTFLOW SUMMARY (MG)

POND EVAPORATION.....	0.0
POND PERCOLATION.....	0.0
IRRIGATION.....	48.0
TOTAL	48.0

OVERALL BALANCE

TOTAL INFLOW-OUTFLOW (MG).....	0.0
MAX. REQ'D STORAGE (MG).....	0.08
MAX. REQ'D STORAGE (ACFT)	0.3
MAX. DEPTH (FT)	25.0
SURFACE AREA (AC)	1.2
SURFACE AREA (SF)	54,330
SQUARE DIM (FT)	233

Acres Needed, vertical walls 0.0
Storage Catchment Area Large Enough

POWERLINE ROAD, UMATILLA OR

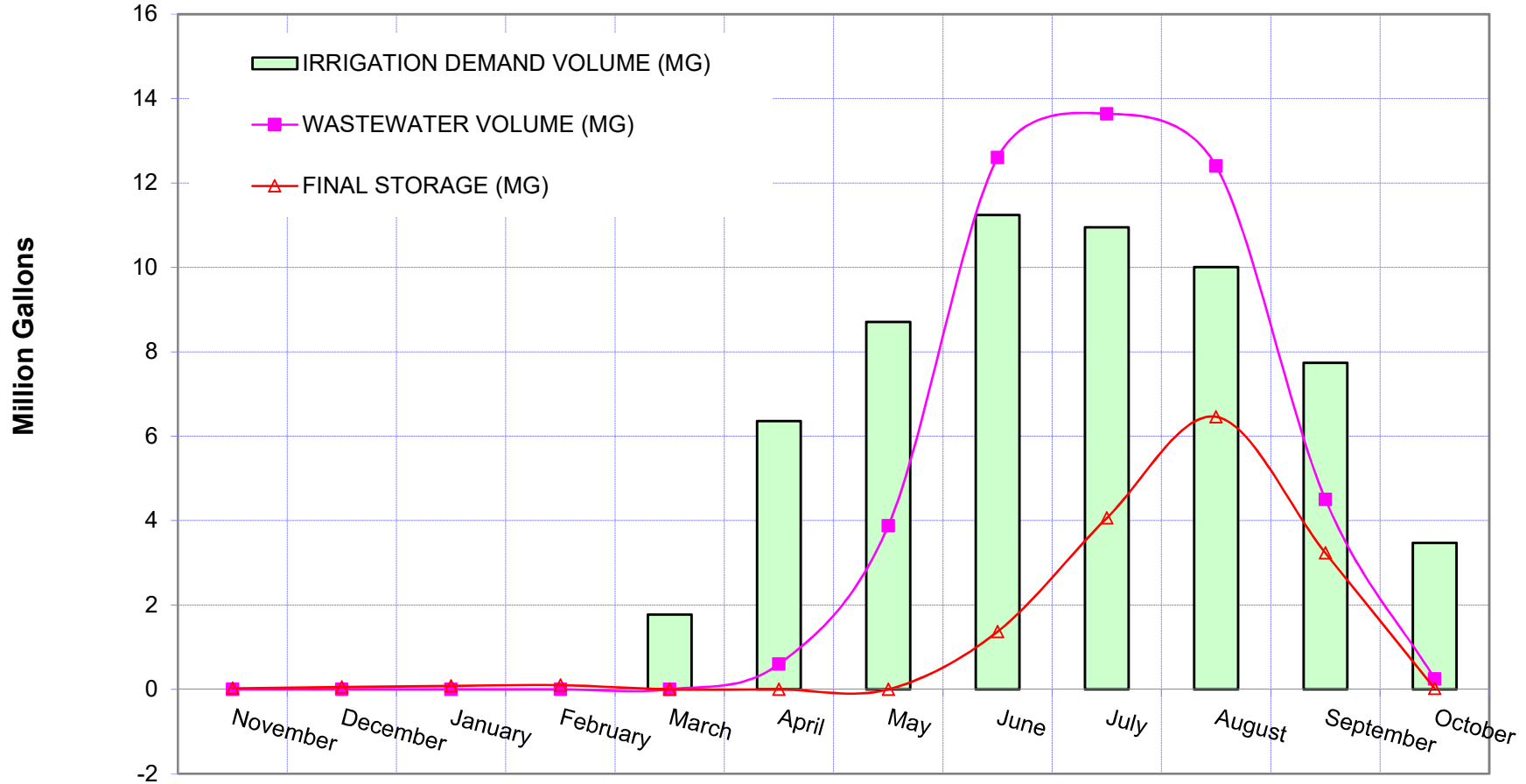
WATER BALANCE

Annual Irrigation Demand 60.25 inches

IWW INFLOW 47.86 MG

Area Irrigated 93.94 Acres

Storage 6.5 MG



POWERLINE ROAD, UMATILLA OR
Flow 0.223 MGD Summer Average

Annual Irrigation Demand 60.25 inches
Storage 6.5 MG
Flow 0.13 MGD Annual Average

Area Irrigated 99.4 Acres
Area Not Irrigated 4.6 Acres
Balance 104.0 Acres

0.0

STORAGE LAGOON W/ LAND APPLICATION ON LAWN DURING GROWING SEASON

DRAFT WORKING DOCUMENT: 12/19/2019

AVG ANN WASTEWATER DESIGN FLOW, MGD	0.13	REQ'D IRRIGATION AREA (AC)	94	
RAIN CATCHMENT AREA (AC).....	0.80 Acres of Storage Ponds	AVERAGE IRRIGATION REDUCTION	1.00 To reduce the average demand to	
POND PERIMETER RUNOFF FRACTION.....	1.00	IRRIGATION EFFICIENCY (DECIMAL FRACT).....	1.00 This increased the irrigation demand	
POND EVAP AREA AT ZERO STOR (AC).....	0.40	PRECIP/AVG PRECIP RATIO.....	1.00 This increases the average precipitation	
POND EVAP AREA ADD PER UNIT STOR (AC/MG).....	0.033	EVAPORATION / AVE EVAPORATION RATION.....	1.00 This reduces the average evaporation	
		Flow Ratio	KNOW AVERAGE FLOW / DESIGN FLOW.....	1.00 This increased the flow to the future

PARAMETER

	11	12	1	2	3	4	5	6	7	8	9	10	TOTAL	
INPUT DATA	November	December	January	February	March	April	May	June	July	August	September	October		
MONTHLY FLOW RATIOS	0.00	0.00	0.00	0.00	0.00	0.02	0.13	0.42	0.44	0.40	0.15	0.01		
MONTHLY FLOWS (MGD)	0.00	0.00	0.00	0.00	0.00	0.02	0.13	0.42	0.44	0.40	0.15	0.01	0.1303	Annual Avg. Daily Flow (MGD)
GIVEN INFLOW-OUTFLOW (MG)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	
AVG PAN EVAP (IN)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	Average Annual Pan Evaporation
AVG PRECIP (IN)	1.14	1.32	1.23	0.85	0.67	0.79	0.69	0.50	0.22	0.29	0.39	0.60	8.69	Average Annual Precipitation
MONTHLY AVE. TEMP.	42.00	34.70	34.20	38.70	46.00	52.70	60.50	67.70	74.60	73.10	73.10	52.40		Degrees F

CALCULATIONS

DAYS IN MONTH	30.0	31.0	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0		
BEGINNING STORAGE (MG)	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	1.4	4.1	6.5	3.2		
WASTEWATER FLOW (MGD)	0.00	0.00	0.00	0.00	0.00	0.02	0.13	0.42	0.44	0.40	0.15	0.01	4.0	Million Gallons per Month
WASTEWATER VOLUME (MG)	0.0	0.0	0.0	0.0	0.0	0.6	3.9	12.6	13.6	12.4	4.5	0.2	47.9	Million Gallon Per Year
PAN COEFFICIENT	0.89	0.96	0.96	0.93	0.85	0.80	0.72	0.66	0.59	0.60	0.60	0.80		
POND EVAP (IN)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	Design Annual Evaporation
EVAPORATION AREA (AC)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.5		
EVAPORATION VOL (MG)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	Evaporation Volume
PRECIPITATION (IN)	1.1	1.3	1.2	0.9	0.7	0.8	0.7	0.5	0.2	0.3	0.4	0.6	8.7	Designed Annual Precipitation
PRECIPITATION VOL (MG)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	Precip Volume
RAIN YET TO FALL (IN)	8.7	7.6	6.2	5.0	4.2	3.5	2.7	2.0	1.5	1.3	1.0	0.6		
AVG. MONTHLY Pdef (IN)	0.0	0.0	0.0	0.0	0.7	2.5	3.4	4.4	4.3	3.9	3.0	1.4	23.60	Average Annual Pdef
Vadose Zone Storage (IN)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	Inches Stored in The Vadose Zone
MODELED IRRIG DEMAND (IN)	0.0	0.0	0.0	0.0	0.7	2.5	3.4	4.4	4.3	3.9	3.0	1.4	23.60	Designed Annual Irrigation Demand
IRRIGATION DEMAND VOLUME (MG)	0.0	0.0	0.0	0.0	1.8	6.4	8.7	11.2	11.0	10.0	7.7	3.5	60.2	Irrigation Demand (MG)
REUSE WATER IRRIGATED	0.0	0.0	0.0	0.0	0.1	0.6	3.9	11.2	11.0	10.0	7.7	3.5	48.0	Volume Reuse water Irrigated (MG)
STORAGE GAIN (MG)	0.0	0.0	0.0	0.0	-1.8	-5.7	-4.8	1.4	2.7	2.4	-3.2	-3.2		
FINAL STORAGE (MG)	0.0	0.1	0.1	0.1	0.0	0.0	0.0	1.4	4.1	6.5	3.2	0.0		

ANNUAL INFLOW SUMMARY (MG)

WASTEWATER.....	47.9
PRECIPITATION.....	0.2
GIVEN INFLOWS-OUTFLOWS.....	0.0
TOTAL	48.1

ANNUAL OUTFLOW SUMMARY (MG)

POND EVAPORATION.....	0.0
POND PERCOLATION.....	0.0
IRRIGATION.....	48.0
TOTAL	48.0

OVERALL BALANCE

TOTAL INFLOW-OUTFLOW (MG).....	0.0
MAX. REQ'D STORAGE (MG).....	6.46
MAX. REQ'D STORAGE (ACFT)	19.8
MAX. DEPTH (FT)	25.0
SURFACE AREA (AC)	1.2
SURFACE AREA (SF)	54,330
SQUARE DIM (FT)	233

Acres Needed, vertical walls 0.8
Storage Catchment Area Large Enough

Exhibit D - Traffic Impact Study

Urban Growth Boundary Expansion City of Umatilla, Oregon Traffic Impact Analysis

June 2020

Prepared by:



J-U-B ENGINEERS, Inc.
1201 Adams Avenue
La Grande, Oregon 97850

Urban Growth Boundary Expansion City of Umatilla, Oregon Traffic Impact Analysis

June 2020



EXPIRES: 06/30/2020

Prepared by:

Spencer Montgomery
Shae Talley, PE



J-U-B ENGINEERS, Inc.
1201 Adams Avenue
La Grande, Oregon 97850

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Appendices

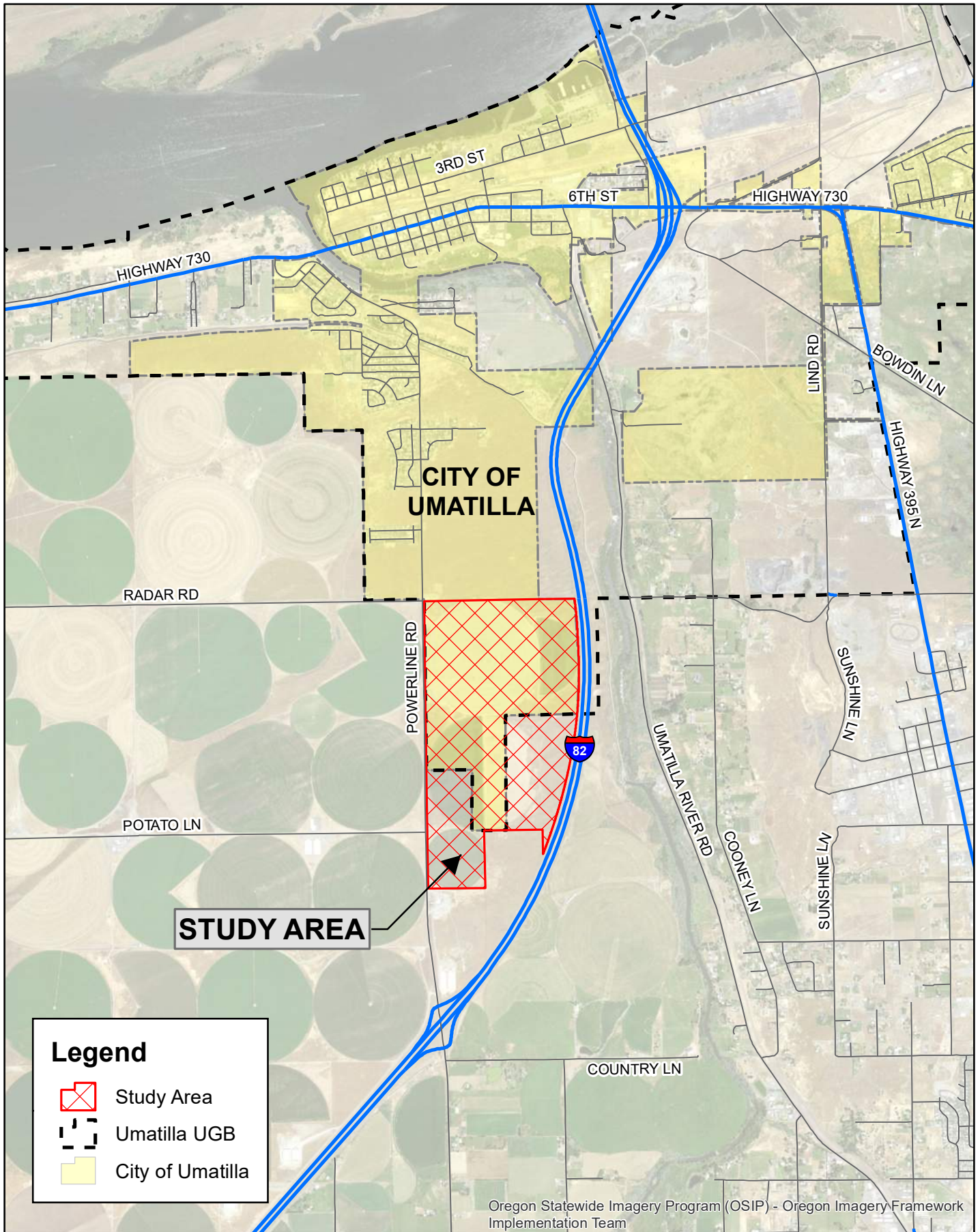
- Appendix A – Traffic Counts
- Appendix B– Level of Service Worksheets
- Appendix C – City of Umatilla Plan Map
- Appendix D – Traffic Growth Calculations

Introduction and Background

Cleaver Land, LLC is preparing an application proposing a Comprehensive Plan Amendment to expand the City of Umatilla Urban Growth Area and associated Zoning Map for economic development purposes. There is interest in development on property with good highway access adjacent to the existing Umatilla City limits.

