



**City Council Work Session
June 5, 2017 - 6:00 PM
Public Safety Building 401 East Third Street**

- I. CALL MEETING TO ORDER**
- II. ROLL CALL**
- III. REVIEW OF THE COUNCIL AGENDA AND MEETING**
- IV. COUNCIL BUSINESS ITEMS**
- V. EXECUTIVE SESSION PURSUANT TO ORS 192.660(2) | PERFORMANCE EVALUATIONS OF PUBLIC OFFICERS AND EMPLOYEES**
Executive Sessions are closed to the public
- VI. ADJOURNMENT**

PUBLIC COMMENT

WORK SESSIONS ARE INTENDED FOR DISCUSSION. NO ACTION WILL BE TAKEN ON THE AGENDA ITEMS AND NO DECISIONS WILL BE MADE. NO ORAL OR WRITTEN TESTIMONY WILL BE HEARD OR RECEIVED FROM THE PUBLIC.



**City Council Business Session
June 5, 2017 - 7:00 PM
Public Safety Building 401 East Third Street**

I. CALL TO ORDER

II. ROLL CALL

III. PLEDGE OF ALLEGIANCE

IV. CITY MANAGER'S REPORT

V. PUBLIC COMMENTS

(30 minutes maximum which may be extended at the mayor's discretion; an opportunity to speak for not more than five (5) minutes per speaker allowed)

VI. CONSENT CALENDAR

- VI.a A resolution to authorize the City Manager to enter into an amendment for professional services agreement with Keller Associates to complete the update to the Wastewater Master Plan

[Res 2017-3378 Wastewater Master Plan Awd Amendment.docx](#)

- VI.b A resolution to authorize the City Manager to enter into a construction contract with James W. Fowler Company for the WWTP Oxidation Ditch Rehabilitation Project in the amount of \$479,727.00

[Res 2017-3370_WWTP OxiDitchRehabPrj_Bid Award.pdf](#)

- VI.c May 2, 2017 Council Minutes

[RCA Council Minutes](#)

VII. PUBLIC HEARINGS

- VII.a An Ordinance denying an annexation application for 25.66 acres of property located at 25020, 25240 and 25300 NE North Valley Road, Yamhill County Tax Lots 3207-600, 700 and 800 into the Newberg city limits

[RCA Ordinance 2815 ANX - Dutchman Ridge Extension 6.5.17.doc](#)

[Attachment 1 - Dutchman Ridge Extension Request 5-22-17.pdf](#)

- VII.b A resolution declaring the City of Newberg's election to receive revenues through the state revenue sharing program AND A resolution certifying the provision of municipal services by the City of Newberg for the purposed of participation in the

state revenue sharing program

[RCA, Res 2017-3371 & 3372.pdf](#)

- VII.c Resolutions 2017-3373, A resolution adopting the City of Newberg, Oregon budget for the 2017-18 Fiscal Year, making appropriations, imposing the tax, and categorizing the tax

[RCA Resolution for 2017-3373 Budget Adoption.pdf](#)

- VII.d Resolution 2017-3381, Supplemental Budget #2 for Fiscal Year 2016-2017

[RCA Resolution 2017-3381.pdf](#)

- VII.e An Ordinance adopting the 2017 Water System Master Plan and Incorporating the 2017 Water Master Plan into the Newberg Comprehensive Plan

[RCA Ordinance 2816 with Exhibits.pdf](#)

[Attachment 1 - Resolution 2017-325.pdf](#)

[Attachment 2 Newberg Urban Area Management Agreement.pdf](#)

[Attachment 3 CIP Water 2017-2022.pdf](#)

[Attachment 4 - PC Resolution 2017-326 signed 2017-0427.pdf](#)

[Attachment 5 - Newberg Water Master Plan Power Point - City Council 6-5-2017.pdf](#)

- VII.f A Resolution to approve the Water System Development Charge Methodology and decrease the charge

[Res 2017-3376 Water SDC.pdf](#)

[SDCPublicHearing 6-5-2017.pptx](#)

VIII. NEW BUSINESS

- VIII.a Newberg 2030 Project Update – Tasks 2 and 3

[RCA Information.doc](#)

[Attachment 1 - Newberg Div 38 BLI FINAL 3_28_17.pdf](#)

[Attachment 2 - Newberg BLI Comparison FINAL 3_28_17.pdf](#)

[Attachment 3 - Newberg Div 38 BLI City Council 6-5-17.pdf](#)

[Attachment 4 - Newberg_BLI_Issue_Memo_20170518.pdf](#)

IX. COUNCIL BUSINESS

X. ADJOURNMENT

COMMENTS

Council accepts comments on agenda items during the meeting. Fill out a form identifying the item you wish to speak on prior to the agenda item beginning and turn it into the City Recorder. Speakers who wish the Council to consider written material are encouraged to submit written information in writing by 12:00 p.m. (noon) the day of the meeting.

ADA STATEMENT

ACCOMMODATION OF PHYSICAL IMPAIRMENTS: In order to accommodate persons with physical impairments, please notify the City Recorder's Office of any special physical or language accommodations you may need as far in advance of the meeting as possible and no later than two business days prior to the meeting. To request these arrangements, please contact the City Recorder at (503) 537-1283. For TTY services please dial 711.

ORDER

The Mayor reserves the right to change the order of items to be considered by the Council at their meeting. No new items will be heard after 11:00 p.m., unless approved by the Council.

REQUEST FOR COUNCIL ACTION

DATE ACTION REQUESTED: June 5, 2017

Order ____ Ordinance ____ Resolution XX Motion ____ Information ____
No. No. No. 2017-3378

SUBJECT: A resolution to authorize the City Manager to enter into an amendment for professional services agreement with Keller Associates to complete the update to the Wastewater Master Plan.

**Contact Person (Preparer) for this Motion: Kaaren Hofmann, P.E., City Engineer
Dept.: Engineering Services Department
File No.:**

RECOMMENDATION:

Adopt Resolution No. 2017-3378.

EXECUTIVE SUMMARY:

The City's Wastewater Master Plan was last updated in 2007. The plan should generally be updated every 10 years. Along with collection and treatment components, this plan will address:

- Non-potable water storage and distribution: better identify future potential users and to evaluate the system filter, pumping, distribution line, and storage costs vs. the benefits of the reuse system;
- Trunk line conveyance capacity;
- Treatment capacity;
- Inflow and Infiltration Impacts; and
- Pump Station Capacity and possible consolidation.

Keller Associates has been collecting data on our existing wastewater system in order to update the hydraulic model of the trunk line system. As a part of this data collection, spot checks in the field were conducted to verify accuracy of the model and the information in our Geographical Information System. Unfortunately, these checks show that the model, GIS and actual field measurements are not the same. In order to accurately model our system and determine what improvements are needed in the system, the larger pipes in the wastewater system need to be surveyed. Our consultant will be able to do this additional scope of work for about \$50,000.

Council awarded the Wastewater Master Plan contract to Keller Associates via Resolution No. 2016-3324. That contract was for \$299,480 and the City Manager was authorized to amend the contract up to 10% of the original contract amount. Amendment No. 1 was signed on May 10, 2017. That amendment was only able to cover approximately half of the necessary work. The negotiated scope of work and cost breakdown of Amendment No. 2 for Council consideration is attached as Exhibit "A."

FISCAL IMPACT:

Keller Associates will complete the master plan update for \$345,960. The budget for the project was \$300,000 and this was appropriated in the FY 2016 -2017 and the FY 2017-2018 budgets. An additional \$50,000 will need to be appropriated to complete this work in the FY2017-2018 budget, which may result in a supplemental budget in 2017-18. This money will come from the Wastewater Fund Contingency

(FY17-18 Contingency of \$1,129,457 before transfer of \$32,500) and the Wastewater SDC Fund Contingency line (FY17-18 Contingency of \$3,766,802 before transfer of \$17,500). No projects are expected to be impacted by this amendment.

STRATEGIC ASSESSMENT:

This update to the Wastewater Master Plan will help staff determine the needs of the City's wastewater system over the next 20 years. There will be significant public involvement through the use of a citizen advisory committee through the process of updates to the 2007 Master Plan.

A RESOLUTION TO AUTHORIZE THE CITY MANAGER TO ENTER INTO AN AMENDMENT FOR A PROFESSIONAL SERVICES AGREEMENT WITH KELLER ASSOCIATES TO COMPLETE THE UPDATE TO THE WASTEWATER MASTER PLAN.

RECITALS:

1. The City of Newberg's existing Wastewater Master Plan is ten years old. The Master Plan should be updated every ten years.
2. The Master Plan will help staff determine the needs of the City's wastewater treatment and collection system for the next 20 years.
3. Council awarded the Wastewater Master Plan contract to Keller Associates via Resolution No. 2016-3324. That contract was for \$299,480 and the City Manager was authorized to amend the contract up to 10% of the original contract amount.
4. As a part of the project, spot checks in the field were conducted to verify accuracy of the model and the information in our Geographical Information System. Unfortunately, these checks show that the model, GIS and actual field measurements are not the same. In order to accurately model our system and determine what improvements are needed in the system, the larger pipes in the wastewater system need to be surveyed.
5. Keller Associates submitted a detailed proposal outlining the scope of work with a reasonable cost breakdown included in Exhibit "A" and by this reference incorporated.

THE CITY OF NEWBERG RESOLVES AS FOLLOWS:

1. The City Council, acting as contract review board for the City, does hereby authorize the City Manager to enter into an amendment to the Professional Services Agreement with Keller Associates to complete the update to the Wastewater Master Plan in the amount of \$345,960.
2. The City Attorney will modify and approve all contracts and agreements as to form and content.
3. The City Manager is authorized to amend the Professional Services Agreement up to ten (10) percent of the revised contract amount.

➤ **EFFECTIVE DATE** of this resolution is the day after the adoption date, which is: June 6, 2017.

ADOPTED by the City Council of the City of Newberg, Oregon, this 5th day of June, 2017.

Sue Ryan, City Recorder

ATTEST by the Mayor this 8th day of June, 2017.

Bob Andrews, Mayor

REQUEST FOR COUNCIL ACTION

DATE ACTION REQUESTED: June 5, 2017

Order ____ No.	Ordinance ____ No.	Resolution <u>XX</u> No. 2017-3370	Motion ____	Information ____
SUBJECT: A resolution to authorize the City Manager to enter into a construction contract with James W. Fowler Company for the WWTP Oxidation Ditch Rehabilitation Project in the amount of \$479,727.00			Contact Person (Preparer) for this Motion: Paul Chiu, P.E., Senior Engineer Dept.: Engineering Services Department File No.:	

RECOMMENDATION:

Adopt Resolution No. 2017-3370.

EXECUTIVE SUMMARY:

The City's Wastewater Treatment Plant has two oxidation ditches that provide aerobic digestion for wastewater treatment (refer to Figure 1 on the next page) and one of them can be shut down for maintenance as needed in the summer. Both oxidation ditches were constructed in 1985 and large cracks have formed in the concrete floors, inclined slabs, and divider walls, of both oxidation ditches.

HDR Engineering, Inc., the City's consultant, completed the required construction plans, specifications and cost estimate for rehabilitating Oxidation Ditch No. 2. The project includes the removal and replacement of over 1,500 square feet of concrete inside the oxidation ditch, the installation of a layer of fiber reinforced concrete to the entire sloped surface of the oxidation ditch and also miscellaneous structural concrete repairs. The Engineer's estimate is in the range of \$500,000.00 to \$700,000.00.

The project was advertised for bid on April 17, 2017.

On May 16, 2017, the city received and opened two qualified bids from:

- (a) James W. Fowler Company for \$479,727.00; and
- (b) PCR, Inc. for \$799,560.00.

PCR's price markup at 2-1/2 times (in comparison with Fowler's markup at 1-1/2 times) for the shotcrete sub-bid is the reason for their high bid total.

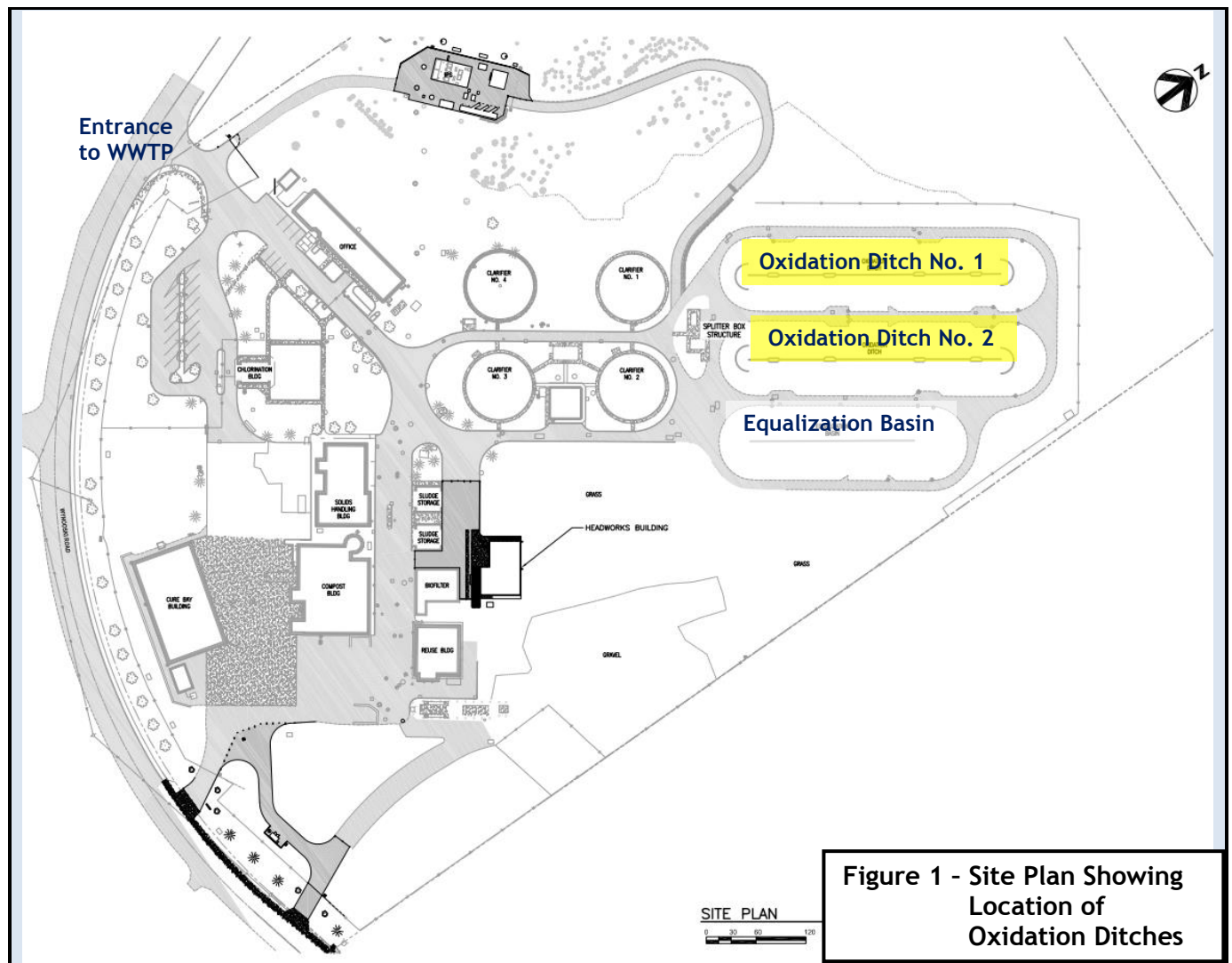


Figure 1 - Site Plan Showing Location of Oxidation Ditches

FISCAL IMPACT:

Funding for rehabilitation of the WWTP Oxidation Ditch project has been appropriated in the current and the next fiscal year budgets totaling \$1,200,000.00 under account number 04-5150-706310.

STRATEGIC ASSESSMENT:

This project is scheduled for summer construction when one of the two oxidation ditches can be emptied without adverse impact to the wastewater treatment process.

The city has chosen rehabilitation for the existing oxidation ditches because the current wastewater treatment volumes do not warrant the design and construction for another new oxidation ditch at this time. The rehabilitation of Oxidation Ditch No. 2 will extend its service life for another 20 years. Rehabilitation of Oxidation Ditch No. 1 is proposed to be completed in the next several years.