The proposed Urban Growth Boundary (UGB) expansion includes two parcels, Tax Lots 1400 and 6601 on Assessors Map 5N28C totaling approximately 147 acres situated between Powerline Road and I-82 south of the current city limits. The proposed UGB expansion would add the remainder of Tax lot 1400, 107.66 acres, and all of Tax Lot 6601, 39.09 acres, into the UGB. This property would be brought into the UGB as Light Industrial land. A rezone of approximately 294 acres, situated immediately north of the expansion area, from residential to Light Industrial is also part of the land use action. The area for the UGB Expansion and rezone totaling 441 acres to be rezoned as Light Industrial is shown in Figure 1. This report provides the Traffic Impact Analysis of the UGB expansion and rezoning.

This Traffic Impact Analysis has been requested by the City of Umatilla to document potential traffic impacts as a result of the proposed 147 acre UGB expansion and rezone of the 294 acre parcel. This study will summarize existing traffic conditions (2020) as well as future traffic operational conditions in 2040 with and without the anticipated action of the UGB rezone and expansion. This study also identifies mitigation that may be necessary to provide safety and acceptable Levels of Service (LOS) in order to meet City of Umatilla and Oregon Department of Transportation (ODOT) standards. ODOT relies on the Volume-To-Capacity (VC) Ratio as the measure of quality of service. VC represents the measurement of the operating capacity of a roadway or intersection where the number of vehicles passing through is divided by the number of vehicles that could theoretically pass through when at capacity. If vehicles (v) divided by capacity (c) is less than one the facility has additional capacity.



Existing Conditions

This section will document existing conditions with respect to land use, roadway characteristics, traffic volumes and traffic operations at the study intersections.

Land Use

Land use of the 294 acres parcel within the current city limits is zoned residential but currently functions as agricultural production. Crops regularly in rotation are potatoes, onions, corn, legumes and recently hemp. The 147 acres to be expanded into the UGB is zoned agricultural which is consistent with the immediate vicinity and zoning in the area. There is, however, substantial residential subdivision growth north of the subject UGB expansion.

Roadway Characteristics

Roadways are described below, while the lane geometry for study intersections and existing PM peak hour traffic volumes are shown in Figure 2.

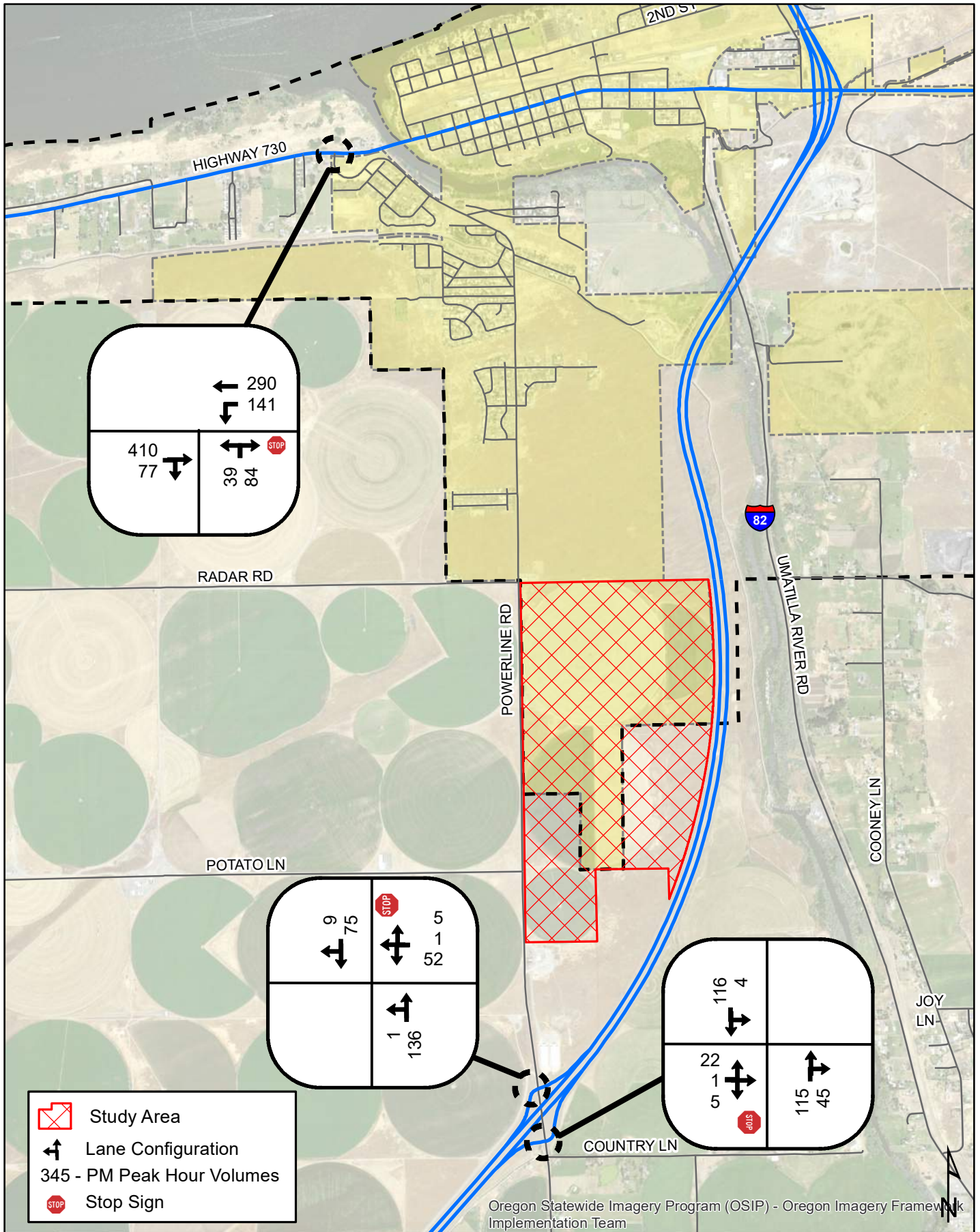
Powerline Road is a north-south Major Collector that provides a connection from an I-82 interchange (Exit 5) to the south to an intersection with US 730 to the north in the City of Umatilla. South, Powerline Road crosses over I-82 and intersects Westland Road 2.7 miles south of I-82. Powerline Road has a single through lane in each direction. The 12 foot lanes are paved with minimal gravel shoulders. The north 0.5 mile prior to US 730 has paved shoulders. The speed limit of Powerline Road from the intersection of US 730 south 1.4 miles is posted 35 MPH then the speed limit is increased to 45 MPH to MP 2. South of MP 2 the assumed speed limit is 55 MPH per rural highway standards in Oregon.

I-82 is an east-west divided Interstate Highway which connects I-90 at Ellensburg, WA to I-84 approximately 10.5 miles south of the Oregon-Washington border. There are two lanes in each direction separated by a center median. It has a posted speed limit of 70 MPH (65 MPH Trucks). At the I-82 Interchange with Powerline road single lane approaches exist for all movements at both ramps. In the study area I-82 is oriented in a north-south direction, thus for clarity and for the purposes of this report I-82 westbound will be referred to as northbound, with the ramps being the east and west legs of the intersection at Powerline Road which also runs north/south, and I-82 eastbound will be referred to as southbound with the ramps being the east and west legs of the intersection at Powerline Road.

US 730 in the vicinity of the intersection with Powerline Road is a 3 lane principal arterial Highway with one through lane in each direction and a center turn lane (although the west leg of the intersection at Powerline Road is not striped such that it promotes a northbound left turn into the center lane). US 730 has wide paved shoulders on both sides. US 730 terminates at I-84 west of Umatilla and terminates at the Wallula Junction to the east. At the Intersection with Powerline Road the posted speed is 40 MPH.

Traffic Volumes

Turning movement counts were collected by All Traffic Data (provided to PBS for a separate TIA) collected on March 4, 2020 prior to the COVID-19 stay at home orders. PM peak period traffic at the intersection of US 730 /Powerline Road as well as the I-82 SB Ramps/Powerline Road and I-82 NB Ramps/Powerline Road are included in Appendix A. The PM peak hour occurred from 4:05 – 5:05 at US 730 and from 4:45 – 5:45 PM for both ramp intersections.



Oregon Statewide Imagery Program (OSIP) - Oregon Imagery Framework Implementation Team

Operational Analysis

The analysis of Level-of-Service (LOS) is a means of quantitatively describing the quality of operational conditions of a roadway segment or intersection and the perception by motorists and passengers. Service levels are identified by letter designation, A – F, with LOS “A” representing the best operating conditions and LOS “F” the worst. Each LOS represents a range of operating conditions. For intersections the measure used is average control delay in seconds per vehicle. While there are several methodologies for estimating the LOS of intersections, the most commonly used is presented in the Highway Capacity Manual and is the methodology used in this study (HCM 2010). The Highway Capacity Manual LOS criteria for intersections are summarized in Table 1.

Table 1. Level of Service Criteria for Intersections

Level of Service (LOS)	Average Control Delay (seconds/vehicle)	
	Signalized Intersections	Unsignalized Intersections
A	< =10	< =10
B	>10 - < 20	>10 - < 15
C	>20 - < 35	>15 - < 25
D	>35 - < 55	>25 - < 35
E	>55 - < 80	>35 - < 50
F	>80	>50

Source: Highway Capacity Manual 6th Edition, Transportation Research Board, National Research Council, Washington, D.C., 2017.

For unsignalized intersections “delay” is based on the availability of gaps in the major street to allow minor street movements to occur. The methodology prioritizes each movement at an unsignalized intersection consistent with rules that govern right-of-way for drivers. In other words, major street through and right turn traffic has absolute priority over all other movements. Major street left turns must yield to opposing through traffic and right turns. Minor street through traffic and right turns yield to major street higher priority movements, and the minor street left turns have the lowest priority and must yield to all other movements. As traffic volumes increase, the availability of gaps will decrease and greater delay tends to result in driver frustration and anxiety, loss of time, unnecessary fuel consumption, and contributes to unnecessary air pollution. The City of Umatilla Transportation System Plan references ODOT’s minimum requirements which has LOS D for signalized intersections (meaning the LOS must be D or better), and LOS E for two-way stop controlled (TWSC) conditions. ODOT has a mobility standard of a v/c ratio of 0.85 or less for Highway 730 at Powerline road based on its classification and location. ODOT also has a mobility standard of a v/c ratio of 0.70 or less for interstate highways for locations outside a UGB and on rural lands. This standard would apply to the two interchange ramps of I-82 at Powerline Road.

Peak hour traffic volumes and existing intersection geometry were evaluated using the Highway Capacity Software to determine the delay and LOS at the existing study intersections. The LOS worksheet calculations are included in Appendix B. The results of the capacity analysis are shown in Table 2, which shows that all study intersections currently function at acceptable Levels of Service with the two I-82 ramps providing LOS B, and the Powerline Road/US 730 intersection providing LOS C with 23 seconds of average vehicle delay.

Table 2. 2020 Existing Conditions Delay, Level of Service and volume to capacity ratios

Intersection	2020 Existing
I-82 SB ramps/Powerline Road	WB – 10.4/B, 0.09
I-82 NB ramps/Powerline Road	EB—10.2/B, 0.04
US 730/Powerline Road	NB—23.0/C, 0.41 WBL—9.2/A, 0.16

LEGEND

10.4/B, 0.09 Delay (in seconds) and Level of Service, volume to capacity ratio
 NB = northbound, SB = southbound, WB = westbound, EB = eastbound

2040 Conditions

This section evaluates traffic volumes at the study intersections for future conditions with the proposed UGB Expansion and Rezone as well as under the No Action Scenario.

Proposed Land Use Change

The proposed land use action includes 294 acres currently within the City limits and zoned R-1 Single Family Residential to be rezoned to Light Industrial. It also includes expansion of the Urban Growth Boundary by 147 acres of currently zoned agricultural land to be zoned Light Industrial for a total of 441 acres of Light Industrial land. This is shown in Figure 3. The current City of Umatilla Plan Map showing existing zoning is included in Appendix C.

Forecast 2040 Traffic Volumes

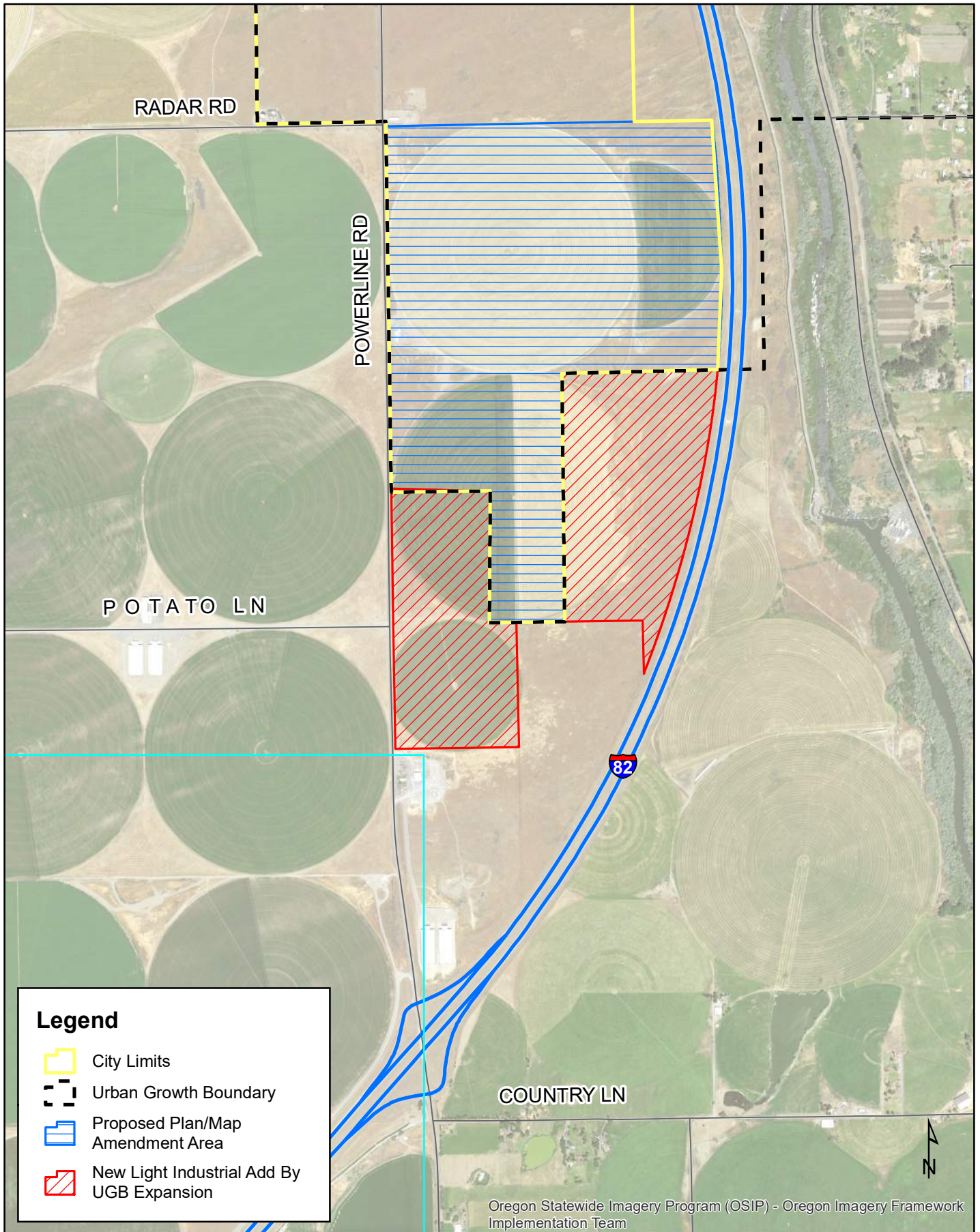
As is typical with most traffic studies, a growth rate for background traffic is used to apply to existing traffic volumes to account for growth in traffic that is the result of development outside the study area. The Coordinated Population Forecast for Umatilla County produced by Population Research Center at Portland State University indicates a forecast population growth rate of 1.1% per year for the City of Umatilla. For the purposes of this analysis a background growth rate of 1.5% was used to represent a conservatively high growth rate for traffic forecasting purposes. Added to this growth were trips for a recently approved residential development that is anticipated to add trips to the Powerline Road/US 730 intersection. The resulting 2040 No Action Traffic Volumes are shown in Figure 4, with detailed trips by movement included in Appendix D.

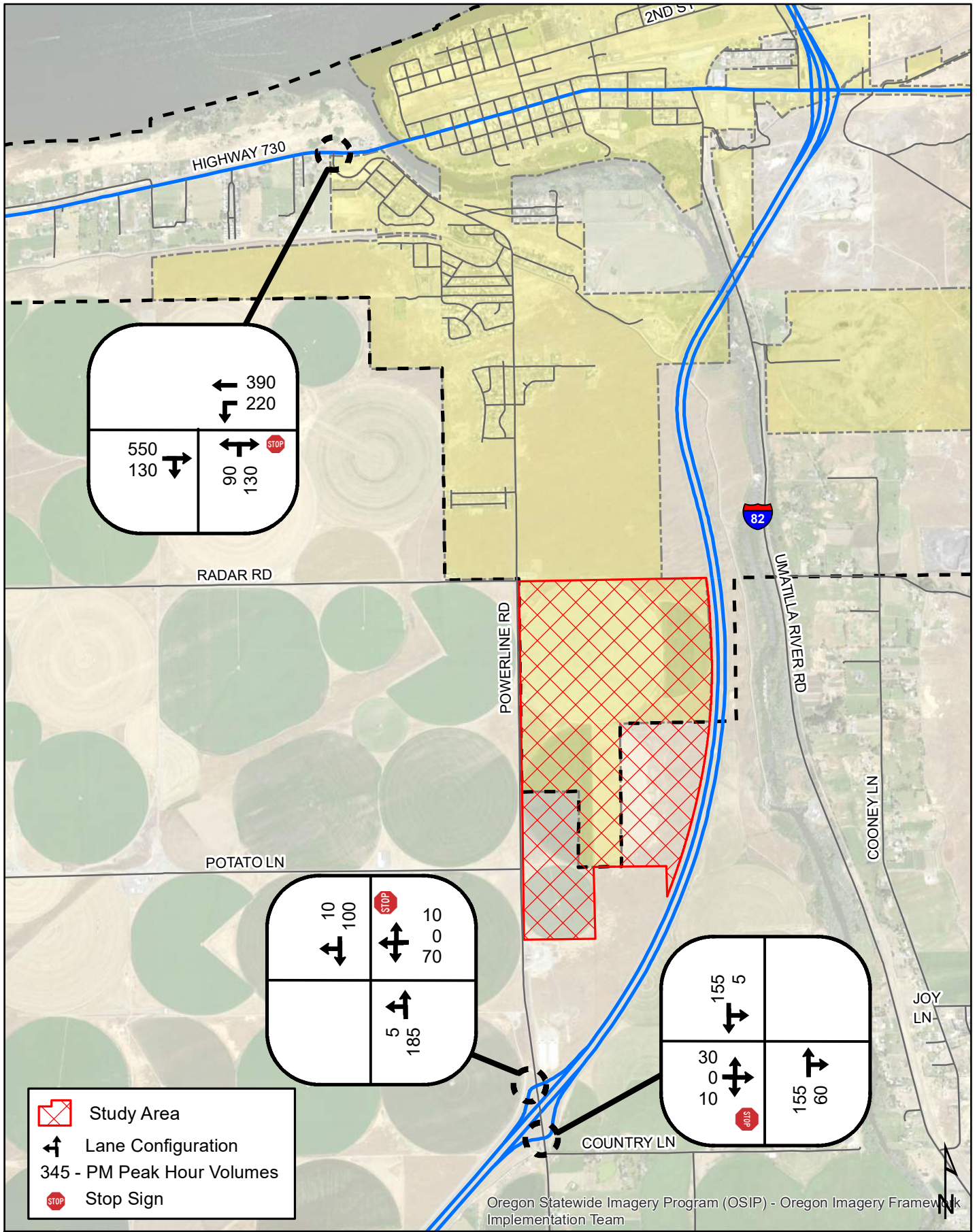
To estimate the new trips that could be generated by the proposed rezone and UGB Expansion the 10th Edition of the Institute of Transportation Engineers (ITE) *Trip Generation* Manual was used. This is a nationally recognized compilation of trip generation rates for common land uses. There is no specific development layout to use for development projections.

General Light Industrial (Land Use 110) fitted curve was used. To estimate the potential square footage of development for the site a floor area of 20% was applied to the 441 acres, resulting in 3.841 million square feet. Using the fitted curve equations in the ITE manual the resulting trips shown in Table 3 are anticipated upon build-out of the proposed industrial land.

By comparison, the trips for Single Family Residential is also shown in Table 3. The number of potential homes that could be constructed on the 294 acres of currently zoned residential land was estimated by reducing the total land by 25% to account for buildable lands, right-of-way, stormwater, etc. and dividing by a lot size of 7,000 sq ft, resulting in 1,372 potential residential lots. The fitted curve equations are shown in Table 3.

Examination of Table 3 shows that the proposed 441 acres of light industrial land would generate approximately 458 PM peak hour trips. The existing zoning of 294 acres of residential would generate approximately 1,256 PM peak hour trips. Thus, even with the UGB Expansion under this proposal, the rezone from residential to light industrial is likely to reduce the total trips generated by the 441 acres by nearly 800 trips during the PM peak hour. This would indicate that the combined UGB Expansion/rezone proposed land use action would have significantly less impact than the current zoning of the land in question.





Oregon Statewide Imagery Program (OSIP) - Oregon Imagery Framework Implementation Team



FIGURE 4:
2040 NO ACTION
PM PEAK HOUR
TRAFFIC VOLUMES

CITY OF UMATILLA
Urban Growth Bounday Expansion
Traffic Impact Analysis

Table 3. Trip Generation

Description / ITE Code	Units	ITE Vehicle Trip Generation Rates				Expected Units	Total Trips		Distribution of Trips	
		Weekday	PM	PM In	PM Out		Daily	PM Hour	PM In	PM Out
General Light Industrial 110	1,000 sq ft	$T = 3.79(X) + 57.96$	$\ln(T) = i.69 \ln(X) + 0.43$	13%	87%	3,842	14,620	458	60	398
Single Family Residential 210	Dwelling Unit	$\ln(T) = 0.92 \ln(X) + 2.71$	$\ln(T) = 0.96 \ln(X) + 0.20$	63%	37%	1,372	11,570	1,256	791	465

To distribute the new 458 PM peak hour trips to the study intersections, an examination of traffic volumes in the study area considered in conjunction with the roadway network and the type of development proposed, resulted in the following trip distribution percentages:

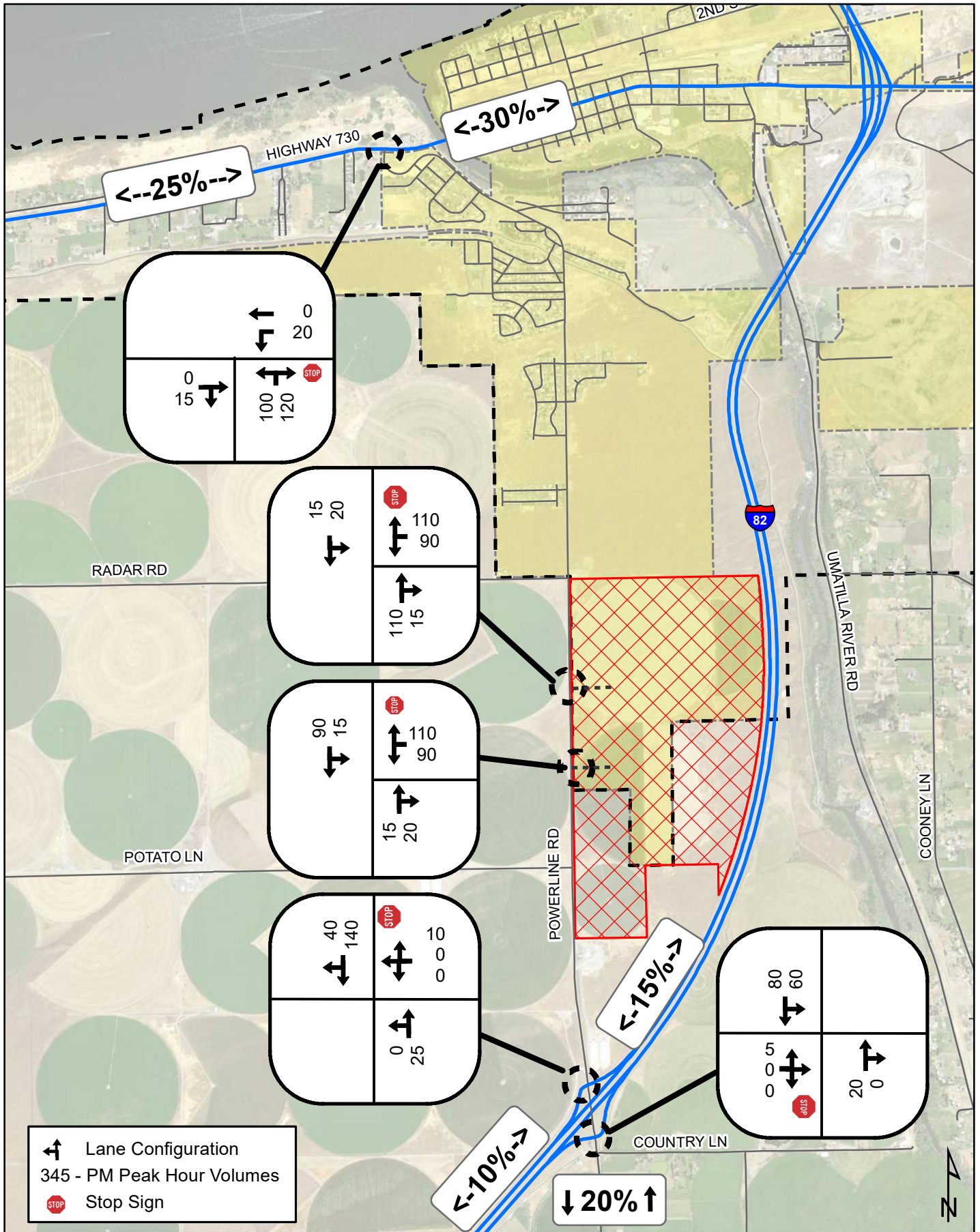
- 10% to/from the south on I-82
- 15% to/from the north on I-82
- 20% to/from the south on Powerline towards Hermiston
- 25% to/from the west on US 730
- 30% to/from the east on US 730

These percentages account for deliveries that will use I-82 more than the current traffic patterns, and the proximity to I-82 may lend itself to some northbound traffic to access the freeway at Powerline Road rather than using US 730. These percentages are also conservatively high in that they do not discount for employees that could live off Powerline to the north but south of US 730. Trip distribution percentages along with the resulting site generated trips are shown in Figure 5. Traffic volumes shown in Figure 5 were added to the No Action volumes shown in Figure 4 to estimate total 2040 PM peak hour traffic volumes with the UGB expansion and associated rezone that are shown in Figure 6.