RESOLUTION No. 2017-3370

A RESOLUTION AUTHORIZING THE CITY MANAGER TO ENTER INTO A CONSTRUCTION CONTRACT WITH JAMES W. FOWLER COMPANY FOR THE WWTP OXIDATION DITCH REHABILITATION PROJECT IN THE AMOUNT OF \$479,727.00

RECITALS:

1. The city's consultant, HDR Engineering, Inc., completed the construction plans, specifications and cost estimate for the Wastewater Treatment Plant Oxidation Ditch Rehabilitation Project to provide repairs to Oxidation Ditch No. 2 which is crucial for the wastewater treatment process.
2. The WWTP Oxidation Ditch Rehabilitation Project is an approved capital improvement project in the 2016-17 and 2017-18 fiscal year budgets.
3. The City of Newberg advertised the project on the city's website and in the Daily Journal of Commerce on April 17, 2017, soliciting bids in accordance with ORS Chapter 279C Public Contracting and Public Procurement requirements.
4. Two qualified bids were received on May 16, 2017. They were from: (a) James W. Fowler Company for \$479,727.00; and (b) PCR, Inc. for \$799,560.00. The Engineer's estimate is in the range of \$500,000.00 to \$700,000.00.
5. James W. Fowler Company is the low bidder and the bid submitted is responsive.

THE CITY OF NEWBERG RESOLVES AS FOLLOWS:

1. The City Council, acting as contract review board for the city, does hereby authorize the City Manager to enter into a contract with James W. Fowler Company to complete the Wastewater Treatment Plant Oxidation Ditch Rehabilitation Project in the amount of \$479,727.00.
2. The City Attorney will review and approve all contracts and agreements as to form and content.
3. The City Manager is authorized to negotiate and approve any needed construction change orders not to exceed 10 percent of the original contract amount.

➤ **EFFECTIVE DATE** of this resolution is the day after the adoption date, which is: June 6, 2017.

ADOPTED by the City Council of the City of Newberg, Oregon, this 5th day of June, 2017.

Sue Ryan, City Recorder

ATTEST by the Mayor this 8th day of June, 2017.

Bob Andrews, Mayor

REQUEST FOR COUNCIL ACTION

DATE ACTION REQUESTED: June 5, 2017

Order ____ No.	Ordinance ____ No.	Resolution ____ No.	Motion <u>XX</u>	Information ____
-------------------	-----------------------	------------------------	------------------	------------------

SUBJECT: Minutes

Contact Person (Preparer) for this
Motion: Sue Ryan, City Recorder
Dept.: Administration

RECOMMENDATION:

Approve City Council minutes from May 2nd, 2017.

NEWBERG CITY COUNCIL MINUTES
REGULAR SESSION
May 2, 2017, 7:00 PM
PUBLIC SAFETY BUILDING (401 E. THIRD STREET)

A work session was held at 6:00 p.m. preceding the meeting. Present were Mayor Bob Andrews, Councilors Mike Corey, Scott Essin, Hayley Delle, Denise Bacon, and Stephen McKinney. Councilor Patrick Johnson was absent. Also present were City Manager Joe Hannan, City Attorney Truman Stone, City Recorder Sue Ryan, Community Development Director Doug Rux, Public Works Director Jay Harris, Human Resources Director Anna Lee, Library Director Leah Griffith, City Engineer Kaaren Hofmann, and Finance Director Matt Zook.

Mayor Andrews called the meeting to order. He had one item for Council Business.

Yamhill County Transit Authority Director Cynthia Thompson said they were requesting an increase in Newberg's contribution to the Transit Authority. She passed out two handouts to the Council on the Yamhill County Transit Area and on the Transit Agency's goals for Fiscal Year 2017-18. She discussed the map of the transit area, the services they provided, and their operating structure. First Transit contracted with the County to staff the bus routes. Ms. Thompson contracted with the County to manage the service. Ms. Thompson gave background on YCTA services and costs. Ridership in Newberg could be improved. They were working on their Transit Development Plan. They would be doing a ridership survey and there would be a focus group in Newberg to discuss the service in the City. There was discussion on transit shelter locations and the ridership survey.

Yamhill County Commissioner Rick Olson said he could contact ODOT to discuss how transit buses should be handled in the Springbrook and Highway 99 area. It should have been considered as part of the design. The City, County, and ODOT needed to do improve collaboration on transit projects. There was discussion about future needs. Ms. Thompson said they would solicit community input. She explained ridership had been low historically for a number of reasons. She gave examples of different programs that could increase ridership. YCC Olson had been discussing development and land use issues with McMinnville and how they were going to include the Transit Authority on public agency applications so there could be feedback on how it would affect transit. He suggested Newberg could do the same. Ms. Thompson said they were asking cities for an increase of 5% in their contribution to the Transit Authority to help with a grant match requirement for new buses.

There was discussion on addressing senior needs, more visible information on transit, a community survey on use, the needs for east to west transit service and adding Newberg's events to the county's list. Mayor Andrews asked if all 10 of the Yamhill communities were supporting the Transit Authority. Ms. Thompson said no but she was asking them for the same support as she was asking from Newberg. County Commissioner Olson said in conjunction with the Transit Plan, focus groups would discuss how the transit system could be successful and what facilities needed to be provided. This would include business and other community groups not just riders.

CALL MEETING TO ORDER

The Mayor called the business session to order at 7:00 p.m.

ROLL CALL

Members Present:	Mayor Bob Andrews	Scott Essin	Stephen McKinney
	Mike Corey	Hayley Delle	Denise Bacon

Members Present via Telephone: Patrick Johnson

Staff Present: Joe Hannan, City Manager Truman Stone, City Attorney
Sue Ryan, City Recorder Doug Rux, Community Development Director
Jay Harris, Public Works Director Matt Zook, Finance Director
Kaaren Hofmann, City Engineer Steve Olson, Senior Planner

PLEDGE OF ALLEGIANCE: The Pledge of Allegiance was performed.

CITY MANAGER'S REPORT: City Manager Hannan reported on current activities across the City including: Tualatin Valley Fire & Rescue/City Interagency meeting to discuss focus groups, response times, contract and looming deadlines for the annexation decision; work on animal control, shelter lease and response to County Sheriff's changes; Parkway Committee meeting; follow-up meeting on Sportsman Airpark and discussing initial questions regarding park ownership, future plans and FAA grant process; monthly City Managers meeting at Council of Governments where there was discussion regarding the legislative session and comparing different experiences with the current budget preparations; attending the Yamhill County Cultural Congress to discuss future and promotion of arts in Newberg and Yamhill County; visiting the Oregon Electric Railway Museum to discuss establishing a trolley service in Newberg; Mayor's Cabinet meeting; attending regional, county and local committee meetings on various topics including creating a parking management plan for the Cultural Center and meeting with owners and engineers for Gracie's Landing on development issues.

PUBLIC COMMENTS: None

CONSENT CALENDAR:

MOTION: Corey/Bacon moved to approve the Consent Calendar including Council Minutes for March 27 and April 3, 2017. Motion carried (7 Yes/0 No).

PUBLIC HEARING: Ordinance 2016-2811- Transportation Utility Fee:

Mayor Andrews re-opened the legislative public hearing. He asked for declarations of conflicts of interest or abstentions or objections to Council jurisdiction. There were none.

Public Works Director Harris gave the staff report. About a year ago Council directed staff to prepare a pavement maintenance funding plan. Last July an ad hoc committee was formed to work on a proposed funding package. They determined \$1.2 million would be Phase 1. There had been significant public outreach on this proposal. The first hearing was held in December, and the Council indicated the assumptions on the funding amount and funding prioritization were acceptable. Council directed staff at that on the funding allocation of 35% residential and 65% non-residential, and there was discussion regarding the definition of vacancy and profit vs. non-profit fee caps. The second hearing was held in January. The Council heard public testimony and several concerns including the fee cap amounts, when the fee would go into effect, heavy vehicle impacts, non-profit entity uses, an appeals section, and the split between residential and non-residential funding.

The ad hoc committee proposed no changes and to keep the targeted revenue for the TUF at \$1.2 million. They recommended eliminating the maximum fee cap. Regarding funding allocation, they agreed with Council to keep it at the 35 % residential share. On prioritizing improvements, the committee wanted to maintain the split of 70% going to good to fair streets and 30 going to poor streets. They discussed fee waivers for hardships and vacancies and did not think modifications were needed. The committee kept the variable within class model. This lumps trips into ranges so the exact trip rate of the business did not need to be kept up to date. The committee said the heavy vehicle clause should be discussed as a separate ordinance or resolution. They recommended not combining non-profits or giving them fee caps. They did think there should be a 50% fee reduction for the School District because property taxes fund schools. He said compared to other municipalities Newberg was in the middle range at \$4.99 for single family residential, \$371 for a 100,000 square foot manufacturing facility, and \$3,192 for 100,000 square foot supermarket. He showed a map of future conditions with full funding five years from now. At year five, out of the 65.5 miles, 48 miles of roads would be touched.

As they got caught up, more money could be spent on the poor condition roads. The expectation was to have the PCI maintained around the tenth year. He explained the collection timeline.

Councilor Essin asked what improvements could be made with the 30% for the worst roads? PWS Director Harris said a full dig out was very expensive, and grind and inlay was less expensive. Staff still had to assess the roads to know what needed to be done. They planned to prioritize the roads that had the most trips per day first.

Mayor Andrew said the City could spend more than the minimum 30% recommendation.

Councilor Essin clarified it was a guideline. How would they determine what would get done in the first year? PWS Director Harris said they would follow the pavement model and those projects would be prioritized. A five year capital improvement project plan for paving would be created from data. This would be an engineering decision, and the plan would come to Council every year for the budget. Councilor Johnson wanted to know the plan for letting citizens and businesses know about the work. PWS Director Harris said there would be ongoing public outreach for this program especially when it was implemented. Mayor Andrews asked how much of the monthly fee would go to administration and not pavement. PWS Director Harris said about 5 %. Councilor Essin asked about the reduction for the School District. PWS Director Harris said the only one to get a reduction was the School District because they said they would have to cut services if they had to pay the full amount. The ad hoc committee thought the district's payment should be reduced by 50%.

Proponents: None

Opponents: Robert Soppe, Newberg, said in general he was in favor of the ordinance. In the fee waiver section, there was language about the City Manager's authority over applications for fee reductions or waivers, which was out of place to talk about reductions in this section. Regarding the appeals process, the owner must appeal within 15 business days of the City Manager's decision about the assigned category. He wanted to know when the decision would occur and if it was an adequate amount of time. He suspected it wasn't and suggested the Council understand the appeals process before adopting the ordinance. He did not think the documents explained the justification for the School District reduction. The Council needed to be clear to its constituency about the reasons for the reduction. He did not think the reason of property taxes was correct. The boundary of the City and boundary of the School District were different and the responsible party for the fee was quite frequently not the property owner who was responsible for the property taxes.

When the City was imposing fees, accuracy and consistency was very important in order to be credible. To maintain the current pavement conditions, \$2.5 million per year was needed. The report from Kittelson and Associates stated \$2.5 million per year would increase the PCI from 78 to 100 by 2026. This did not sound like maintaining conditions. In March of 2016, the Council adopted priorities, but none of the priorities applied to the pavement system. Because this was a dramatic change, Council should consider how the priority setting process worked. He urged the Council to do the following before approving the ordinance: make sure the appeals process was both clear and reasonable, be clear to the TUF rate payers why the School District would be subsidized, direct staff to be more consistent with executive summaries, and review how something of this importance and cost was not in the Council priorities just over a year ago but was now before them to approve.

Councilor Essin asked for clarification on his concerns. Mr. Soppe said his main concern was how the appeals process worked. He was not clear when the 15 business days started. He also thought it should be clear why the School District was being given a reduction.

Undecided: None

Mayor Andrews closed the public comments portion of the hearing.

Mayor Andrews asked for answers on the appeals process. City Attorney Stone explained how the process would work. When the bills went out and properties were assigned a category, if someone had a question or concern about the interpretation or how they were categorized, they could make an administrative appeal to the City Manager by writing a letter or filling out a form. The administrative review was the first level and the City Manager would make the decision. If someone was not satisfied with that decision, it could be appealed to the City Council. They had to follow the 15 day timeframe to request an appeal to the City Council and they must specify the basis for the appeal on a specific contention that the City Manager's decision was incorrect. There was a burden on the appellant to specify the reason for the appeal and the background information.

Councilor McKinney said the suggestion was that 15 days was an unreasonable amount of time. Would 30 days be more reasonable? PWS Director Harris said the first process was with the City Manager, which had no timeframe. If they did not like that decision, they had 15 days to file an appeal to the City Council.

PWS Director Harris recommended approval of the Ordinance.

Mayor Andrews closed the public hearing.

MOTION: Johnson/Corey moved to approve Ordinance 2016-2811, An Ordinance amending the Newberg Municipal Code Title 3 to add a new chapter adopting a Transportation Utility Fee to be read by title only.

Council Deliberation:

Councilor Essin said the School District was concerned that they did not have time to include this in their budget. The private schools were being charged much less than the public schools. He was not clear why the School District was the only one getting a reduction. Mayor Andrews explained the ordinance would go into effect July 1, 2017, which would have no impact on the current school budget. One of the ad hoc committee members was a representative of the School District.

City Engineer Hofmann said each school paid per student and there was a different rate depending on whether it was an elementary school, secondary school, or college. Private schools paid more per student because it was assumed that most were being driven to and picked up from school instead of on a school bus. Private schools were not getting a reduction.

Councilor Essin did not prefer to have a minimum spent on any portion of the roads. If for the first year they wanted to spend it all on slurry sealing because that would save the most roads or to fix all the pot holes, he wanted the flexibility for staff to do so. He did not think the School District should receive a reduction.

Mayor Andrews said they could not spend all the money on the good roads, which was the reason for the 70/30 split. He had wrestled with this decision and had attended the ad hoc committee meetings and talked with many members of the community. He would be voting in support.

Councilor Bacon said she would be voting yes. It was not easy and she knew some people would struggle, but they had to do something about the roads.

Councilor Johnson had sent the Council an email earlier today about why he would support it. The feedback he had received from constituents was 90% in favor due to road conditions. If something was not done, the problem would only get worse.

Councilor McKinney said he would support the ordinance. He attended some of the ad hoc committee meetings, and saw how they were trying to make the fee fair and reasonable. He had hoped that they would collect more funding because it did not fully take care of the road problem. This had been a Council goal previously.

Motion carried (6 Yes/1 No [Essin]).

Resolution 2017-3375, Transportation System Development Charge (SDC):

Mayor Andrews called to order the administrative public hearing. He asked for declarations of conflicts of interest or abstentions or objections to Council jurisdiction. There were none.

John Ghilarducci, FCS Group, delivered the staff report. SDCs are one time charges paid at the time of development or redevelopment and are for capital construction only. It's how the City charges for impacts to the

transportation system. He explained how the reimbursement fee portion and improvement fee portion of the charge were calculated. If a developer built a project on the project list, they were given credits against their SDCs for the oversizing capacity. One change proposed to the Transportation SDC was how charges are applied. Currently it was based on average daily vehicle trip generation. They were proposing a charge based on peak hour person trip generation. The system was built to meet peak hour demands and that should be captured in the SDC charge. Person trips would allow them to capture bicycle and pedestrian trips for multi-modal project allocations. Other changes included recommendations about the City's credit policy. They recommended the City no longer provide SDC waivers for downtown development.

Growth was the denominator in the SDC calculation and the peak hour estimates were taken from the Transportation System Plan. The City had spent \$7.2 million since 2007 on capacity increasing transportation infrastructure funded by SDCs. They assumed some of that capacity had been used up, and the reimbursement fee would be adjusted to \$4.5 million. The larger numbers were in the improvement fee. Of the \$116 million of projects, \$52.2 million had been identified as capacity increasing to meet the needs of future users. The law also allowed the City to recover the cost of accounting for the SDC program studies, which was about \$240,000. The total Transportation SDC would be \$3,371 per peak hour person trip. Under the current methodology, a new single family residence would pay \$3,053 and under the proposed methodology it would be \$5,788. The impacts on development varied as land uses generated peak hour trips differently depending upon the type of use. He compared the combined total of all SDCs in Newberg with other neighboring cities and Newberg was in the bottom third.

There was discussion on how Newberg compared to other municipalities, which was the same for commercial, residential and industrial. There was discussion on the Transportation Development Tax used by other municipalities to fund projects. Mr. Ghilarducci clarified SDC calculations that a single family residence generated 1.71 peak hour person trips on average which was multiplied by the \$3,371 to arrive at the \$5,788. There were different trip generations depending on the land use that were applied to the \$3,371 charge.