Traffic Operations Analysis

The traffic volumes shown in Figures 4 and 6 were evaluated for traffic operations to determine the anticipated delay and Level of Service for 2040 Conditions under the No Action Scenario as well as with the UGB Expansion and associated Rezone. The results of the analysis are summarized in Table 4, with the LOS worksheets included in Appendix B.

As shown in Figure 4, under the No Action scenario, the two I-82 interchange ramps are anticipated to function at LOS B with relative low delay. The intersection of Powerline Road, however, is anticipated to have significant delay with over 300 seconds for the northbound approach. As noted earlier, US 730 has very wide shoulders as well as a two-way left turn lane that is not specifically striped to receive a northbound left turn from Powerline Road. An analysis was performed to determine appropriate mitigation. It was found that if the west leg were restriped to include an eastbound right turn lane and to accommodate left turns into the two way left turn lane, along with an exclusive northbound left turn lane, that acceptable LOS could be provided with the delay for the northbound left turn reduced to 39 seconds for LOS E.



Lane Configuration
 345 - PM Peak Hour Volumes
 Stop Sign

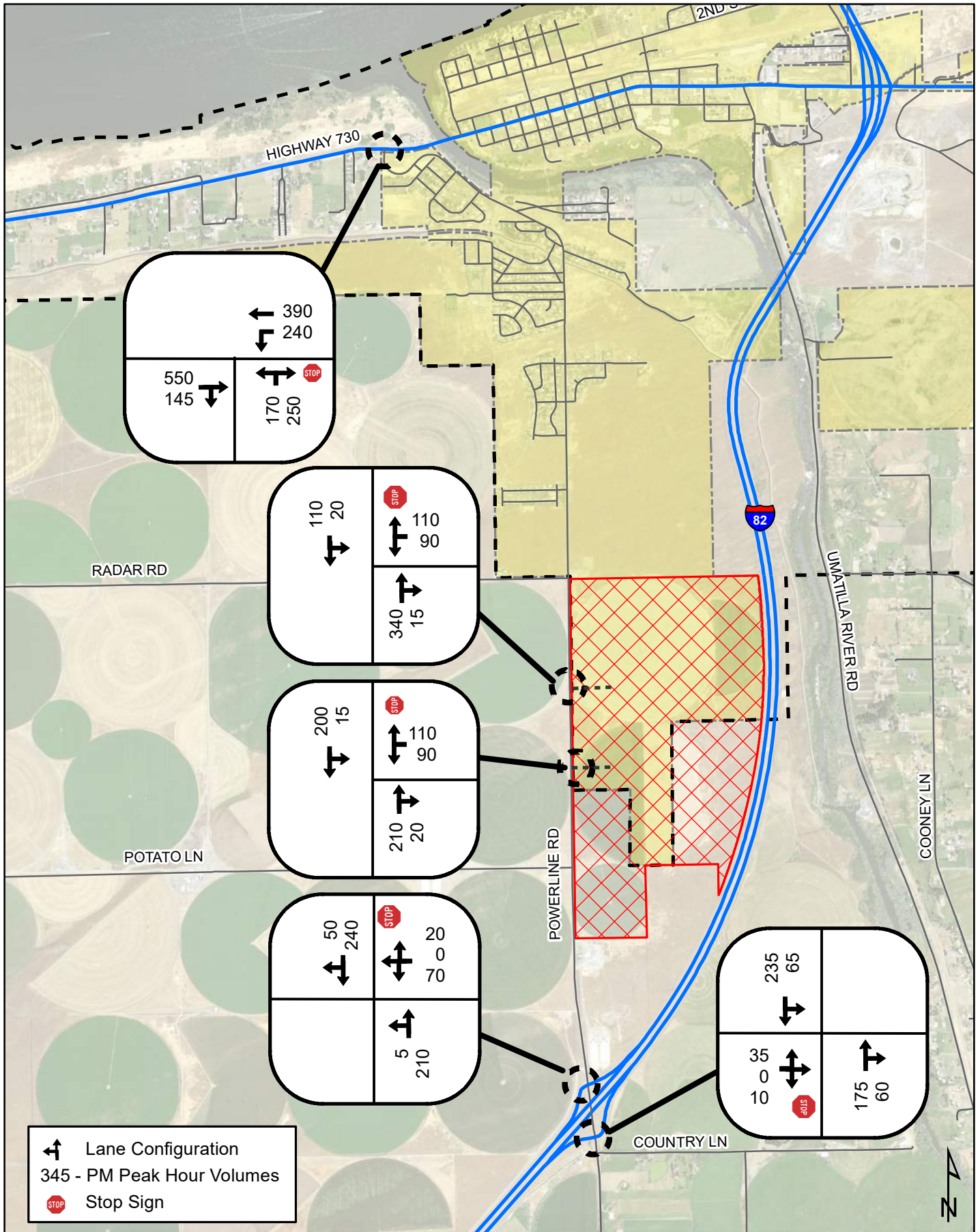


FIGURE 6:
2040 PM PEAK HOUR
TRAFFIC VOLUMES WITH
UGB EXPANSION AND REZONE

Table 4. 2040 Delay, Level of Service and Volume to Capacity Ratios

Intersection	2020 Existing	2040 No Action	2040 With UGB Expansion and Rezone
I-82 SB ramps/Powerline Road	WB – 10.4/B, 0.09	WB—11.1/B, 0.13	WB—13.1/B,0.18
I-82 NB ramps/Powerline Road	EB—10.2/B, 0.04	EB—10.8/B, 0.07	EB—13.2/B, 0.10
US 730/Powerline Road	NB—23.0/C, 0.41 WBL—9.2/A, 0.16	NB—322.8/F, 1.54 WBL—10.9/B, 0.29	NB—1066/F, 3.23 WBL—11.3/B, 0.32
		(1) NBL—39.0/E, 0.49 WBL—10.9/B, 0.29	(1) NB—120.4/F, 1.01 WBL—11.3/B, 0.32

LEGEND

10.4/B, 0.09 Delay (in seconds) and Level of Service, volume to capacity ratio
 NB = northbound, SB = southbound, WB = westbound, EB = eastbound

(1) Includes exclusive NB left turn lane, exclusive EB right turn lane and restriping for a receiving lane WB for NB left turn traffic to use the two-way left-turn lane.

With the UGB Expansion and associated rezone, acceptable LOS/delay is again provided at the two I-82 ramps. Even greater delay is expected at the Powerline Road/US 730 intersection. The improvements described above for the No Action scenario (restriping for an eastbound right turn lane and westbound receiving lane for the two-way left turn lane, and northbound left turn lane) will help significantly, but will still not achieve acceptable LOS. The intersection of Powerline Road/US 730 will need a higher level of traffic control such as a traffic signal or roundabout. A sensitivity analysis was conducted to determine what level of growth could occur prior to the need for a traffic signal. It was found that 10 years of background growth and 50% of the site generated trips could be added to the intersection while still providing acceptable LOS if the low cost improvements described above were implemented.

Turn Lane Analysis

An evaluation of left and right turn lanes, for the 2040 PM Peak traffic with the UGB expansion and rezoning, on US 730 and Powerline Road and at the two I-82 interchange ramp locations was performed. The ODOT Analysis Procedures Manual (APM) states:

“A left turn lane improves safety and increases the capacity of the roadway by reducing the speed differential between the through and the left turn vehicles. Furthermore, the left turn lane provides the turning vehicle with a potential waiting area until acceptable gaps in the opposing traffic allow them to complete the turn.”

“The purpose of a right turn lane at an unsignalized intersection is to improve safety and to maximize the capacity of a roadway by reducing the speed differential between the right turning vehicles and the other vehicles on the roadway.”

Exhibits 12-1 and 12-2 from the April 2020 ODOT Analysis Procedures Manual Version 2, were used to determine the need for turn lanes at the three study intersections.

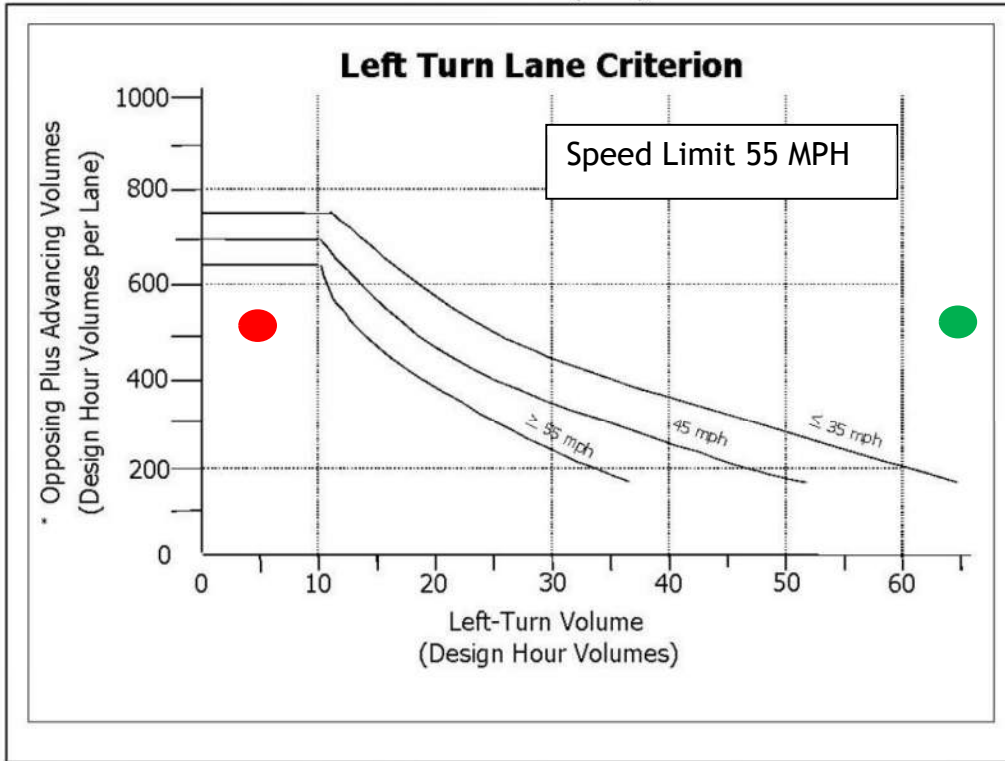
Examination of Exhibit 12-1 shows that the intersection of Powerline Road and the southbound I-82 on ramp will not require an exclusive left turn lane. The northbound Powerline Road advancing traffic equals 215 vehicles of which only 5 vehicles turn left to the I-82 eastbound on ramp. The single shared through and left lane is sufficient given the 290 opposing southbound vehicles. Note there are no opposing left turns due to the one-way ramp intersection.

Examination of Exhibit 12-1 shows that the intersection of Powerline Road and the northbound I-82 on ramp will require an exclusive left turn lane. The southbound Powerline Road advancing traffic equals 300 vehicles of which 65 vehicles turn left to the I-82 northbound on ramp towards Umatilla. A single shared through and left lane exceeds the ODOT requirement given the 235 opposing northbound vehicles. Note there are no opposing left turns due to the one-way ramp intersection. The speed limit of Powerline Road is 55 MPH although the 95% percentile could logically be less but examination of Exhibit 12-1, even a much lesser speed would still require the left turn lane. Design of this additional lane will need to consider the proximity to the I-82 overpass structure. A sensitivity analysis indicated that approximately 33% of the industrial land and background growth could occur without the need for the left turn lane based on the assumptions of this study.

Examination of Exhibit 12-2 shows that the intersection of Powerline Road and eastbound I-82 on ramp will require an exclusive right turn lane. The southbound Powerline Road approaching volume is 290 peak hourly vehicles of which 50 are turning right on to the eastbound I-82 on ramp. The speed limit for Powerline Road is 55 MPH. Sensitivity analysis revealed that this right turn lane would not be needed until approximately 80% of the background growth and industrial land were developed.

Examination of Exhibit 12-2 shows that the intersection of US 730 and Powerline Road will require an exclusive right turn lane for the eastbound US 730 to southbound Powerline Road movement. The eastbound US 730 approaching volume equals 695 peak hour vehicles of which 145 will turn right on Powerline Road southbound. The speed limit for US 730 is 40 MPH at this location. Given the results of this analysis the traffic volumes for existing conditions were also evaluated and are shown in the exhibit as well. This indicates that an eastbound right turn lane is currently warranted at the Powerline Road/US 730 intersection.