CM Hannan asked about SDC waivers, such as for affordable housing. Mr. Ghilarducci said the law required rate making principles in calculating the SDC charge. They had to charge based on usage or impact. Waivers could get the City if not made based on usage or impact. There needed to be reduced trip generation or no improvements being planned that resulted in a lower charge.

Proponents: None.

Opponents: Robert Soppe, Newberg, had some concerns about the resolution. When the Transportation System Plan that supported this new methodology was adopted, he raised the concern about the difference between the cost of projects from the previous TSP. It had projects broken down by how they would be funded. The new TSP did not do that. The total cost of projects used to determine the SDC rate was much higher than the old methodology. A good example was project E-14, the connection of Crestview Drive through Crestview Crossing. The TSP showed the developer shouldering the entire cost and no cost to the SDC fund. Under the proposed methodology, all of the \$1.83 million was included in the SDC rate calculation. The net result was that developers would be paying SDCs at rates that supported projects that would not be funded by SDCs. This was not an issue about what percentage of a project was SDC eligible. The issue was that the cost of the project being used to calculate SDC rates even though SDCs might not be used to fund the project. He was also concerned about SDC credits. In the section of the Municipal Code that allowed credits for qualified public improvements, under the definition of qualified public improvements it stated credits should only be applied to residential developments and that the improvement for which the credit was given could not be within or adjacent to the development. This was not the policy that the City had followed in numerous instances. He thought they needed to look at this section of the Code and at past credits to see if they were consistent with the Code.

Councilor McKinney asked for clarification. Mr. Soppe said the City was calculating SDCs based on the cost of projects without regard for how the projects were being paid for. Councilor McKinney said was too much being collected? Mr. Soppe said yes. The other issue was if the City gave credits for projects other than residential, they did not have the authority to do so and it needed to be fixed. Councilor Essin asked what he recommended. Mr. Soppe thought they should follow the old methodology or justify the new methodology. He did not think the new methodology made sense to calculate SDCs based on projects that would not be paid for by SDCs.

Undecided: None.

Mayor Andrews closed the public comments portion of the hearing.

Mr. Ghilarducci said identification of other funding in the TSP was speculative and uncertain. The inclusion of a project identified as developer funded allowed the City to spend SDCs on the project if there was a need in the future, such as partnering with the developer or building it without developer participation. If it was not on the list, the City could not spend SDCs on it. Leaving it on the list provided the developer a credit for the oversizing portion of their project. There were advantages for these projects to be on the list. CE Hofmann said the methodology was sent out to an interested party list and no comments were received in opposition. She recommended approval of the resolution.

There was discussion regarding how SDCs were used for projects and possibly adopting a Transportation Development Tax similar to Washington County.

Mayor Andrews closed the public hearing.

MOTION: Corey/Bacon moved to approve Resolution 2017-3375, A Resolution to approve the Transportation System Development Charge methodology and increase the charge.

Council Deliberation: Councilor Essin said staff's answer to Mr. Soppe's question was that the projects on the list allowed the City to build the project in case it was not built by the developer. They were collecting extra money, but if they did not then they ran the risk of not being able to do the project. CE Hoffman said Mr. Soppe's concern was that the entire project cost was included rather than assuming the developer would pay a portion of it and the rest of the funding would come from somewhere else, which was purely speculative. They did not know for sure who would pay or build it, so the City assumed the entire cost in the SDC calculation so the City could build the entire project if they chose. Staff recommended moving forward with the new methodology. The development community had no concerns with the change. Mr. Ghilarducci explained that if a developer built a project, he would get SDC credits for the portion that was oversized that could be used for the next time they built in Newberg and that cash did not come into the City. The City should only generate the amount of money that would be needed for the SDC credits. The City did not get extra money, they were crediting it back and the developer did not have to pay SDCs for the next project.

Motion carried (7 Yes/ 0 No).

Resolution 2017-3366, McCaw Partition:

Mayor Andrews opened the legislative public hearing. He asked for declarations of conflicts of interest or abstentions or objections to Council jurisdiction. There was none.

Senior Planner Olson presented the staff report. This property was outside the City limits, but inside the Urban Growth Boundary and was a recommendation to the County. The property owner was proposing to partition the existing two acre lot into two one acre lots and would build a house on the new lot. They had submitted a proposed development plan that showed how the partition would not preclude future urban development of the property. Staff recommended approval.

17

Proponents: None
Opponents: None
Undecided: None

Mayor Andrews closed the public hearing.

MOTION: Bacon/Corey moved to approve Resolution 2017-3366, A Resolution recommending that Yamhill County approve a proposed partition at 2201 NE Chehalem Drive, Yamhill County Tax Lot No. 3218BA-400. Motion carried (7 Yes/ 0 No).

COUNCIL BUSINESS:

MOTION: Andrews/Corey moved to accept Councilor Delle's letter of resignation with her final meeting on May 15. Motion carried (7 Yes/ 0 No).

ADJOURNMENT: The meeting was adjourned at 9:34 p.m.

ADOPTED by the Newberg City Council this 5th day of June, 2017.

Sue Ryan, City Recorder

ATTESTED by the Mayor this ____ day of June, 2017.

Bob Andrews, Mayor

REQUEST FOR COUNCIL ACTION

DATE ACTION REQUESTED: June 5, 2017

Order ____ Ordinance XX Resolution ____ Motion ____ Information ____
No. No. 2017-2815 No.

SUBJECT: An Ordinance denying an annexation application for 25.66 acres of property located at 25020, 25240 and 25300 NE North Valley Road, Yamhill County Tax Lots 3207-600, 700 and 800 into the Newberg city limits

Contact Person (Preparer) for this
Motion: Steve Olson, Senior Planner
Dept.: Community Development
File No.: ANX-17-001

HEARING TYPE: ☐ LEGISLATIVE ☒ QUASI-JUDICIAL ☐ NOT APPLICABLE

RECOMMENDATION:

Staff recommends that City Council make a motion and approve a motion to continue the public hearing to September 18, 2017 at 7 p.m. and to reopen the public record to accept written and oral testimony.

EXECUTIVE SUMMARY:

The proposed annexation is for three parcels totaling approximately 25.66 acres of property plus the area of the adjacent right-of-way, located at 25020, 25240 and 25300 NE North Valley Road. The property is located within the Newberg urban growth boundary and has a Newberg Comprehensive Plan designation of LDR (Low Density Residential) with a Stream Corridor overlay. The annexation would change the zoning of the property from Yamhill County AF-10 to Newberg R-1 (Low Density Residential) with a Stream Corridor overlay. The R-1 zone has a minimum lot size of 5,000 square feet for future residential development. The applicant's concept development plan shows a subdivision for single-family homes, with an average lot size of over 5,000 square feet. The concept development plan is not binding on the applicant, and the annexation does not approve a subdivision for the property, but the subdivision concept does show how the site could potentially be developed.

The City Council held a public hearing on May 15, 2017, listened to public testimony, closed public testimony, and waived the second reading for this ordinance. The Council deliberated, and approved a motion to deny the application but to set it over to the next meeting on June 5, 2017 so the Ordinance language and findings could be revised.

The applicant, subsequent to the May 15, 2017 City Council meeting, submitted a request to extend the 120 day rule to exhaust all local review processes by an additional 90 days. The applicant additionally requested that the public record be reopened to allow for submission of additional evidence. The 90 day extension extends the local review timeline out to September 18, 2017.

FISCAL IMPACT:

No direct fiscal impact to the city other than 25.66 acres will not be added to the city property tax base.

STRATEGIC ASSESSMENT (RELATE TO COUNCIL PRIORITIES FROM MARCH 2016):

Not applicable.

ATTACHMENTS:

1. Del Boca Vista Extension Request and Request to Reopen the Public Record

Doug Rux

From: dan@dbvcorp.com
Sent: Monday, May 22, 2017 10:14 AM
To: Doug Rux
Cc: Truman Stone; Joe Hannan; 'Jessica S. Cain'
Subject: RE: Dutchman Ridge Annexation Application

Doug,

We are asking for 90 days. Should we need more time, is an additional extension permissible?

Daniel Danicic
Del Boca Vista, LLC
971-706-2058

From: Doug Rux [mailto:Doug.Rux@newbergoregon.gov]
Sent: Monday, May 22, 2017 10:08 AM
To: 'dan@dbvcorp.com' <dan@dbvcorp.com>
Cc: Truman Stone <Truman.Stone@newbergoregon.gov>; Joe Hannan <Joe.Hannan@newbergoregon.gov>; 'Jessica S. Cain' <jessica@dbvcorp.com>
Subject: RE: Dutchman Ridge Annexation Application

Dan,

How long of an extension are you requesting?

Doug Rux, AICP
Community Development Director
City of Newberg
503.537.1212
Doug.Rux@newbergoregon.gov

From: dan@dbvcorp.com [mailto:dan@dbvcorp.com]
Sent: Monday, May 22, 2017 9:42 AM
To: Doug Rux
Cc: Truman Stone; Joe Hannan; 'Jessica S. Cain'
Subject: Dutchman Ridge Annexation Application

Doug,

We are formally asking for an extension of the 120-day and reopening of the public record to allow for submission of additional evidence.

Thank you.

Daniel Danicic

Direct # 971-706-2052

dan@dbvcoro.com



971.706.2052 • 971.206.5009
PO BOX 3189 VAIL BMC, 97132

WWW.DANICIC.COM

REQUEST FOR COUNCIL ACTION

DATE ACTION REQUESTED: June 5, 2017

Order ____	Ordinance ____	Resolution <u>XX</u>	Motion ____	Information ____
No.	No.	No. 2017-3371 and	2017-3372	

SUBJECT: Public Hearing and Approval for State Revenue Sharing for 2017-18

Contact Person (Preparer) for this Motion: Matt Zook
Dept.: Finance
File No.:

HEARING TYPE: ADMINISTRATIVE

RECOMMENDATION:

Adopt Resolution No. 2017-3371 and Resolution No. 2017-3372

EXECUTIVE SUMMARY:

The City of Newberg relies upon State Shared Revenues to provide vital services to its citizens. The City is required to meet certain obligations to participate in this program. To receive the “State Revenue Sharing” funds identified as 14% of total liquor revenues, the City must hold public hearings before the Budget Committee and City Council to discuss the uses of these revenues. The City performed the public hearing to discuss *possible* uses of the revenue before the Budget Committee on May 3, 2017. The Budget Committee passed a motion to use the State Revenue Sharing funds to support General Fund operations. The City Council will hold a public hearing on the *proposed* uses of the revenue on June 5, 2017, before the adoption of Resolution 2017-3371. The adoption of Resolution 2017-3371 will finalize this requirement.

The City has an additional requirement in order to receive the “State Revenue Sharing” funds (14% of total liquor revenues), as well as other State Shared Revenues identified as Liquor Tax (20% of the total liquor revenues), Cigarette Tax, and Gas Tax. This requirement comes as a result of Yamhill County having a population greater than 100,000. The city must certify that it provides at least four of the following municipal services – fire protection, police protection, street construction/maintenance/lighting, sanitary sewers, storm sewers, planning/zoning/subdivision control, or one or more utility services. The adoption of Resolution 2017-3372 will finalize this requirement.

Future participation in state revenue sharing of state marijuana tax is anticipated to require a quarterly certification process. No action is required at this time.

Upon adoption of these two resolutions, City staff will send the two resolutions included in this packet to the Department of Administrative Services before July 31, 2017.

FISCAL IMPACT:

The FY 2017-18 Approved Budget anticipates Stated Shared Revenues in the following funds:

- | | | |
|--------------------------|-------------|---|
| 1) Liquor Taxes | \$365,164 | General Fund (requires Resolution 2017-3372) |
| 2) Cigarette Taxes | \$27,474 | General Fund (requires Resolution 2017-3372) |
| 3) State Revenue Sharing | \$237,412 | General Fund (requires Resolution 2017-3371 and 3372) |
| 4) Gas Taxes | \$1,323,500 | Street Fund (requires Resolution 2017-3372) |

STRATEGIC ASSESSMENT (RELATE TO COUNCIL GOALS):

Strategically, this revenue contributes to the provision of basic core services, namely the livability of the community and the protection of life and property.



RESOLUTION No. 2017-3371

**A RESOLUTION DECLARING THE CITY OF NEWBERG'S ELECTION TO
RECEIVE REVENUES THROUGH THE STATE REVENUE SHARING
PROGRAM**

RECITALS:

1. **WHEREAS**, State Revenue Sharing Law, ORS 221.770 requires cities to pass an ordinance or resolution each year stating that they want to receive state revenue sharing money;
2. **WHEREAS**, a copy of this ordinance or resolution must be filed with Shared Financial Services of the Department of Administrative Services before July 31 of each year; and
3. **WHEREAS**, the City held a public hearing to discuss *possible* uses of the revenue before the Budget Committee on May 3, 2017. The Budget Committee passed a motion to use the State Revenue Sharing funds to support General Fund operations. The City Council held a public hearing on the *proposed* uses of the revenue on June 5, 2017.

THE CITY OF NEWBERG RESOLVES AS FOLLOWS:

Section 1. Pursuant to ORS 221.770, the City hereby elects to receive state revenues for fiscal year 2017-18.

➤ **EFFECTIVE DATE** of this resolution is the day after the adoption date, which is: June 6, 2017.

ADOPTED by the City Council of the City of Newberg, Oregon, this 5th day of June, 2017.

Sue Ryan, City Recorder

ATTEST by the Mayor this _____ day of _____, 2017.

Bob Andrews, Mayor

I certify that a public hearing before the Budget Committee was held on May 3, 2017 and a public hearing before the City Council was held June 5, 2017, giving citizens an opportunity to comment on use of State Revenue Sharing.

Sue Ryan, City Recorder



RESOLUTION No. 2017-3372

A RESOLUTION CERTIFYING THE PROVISION OF MUNICIPAL SERVICES BY THE CITY OF NEWBERG FOR THE PURPOSES OF PARTICIPATION IN THE STATE REVENUE SHARING PROGRAM

RECITALS:

1. Whereas, ORS 221.760 provides as follows:

Section 1. The officer responsible for disbursing funds to cities under ORS 323.455, 366.785 to 366.820 and 471.805 shall, in the case of a city located within a county having more than 100,000 inhabitants according to the most recent federal decennial census, disburse such funds only if the city provides four or more of the following services:

- (1) Police protection
- (2) Fire protection
- (3) Street construction, maintenance, and lighting
- (4) Sanitary sewer
- (5) Storm sewers
- (6) Planning, zoning, and subdivision control
- (7) One or more utility services

And

2. Whereas, city officials recognize the desirability of assisting the state officer responsible for determining the eligibility of cities to receive such funds in accordance with ORS 221.760, now, therefore,

THE CITY OF NEWBERG RESOLVES AS FOLLOWS:

That the City of Newberg hereby certifies that it provides the following four or more municipal services enumerated in Section 1, ORS 221.760:

- (1) Police protection
- (2) Fire protection
- (3) Street construction, maintenance, and lighting
- (4) Sanitary sewer
- (5) Storm sewers
- (6) Planning, zoning, and subdivision control
- (7) Water utility service

➤ **EFFECTIVE DATE** of this resolution is the day after the adoption date, which is: June 6, 2017.

ADOPTED by the City Council of the City of Newberg, Oregon, this 5th day of June, 2017.

Sue Ryan, City Recorder

ATTEST by the Mayor this _____ day of _____, 2017.

Bob Andrews, Mayor

REQUEST FOR COUNCIL ACTION

DATE ACTION REQUESTED: June 5, 2017

Order ____ Ordinance ____ Resolution X Motion ____ Information ____
No. No. No. 2017-3373

SUBJECT:

- 1. Hold Public Hearings on the 2017-2018 City Budget**
- 2. Adopt Resolution No. 2017-3373, adopting the 2017-2018 City Budget**

**Contact Person (Preparer) for this
Motion: Matt Zook
Dept.: Finance**

HEARING TYPE: ADMINISTRATIVE

RECOMMENDATION:

Adopt Resolution No. 2017-3373 adopting the 2017-2018 Budget, and appropriating as recommended by the Budget Committee on May 10, 2017.

EXECUTIVE SUMMARY:

The Budget Committee met on April 25, May 3, May 9 and May 10, 2017, to review and deliberate on the proposed 2017-2018 City Budget presented by the Budget Officer.

The Budget Committee approved three modifications to the 2017-2018 Proposed Budget. The first modification increased the Blaine St stormwater project by \$100,000 due to lower project expenses in 2016-17, affecting the Capital Project Fund (04), the Stormwater Fund (17), and the Stormwater SDC Fund (43). The second modification increased the development/marketing grants by \$250,000 in the Transient Lodging Tax Fund (19) which will not be awarded in 2016-17. The third modification reallocated funds within several projects in the Street Capital Project Fund (18). The combined total of these modifications increased the 2017-18 budget by \$450,000. Exhibit A provides a numerical summary of these changes between the Proposed and Approved budgets.

City Staff is recommending two additional changes to the Approved budget that will result in a reclassification of Contingency to Reserves in Street Capital Projects Fund (18) and Stormwater SDC Fund (43). After review of Oregon Budget Law it has been determined that a non-operating fund, such as Fund 18 & 43, cannot have an appropriation for a contingency. Therefore, these line items will move \$170,396 & \$14,234, respectively, from Contingency to Reserves. Total appropriations will be reduced by these amounts, but the overall budget will remain the same.

FISCAL IMPACT: The 2017-2018 Budget equals \$97,403,431 with 144.33 FTE. Total appropriations equals \$83,102,953, with reserves and unappropriated ending fund balances totaling \$14,300,478. The permanent property tax rate remains at \$4.3827 per \$1,000.00 assessed value.

STRATEGIC ASSESSMENT: This is a balanced budget and reflects the direction and priorities of the City Council to meet the needs of this community.

Changes to the 2017-18 Budget from Proposed to Approved

			Proposed	Approved	Change		
Fund 04 - Proprietary Capital Projects Fund							
Revenues							
04-0000-390017	Transfer In-Stormwater Fund	\$	800,000	\$	895,000	\$ 95,000	Change #1
04-0000-390043	Transfer In-Stormwater SDC	\$	50,000	\$	55,000	\$ 5,000	
Expenses							
04-5150-717711	Blaine St (2nd - 11th)	\$	800,000	\$	900,000	\$ 100,000	
Total Proprietary Capital Projects Fund		\$	7,035,000	\$	7,135,000	\$ 100,000	
Fund 17 - Stormwater Fund							
Revenues							
17-0000-300000	Beg F/B-Net Working Capital	\$	803,152	\$	898,152	\$ 95,000	Change #1
Expenses							
17-9170-904000	Transfer Out-Capital Projects	\$	800,000	\$	895,000	\$ 95,000	
Total Stormwater Fund		\$	2,292,076	\$	2,387,076	\$ 95,000	
Fund 18 - Street Capital Projects Fund							
Expenses							
18-5150-702111	College St Bikelane & Sidewalk	\$	150,000	\$	120,000	\$ (30,000)	Change #3
18-5150-702163	Villa Rd - Haworth to Crestview	\$	2,500,000	\$	2,715,000	\$ 215,000	
18-5150-702171	Pavement Rehabilitation	\$	330,000	\$	225,000	\$ (105,000)	
18-5150-702176	LED Street Light Conversion	\$	80,000	\$	-	\$ (80,000)	
Total Street Capital Projects Fund		\$	5,105,396	\$	5,105,396	\$ -	
Fund 19 - Transient Lodging Tax Fund							
Revenues							
19-0000-300000	Beg F/B-Net Working Capital	\$	-	\$	250,000	\$ 250,000	Change #2
Expenses							
19-1110-592500	Tourism Promotion	\$	24,237	\$	24,787	\$ 550	
19-1110-592501	Visitor Center Contract	\$	140,436	\$	139,886	\$ (550)	
19-9130-603100	Development/Marketing Grants	\$	180,622	\$	430,622	\$ 250,000	
Total Transient Lodging Tax Fund		\$	1,047,427	\$	1,297,427	\$ 250,000	
Fund 43 - Stormwater SDC Fund							
Revenues							
43-0000-300000	Beg F/B-Net Working Capital	\$	89,806	\$	94,806	\$ 5,000	Change #1
Expenses							
43-9170-904000	Transfer Out-Capital Projects	\$	50,000	\$	55,000	\$ 5,000	
Total Stormwater SDC Fund		\$	161,006	\$	166,006	\$ 5,000	
Total Change to Budget							
		\$	96,953,431	\$	97,403,431	\$ 450,000	



RESOLUTION No. 2017-3373

**A RESOLUTION ADOPTING THE CITY OF NEWBERG, OREGON
BUDGET FOR THE 2017-2018 FISCAL YEAR, MAKING
APPROPRIATIONS, IMPOSING THE TAX, AND CATEGORIZING THE
TAX**

RECITALS:

1. The City of Newberg Budget Committee approved the fiscal year 2017-18 budget on May 10, 2017.
2. The notice of this budget hearing (Form LB-1) was published in the May 31, 2017 Newberg Graphic.

THE CITY OF NEWBERG RESOLVES AS FOLLOWS:

1. Adopting the Budget. The City Council of the City of Newberg hereby adopts the budget for fiscal year 2017-18 in the total of \$97,403,431 now on file at City Hall located at 414 E. First Street, Newberg, Oregon.
2. Making Appropriations. The amounts for the fiscal year beginning July 1, 2017, and for the purposes shown below are hereby appropriated:

General Fund (01)

General Government	210,073
Municipal Court	312,131
Police	6,835,552
Fire	3,866,703
Communications	3,509,676
Library	1,767,171
Planning	1,262,702
Transfers	143,834
Contingency	643,504

Total General Fund (01)	18,551,346
-------------------------	------------

Street Fund (02)

Public Works	1,362,441
Transfers	987,150
Contingency	95,939

Total Street Fund (02)	2,445,530
------------------------	-----------

Civil Forfeiture Fund (03)

Police	25,434
Total Civil Forfeiture Fund (03)	25,434

Proprietary Capital Projects Fund (04)

Capital Projects	7,135,000
Total Proprietary Capital Projects Fund (04)	7,135,000

Emergency Medical Services Fund (05)

Fire	200,000
Transfers	351,741
Contingency	36,295
Total Emergency Medical Services Fund (05)	588,036

Wastewater Fund (06)

Public Works	5,661,478
Special Payments	50,000
Debt Service	2,327,273
Transfers	3,110,000
Contingency	1,979,530
Total Wastewater Fund (06)	13,128,280

Water Fund (07)

Public Works	3,779,337
Special Payments	25,000
Debt Service	414,603
Transfers	1,805,174
Contingency	2,084,343
Total Water Fund (07)	8,108,457

Building Inspection Fund (08)

Building Inspection	689,957
Transfers	16,810
Contingency	1,050,905
Total Building Inspection Fund (08)	1,757,672

Debt Service Fund (09)

Debt Service	736,006
Total Debt Service Fund (09)	736,006

City Hall Fund (10)

Transfers	108,486
Total City Hall Fund (10)	108,486

9-1-1 Emergency Fund (13)

Communications	224,876
Contingency	19,481
Total 9-1-1 Emergency Fund (13)	244,357

Economic Development Fund (14)

Planning	79,123
Special Payments	763,337
Transfers	4,872
Contingency	132,568

Total Economic Development Fund (14) 979,901

Public Safety Fee Fund (16)

Police	354,914
Communications	187,878
Contingency	63,629

Total Public Safety Fee Fund (16) 606,421

Stormwater Fund (17)

Public Works	1,279,253
Transfers	895,000
Contingency	212,823

Total Stormwater Fund (17) 2,387,076

Street Capital Projects Fund (18)

Capital Projects	4,935,000
------------------	-----------

Total Street Capital Projects Fund (18) 4,935,000

Transient Lodging Tax Fund (19)

General Government	166,673
Special Payments	450,622
Transfers	680,132

Total Transient Lodging Tax Fund (19) 1,297,427

Library Gift & Memorial Fund (22)

Library	160,000
Contingency	39,116

Total Library Gift & Memorial Fund (22) 199,116

Cable TV Trust Fund (23)

General Government	38,025
--------------------	--------

Total Cable TV Trust Fund (23) 38,025

PERS Stabilization Reserve Fund (25)

Transfers	179,255
Total PERS Stabilization Reserve Fund (25)	179,255

Admin / Support Services Fund (31)

City Manager's Office	857,483
Finance	1,057,762
General Office	177,289
Information Technology	1,071,444
Legal	480,443
Public Works	1,044,410
Insurance	366,446
Transfers	3,362
Contingency	244,898
Total Admin / Support Services Fund (31)	5,303,536

Vehicle / Equipment Replacement Fund (32)

City Manager's Office	2,481
Finance	17,496
Information Technology	76,396
Legal	423
Municipal Court	4,114
Police	461,425
Communications	153,488
Library	13,103
Planning	2,975
Building Inspection	26,412
Public Works	1,567,572
Facilities Repair / Maintenance	160,940
Total Vehicle / Equipment Replacement Fund (32)	2,486,825

Street System Development Fund (42)

Transfers	3,971,000
Contingency	1,359,238
Total Street System Development Fund (42)	5,330,238

Stormwater System Development Fund (43)

Transfers	55,000
Contingency	96,772
Total Stormwater System Development Fund (43)	151,772

Wastewater System Development Fund (46)

Debt Service	284,724
Transfers	1,295,000
Contingency	3,766,802
Total Wastewater System Development Fund (46)	5,346,526

Water System Development Fund (47)

Debt Service	845,831
Transfers	183,100
Contingency	4,300
Total Water System Development Fund (47)	1,033,231

Total Appropriated Budget 83,102,953

Unappropriated Fund Balance - General Fund (01)	1,100,000
Unappropriated Fund Balance - Debt Service Fund (09)	44,365
Unappropriated Fund Balance - City Hall Fund (10)	496,600
Reserves - Wastewater Fund (06)	5,830,907
Reserves - Water Fund (07)	6,643,976
Reserves - Street Capital Projects Fund (18)	170,396
Reserves - Stormwater SDC Fund (43)	14,234

Total Budget 97,403,431

3. Imposing and Categorizing the Tax. The City Council of the City of Newberg imposes the taxes provided for in the adopted budget at the rate of \$4.3827 per \$1,000.00 of assessed value for permanent tax rate, and that these taxes are hereby imposed and categorized for the tax year 2017-2018 upon the assessed value of all taxable property within the City as follows:

	<u>General Government Limitation</u>	<u>Excluded from the Limitation</u>
General Fund	\$4.3827 per \$1,000.00 TAV	

4. The Finance Director is authorized and directed to certify the levy with the Yamhill County Assessor and Yamhill County Clerk.

➤ **EFFECTIVE DATE** of this resolution is the day after the adoption date, which is June 6, 2017.

ADOPTED by the City Council of the City of Newberg, Oregon, this 5th day of June, 2017.

Sue Ryan, City Recorder

ATTEST by the Mayor this ____ day of June, 2017.

Bob Andrews, Mayor

REQUEST FOR COUNCIL ACTION

DATE ACTION REQUESTED: June 5, 2017

Order ____ No.	Ordinance ____ No.	Resolution <u>X</u> No. 2017-3381	Motion ____	Information ____
-------------------	-----------------------	--------------------------------------	-------------	------------------

SUBJECT: Request for approval of Supplemental Budget #2 for fiscal year 2016-2017 as described in Exhibit "A".

Contact Person (Preparer) :

Matt Zook

HEARING TYPE: ADMINISTRATIVE

RECOMMENDATION:

Adopt **Resolution No. 2017-3381** for approval of Supplemental Budget #2 for fiscal year 2016-2017.

EXECUTIVE SUMMARY:

The changes recommended in Supplemental Budget #2 include relatively minor adjustments in operations, as well as re-categorization of special payments and reserves in order to follow Oregon budget law. A brief description of the changes in each fund is provided below

BACKGROUND:

General Fund – Minor unanticipated increase in operational expenditures in the General Government department.

Street Fund – The Department Support Manager was moved from the General Fund Fire Department to four Public Works funds (25% each in Street, Wastewater, Water, and Stormwater) where the employee's work was actually performed. The Street and Stormwater funds require an increase in appropriations, where the Wastewater and Water funds have adequate appropriations.

EMS Fund – In the course of closing the books on the EMS operations and transitioning to TVF&R operations, \$19,290 of a total of \$23,500 in donations from the Newberg Charitable Organization (NCO) remained unspent. Frank Douglas, Medical Services Chief with TVF&R and former Division Chief with the City, arranged NCO to return the unspent funds as they were no longer needed for the intended purpose, considering of the equipment owned by TVF&R. This allowed NCO to consider donating new opportunities, such as TVF&R Mobile Integrated Health program. The return of donated funds received in a prior year represents an expense in the current year, and as such was not originally appropriated in the original budget. The offset for the additional expense is higher than anticipated revenue from user fees from ambulance services billed prior to June 30, 2016 (approximately \$39k). The net revenue between the additional user fees and the return of unspent donations is \$19,450 and increases Contingency.

Finally, the loan to TVF&R of \$500,000 was incorrectly categorized as Capital Outlay in the Adopted Budget. The loan should have been categorized as Special Payments. This is being corrected with Supplemental Budget #2.

Building Inspection Fund – The Plans Examiner position was vacated in May. Professional services from the Mid-Willamette Valley Council of Governments will backfill this position until the staff position is

filled in June or July. The payment of unused vacation time offsets some or all of the savings from vacant positions, requiring additional funds for coverage. The Building Department activity is robust enough to require the additional appropriation, which is being covered from Contingency.

911 Emergency Fund – Overtime costs are higher than anticipated. These costs will be offset by 911 revenue coming in higher than anticipated, as well as a transfer from Contingency.

Economic Development Fund – Approximately \$2,000 unanticipated in operational expenditures in materials & services. In addition, the budget for economic development and affordable housing loans and grants was incorrectly categorized as Capital Outlay in the Adopted Budget. These should have been categorized as Special Payments. This is being corrected with Supplemental Budget #2.

Stormwater Fund – The Department Support Manager was moved from the General Fund Fire Department to four Public Works funds (25% each in Street, Wastewater, Water, and Stormwater) where the employee's work was actually performed. The Street and Stormwater funds require an increase in appropriations, where the Wastewater and Water funds have adequate appropriations.

Street Capital Projects Fund – In accordance with Oregon Budget Law, non-operating funds, such as capital project funds, cannot hold funds in Contingency. This was brought to staff's attention in December 2016 by the city's audit firm. Supplemental Budget #2 moves approximately \$166,000 from Contingency to Reserves. These funds represent payments from developers for future improvements.

Transient Lodging Tax (TLT) Fund – In the event that actual revenues exceed the budget, the transfer to the General Fund would exceed appropriations. While revenues are difficult to predict, this budget change increases revenue and the appropriate expenditures to accommodate compliance with Oregon budget law. The actual transfer to General Fund, which is approximately 65% of TLT revenue, will be based on actual revenue received, with the remaining 35% staying in the TLT fund for tourism promotion purposes.

Library Gift, Memorial & Grant Fund – This fund accounts for Library grants as well as pass-through funds for the Library Friends. Actual activity may be higher than appropriated.

Admin Support Services Fund – The Information Technology Department had unanticipated backup system expenditures.

Fire Equipment Fee Fund – Additional interest revenue that will be used toward the fixed amount of the TVF&R contract payment.

Stormwater System Development Fund – In accordance with Oregon Budget Law, non-operating funds, cannot hold funds in Contingency. This was brought to staff's attention in December 2016 by the city's audit firm. Supplemental Budget #2 moves approximately \$14,000 from Contingency to Reserves. These fund represent payments from developers for future improvements.

FISCAL IMPACT:

Supplemental Budget #2 results in a net decrease in total appropriations of \$81,441, bringing total appropriations to \$74,926,725. The adjusted adopted budget includes appropriations, unappropriated ending fund balances (\$1,626,684), and reserves (\$12,993,680) for a total amount of \$89,547,089.



RESOLUTION No. 2017-3381

**A RESOLUTION TO ADOPT SUPPLEMENTAL BUDGET #2 FOR FISCAL
YEAR 2016-2017 BEGINNING JULY 1, 2016, AND ENDING JUNE 30,
2017**

RECITALS:

1. The 2016-2017 Budget was adopted by Resolution No. 2016-3297 on June 6, 2016.
2. Supplemental Budget #1 was adopted by Resolution No. 2017-3350 on January 3, 2017.
3. Additional operational and unanticipated expenses and revenues have occurred or may occur for which the budget needs to be adjusted. In addition, some activity is being properly re-categorized to comply with Oregon budget law. These changes are identified by fund as shown in Exhibit "A".
4. Notice of Public Hearing for this Supplemental Budget was published in the Newberg Graphic on May 31, 2017.