Exhibit 12-1 Left Turn Lane Criterion (TTI)

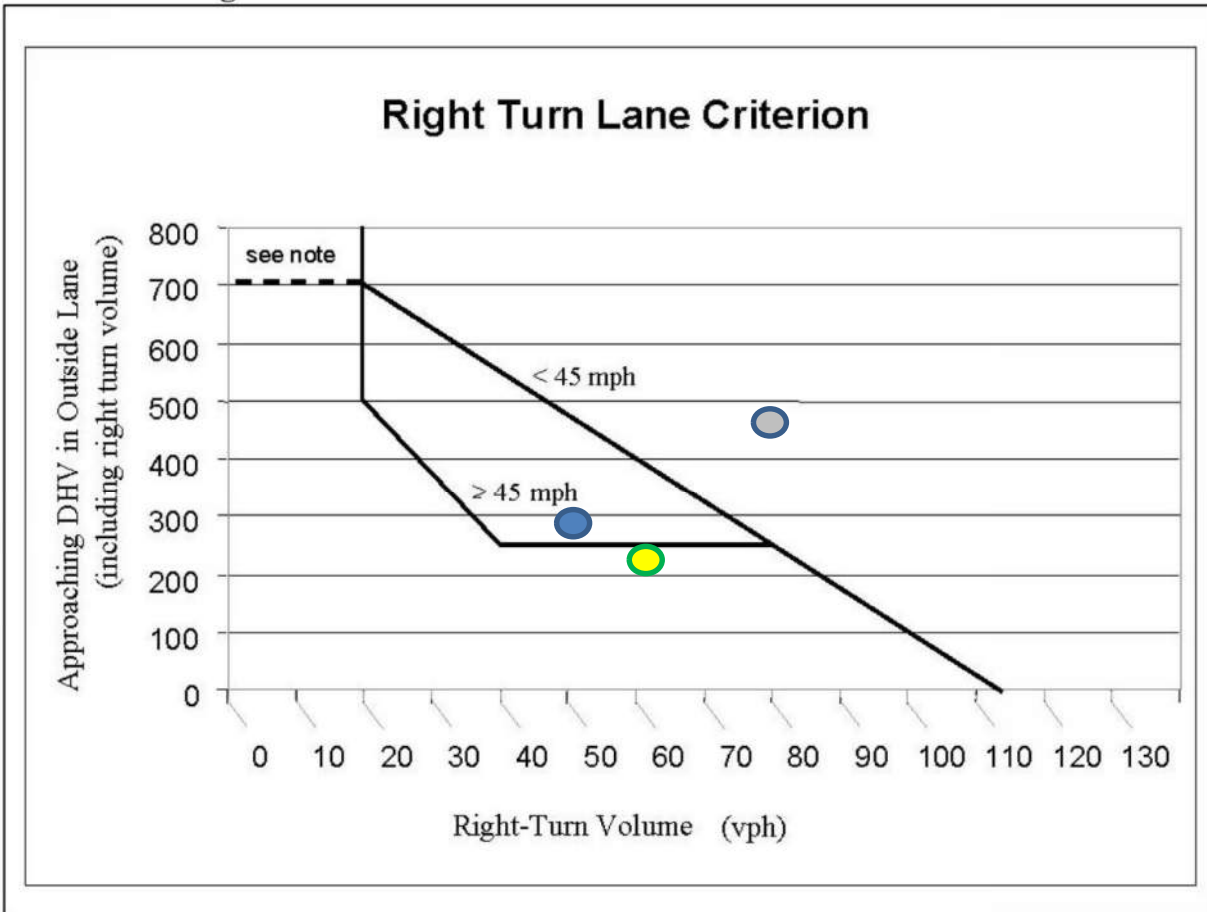


*(Advancing Volume/Number of Advancing Through Lanes) + (Opposing Volume/Number of Opposing Through Lanes)

Opposing left turns are not counted as opposing volumes

- 2040 with UGB – NB Powerline Road/ -I-82 SB On Ramp
- 2040 with UGB - SB Powerline Road/I-82 NB On Ramp

Exhibit 12-2 Right Turn Lane Criterion



Note: If there is no right turn lane, a shoulder needs to be provided. If this intersection is in a rural area and is a connection to a public street, a right turn lane is needed.

- 2040 with UGB – SB Powerline Road/I-82 SB On Ramp
- 2040 with UGB – NB Powerline Road/I-82 NB On Ramp
- 2040 with UGB – US 730/Powerline Road
- Existing – US 730/Powerline Road

Summary and Recommendations

Cleaver Land, LLC is preparing an application proposing a Comprehensive Plan Amendment to expand the City of Umatilla Urban Growth Area and associated Zoning Map. There is interest in development on property with good highway access adjacent to the existing Umatilla city limits for economic development purposes.

The proposed Urban Growth Boundary (UGB) expansion includes two parcels, Tax Lots 1400 and 6601 on Assessors Map 5N28C totaling approximately 147 acres situated between Powerline Road and I-82 south of the current city limits. The proposed UGB expansion would add the remained of Tax lot 1400, 107.66 acres, and all of Tax Lot 6601, 39.09 acres, into the UGB. This property would be brought into the UGB as Light Industrial land. A rezone of approximately 294 acres, situated immediately north of the expansion area, from residential to Light Industrial is also part of the land use action.

Three study intersections of Powerline Road at the I-82 northbound and southbound ramps as well as at US 730 have been evaluated for existing conditions, 2040 No Action and 2040 with the Urban Growth Boundary Expansion and associated Rezone.

New trips that could be generated by the proposed rezone and UGB Expansion were estimated with over 3.8 million square feet of Light Industrial development potential. It is anticipated that this level of development could generate 458 PM peak hour trips. By comparison, however, the trips for Single Family Residential which is the current zoning that could accommodate approximately 1,372 residential lots, could generate 1,256 PM peak hour trips. Thus, even with the UGB Expansion under this proposal, the rezone from residential to light industrial is likely to reduce the total trips generated by the 441 acres by nearly 800 trips during the PM peak hour. This would indicate that the combined UGB Expansion/rezone proposed land use action would have significantly less impact than the current zoning of the land in question.

Capacity analysis of the three study intersections indicates that they all function with acceptable Levels of Service. For the 2040 No Action Scenario the I-82 interchange ramps will function with good LOS, however the intersection of Powerline Road/US 730 will need an exclusive northbound left turn and restriping of the west leg to accommodate an exclusive right turn lane and westbound receiving lane for northbound left turns to utilize the two-way left-turn nature of US 730.

With the UGB Expansion and associated rezone, acceptable LOS/delay is again provided at the two I-82 ramps. Even greater delay is expected at the Powerline Road/US 730 intersection. The improvements described above for the No Action scenario will help significantly, but will still not achieve acceptable LOS. The intersection of Powerline Road/US 730 will need a higher level of traffic control such as a traffic signal or roundabout. The traffic signal would likely be required at about 10 years of background growth and 50% of the site generated trips if the low cost improvements described above were implemented.

An evaluation of the need for left and right turns for safety purposes was also performed. A southbound right turn at the southbound I-82 ramps will be needed at approximately 80% of the background growth and 80% of the industrial development. A southbound left turn will be needed at the I-82 northbound ramps at approximately 33% of the background growth and 33% of the industrial development.

APPENDIX A

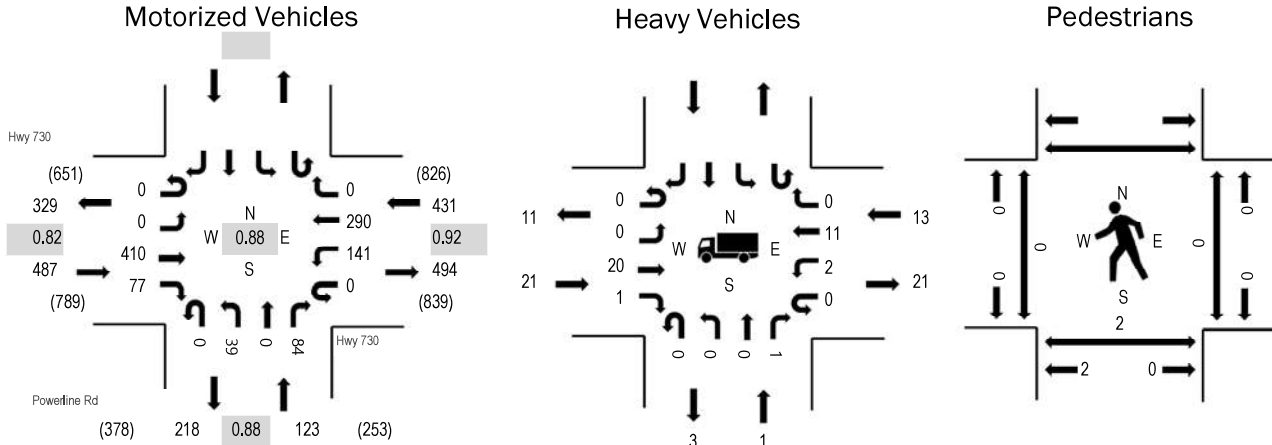
Traffic Counts



(303) 216-2439
www.alltrafficdata.net

Location: Powerline Rd & Hwy 730 PM
Date: Wednesday, March 4, 2020
Peak Hour: 04:05 PM - 05:05 PM
Peak 15-Minutes: 04:40 PM - 04:55 PM

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	4.3%	0.82
WB	3.0%	0.92
NB	0.8%	0.88
SB		
All	3.4%	0.88

Traffic Counts - Motorized Vehicles

Interval Start Time	Hwy 730 Eastbound				Hwy 730 Westbound				Powerline Rd Northbound				Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	0	39	9	0	8	17	0	0	1	0	3					77	1,021
4:05 PM	0	0	38	6	0	10	21	0	0	3	0	7					85	1,041
4:10 PM	0	0	40	13	0	9	12	0	0	0	0	12					86	1,031
4:15 PM	0	0	38	9	0	8	22	0	0	6	0	6					89	1,023
4:20 PM	0	0	48	4	0	14	24	0	0	3	0	4					97	1,004
4:25 PM	0	0	34	13	0	9	17	0	0	8	0	7					88	975
4:30 PM	0	0	29	2	0	13	26	0	0	2	0	6					78	969
4:35 PM	0	0	23	6	0	7	24	0	0	2	0	3					65	963
4:40 PM	0	0	43	5	0	11	25	0	0	1	0	9					94	986
4:45 PM	0	0	43	5	0	18	35	0	0	2	0	11					114	980
4:50 PM	0	0	17	4	0	14	40	0	0	7	0	7					89	938
4:55 PM	0	0	27	4	0	11	13	0	0	0	0	4					59	906
5:00 PM	0	0	30	6	0	17	31	0	0	5	0	8					97	
5:05 PM	0	0	24	4	0	7	27	0	0	6	0	7					75	
5:10 PM	0	0	21	8	0	10	27	0	0	5	0	7					78	
5:15 PM	0	0	25	4	0	9	23	0	0	1	0	8					70	
5:20 PM	0	0	20	5	0	8	23	0	0	6	0	6					68	
5:25 PM	0	0	19	2	0	11	33	0	0	5	0	12					82	
5:30 PM	0	0	21	4	0	12	23	0	0	6	0	6					72	
5:35 PM	0	0	25	2	0	14	35	0	0	4	0	8					88	
5:40 PM	0	0	30	1	0	13	29	0	0	7	0	8					88	
5:45 PM	0	0	21	2	0	14	20	0	0	2	0	13					72	
5:50 PM	0	0	16	0	0	13	19	0	0	3	0	6					57	
Count Total	0	0	671	118	0	260	566	0	0	85	0	168					1,868	
Peak Hour	0	0	410	77	0	141	290	0	0	39	0	84					1,041	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	4	1	0		5	4:00 PM	0	0	0	0	4:00 PM	0	0	0	0		
4:05 PM	3	0	1		4	4:05 PM	0	0	0	0	4:05 PM	0	0	0	0		
4:10 PM	2	0	0		2	4:10 PM	0	0	0	0	4:10 PM	0	0	0	0		
4:15 PM	2	0	1		3	4:15 PM	0	0	0	0	4:15 PM	0	0	0	0		
4:20 PM	4	0	1		5	4:20 PM	0	0	0	0	4:20 PM	0	0	0	0		
4:25 PM	3	0	0		3	4:25 PM	0	0	0	0	4:25 PM	0	0	0	0		
4:30 PM	3	1	2		6	4:30 PM	0	0	0	0	4:30 PM	0	0	0	0		
4:35 PM	0	0	0		0	4:35 PM	0	0	0	0	4:35 PM	0	0	0	0		
4:40 PM	0	0	0		0	4:40 PM	0	0	0	0	4:40 PM	0	2	0	2		
4:45 PM	1	0	2		3	4:45 PM	0	0	0	0	4:45 PM	0	0	0	0		
4:50 PM	1	0	3		4	4:50 PM	0	0	0	0	4:50 PM	0	0	0	0		
4:55 PM	1	0	2		3	4:55 PM	0	0	0	0	4:55 PM	0	0	0	0		
5:00 PM	1	0	1		2	5:00 PM	0	0	0	0	5:00 PM	0	0	0	0		
5:05 PM	2	0	1		3	5:05 PM	0	0	0	0	5:05 PM	0	0	0	0		
5:10 PM	2	1	1		4	5:10 PM	0	0	0	0	5:10 PM	0	0	0	0		
5:15 PM	1	0	0		1	5:15 PM	0	0	0	0	5:15 PM	0	0	0	0		
5:20 PM	1	0	2		3	5:20 PM	0	0	1	1	5:20 PM	0	0	0	0		
5:25 PM	2	0	1		3	5:25 PM	0	0	0	0	5:25 PM	0	0	0	0		
5:30 PM	0	0	1		1	5:30 PM	0	0	0	0	5:30 PM	0	0	0	0		
5:35 PM	1	0	3		4	5:35 PM	0	0	0	0	5:35 PM	0	0	0	0		
5:40 PM	3	0	2		5	5:40 PM	0	0	0	0	5:40 PM	0	0	0	0		
5:45 PM	1	0	1		2	5:45 PM	0	0	0	0	5:45 PM	0	2	0	2		
5:50 PM	1	0	3		4	5:50 PM	0	0	0	0	5:50 PM	0	0	0	0		
Count Total	39	3	28		70	Count Total	0	0	1	1	Count Total	0	4	0	4		
Peak Hour	21	1	13		35	Peak Hour	0	0	0	0	Peak Hour	0	2	0	2		