THE CITY OF NEWBERG RESOLVES AS FOLLOWS:

To recognize unanticipated operational expenses in various funds to be covered by transfers from contingencies and offset by additional resources, as well as properly re-categorize certain fund activity, as attached in Exhibit "A", which is hereby adopted and by this reference incorporated.

- **EFFECTIVE DATE** of this resolution is the day after the adoption date, which is: June 6, 2017.

ADOPTED by the City Council of the City of Newberg, Oregon, this 5th day of June, 2017.

Sue Ryan, City Recorder

ATTEST by the Mayor this ____ day of June, 2017.

Bob Andrews, Mayor

EXHIBIT "A" TO RESOLUTION NO. 2017-3381

City of Newberg Supplemental Budget #2 Fiscal Year 2016-2017

SUMMARY OF PROPOSED BUDGET CHANGES

AMOUNTS SHOWN ARE REVISED TOTALS IN THOSE FUNDS BEING MODIFIED

<u>FUND 01 - GENERAL FUND</u>		BUDGET	CHANGE	REVISED
General Government	<i>Increase</i>	208,748	4,918	213,666
Contingency	<i>Decrease</i>	1,175,681	(4,918)	1,170,763

Revised Total Resources	16,947,889
-------------------------	------------

Revised Total Requirements	16,947,889
----------------------------	------------

Minor miscellaneous materials & services expenses

<u>FUND 02 - STREETS</u>		BUDGET	CHANGE	REVISED
Public Works	<i>Increase</i>	1,317,871	80,357	1,398,228
Contingency	<i>Decrease</i>	430,155	(80,357)	349,798

Revised Total Resources	3,024,383
-------------------------	-----------

Revised Total Requirements	3,024,383
----------------------------	-----------

0.25 FTE (full time equivalent position) moved from General Fund-Fire to PW funds for Dept Support Manager. Also, additional professional services for the implementation of the Transportation Utility Fee.

<u>FUND 05 - EMERGENCY MEDICAL SERVICES</u>		BUDGET	CHANGE	REVISED
Resources	<i>Increase</i>	1,573,244	38,740	1,611,984
Fire	<i>Decrease</i>	1,173,483	(480,710)	692,773
Special Payments	<i>Increase</i>	-	500,000	500,000
Contingency	<i>Increase</i>	61,549	19,450	80,999

Revised Total Resources	1,611,984
-------------------------	-----------

Revised Total Requirements	1,611,984
----------------------------	-----------

Resources: Higher than anticipated user fee collection and interest revenue. Requirements: Fire-return of unspent donation to Newberg Charitable Organization from 2015-16 (increase in Fire of \$19,290). Recategorize TFRV&R contractual loan from Capital Outlay to Special Payments to properly categorize expense (decrease in "Fire" of \$500,000). Net change to Fire is a decrease of \$480,710. Increase in Special Payments to offset decrease in Fire.

<u>FUND 08 - BUILDING INSPECTION</u>		BUDGET	CHANGE	REVISED
Building Inspection	<i>Increase</i>	583,181	20,000	603,181
Contingency	<i>Decrease</i>	637,905	(20,000)	617,905

Revised Total Resources	1,238,541
-------------------------	-----------

Revised Total Requirements	1,238,541
----------------------------	-----------

Staff transition requires contracting out for professional services for interim planning services.

<u>FUND 13 - 911 Emergency</u>		BUDGET	CHANGE	REVISED
Resources	<i>Increase</i>	206,813	18,000	224,813
Communications	<i>Increase</i>	193,770	27,000	220,770
Contingency	<i>Decrease</i>	13,043	(9,000)	4,043

Revised Total Resources	224,813
Revised Total Requirements	224,813

Resources: Higher than anticipated 911 tax revenue. Requirements: Higher than anticipated personnel costs (overtime).

<u>FUND 14 - ECONOMIC DEVELOPMENT</u>		BUDGET	CHANGE	REVISED
Planning	<i>Decrease</i>	625,745	(599,962)	25,783
Special Payments	<i>Increase</i>	-	601,962	601,962
Contingency	<i>Decrease</i>	400,612	(2,000)	398,612

Revised Total Resources	1,031,199
Revised Total Requirements	1,031,199

Properly categorize potential Economic Development and Affordable Housing loans from "Planning" to "Special Payments" (\$601,962). Increase Planning from Contingency (\$2,000) for miscellaneous Materials & Services costs.

<u>FUND 17 - STORMWATER</u>		BUDGET	CHANGE	REVISED
Public Works	<i>Increase</i>	1,190,393	26,748	1,217,141
Contingency	<i>Decrease</i>	573,003	(26,748)	546,255

Revised Total Resources	2,607,440
Revised Total Requirements	2,607,440

0.25 FTE (full time equivalent position) moved from GF Fire to PW funds for Dept Support Manager.

<u>FUND 18 - STREET CAPITAL PROJECTS</u>		BUDGET	CHANGE	REVISED
Contingency	<i>Decrease</i>	166,547	(166,547)	-
Reserves for Future Expenditures	<i>Increase</i>	-	166,547	166,547

Revised Total Resources	1,791,430
Revised Total Requirements	1,791,430

Correctly categorize reserves in non-operating account.

<u>FUND 19 - TRANSIENT LODGING TAX</u>		BUDGET	CHANGE	REVISED
Resources	<i>Increase</i>	1,177,943	30,000	1,207,943
General Government	<i>Increase</i>	512,038	9,600	521,638
Transfers	<i>Increase</i>	665,905	20,400	686,305

Revised Total Resources	1,207,943
Revised Total Requirements	1,207,943

In the event that actual revenues exceed the budget, the transfer to the General Fund would exceed appropriations. While revenues are difficult to predict, this budget change increases revenue and the appropriate expenditures to accommodate compliance with Oregon budget law. Actual transfer to General Fund will be based on actual revenue received.

<u>FUND 22 - LIBRARY GIFT, MEMORIAL & GRANT</u>		BUDGET	CHANGE	REVISED
Resources	<i>Increase</i>	194,951	11,000	205,951
Library	<i>Increase</i>	142,000	11,000	153,000
Revised Total Resources		205,951		
Revised Total Requirements		205,951		

Potential additional grant revenue and expenditures.

<u>FUND 31 - ADMIN SUPPORT SERVICES</u>		BUDGET	CHANGE	REVISED
Information Technology	<i>Increase</i>	1,006,726	5,000	1,011,726
Contingency	<i>Decrease</i>	185,701	(5,000)	180,701
Revised Total Resources		4,797,639		
Revised Total Requirements		4,797,639		

Unanticipated materials & services costs for backup system.

<u>FUND 33 - FIRE EQUIPMENT FEE</u>		BUDGET	CHANGE	REVISED
Resources	<i>Increase</i>	371,152	1,600	372,752
Fire	<i>Increase</i>	371,152	1,600	372,752
Revised Total Resources		372,752		
Revised Total Requirements		372,752		

Account for additional interest revenue and payment to TVF&R contract.

<u>FUND 43 - STORMWATER SYSTEM DEVELOPMENT</u>		BUDGET	CHANGE	REVISED
Contingency	<i>Decrease</i>	82,424	(14,234)	68,190
Reserve for Future Expenditures	<i>Increase</i>	-	14,234	14,234
Revised Total Resources		195,216		
Revised Total Requirements		195,216		

Correctly categorize reserves.

Total Decrease in appropriations: (81,441)

Reconciliation of 2016-17 Budget Changes

Appropriations

Total Appropriations from original Adopted Budget (June 6, 2016)		\$72,527,898
Changes in appropriations		
Supplemental Budget #1 (January 3, 2017)		2,480,268
Supplemental Budget #2 (June 5, 2017)		<u>(81,441)</u>
Total Appropriations including Supplemental Budgets		<u><u>\$74,926,725</u></u>

Unappropriated Ending Fund Balance

Unappropriated Ending Fund Balance (UEFB) - General Fund		\$1,100,000
Unappropriated Ending Fund Balance - Debt Service Fund	\$31,309	
Increase in UEFB - Debt Service Fund (Supplemental Budget #1)	<u>5,717</u>	37,026
Unappropriated Ending Fund Balance - City Hall Fee Fund	\$494,268	
Decrease in UEFB - City Hall Fee Fund (Supplemental Budget #1)	<u>(4,610)</u>	489,658
Total Unappropriated Ending Fund Balance		<u><u>\$1,626,684</u></u>

Reserves

Reserves - General Fund		\$68,223
Reserves - Wastewater Fund		5,830,907
Reserves - Water Fund		6,497,805
Reserves - Stormwater Fund		236,709
Reserves - PERS Stabilization Fund		179,255
Reserves - Streets Capital Project Fund	\$0	
Increase in Reserve (Supplemental Budget #2)	<u>166,547</u>	166,547
Reserves - Stormwater SDC	\$0	
Increase in Reserve (Supplemental Budget #2)	<u>14,234</u>	14,234
Total Reserves		<u><u>\$12,993,680</u></u>

Adjusted Adopted Budget

\$89,547,089

REQUEST FOR COUNCIL ACTION

DATE ACTION REQUESTED: June 5, 2017

Order ____ Ordinance XX Resolution ____ Motion ____ Information ____
No. No. 2017-2816 No.

SUBJECT: An Ordinance adopting the 2017 Water System Master Plan and Incorporating the 2017 Water Master Plan into the Newberg Comprehensive Plan

Contact Person (Preparer) for this
Motion: Doug Rux, Director
Dept.: Community Development
File No.: CPTA-17-001

HEARING TYPE: ☒ LEGISLATIVE ☐ QUASI-JUDICIAL ☐ NOT APPLICABLE

RECOMMENDATION:

Adopt Ordinance No. 2017-2816.

EXECUTIVE SUMMARY:

The City of Newberg currently operates under a 2005 Water Distribution System Master Plan and a 2002 Water Treatment Facilities Plan. These master plans are prepared under a 20 year horizon and are updated approximately every 10 years.

The City of Newberg through the Engineering Services Department has been engaged since 2015 in preparing the 2017 Water System Master Plan which updates the 2002 and 2005 plans. Murraysmith were the consultants selected to update the current plans and incorporate the two existing plans into one comprehensive document. The Newberg Planning Commission initiated the Comprehensive Plan Text Amendment on March 9, 2017 by adopting Resolution No. 2017-325 (Attachment 1).

Oregon Revised Statutes and Oregon Administrative Rules govern the preparation of and amendments to water system master plans. Specifically Oregon Statewide Planning Goal 11 Public Facilities and Services, ORS 197.712(2)(e), Oregon Administrative Rules Chapter 333 Division 61 Public Water Systems and Chapter 660 Division 11 Public Facilities Planning are the applicable Statute, goals and rules.

A Citizens Advisory Committee was created for the 2017 Water System Master Plan. Members of the Committee included the following:

Brett Baker – Austin Industries
Don Clements – Chehalem Park and Recreation District
Larry Hampton – Newberg School District
Clyde Thomas – George Fox University
Jeff Shorzman – Providence Newberg Medical Center
Pierre Zreik – Allison Inn and Spa
Stan Kern – Citizen
Scott Essin – Newberg City Council

For water system master plans the following are applicable provisions to be included:

1. Sources of water
2. Treatment system
3. Storage system
4. Pumping system
5. Primary distribution system

The 2017 Water System Master Plan is broken into the following sections:

1. Introductions and Existing Water System
2. Water Requirements
3. Planning and Analysis Criteria
4. Water Supply Analysis
5. Water System Analysis
6. Operations and Maintenance
7. Recommendations and Capital Improvement Program

The proposed plan is based on a 20 year horizon to 2035.

Introductions and Existing Water System

This section of the Plan outlines the Springs Water System, the City water service area including service within the city limits, a small number of customers outside of the city and independent water districts outside of the city. For purposes of the study the study area is the Newberg Urban Growth Boundary plus the water districts outside of the city. It is important to note that the Newberg Municipal Code prohibits city water service to new customers in private water systems outside of the city.

This section also addresses the City's water supply from the well field located south of the Willamette River in Marion County, Raw Water Transmission, Water Treatment Plant, Pressure Zones, Storage Reservoirs, Booster Pump Stations, Distribution System, Non-potable Reuse System, and Supervisory Control and Data Acquisition (SCADA). Figure 1 in Exhibit A is a map of the City's water service area and water districts.

Water Requirements

Section 2 details the Planning Period, Service Area, Historical Population, Historical Water Demand, Future Population projections and Water Demand Forecast including pressure zones for zones 1, 2 and 3.

Planning and Analysis Criteria

Section 3 analyzes the performance of the City's water system. It includes the Water Supply Capacity, Distribution System Capacity and Service Pressures, Water Quality, Pump Station Capacity, and Fire Flow Recommendations. In Summary Supply components, source transmission, treatment and high service pumps should be capable of providing a maximum daily demand (MMD) at firm capacity.

Redundant Supply: One day of wintertime average demand should be available from a source on the north side of the Willamette River.

Service Pressure:

- Normal range under ADD conditions: 40 to 80 psi
- Maximum per Oregon Plumbing Specialty Code: 80 psi
- Minimum under PHD conditions: 75 percent of normal range
- Minimum under emergency or fire flow conditions per OHA requirements: 20 psi

Distribution Mains:

- Maximum velocity under normal operating conditions: 5 fps
- Maximum velocity under emergency or fire flow conditions: 8 fps

Storage Volume: Recommended storage volume capacity is the sum of the operational, fire and emergency storage volume components.

Pump Station Capacity: Pump stations pumping to gravity storage facilities should have adequate firm capacity to provide MDD to the zone. Pump stations supplying constant pressure service without the benefit of storage should have firm pumping capacity to meet PHD while simultaneously supplying the largest fire flow demand in the pressure zone.

Fire Flow: The distribution system should be capable of supplying the recommended fire flows while maintaining minimum residual pressures everywhere in the system of 20 psi.

Water System Analysis

Section 4 of the Plan details the Existing Supply, Assessment of the well field south of the Willamette River including current source capacity estimates and water rights. Other elements include Future Supply, Groundwater Source Expansion, Transmission and Treatment for Redundant Supply and Redundant Supply Estimated Cost.

The summary of this section indicates the need for a source expansion. The most viable alternative is in the Gearn's Ferry Area. This option meets the objective of developing redundant supply on the north side of the Willamette River. The information related to existing wells in this area indicates the alluvial aquifer has productive material. The City's existing water rights could be used for wells in the alluvial aquifer in the Gearn's Ferry Area and significant property is publicly owned by the Chehalem Park and Recreation District. There may be other alternatives to provide a redundant supply as we move forward on developing the need.

Water Distribution System Analysis

Section 5 provides a Pressure Zone Analysis, Storage Capacity Analysis, Pump Capacity analysis, Distribution Capacity and Hydraulic Performance, Distribution System Water Quality.

In summary the Plan identifies the need for a new reservoir of .24 MG (Million Gallons) and there will be need for a Bella Road East (near Zimri Road) and Bell Road West (near College Street) booster pump stations.

Operations and Maintenance

Section 6 discusses the Operation and Maintenance (O&M) of the water system including the O&M Structure, Regulations and Guidelines, Current Practices and Procedures and has Conclusions and Recommendations.

Recommendations and Capital Improvement Program

Section 7 contains the Capital improvement Program for the water system which includes Supply, Storage Reservoirs, Pump Stations, Distribution Mains, Planning, Non-potable System, and CIP funding. Table 7-5 provides a list of the capital improvement projects. Separately the City Council will be reviewing the System Development Charges associated with the CIP project list.

FISCAL IMPACT:

Table 7-5 identifies the Capital Improvement Program projects and costs which totals \$159,710,500 over the next 20 years. Appendix D contains the Methodology Report for Water System Development Charges (SDC) outlining projects costs and what portion is SDC eligible. The SDC rates will be addressed by the City Council under a separate Request for Council Action to be presented by the Engineering Services Department.

STRATEGIC ASSESSMENT (RELATE TO COUNCIL PRIORITIES FROM MARCH 2016):

Not applicable.