(303) 216-2439
www.alltrafficdata.net

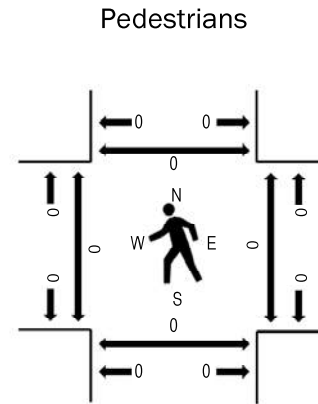
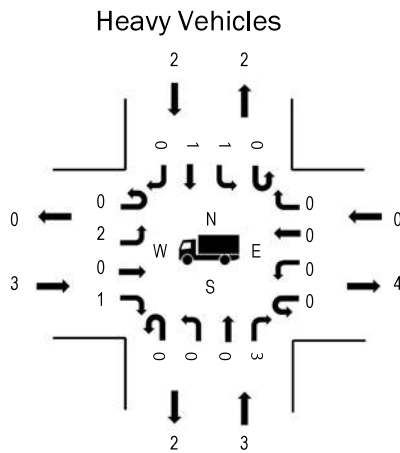
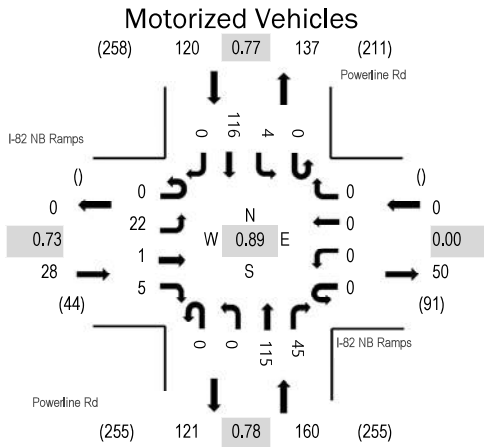
Location: Powerline Rd & I-82 NB Ramps PM

Date: Wednesday, March 4, 2020

Peak Hour: 04:45 PM - 05:45 PM

Peak 15-Minutes: 05:05 PM - 05:20 PM

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	10.7%	0.73
WB	0.0%	0.00
NB	1.9%	0.78
SB	1.7%	0.77
All	2.6%	0.89

Traffic Counts - Motorized Vehicles

Interval Start Time	I-82 NB Ramps Eastbound				I-82 NB Ramps Westbound				Powerline Rd Northbound				Powerline Rd Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	0	0	0	0	0	0	0	0	0	8	0	0	1	11	0	20	285
4:05 PM	0	0	0	0	0	0	0	0	0	0	5	4	0	1	17	0	27	286
4:10 PM	0	1	0	0	0	0	0	0	0	0	6	2	0	0	15	0	24	284
4:15 PM	0	2	0	1	0	0	0	0	0	0	7	7	0	2	14	0	33	288
4:20 PM	0	3	0	0	0	0	0	0	0	0	7	1	0	2	14	0	27	289
4:25 PM	0	0	0	0	0	0	0	0	0	0	5	6	0	0	10	0	21	283
4:30 PM	0	1	0	0	0	0	0	0	0	0	3	4	0	0	11	0	19	284
4:35 PM	0	1	0	1	0	0	0	0	0	0	4	3	0	0	11	0	20	294
4:40 PM	0	3	0	0	0	0	0	0	0	0	4	3	0	0	14	0	24	306
4:45 PM	0	5	0	0	0	0	0	0	0	0	14	1	0	0	10	0	30	308
4:50 PM	0	1	0	1	0	0	0	0	0	0	6	4	0	0	6	0	18	295
4:55 PM	0	1	0	1	0	0	0	0	0	0	7	2	0	0	11	0	22	294
5:00 PM	0	2	0	0	0	0	0	0	0	0	9	2	0	0	8	0	21	
5:05 PM	0	1	0	1	0	0	0	0	0	0	4	4	0	0	15	0	25	
5:10 PM	0	1	0	0	0	0	0	0	0	0	12	5	0	2	8	0	28	
5:15 PM	0	2	0	0	0	0	0	0	0	0	18	4	0	0	10	0	34	
5:20 PM	0	4	0	0	0	0	0	0	0	0	7	1	0	0	9	0	21	
5:25 PM	0	1	0	0	0	0	0	0	0	0	8	1	0	1	11	0	22	
5:30 PM	0	1	1	0	0	0	0	0	0	0	12	9	0	0	6	0	29	
5:35 PM	0	2	0	1	0	0	0	0	0	0	9	5	0	1	14	0	32	
5:40 PM	0	1	0	1	0	0	0	0	0	0	9	7	0	0	8	0	26	
5:45 PM	0	1	0	0	0	0	0	0	0	0	6	4	0	0	6	0	17	
5:50 PM	0	1	1	0	0	0	0	0	0	0	6	0	0	0	9	0	17	
Count Total	0	35	2	7	0	0	0	0	0	0	176	79	0	10	248	0	557	
Peak Hour	0	22	1	5	0	0	0	0	0	0	115	45	0	4	116	0	308	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	1	0	1	2	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	1	1	0	0	2	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	0	0	0	1	1	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	1	0	0	0	1	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	1	1	0	0	2	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	1	0	1	2	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	1	0	0	0	1	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	1	0	1	2	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
Count Total	4	5	0	4	13	Count Total	0	0	0	0	0	Count Total	0	0	0	0	0
Peak Hour	3	3	0	2	8	Peak Hour	0	0	0	0	0	Peak Hour	0	0	0	0	0



(303) 216-2439
www.alltrafficdata.net

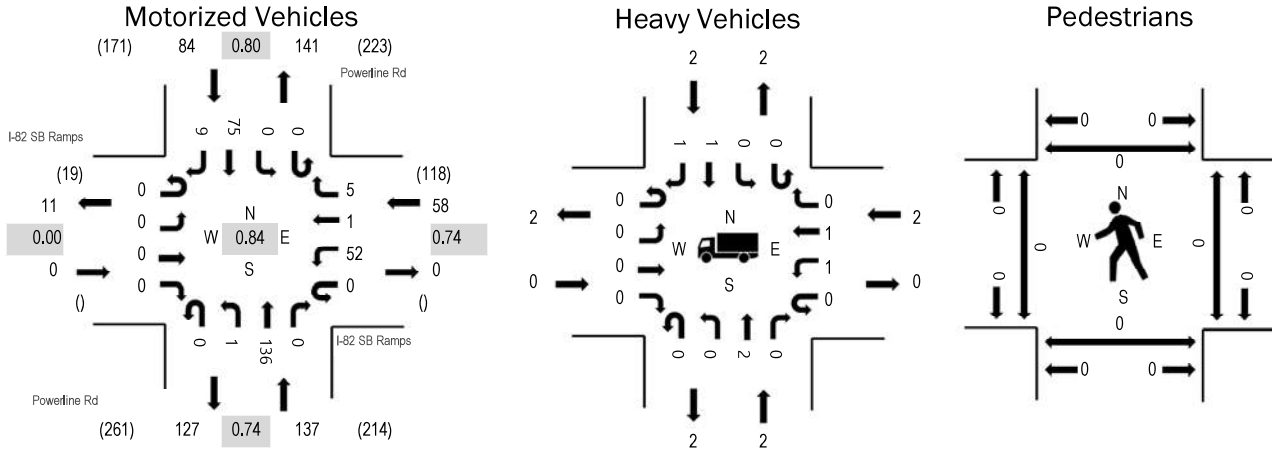
Location: Powerline Rd & I-82 SB Ramps PM

Date: Wednesday, March 4, 2020

Peak Hour: 04:45 PM - 05:45 PM

Peak 15-Minutes: 05:10 PM - 05:25 PM

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.00
WB	3.4%	0.74
NB	1.5%	0.74
SB	2.4%	0.80
All	2.2%	0.84

Traffic Counts - Motorized Vehicles

Interval Start Time	I-82 SB Ramps Eastbound				I-82 SB Ramps Westbound				Powerline Rd Northbound				Powerline Rd Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	0	0	0	0	7	0	0	0	0	6	0	0	0	5	0	18	262
4:05 PM	0	0	0	0	0	5	0	0	0	0	9	0	0	0	12	1	27	262
4:10 PM	0	0	0	0	0	10	0	0	0	0	6	0	0	0	7	1	24	256
4:15 PM	0	0	0	0	0	5	0	1	0	0	9	0	0	0	9	0	24	253
4:20 PM	0	0	0	0	0	3	0	0	0	0	8	0	0	0	9	3	23	258
4:25 PM	0	0	0	0	0	4	0	1	0	0	7	0	0	0	11	0	23	268
4:30 PM	0	0	0	0	0	6	0	1	0	0	5	0	0	0	7	2	21	265
4:35 PM	0	0	0	0	0	3	0	0	0	0	2	0	0	0	7	0	12	263
4:40 PM	0	0	0	0	0	5	0	2	0	0	7	0	0	0	4	1	19	275
4:45 PM	0	0	0	0	0	6	0	1	0	0	14	0	0	0	10	0	31	279
4:50 PM	0	0	0	0	0	4	0	0	0	0	13	0	0	0	4	2	23	259
4:55 PM	0	0	0	0	0	1	0	0	0	0	10	0	0	0	6	0	17	258
5:00 PM	0	0	0	0	0	3	0	2	0	0	6	0	0	0	7	0	18	
5:05 PM	0	0	0	0	0	7	0	0	0	1	8	0	0	0	5	0	21	
5:10 PM	0	0	0	0	0	4	0	1	0	0	9	0	0	0	7	0	21	
5:15 PM	0	0	0	0	0	6	0	0	0	0	16	0	0	0	6	1	29	
5:20 PM	0	0	0	0	0	3	0	0	0	0	21	0	0	0	6	3	33	
5:25 PM	0	0	0	0	0	5	0	1	0	0	6	0	0	0	7	1	20	
5:30 PM	0	0	0	0	0	3	0	0	0	0	11	0	0	0	4	1	19	
5:35 PM	0	0	0	0	0	5	1	0	0	0	12	0	0	0	5	1	24	
5:40 PM	0	0	0	0	0	5	0	0	0	0	10	0	0	0	8	0	23	
5:45 PM	0	0	0	0	0	3	0	0	0	0	6	0	0	0	2	0	11	
5:50 PM	0	0	0	0	0	4	0	0	0	0	12	0	0	0	6	0	22	
Count Total	0	0	0	0	0	107	1	10	0	1	213	0	0	0	154	17	503	
Peak Hour	0	0	0	0	0	52	1	5	0	1	136	0	0	0	75	9	279	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	0	1	1	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	0	0	1	1	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	0	1	0	0	1	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	0	0	1	1	2	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	0	0	1	0	1	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	1	0	0	1	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	0	0	1	1	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	1	0	0	1	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	1	1	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	1	0	1	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	0	1	0	1	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
Count Total	0	3	4	5	12	Count Total	0	0	0	0	0	Count Total	0	0	0	0	0
Peak Hour	0	2	2	2	6	Peak Hour	0	0	0	0	0	Peak Hour	0	0	0	0	0

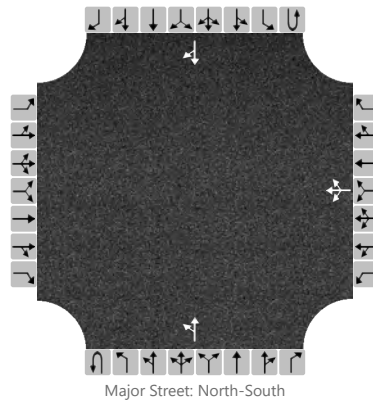
APPENDIX B

Level of Service Worksheets

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Montgomery	Intersection	I-84 SB ramps/Powerline
Agency/Co.	JUB Engineers	Jurisdiction	City of Umatilla
Date Performed	5/14/2020	East/West Street	I-84 SB ramps
Analysis Year	2020	North/South Street	Powerline Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.84
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Umatilla UGB Expansion		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LTR			LT						TR
Volume, V (veh/h)						52	1	5		1	136				75	9
Percent Heavy Vehicles (%)						3	3	3		3						
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1	6.5	6.2		4.1						
Critical Headway (sec)						6.43	6.53	6.23		4.13						
Base Follow-Up Headway (sec)						3.5	4.0	3.3		2.2						
Follow-Up Headway (sec)						3.53	4.03	3.33		2.23						

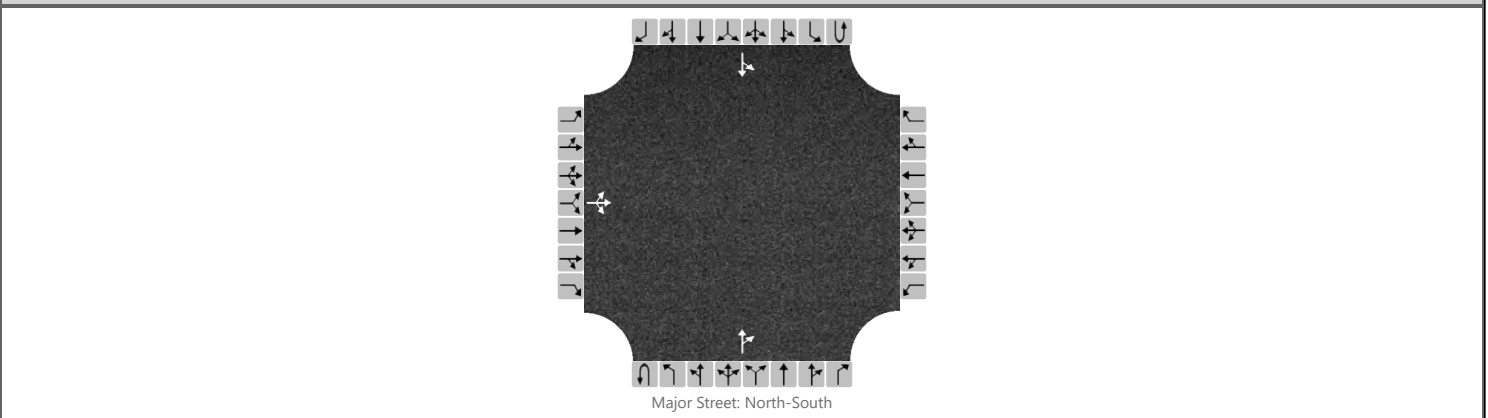
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						69				1						
Capacity, c (veh/h)						738				1485						
v/c Ratio						0.09				0.00						
95% Queue Length, Q ₉₅ (veh)						0.3				0.0						
Control Delay (s/veh)						10.4				7.4						
Level of Service, LOS						B				A						
Approach Delay (s/veh)					10.4				0.1							
Approach LOS					B											

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Montgomery	Intersection	I-84 NB ramps/Powerline
Agency/Co.	JUB Engineers	Jurisdiction	City of Umatilla
Date Performed	5/14/2020	East/West Street	I-84 NB ramps
Analysis Year	2020	North/South Street	Powerline Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.89
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Umatilla UGB Expansion		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0	
Configuration			LTR									TR		LT			
Volume, V (veh/h)		22	1	5							115	45		4	116		
Percent Heavy Vehicles (%)		3	3	3										3			
Proportion Time Blocked																	
Percent Grade (%)		0															
Right Turn Channelized		No					No					No					
Median Type/Storage		Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2										4.1		
Critical Headway (sec)		6.43	6.53	6.23										4.13		
Base Follow-Up Headway (sec)		3.5	4.0	3.3										2.2		
Follow-Up Headway (sec)		3.53	4.03	3.33										2.23		

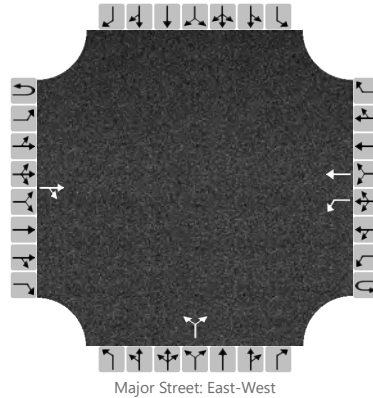
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			32											4		
Capacity, c (veh/h)			725											1388		
v/c Ratio			0.04											0.00		
95% Queue Length, Q ₉₅ (veh)			0.1											0.0		
Control Delay (s/veh)			10.2											7.6		
Level of Service, LOS			B											A		
Approach Delay (s/veh)		10.2										0.2				
Approach LOS		B														

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Montgomery	Intersection	US 730/Powerline
Agency/Co.	JUB Engineers	Jurisdiction	City of Umatilla
Date Performed	5/14/2020	East/West Street	US 730
Analysis Year	2020	North/South Street	Powerline Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.88
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Umatilla UGB Expansion		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	1	1	0		0	1	0		0	0	0
Configuration				TR		L	T				LR					
Volume, V (veh/h)			410	77		141	290			39		84				
Percent Heavy Vehicles (%)						3				3		3				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1					7.1		6.2			
Critical Headway (sec)						4.13					6.43		6.23			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.23					3.53		3.33			

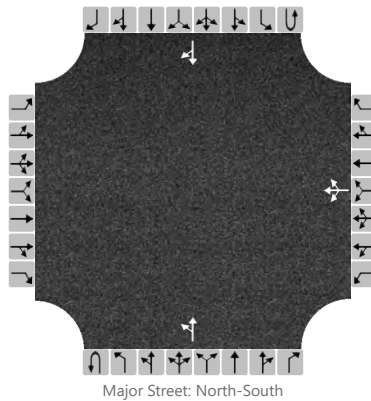
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						160					139					
Capacity, c (veh/h)						1010					337					
v/c Ratio						0.16					0.41					
95% Queue Length, Q ₉₅ (veh)						0.6					2.0					
Control Delay (s/veh)						9.2					23.0					
Level of Service, LOS						A					C					
Approach Delay (s/veh)					3.0				23.0							
Approach LOS									C							

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Montgomery	Intersection	I-84 SB ramps/Powerline
Agency/Co.	JUB Engineers	Jurisdiction	City of Umatilla
Date Performed	5/14/2020	East/West Street	I-84 SB ramps
Analysis Year	2040	North/South Street	Powerline Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Umatilla UGB Expansion - No Action		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LTR			LT						TR
Volume, V (veh/h)						70	0	10		5	185				100	10
Percent Heavy Vehicles (%)						3	3	3		3						
Proportion Time Blocked																
Percent Grade (%)							0									
Right Turn Channelized		No				No				No				No		
Median Type/Storage							Undivided									

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1	6.5	6.2		4.1						
Critical Headway (sec)						6.43	6.53	6.23		4.13						
Base Follow-Up Headway (sec)						3.5	4.0	3.3		2.2						
Follow-Up Headway (sec)						3.53	4.03	3.33		2.23						

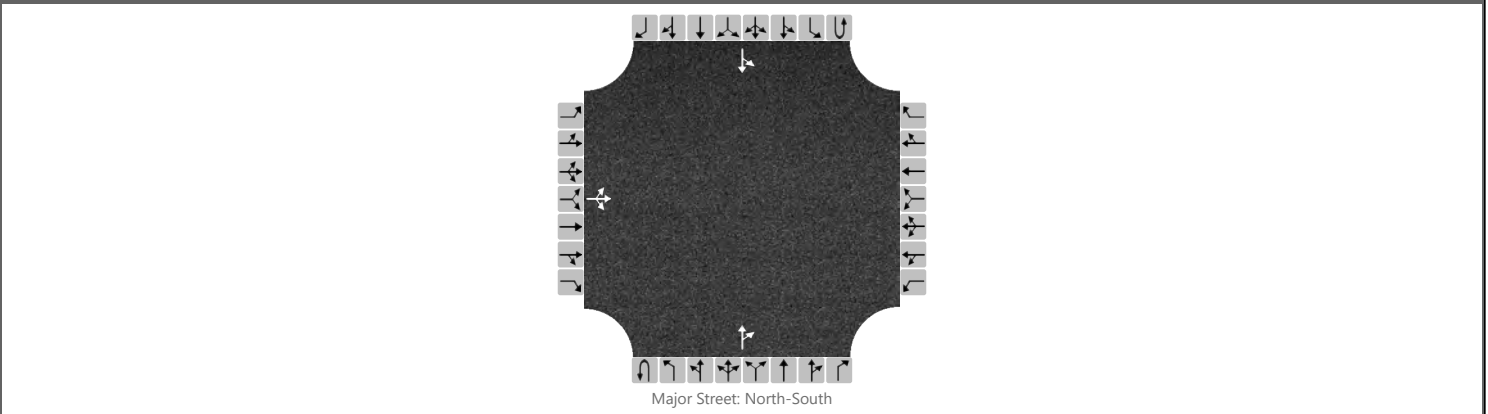
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						89				6						
Capacity, c (veh/h)						676				1457						
v/c Ratio						0.13				0.00						
95% Queue Length, Q ₉₅ (veh)						0.5				0.0						
Control Delay (s/veh)						11.1				7.5						
Level of Service, LOS						B				A						
Approach Delay (s/veh)						11.1				0.2						
Approach LOS						B										

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Montgomery	Intersection	I-84 NB ramps/Powerline
Agency/Co.	JUB Engineers	Jurisdiction	City of Umatilla
Date Performed	5/14/2020	East/West Street	I-84 NB ramps
Analysis Year	2040	North/South Street	Powerline Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Umatilla UGB Expansion - No Action		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0	
Configuration			LTR									TR		LT			
Volume, V (veh/h)		30	0	10							155	60		5	155		
Percent Heavy Vehicles (%)		3	3	3										3			
Proportion Time Blocked																	
Percent Grade (%)		0															
Right Turn Channelized		No					No					No					
Median Type/Storage		Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2										4.1		
Critical Headway (sec)		6.43	6.53	6.23										4.13		
Base Follow-Up Headway (sec)		3.5	4.0	3.3										2.2		
Follow-Up Headway (sec)		3.53	4.03	3.33										2.23		

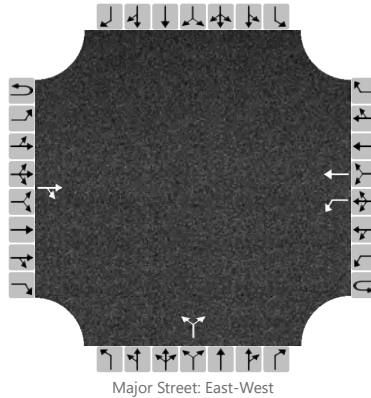
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			44											6		
Capacity, c (veh/h)			660											1320		
v/c Ratio			0.07											0.00		
95% Queue Length, Q ₉₅ (veh)			0.2											0.0		
Control Delay (s/veh)			10.8											7.7		
Level of Service, LOS			B											A		
Approach Delay (s/veh)		10.8										0.3				
Approach LOS		B														

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Montgomery	Intersection	US 730/Powerline
Agency/Co.	JUB Engineers	Jurisdiction	City of Umatilla
Date Performed	5/14/2020	East/West Street	US 730
Analysis Year	2040	North/South Street	Powerline Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Umatilla UGB Expansion - No Action		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	1	1	0		0	1	0		0	0	0
Configuration				TR		L	T				LR					
Volume, V (veh/h)			550	130		220	390			90		130				
Percent Heavy Vehicles (%)						3				3		3				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1					7.1		6.2			
Critical Headway (sec)						4.13					6.43		6.23			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.23					3.53		3.33			

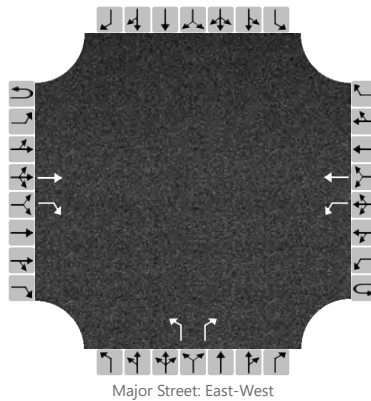
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						244					244					
Capacity, c (veh/h)						850					159					
v/c Ratio						0.29					1.54					
95% Queue Length, Q ₉₅ (veh)						1.2					16.3					
Control Delay (s/veh)						10.9					322.8					
Level of Service, LOS						B					F					
Approach Delay (s/veh)					3.9				322.8							
Approach LOS									F							

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Montgomery	Intersection	US 730/Powerline
Agency/Co.	JUB Engineers	Jurisdiction	City of Umatilla
Date Performed	5/14/2020	East/West Street	US 730
Analysis Year	2040	North/South Street	Powerline Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Umatilla UGB Expansion-No Action-Mit w/turns		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	1	0	1	1	0		1	0	1		0	0	0
Configuration			T	R		L	T			L		R				
Volume, V (veh/h)			550	130		220	390			90		130				
Percent Heavy Vehicles (%)						3				3		3				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized			No			No				No				No		
Median Type/Storage				Left Only								1				

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.13				6.43		6.23				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.23				3.53		3.33				

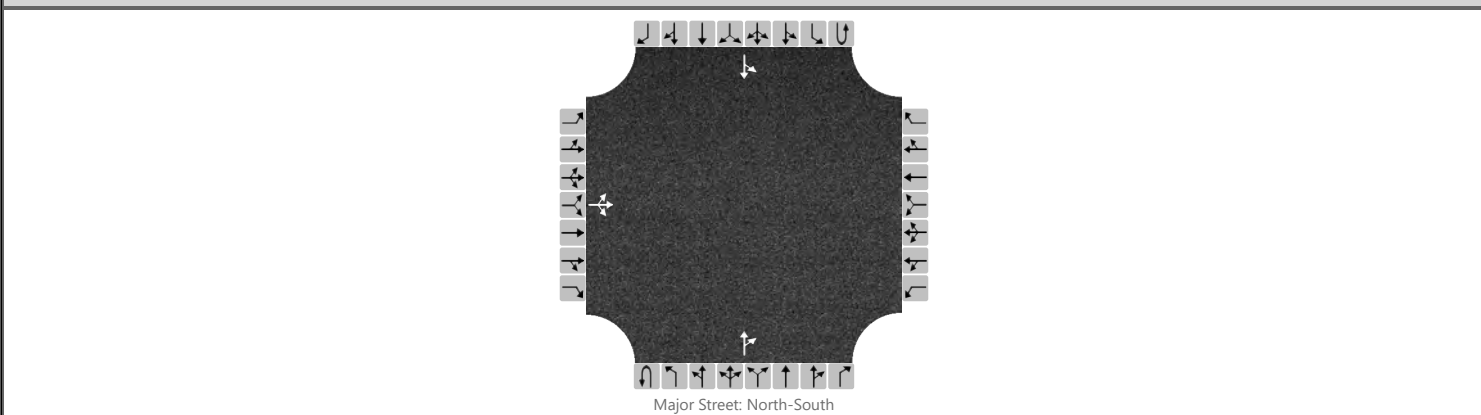
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						244				100		144				
Capacity, c (veh/h)						850				202		492				
v/c Ratio						0.29				0.49		0.29				
95% Queue Length, Q ₉₅ (veh)						1.2				2.5		1.2				
Control Delay (s/veh)						10.9				39.0		15.3				
Level of Service, LOS						B				E		C				
Approach Delay (s/veh)						3.9				25.0						
Approach LOS										D						

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Montgomery	Intersection	I-84 NB ramps/Powerline
Agency/Co.	JUB Engineers	Jurisdiction	City of Umatilla
Date Performed	5/14/2020	East/West Street	I-84 NB ramps
Analysis Year	2040	North/South Street	Powerline Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Umatilla UGB Expansion with Rezone		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0	
Configuration			LTR									TR		LT			
Volume, V (veh/h)		35	0	10							175	60		65	235		
Percent Heavy Vehicles (%)		3	3	3										3			
Proportion Time Blocked																	
Percent Grade (%)		0															
Right Turn Channelized		No					No					No					
Median Type/Storage		Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2										4.1		
Critical Headway (sec)		6.43	6.53	6.23										4.13		
Base Follow-Up Headway (sec)		3.5	4.0	3.3										2.2		
Follow-Up Headway (sec)		3.53	4.03	3.33										2.23		