ATTACHMENTS:

1. Resolution 2017-325 Initiating the Comprehensive Plan Text Amendment
2. Newberg Urban Area Growth Management Agreement 1979 (as amended)
3. 5-Year Water Capital Improvement Plan
4. Resolution No. 2017-326

Ordinance No. 2017-2816 with:

Exhibit "A": 2017 Water System Master Plan

Exhibit "B": Findings

Exhibit "C": Comprehensive Plan Text Amendment - L. Public Facilities and Services (Track Changes and Clean Versions)

**AN ORDINANCE ADOPTING THE 2017 WATER SYSTEM MASTER PLAN
AND INCORPORATING THE 2017 WATER MASTER PLAN INTO THE
NEWBERG COMPREHENSIVE PLAN**

RECITALS:

1. The City of Newberg through the Engineering Services Department has been engaged since 2015 in preparing the 2017 Water System Master Plan which updates the 2005 Water Distribution System Master Plan a 2002 Water Treatment Facilities Plan.
2. Murraysmith were the consultants selected to update the current plans and incorporate the two existing plans into one comprehensive document.
3. The Newberg Planning Commission initiated the Comprehensive Plan Text Amendment on March 9, 2017 by adopting Resolution No. 2017-325
4. Oregon Revised Statutes and Oregon Administrative Rules govern the preparation of and amendments to water system master plans. Specifically Oregon Statewide Planning Goal 11 Public Facilities and Services, ORS 197.712(2)(e), Oregon Administrative Rules Chapter 333 Division 61 Public Water Systems and Chapter 660 Division 11 Public Facilities Planning are the applicable Statute, goals and rules.
5. Citizen Involvement in development of the 2017 Water System Master Plan was provided by a Citizens Advisory Committee of eight (8) members which met three times.
6. The Newberg Planning Commission adopted Resolution No. 2017-326 recommending the City Council approve the 2017 Water System Master Plan.

THE CITY OF NEWBERG ORDAINS AS FOLLOWS:

1. The 2017 Water System Master Plan is adopted as shown in "Exhibit A".
2. The Newberg Comprehensive Plan is amended as shown in Exhibit "C". Adoption is based upon the findings in Exhibit "B". Exhibits "A", "B" and "C" are hereby adopted and by this reference incorporated.

➤ **EFFECTIVE DATE** of this ordinance is 30 days after the adoption date, which is: July 5, 2017.

ADOPTED by the City Council of the City of Newberg, Oregon, this 5th day of June, 2017, by the following votes: **AYE:** **NAY:** **ABSENT:** **ABSTAIN:**

Sue Ryan, City Recorder

ATTEST by the Mayor this 8th day of June, 2017.

Bob Andrews, Mayor



Water Master Plan



City of Newberg, Oregon
May 2017



WATER MASTER PLAN

FOR

CITY OF NEWBERG

MAY 2017



**Murraysmith
888 SW 5th Ave, Suite 1170
Portland, OR 97204
503.225.9010**

TABLE OF CONTENTS

1. INTRODUCTION AND EXISTING WATER SYSTEM	Page
Introduction	1-1
Water System Background	1-1
Springs Water System.....	1-2
Water Service Area	1-2
Supply Facilities	1-2
Well Field	1-2
Raw Water Transmission	1-3
Water Treatment Plant	1-4
Pressure Zones.....	1-4
Storage Reservoirs.....	1-5
North Valley Reservoirs	1-5
Corral Creek Reservoir	1-5
Booster Pump Stations	1-6
Distribution System.....	1-6
Metering.....	1-7
Non-potable Reuse System	1-7
SCADA System.....	1-7
 2. WATER REQUIREMENTS	
Planning Period	2-1
Service Area	2-1
Existing	2-1
Future.....	2-1
Historical Population.....	2-1
Historical Water Demand.....	2-2
Water Demand by Pressure Zone	2-3
Water Consumption by Customer Type	2-3
Future Population and Water Demand Forecast.....	2-4
Future Demand by Pressure Zone.....	2-5
 3. PLANNING AND ANALYSIS CRITERIA	
Water Supply Capacity.....	3-1
Normal Operating Supply	3-1
Redundant Supply.....	3-2
Distribution System Capacity and Service Pressures.....	3-2
Pressure Zone Configuration	3-2
Normal Service Pressure.....	3-3
Service Pressure in an Emergency.....	3-3
Distribution Main Criteria	3-3
Water Quality	3-3

Source Water.....	3-3
Distribution System	3-4
Storage Volume.....	3-5
Operational Storage	3-5
Fire Storage.....	3-5
Emergency Storage.....	3-5
Pump Station Capacity	3-6
Pump Station Supplying Pressure Zone with Gravity Storage.....	3-6
Pump Station Supplying Constant Pressure to Zone	3-6
Standby Power	3-6
Fire Flow Recommendations.....	3-6
Summary	3-8

4. WATER SUPPLY ANALYSIS

Existing Supply Assessment	4-1
Existing Groundwater Wells.....	4-1
Current Source Capacity Estimates	4-3
Water Rights Summary.....	4-4
Transmission.....	4-8
Treatment.....	4-8
Future Supply	4-8
Required Capacity.....	4-9
Groundwater Source Expansion Assessment	4-9
Hydrogeology	4-9
Water Rights	4-10
Aquifer Storage and Recovery (ASR)	4-10
Source Expansion Alternatives.....	4-10
Source Conclusion	4-14
Transmission and Treatment for Redundant Supply	4-15
Redundant Supply Estimated Costs	4-15

5. WATER SYSTEM ANALYSIS

Pressure Zone Analysis	5-1
Existing Pressure Zones.....	5-1
Proposed Future Pressure Zones.....	5-2
Storage Capacity Analysis.....	5-3
Existing Storage Capacity Findings.....	5-3
Proposed Bell Road Reservoir	5-3
Pumping Capacity Analysis	5-6
Existing Pumping Capacity Findings	5-8
Proposed Pump Stations	5-8
Back-Up Power.....	5-9
Distribution Capacity and Hydraulic Performance	5-10
Hydraulic Model.....	5-10

Modeled Water Demands	5-10
Model Calibration	5-10
Fire Flow Analysis	5-11
Peak Hour Demand Analysis	5-12
Distribution System Water Quality	5-12
Total Coliform Rule Compliance	5-12
Lead and Copper Rule Compliance	5-12
Stage 2 Disinfectants and Disinfection Byproducts Rule (D/DBPR) Compliance	5-12
Summary	5-13

6. OPERATIONS AND MAINTENANCE

Existing O&M Structure	6-1
O&M Regulations and Guidelines	6-2
Operator Certification	6-3
Current O&M Practices and Procedures	6-4
System Operation	6-4
System Preventive Maintenance	6-4
Record Keeping	6-5
Customer Complaints	6-5
Conclusions & Recommendations	6-6
Distribution System	6-6
Water Storage Tanks	6-7
Staffing	6-7

7. RECOMMENDATIONS AND CAPITAL IMPROVEMENT PROGRAM (CIP)

Cost Estimating Data	7-1
Water System Capital Improvement Program	7-1
CIP Cost Allocation to Growth	7-2
Supply	7-2
Redundant Supply	7-2
Treatment	7-2
Storage Reservoir	7-3
Pump Stations	7-3
Distribution Mains	7-4
Distribution Main Cost Estimates	7-4
Distribution Main Improvements for Fire Flow	7-4
Projects for Future System Expansion	7-6
Routine Main Replacement Program	7-8
Planning Studies and Facility Assessments	7-9
Other	7-9
Non-potable Distribution System	7-9
Public Works Maintenance Facility Improvements	7-10
CIP Funding	7-10

Water Rates.....	7-10
System Development Charges (SDCs)	7-11
Summary	7-14

FIGURES

1-1 Water Service Area Map.....	1-8
1-2 Existing Water System Schematic	1-9
2-1 Current Annual Water Consumption by Customer Type	2-4
6-1 Water Utility Public Works Staff FTE	6-2
7-1 Pipe Replacement Program.....	7-16
7-2 Overview of SDC Methodology	7-12

TABLES

1-1 Well Capacity Summary.....	1-3
1-2 WTP High Service Pump Summary	1-4
1-3 Reservoir Summary	1-5
1-4 Distribution System Pipe Summary.....	1-6
2-1 Historical Water Demand Summary	2-3
2-2 Current Water Demand by Pressure Zone	2-3
2-3 Future Water Demand Summary	2-5
2-4 Future Water Demand by Pressure Zone	2-6
2-5 North Hills URA Future Water Demand	2-7
3-1 Summary of Recommended Fire Flows	3-7
4-1 Source Capacity Estimates.....	4-4
4-2 City of Newberg Water Rights for Use of Groundwater	4-6
4-3 Allocation of Water Right Capacity - Groundwater	4-7
4-4 Redundant Supply Cost Estimate Summary	4-16
5-1 Storage Capacity Analysis	5-5
5-2 Pumping Capacity Analysis.....	5-7
5-3 Calibration Confidence	5-11
6-1 Certification Status of Personnel	6-3
7-1 Unit Cost for Water Main Projects	7-4
7-2 Distribution Main Improvements for Fire Flow	7-5
7-3 Distribution Main Improvements for System Expansion	7-7
7-4 20-Year Distribution Main Replacement Cost Summary.....	7-8
7-5 Proposed Capital Improvement Program (CIP) Summary	7-15

APPENDICES

- Appendix A: Plates 1 Proposed Water System Map
- Appendix B: Newberg Recycled Water Use Evaluation
- Appendix C: Source Expansion Assessment
- Appendix D: Water SDC Methodology

SECTION 1

INTRODUCTION AND EXISTING WATER SYSTEM

Introduction

The purpose of this Water Master Plan (WMP) is to perform an analysis of the City of Newberg's (City's) water system and:

- Document existing water system service area, facilities and operation
- Estimate future water requirements including potential water system expansion areas
- Identify deficiencies and recommend water facility improvements that correct deficiencies and provide for growth
- Update the City's capital improvement program (CIP)
- Evaluate the City's existing operation and maintenance (O&M) program
- Evaluate the City's existing system development charges (SDCs)

In order to identify system deficiencies, existing water infrastructure inventoried in this section will be assessed based on estimated existing and future water needs developed in **Section 2** and water system performance criteria described in **Section 3**. The results of this analysis are presented in **Sections 4 and 5**. **Section 7** identifies improvement projects to mitigate existing and projected future deficiencies and provide for system expansion including a prioritized CIP and a discussion of CIP funding including an updated SDC methodology. **Section 6** presents the O & M evaluation. The planning and analysis efforts presented in this WMP are intended to provide the City with the information needed to inform long-term water infrastructure decisions.

This plan complies with water system master planning requirements established under Oregon Administrative Rules (OAR) for Public Water Systems, Chapter 333, Division 61.

Water System Background

The City owns and operates a public water system that supplies potable water to all residents, businesses and public institutions within the city limits. This section describes the water service area and inventories the City's water system facilities including existing supply sources, pressure zones, finished-water storage reservoirs, pump stations and distribution system piping.

Plate 1 in Appendix A illustrates the City's water system service area limits, water system facilities and distribution system piping. The water system schematic in **Figure 1-2** at the end of this section shows the existing configuration of water system facilities and pressure zones.

Springs Water System

Historically Newberg maintained four natural spring sources north of the city center which were part of the City's original water system at the start of the 20th century. Following the development of the City's well field, the springs were disconnected from the City distribution system and used to supply only the "springs" or "riparian" customers nearby. Almost all of these springs customers are outside of the city limits and urban growth boundary (UGB).

In 2015, the City divested from the Springs Water System. Ownership, operation and maintenance of springs sources, including Snider, Skelton, Atkinson and Oliver Springs as well as treatment, piping, water rights and easements were transferred to the Chehalem Spring's Water Association, established by the property owners who receive water from the springs for the purpose of operating the springs system. The City retains ownership of parcels where the springs are located which are leased to the Chehalem Spring's Water Association. Analysis of springs system sources, facilities and service areas are not included in this Master Plan.

Water Service Area

The City's current water service area includes all properties within the city limits as well as a small number of customers outside the city limits and a number of independent water districts outside the city. Current customers outside the city limits include; residents of Aspen Estates along Highway 240 west of Chehalem Creek, properties along Highway 99W east of Providence Hospital including the Rex Hill Winery. Private water systems supplied by the City of Newberg include; Chehalem Terrace Water Company, Chehalem Valley Water Association, Northwest Newberg Water Association, Sam Whitney Water District, Sunny Acres Water District and West Sheridan Street Water Association. Portions of these private water systems are within the UGB and Urban Reserve Areas (URAs).

The future service area and the study area for this Master Plan includes all areas within the city limits and UGB. All customers of existing small water districts supplied by the City are also included in the Master Plan analysis. Newberg's municipal code prohibits City water service to new customers in private water systems outside the City. The existing and future service area boundaries are illustrated on **Figure 1-1** at the end of this section.

Supply Facilities

Well Field

The City draws its water supply from a well field located in Marion County farmland across the Willamette River from the City's Water Treatment Plant (WTP). The well field includes nine existing wells, five of which are currently active. Due to declining yields Well Nos. 1, 2 and 3 have been taken out of service. A ninth well was recently completed. Due to the close proximity of wells in the City's well field, nominal well capacities may be impacted by the

number and combination of wells in operation at the same time. Wells are operated by City staff in combinations which best meet the anticipated system demands for the day. All active wells, except Well 9, are equipped with variable frequency drives (VFDs) which adjust pump speed and well production based on the water level at the City's finished water storage reservoirs. Active City well capacities in gallons per minute (gpm) are summarized in **Table 1-1**.

The well field lies within the Willamette River floodplain and was entirely submerged during the 1996 flood. Well 8 was constructed with mooring piles incorporated into the well house design to allow City staff to dock a boat at the well if needed in case of a flood. Well 8 is also the only existing City well with a transfer switch to allow well operation by a portable generator.

**Table 1-1
Well Capacity Summary**

Well	Year Constructed	Nominal Capacity (gpm)	
		Min	Max
4	1970	350	400
5	1980	400	425
6	1980	900	1,600
7	2001	1,000	1,700
8	2007 (pump upsized 2014)	1,700	2,300
9	2016	1,800	1,800
TOTAL	gpm	6,150	8,225
	mgd	8.9	11.8

Raw Water Transmission

Water is supplied from the well field to the WTP on the north side of the Willamette River through two large-diameter raw water transmission mains. The first main is a 1,900 foot long, 24-inch diameter cast iron main suspended from a decommissioned highway bridge. The 24-inch main has an approximate capacity of 10 million gallons per day (mgd) (7,000 gpm). The approaches to the former Highway 219 bridge have been demolished and the bridge is now owned and maintained by the City for the sole purpose of carrying the 24-inch water transmission main from the well field to the WTP. A second 30-inch diameter high density polyethylene (HDPE) transmission main, constructed downstream in 2006, carries water from the well field under the Willamette River to the WTP.

Water Treatment Plant

The City's WTP, constructed in 1953, is located on the north bank of the Willamette River south of downtown Newberg within the fence of the WestRock mill. The WTP was expanded and upgraded in 1961, 1970, 1980, 1997 and 2006. The current WTP is a conventional filtration facility used to treat high levels of dissolved iron in the well source water. The plant has a nominal capacity of 9 mgd. According to City staff, operational capacity at the WTP is limited to approximately 8 mgd due to undersized piping between the raw water transmission mains and the settling basins.

The City's distribution system and finished water storage reservoirs are supplied by four High Service Pumps which draw suction supply from the WTP clearwell. All four line shaft vertical turbine pumps are equipped with VFDs which adjust the pumping rate based on the clearwell water level. The four pumps have a total rated capacity of approximately 14.3 mgd. WTP High Service pumps and capacities are summarized in **Table 1-2**.

Table 1-2
WTP High Service Pump Summary

Pump No.	Install Year	Motor Hp	Manufacturer	Model	Capacity	
					gpm	mgd
1	2005	250	Flowserve	15EHM 3 Stage Vertical Turbine	2,800	4.0
2	2005	250	Flowserve	15EHM 3 Stage Vertical Turbine	2,800	4.0
3	1980	150	Byron Jackson	12MQH 5 Stage Vertical Turbine	1,300	1.9
4	2005	250	Flowserve	15EHM 3 Stage Vertical Turbine	2,800	4.0
TOTAL					9,700	13.9

Pressure Zones

The majority of Newberg's existing water customers are served from Pressure Zone 1 which is supplied by gravity from the City's three finished water storage reservoirs and from the WTP.

Residential customers along Knoll Drive north of Hillsdale Drive which are too high in elevation to receive adequate service pressure from Zone 1 are supplied constant pressure from the Oak Knoll Pump Station at an approximate hydraulic grade line (HGL) of 470 feet. For the purposes of this WMP, this area is referred to as Pressure Zone 2.

Storage Reservoirs

Newberg's water system has three reservoirs with a total combined storage capacity of approximately 12 million gallons (MG). All three reservoirs have an approximate overflow elevation of 403 feet. **Table 1-3** presents a summary of the City's existing storage reservoirs.

North Valley Reservoirs

North Valley Reservoir Nos. 1 and 2 are located outside of the UGB on the north side of North Valley Road west of Highway 219. The reservoirs share a single site which is fully fenced. Reservoir No. 1 is a 4 MG circular, hopper-bottom concrete tank with a domed roof constructed in approximately 1960. Reservoir No. 2 is a 4 MG, circular, prestressed concrete reservoir constructed around 1978.

Reservoir No. 2 is currently being seismically upgraded. Mixing systems are being added to both tanks to mitigate water age issues. Interior coating of both Reservoir No. 1 and 2 was also completed as part of the upgrade project.

Corral Creek Reservoir

The Corral Creek Reservoir is a 4-MG, circular, prestressed concrete reservoir constructed in 2003 on the eastside of the City's water system. This reservoir is equipped with an altitude valve.

Table 1-3
Reservoir Summary

Reservoir Name	Capacity (MG)	Overflow Elevation ² (ft)	Floor Elevation ² (ft)	Diameter (ft)	Type	Year Built
North Valley No. 1	4.0	402.60	376.71 (369) ¹	144	Concrete	1960
North Valley No. 2	4.0	402.69	372	151	Prestressed Concrete	1977
Corral Creek	4.0	402.5	368.85	138	Prestressed Concrete	2003

Note: 1. North Valley Reservoir No. 1 parentheses indicate floor elevation of hopper bottom.

2. Vertical datum is NGVD 1929.

Booster Pump Stations

The Oak Knoll Pump Station is the only booster pump station in the Newberg distribution system. Oak Knoll was installed in 2000 to provide constant pressure service to around 40 homes along Knoll Drive north of Hillsdale Drive at the northern edge of the existing water service area. Located at 3613 Ivy Drive, the package pump station houses three pumps with a total capacity of 1,260 gpm. The station includes low flow and peak demand pumps with approximate capacities of 10 gpm and 250 gpm respectively and one high capacity pump dedicated to providing fire flow at approximately 1,000 gpm. This station includes backup power generation which allows the station to function during temporary power losses, ensuring that adequate service pressures are maintained.

Distribution System

The City's finished water distribution system is composed of various pipe materials in sizes up to 24 inches in diameter. The total length of City-owned potable piping in the service area is approximately 56.4 miles. The City maintains significant lengths of pipes 2-inches in diameter and smaller. Pipe materials under 4-inch diameter are primarily copper, polyvinyl chloride (PVC) and galvanized steel. Larger diameter pipe materials are a mix of cast iron and ductile iron with approximately 80 feet of steel main where the distribution system crosses Highway 219. **Table 1-4** presents a summary of pipe lengths by diameter from the City's Geographic Information Systems (GIS) water utility mapping.

Table 1-4
Distribution System Pipe Summary

Pipe Diameter	Approximate Length (miles)
4-inch or less	5.3
6-inch	13.2
8-inch	23.3
10-inch	4.3
12-inch	6.0
14-inch	0.2
16-inch	0.5
18-inch	2.7
24-inch	0.9
Total Length	56.4

Metering

All customer water use is currently metered using advanced metering infrastructure (AMI). Meters at individual services transmit consumption readings which are collected monthly using a “drive-by” receiving antenna.

Non-potable Reuse System

In addition to potable water distribution, Newberg also maintains a non-potable “purple pipe” distribution system. Non-potable systems are generally intended for irrigation use or to provide process and cooling water for manufacturing applications where potable water quality is not required.

The Newberg non-potable system can be supplied from either the City’s Otis Springs source or reuse water from the Newberg Wastewater Treatment Plant (WWTP) effluent. Otis Springs is located east of the City on the north side of Highway 99W. It produces approximately 300 gpm which is pumped through a 10-inch diameter non-potable main along Highway 99W southwest to a pond at the Chehalem Glenn Golf Course. Otis Springs’ pumps operate based on the water level at the golf course pond and production is metered at both the springs and golf course.

Installed in 2008, a pressurized membrane filtration system provides approximately 350,000 gallons per day of treated WWTP effluent (reuse water) to the golf course irrigation system. Reuse water is supplied from the south end of the course through 10-inch diameter reuse piping and meter installed along Wilsonville Road.

The publicly-owned golf course is the only existing customer of the City’s reuse system. Reuse pipes have been installed in parallel with other infrastructure and road projects at various locations within the Newberg water service area. However, the majority these non-potable mains are isolated pending future opportunities to connect and expand the reuse system. Evaluation of the City’s non-potable reuse system and an analysis of potential customers and future expansion is documented in **Appendix B**.

SCADA System

Newberg’s Supervisory Control and Data Acquisition (SCADA) system is used for remote operation of distribution system components as well as system performance monitoring and recording. Remote telemetry units (RTUs) at the well field, all reservoirs, the Oak Knoll Pump Station and Otis Springs transmit operating information and water levels to the WTP where City staff are able to view the status of the water system and make operational adjustments as required.

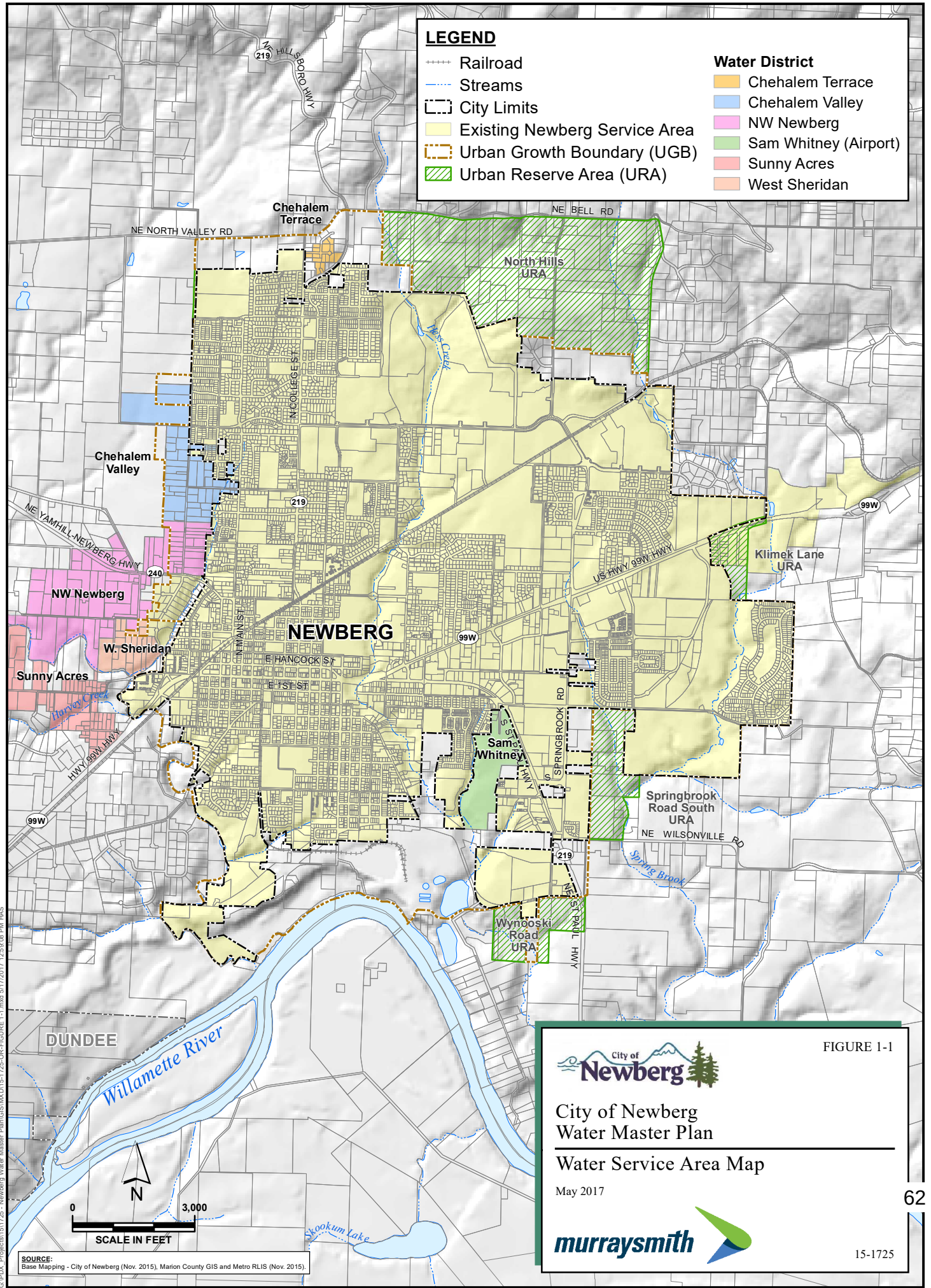
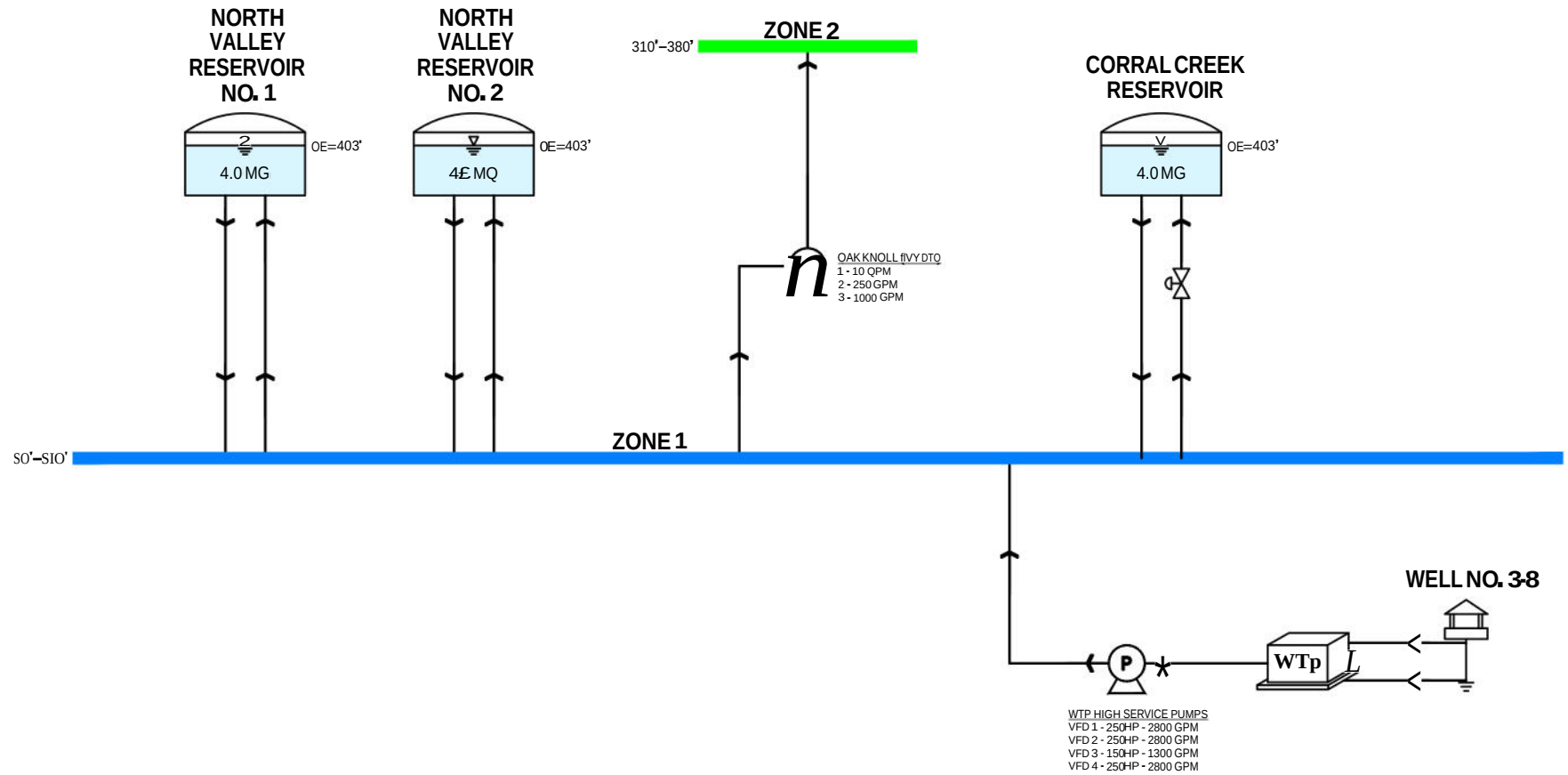


FIGURE 1-1

City of Newberg
Water Master Plan
Water Service Area Map

May 2017





LEGEND

WATER MAIN	
HIGHEST GROUND ELEVATION SERVED BY PRESSURE ZONE OR SUBZONE	
RESERVOIR	
ALTITUDE VALVE	
PUMPSTATION	

ABBREVIATIONS

EL	ELEVATION
GPM	GALLONS PER MINUTE
HP	HORSEPOWER
MG	MILLION GALLONS
OE	OVERFLOW ELEVATION
PRV	PRESSURE REDUCING VALVE
PS	PUMPSTATION
VFD	VARIABLE FREQUENCY (SPEED) DRIVE



CITY OF NEWBERG

EXISTING WATER SYSTEM SCHEMATIC

May 2017



FIGURE 1-2

SECTION 2

WATER REQUIREMENTS

This section presents existing and projected future water demands for the City of Newberg's (City's) water service area. Demand forecasts are developed from future population projections and historical water consumption and production records.

Planning Period

The planning period for this Water Master Plan (WMP) is 20 years, through the year 2035, consistent with Oregon Administrative Rule (OAR) requirements for Water System Master Plans (OAR 333-061).

Service Area

Existing

As presented in **Section 1 Figure 1-1**, the City's current water service area includes all properties within the city limits, a small number of customers outside the city limits and six independent water districts adjacent to the city limits. Private water systems supplied by the City of Newberg include: Chehalem Terrace Water Company, Chehalem Valley Water Association, Northwest Newberg Water Association, Sam Whitney Water District, Sunny Acres Water District and West Sheridan Street Water Association. Portions of these private water systems are within the City's Urban Growth Boundary (UGB) and Urban Reserve Areas (URAs).

Future

The future service area and the study area for this WMP includes all areas within the city limits and UGB. Analysis does not include all of the City's URAs as these are anticipated to develop outside of the 20-year planning horizon. A high level estimate of ultimate water demand in the City's North Hills URA is included in this section as this area's anticipated future growth impacts the sizing of a proposed storage reservoir. The proposed reservoir is discussed in more detail in **Section 5**.

Customers of existing water districts supplied by the City are also included in the WMP demand analysis. It is assumed that these Districts will continue to operate independent distribution systems. Newberg's municipal code prohibits City water service to new customers in private water systems outside the City thus no growth is anticipated for these Districts.

Historical Population

Newberg currently supplies water to approximately 22,900 residents. Current and historical population estimates for Newberg are taken from the Portland State University Population Research Center's (PSU PRC) *2012 Population Forecasts for Yamhill County, its Cities and*

Unincorporated Area 2011 to 2035. This report was adopted by Yamhill County and can be relied upon by the City for planning purposes per OAR 660-032-0040. Historical population estimates are summarized in **Table 2-1**.

Historical Water Demand

Water demand refers to all potable water required by the system including residential, commercial, industrial and institutional uses. The City of Newberg also maintains a non-potable water reuse system which is described in more detail in **Appendix B**. Potable water demands are described using three water use metrics, average daily demand (ADD), maximum day demand (MDD) and peak hour demand (PHD). Each of these metrics are stated in gallons per unit of time such as million gallons per day (mgd) and in gallons per capita per day (gpcd). ADD is the total annual water volume used system-wide divided by 365 days per year. MDD is the largest 24-hour water volume for a given year. In western Oregon, MDD usually occurs each year between July 1st and September 30th. PHD is estimated as the largest hour of demand on the maximum water use day.