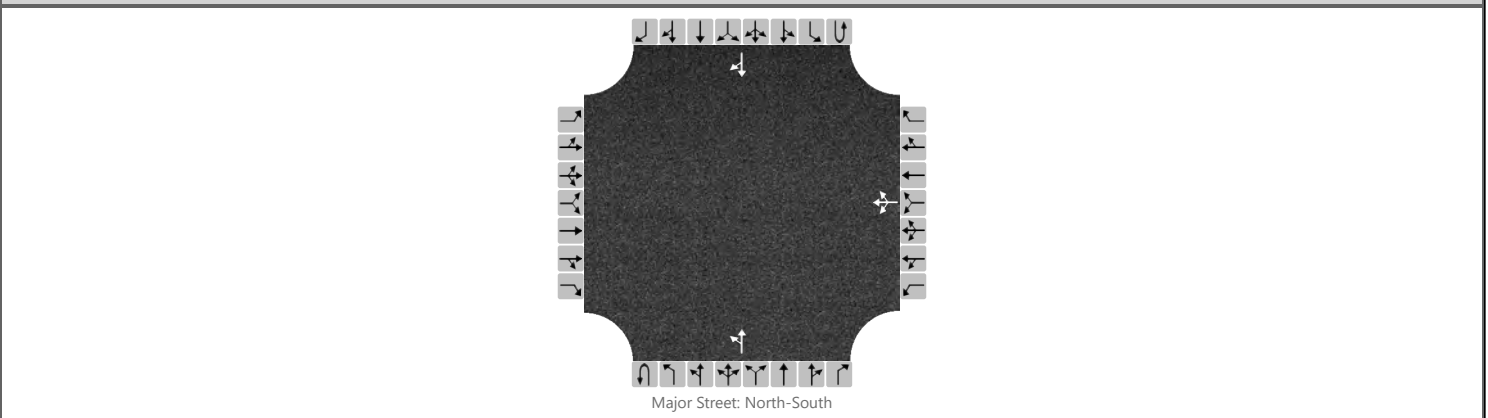
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			50											72		
Capacity, c (veh/h)			489											1296		
v/c Ratio			0.10											0.06		
95% Queue Length, Q ₉₅ (veh)			0.3											0.2		
Control Delay (s/veh)			13.2											7.9		
Level of Service, LOS			B											A		
Approach Delay (s/veh)		13.2										2.1				
Approach LOS		B														

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Montgomery	Intersection	I-84 SB ramps/Powerline
Agency/Co.	JUB Engineers	Jurisdiction	City of Umatilla
Date Performed	5/14/2020	East/West Street	I-84 SB ramps
Analysis Year	2040	North/South Street	Powerline Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Umatilla UGB Expansion with Rezone		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LTR			LT						TR
Volume, V (veh/h)						70	0	20		5	210				240	50
Percent Heavy Vehicles (%)						3	3	3		3						
Proportion Time Blocked																
Percent Grade (%)							0									
Right Turn Channelized		No				No				No				No		
Median Type/Storage							Undivided									

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1	6.5	6.2		4.1						
Critical Headway (sec)						6.43	6.53	6.23		4.13						
Base Follow-Up Headway (sec)						3.5	4.0	3.3		2.2						
Follow-Up Headway (sec)						3.53	4.03	3.33		2.23						

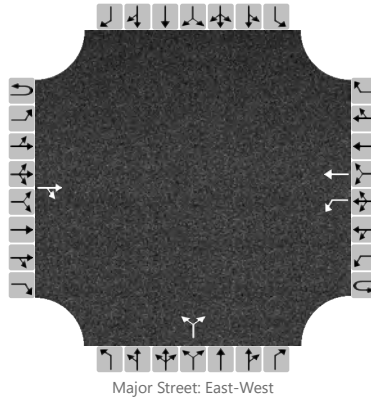
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						100				6						
Capacity, c (veh/h)						546				1230						
v/c Ratio						0.18				0.00						
95% Queue Length, Q ₉₅ (veh)						0.7				0.0						
Control Delay (s/veh)						13.1				7.9						
Level of Service, LOS						B				A						
Approach Delay (s/veh)						13.1				0.2						
Approach LOS						B										

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Montgomery	Intersection	US 730/Powerline
Agency/Co.	JUB Engineers	Jurisdiction	City of Umatilla
Date Performed	5/14/2020	East/West Street	US 730
Analysis Year	2040	North/South Street	Powerline Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Umatilla UGB Expansion-with Rezone		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	1	1	0		0	1	0		0	0	0
Configuration				TR		L	T				LR					
Volume, V (veh/h)			550	145		240	390			170		250				
Percent Heavy Vehicles (%)						3				3		3				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized			No			No				No				No		
Median Type/Storage	Undivided															

Critical and Follow-up Headways

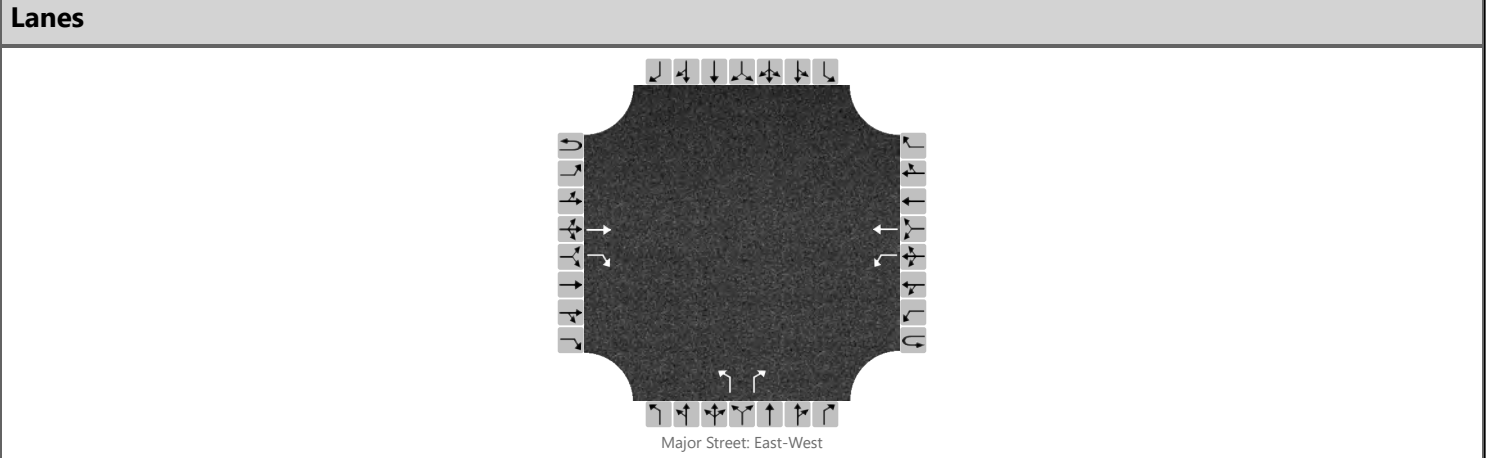
Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.13				6.43		6.23				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.23				3.53		3.33				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						267					467					
Capacity, c (veh/h)						838					145					
v/c Ratio						0.32					3.23					
95% Queue Length, Q ₉₅ (veh)						1.4					44.2					
Control Delay (s/veh)						11.3					1066.0					
Level of Service, LOS						B					F					
Approach Delay (s/veh)						4.3				1066.0						
Approach LOS						F				F						

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Montgomery	Intersection	US 730/Powerline
Agency/Co.	JUB Engineers	Jurisdiction	City of Umatilla
Date Performed	5/14/2020	East/West Street	US 730
Analysis Year	2040	North/South Street	Powerline Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Umatilla UGB Expansion-with Rezone		



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	1	0	1	1	0		1	0	1		0	0	0
Configuration			T	R		L	T			L		R				
Volume, V (veh/h)			550	145		240	390			170		250				
Percent Heavy Vehicles (%)						3				3		3				
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized	No				No				No				No			
Median Type/Storage					Left Only								1			

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.13				6.43		6.23				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.23				3.53		3.33				

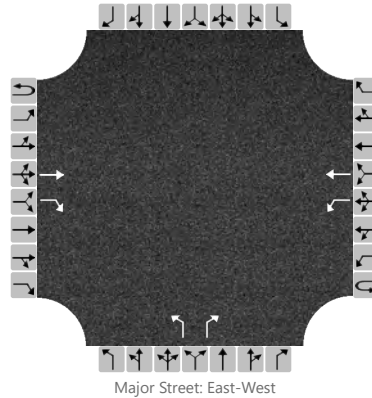
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						267				189		278				
Capacity, c (veh/h)						838				187		492				
v/c Ratio						0.32				1.01		0.57				
95% Queue Length, Q ₉₅ (veh)						1.4				8.5		3.5				
Control Delay (s/veh)						11.3				120.4		21.4				
Level of Service, LOS						B				F		C				
Approach Delay (s/veh)					4.3				61.5							
Approach LOS									F							

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Montgomery	Intersection	US 730/Powerline
Agency/Co.	JUB Engineers	Jurisdiction	City of Umatilla
Date Performed	5/14/2020	East/West Street	US 730
Analysis Year	2030	North/South Street	Powerline Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Umatilla UGB Expansion-with Rezone, with turns		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	1	0	1	1	0		1	0	1		0	0	0
Configuration			T	R		L	T			L		R				
Volume, V (veh/h)			480	115		195	340			60		115				
Percent Heavy Vehicles (%)						3				3		3				
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized	No				No				No				No			
Median Type/Storage					Left Only								1			

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.13				6.43		6.23				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.23				3.53		3.33				

Delay, Queue Length, and Level of Service

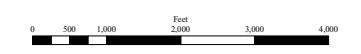
Flow Rate, v (veh/h)						217				67		128				
Capacity, c (veh/h)						922				245		545				
v/c Ratio						0.24				0.27		0.24				
95% Queue Length, Q ₉₅ (veh)						0.9				1.1		0.9				
Control Delay (s/veh)						10.1				25.1		13.6				
Level of Service, LOS						B				D		B				
Approach Delay (s/veh)					3.7				17.6							
Approach LOS									C							

APPENDIX C

City of Umatilla Plan Map

CITY OF UMATILLA PLAN MAP

OFFICIAL CITY AND URBAN GROWTH BOUNDARY
COMPREHENSIVE PLAN AND CITY ZONING MAP
(PER ORDINANCE #827, UPDATED APRIL 2018)



Legend

- | | | |
|---|--|-----------------------------------|
| City Limits | R-1, Single-Family Residential | R, Residential Plan |
| Urban Growth Boundary | R-1/CS, Single-Family/Community Service | C, Commercial Plan |
| CS, Community Service | R-2, Medium Density Residential | M, Industrial Plan |
| DR, Downtown Residential | R-2/CS, Medium Density/Community Service | NP, Natural Resource Plan |
| DT, Downtown Transitional | R-3, Multi-Family | PF, Public Facility Plan |
| DC, Downtown Commercial | M-1, Light Industrial | R-O/S, Recreation-Open/Space Plan |
| NC, Neighborhood Commercial | M-1/CS, Light Industrial/Community Service | FP, Flood Plain |
| MC, McNary Center Mixed Use | M-2, Heavy Industrial | |
| GC, General Commercial | M-2/CS, Heavy Industrial/Community Service | |
| GC/CS, General Commercial/Community Service | | |

UGB PLAN DESIGNATIONS

MAP DISCLAIMER: No warranty is made as to the accuracy, reliability or completeness of this data. Map should be used for reference purposes only. Not survey grade or for legal use. Created by Brandon Seitz

APPENDIX D

Traffic Growth Calculations

Umatilla Urban Growth Boundary Traffic Growth Calculations

Intersection	NB			SB			EB			WB			TOTAL
	LT	T	RT	LT	T	RT	LT	T	RT	LT	T	RT	
	Powerline/US 730												
Existing 2020 PM Peak Hr	39	--	84	--	--	--	--	410	77	141	290	0	1041
2040 Background @ 1.5%/year	53	--	113	--	--	--	--	562	104	190	391	0	1402
Ambience Vested Trips	15	--	17	--	--	--	--	0	26	30	0	0	88
Total 2040 No Action (rounded)	70	--	130	--	--	--	--	550	130	220	390	0	1490
UGB Expansion/Rezone Trips	100	--	120	--	--	--	--	0	15	20	0	0	255
Total 2040 Trips with UGB & Rezone	170	--	250	--	--	--	--	550	145	240	390	0	1744

Intersection	NB			SB			EB			WB			TOTAL
	LT	T	RT	LT	T	RT	LT	T	RT	LT	T	RT	
	Powerline/I-82 EB ramps (SB)												
Existing 2020 PM Peak Hr	1	136	--	--	75	9	--	--	--	52	1	5	279
2040 Background @ 1.5%/year	1	183	--	--	101	12	--	--	--	70	1	7	376
Ambience Vested Trips													0
Total 2040 No Action (rounded)	5	185	--	--	100	10	--	--	--	70	0	10	380
UGB Expansion/Rezone Trips	0	25	--	--	140	40	--	--	--	0	0	10	215
Total 2040 Trips with UGB & Rezone	5	210	--	--	240	50	--	--	--	70	0	20	596

Intersection	NB			SB			EB			WB			TOTAL
	LT	T	RT	LT	T	RT	LT	T	RT	LT	T	RT	
	Powerline/I-82 WB ramps (NB)												
Existing 2020 PM Peak Hr	--	115	45	4	116	--	22	1	5	--	--	--	308
2040 Background @ 1.5%/year	--	155	61	5	156	--	30	1	7	--	--	--	415
Ambience Vested Trips	--												0
Total 2040 No Action (rounded)	--	155	60	5	155	--	30	0	10	--	--	--	415
UGB Expansion/Rezone Trips	--	20	0	60	80	--	5	0	0	--	--	--	165
Total 2040 Trips with UGB & Rezone	--	175	60	65	235	--	35	0	10	--	--	--	580