Water demand can be calculated using either water consumption or water production data. Water consumption data is taken from the City's customer billing records and includes all revenue metered uses. Water production is measured as the water supplied to the distribution system from the City's Water Treatment Plant (WTP) plus the water volume supplied from distribution storage. Water production includes unaccounted-for water like water loss through minor leaks and unmetered, non-revenue uses, such as, hydrant flushing.

For the purposes of this WMP, water production data is used to calculate total water demand in order to account for all water uses including those which are not metered by the City. 2015 customer consumption and billing records are used to distribute current water demands throughout the water system hydraulic model, discussed in **Section 5**.

The historical ratios of ADD:MDD and MDD:PHD are used to estimate future maximum day and peak hour demands. Based on historical system-wide demands, the ratio of ADD:MDD is approximately 2.0. The ratio of MDD:PHD is approximately 1.7 consistent with similar regional water providers. **Table 2-1** summarizes the City's current system-wide water demand based on water production data.

**Table 2-1
Historical Water Demand Summary**

Year	Population	ADD		MDD	
		(mgd)	(gpcd)	(mgd)	(gpcd)
2010	22,110	2.23	101	4.84	219
2011	22,230	2.24	101	4.42	199
2012	22,300	2.27	102	4.76	213
2013	22,580	2.24	99	4.39	194
2014	22,765	2.31	101	4.43	194
2015	22,900	2.38	104	4.75	207

Water Demand by Pressure Zone

As described in Section 1, water systems are divided into pressure zones in order to provide adequate service pressure to customers at different elevations. Each pressure zone is served by specific facilities, such as, reservoirs or pump stations and related piping which supply pressure to customers. In order to assess the adequacy of these facilities, it is necessary to estimate demand in each pressure zone. The majority of Newberg water customers are part of Pressure Zone 1 served by gravity from the City's WTP and three water storage reservoirs. Approximately 40 residential customers in Pressure Zone 2 are supplied constant pressure service from the Oak Knoll Pump Station. Current water demand is distributed between the City's two pressure zones based on metered water consumption from 2015 billing records as summarized in **Table 2-2**.

**Table 2-2
Current Water Demand by Pressure Zone**

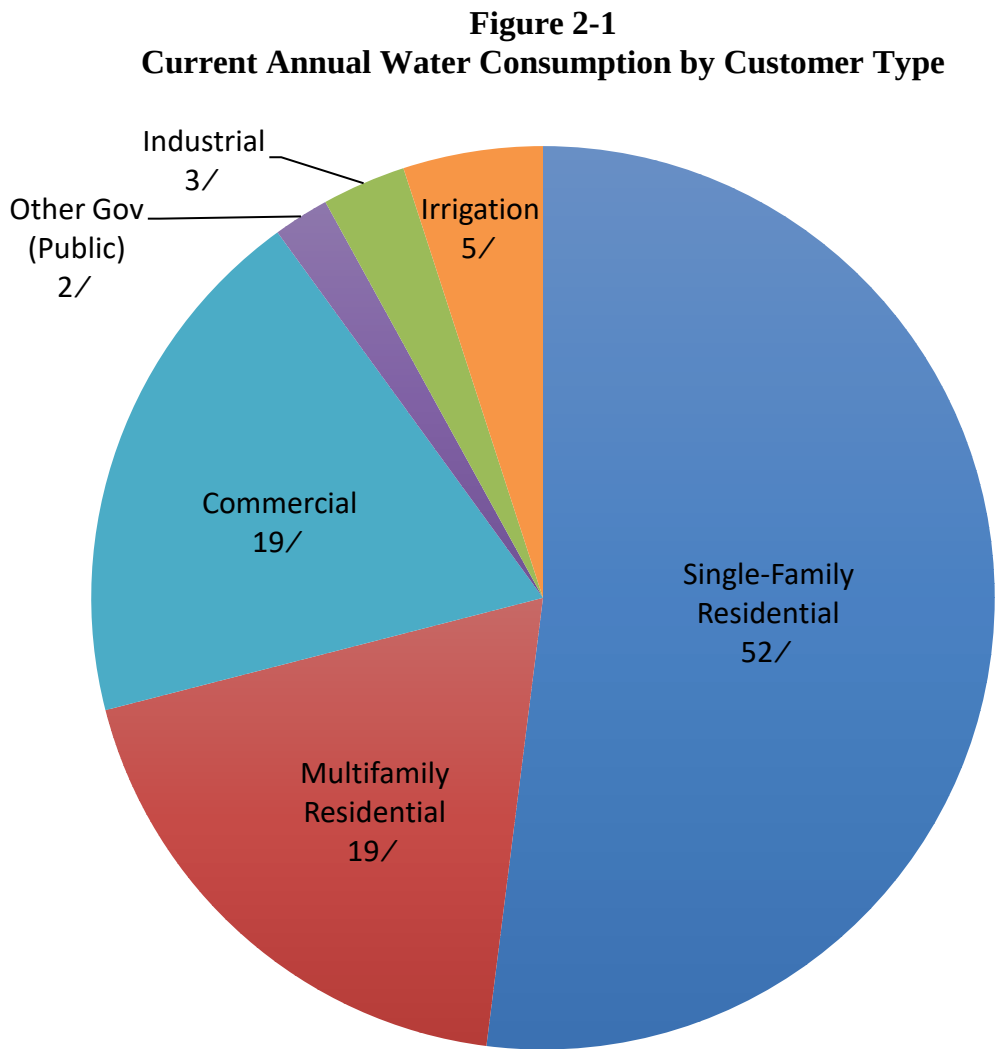
Pressure Zone	2015 ADD (mgd)
1	2.36
2	0.02
System-wide Total	2.38

Water Consumption by Customer Type

The City's water utility billing records maintain six primary customer types; Single-Family, Multifamily, Commercial, Industrial, Other Gov (Public) and Irrigation. The Other Gov customer type includes a wide variety of public facilities including schools, parks and community centers. Irrigation consumption includes irrigation services supplied from the City's drinking water system and does not include irrigation water provided by the non-potable reuse system which is discussed in **Appendix B**. A seventh customer type, "Outside" includes all services outside the current city limits. Based on their meter size, the water demand of these Outside services are assumed to

correlate with the City’s Single-Family (3/4- and 1-inch meters) and Commercial (2-inch and larger meters) customer types.

Percentages of current water consumption by customer type are calculated based on 2015 City water billing records. As illustrated on **Figure 2-1**, the majority of water consumption in Newberg, approximately 71 percent, is by residential customers.



Future Population and Water Demand Forecast

Estimates of future growth and related water demand within the Newberg UGB are developed using the best available information for the City’s service area including adopted population forecasts from the PSU PRC’s *2012 Population Forecasts for Yamhill County, its Cities and Unincorporated Areas 2011 to 2035* report and historical per capita water demands presented in **Table 2-1**. Future system-wide water demands are forecast at 5-, 10- and 20-years.

Historical per capita average daily water demands (ADD) range from 99 to 104 gpcd. An average per capita demand of 101 gpcd is used to forecast ADD based on population projections. Based on 2010 US Census data the average number of persons per household in Newberg is approximately 2.66.

Future MDD is projected from estimated future ADD based on the current average ratio of MDD:ADD, also referred to as a peaking factor. From current water demand data shown in **Table 2-1**, the MDD:ADD peaking factor for the Newberg system is approximately 2.0. Future PHD is similarly projected from future MDD, the PHD:MDD peaking factor is approximately 1.7. Forecasted water demands are summarized in **Table 2-3**.

Table 2-3
Future Water Demand Summary

Year	Forecast Population	ADD (mgd)	MDD (mgd)	PHD (mgd)
2020	28,250	2.86	5.72	9.72
2025	32,213	3.26	6.52	11.08
2035	38,490	3.89	7.78	13.23

Future Demand by Pressure Zone

Forecasted future water demands are allocated to existing and proposed future pressure zones based on an ideal service pressure range of 40 to 80 pounds per square inch (psi) and existing ground elevations in potential water service expansion areas within the UGB and North Hills URA. Existing and proposed pressure zone boundaries for the study area are illustrated on **Plate 1** in **Appendix A**. Estimated future water demands by pressure zone are summarized in **Table 2-4**.

The City's existing Pressure Zone 1 provides service up to approximately 310 feet elevation. As properties within the UGB and above Zone 1 service elevations begin to develop, a higher-elevation Pressure Zone 3 will be required northeast of the city center. For the purposes of this WMP, it is assumed that the proposed Zone 3 would serve customers between 310 and 440 feet elevation ultimately including most of the North Hills URA. Properties in the North Hills URA above 440 feet are assumed to be served from a future Zone 4 which is not analyzed for the purposes of this Master Plan. The City has purchased property north of Bell Road near the intersection with Zimri Drive as a future storage reservoir site to serve higher-elevation development within the UGB and North Hills URA.

It is assumed that Zone 2 customers will continue to be served by constant pressure through the 20-year planning horizon. Beyond the 20-year planning horizon, Zone 2 customers may ultimately be served by gravity from the proposed Bell Road Reservoir, as development warrants.

Proposed Zone 2 Demand

The City anticipates demands in Zone 2 to expand by approximately 171 gallons per minute (gpm) (0.25 mgd) with the addition of the existing North Valley Friends Church, the proposed Veritas School and a proposed 11-lot single-family subdivision at 4016 N College Street (Rourke Property). Additional Zone 2 demand is taken from analysis presented by AKS Engineering & Forestry (December 2015) in support of the Rourke Property subdivision. Completion of these additional Zone 2 customer connections is assumed to occur within the next 5 years.

Proposed Zone 3 Demand

As shown on **Plate 1** in **Appendix A**, within the 20-year planning horizon, the proposed Zone 3 would supply a small portion of the Springbrook development along Aspen Way within the current city limits and UGB. Ultimately, proposed Zone 3 would serve most future customers in the North Hills URA which is anticipated to develop beyond the 20-year planning horizon. Future customers within the North Hills URA above approximately 440-foot elevation are assumed to be served by a future Zone 4.

Future water demand within the proposed 20-year Zone 3 boundary is estimated based on land use classifications from the Yamhill County Comprehensive Plan, City zoning for similar adjacent properties, the *Springbrook Master Plan* and per capita water demands presented earlier in this section. Timeframes for potential development were estimated in 5-year blocks for each parcel within the UGB based on their proximity to existing development and infrastructure as well as property ownership.

Table 2-4
Future Water Demand by Pressure Zone

Forecast Water Demand (mgd)						
Zone	5-Year		10-Year		20-Year	
	ADD	MDD	ADD	MDD	ADD	MDD
1	2.58	5.16	2.97	5.93	3.59	7.18
2	0.27	0.54	0.27	0.54	0.27	0.54
3	0.01	0.02	0.02	0.05	0.03	0.06
Total	2.86	5.72	3.26	6.52	3.89	7.78

North Hills URA Demand

A high level estimate of ultimate water demand in the City's North Hills URA is included in this section as this area's anticipated future growth impacts the sizing of the proposed Bell Road storage reservoir discussed in more detail in **Section 5**. The North Hills URA is anticipated to develop beyond the 20-year planning horizon. Customers in the North Hills URA below approximately 310 feet elevation will be served by extending existing Zone 1 distribution mains.

Customers above 310 feet and below approximately 440 feet elevation will be served from proposed Zone 3. Customers above approximately 440 feet are assumed to be served by a future Zone 4.

Future water demand in the City's North Hills URA is estimated at 11 persons per acre based on the City's 2009 URA analysis presented to the Oregon Land Conservation and Development Commission (LCDC) and current water demand per capita presented earlier in this section. Estimated demand beyond 20 years for the North Hills URA is summarized in **Table 2-5**.

Table 2-5
North Hills URA Future Water Demand

Future Pressure Zone	Land Area (acres)	Projected Growth beyond 20-years		
		Population (at 11 persons/acre)	Water Demand (mgd)	
			ADD	MDD
1	27.5	303	0.03	0.06
3	272.2	2,994	0.30	0.60
4	100.7	1,108	0.11	0.22

SECTION 3

PLANNING AND ANALYSIS CRITERIA

This section presents the planning and analysis criteria used to analyze performance of the City of Newberg (City) water system. Criteria are presented for water supply, distribution system piping, service pressures, storage and pumping facilities. Recommended water needs for emergency fire suppression are also presented. These criteria are used in conjunction with the water demand forecasts developed in **Section 2** to complete analysis of the City's water source presented in **Section 4** and distribution system presented in **Section 5**.

The recommendations of this plan are based on the following performance guidelines, which have been developed through a review of State requirements, American Water Works Association (AWWA) acceptable practice guidelines, *Ten States Standards* and the *Washington Water System Design Manual*. These performance criteria are consistent with the City's 2015 *Public Works Design & Construction Standards*.

Water Supply Capacity

As described in **Section 1**, the City draws its supply from a well field across the Willamette River from the Newberg water service area and the Water Treatment Plant (WTP). Water is supplied from the well field to the WTP through two large-diameter raw water transmission mains, one suspended from a decommissioned highway bridge and the other buried beneath the riverbed. At the WTP, raw water is treated through conventional filtration to remove high levels of dissolved iron in the well source water. After treatment, finished water is pumped by the High Service Pumps from the WTP clearwell through the distribution system to storage reservoirs. The City's overall supply capacity is impacted by each of these components; water source, raw water transmission (river crossings), water treatment plant and high service pumps.

Normal Operating Supply

Under normal operating conditions, the City should plan for adequate firm capacity to supply maximum day demand (MDD) from the well field to the WTP and distribution storage. Firm capacity is defined as total capacity with the largest facility out of service. Supply components are evaluated at firm capacity to provide for system redundancy. Redundancy allows components to be taken out of service, as needed, for both unscheduled repairs and regular maintenance. For the City's supply components firm capacity criteria are as follows. The City's total supply capacity is limited by the source, transmission or treatment component with the smallest firm capacity.

- **Source** – MDD available with the largest well out of service
- **Raw water transmission (river crossings)** – minimum of two transmission main river crossings, MDD available with one crossing out of service

- **Water Treatment Plant** – minimum of two parallel treatment trains, MDD available with one train out of service
- **High Service Pumps** – minimum of three pumps, MDD available with the largest pump out of service

Redundant Supply

The well field is the City's only existing source. This source may be vulnerable to flooding or other natural disasters. Existing raw water transmission mains across the Willamette River from the well field to treatment and customers may also be vulnerable to ground movement, seismic activity or other natural disasters. Due to the potential vulnerability of the existing supply system, the City should plan for adequate redundant supply capacity to provide one day of wintertime average water demand. It is assumed that new redundant sources would preferably be located on the north side of the Willamette River.

Distribution System Capacity and Service Pressures

Pressure Zone Configuration

Water distribution systems are separated by ground elevation into pressure zones in order to provide service pressures within an acceptable range to all customers. Typically, water from a reservoir will serve customers by gravity within a specified range of ground elevations so as to maintain acceptable minimum and maximum water pressures at each individual service connection. When it is not feasible or practical to have a separate reservoir for each pressure zone, pump stations or pressure reducing valves (PRVs) are used to serve customers in higher or lower pressure zones respectively from a single reservoir.

Currently, the majority of Newberg water customers are served by a single pressure zone. It is anticipated that future growth at higher elevations in northeast Newberg will require development of additional pressure zones. All existing and future pressure zones should incorporate at least one of the following strategies to promote service reliability and redundancy:

- Gravity storage within the pressure zone.
- Standby pump station power.
- Multiple pump stations supplying the pressure zone.
- A PRV connection to an upper pressure zone configured for emergency and supplemental fire flow supply. These valves should be equipped with pressure sustaining features to prevent under-pressurization of the upper pressure zone.

Normal Service Pressure

The desired service pressure range under average daily demand (ADD) and normal operating conditions is 40 to 80 pounds per square inch (psi) consistent with the City's 2015 *Public Works Design and Construction Standards*. Whenever feasible, it is desirable to achieve the 40 psi lower limit at the highest fixture within a structure. The maximum 80 psi service pressure limit is required by the *Oregon Plumbing Specialty Code* (OPSC) 608.2. Conformance to this pressure range may not always be possible or practical due to topographical relief and existing system configurations. Where mainline pressures exceed 80 psi, service connections should be equipped with individual PRVs.

The distribution system should be capable of supplying the peak hourly demand (PHD) while maintaining service pressures of not less than 75 percent of normal system pressures.

Service Pressure in an Emergency

During a fire flow event or emergency, the minimum service pressure is 20 psi as required by Oregon Health Authority, Drinking Water Services (OHA) and OAR 333-061-0025(7). The system should be capable of providing fire flow capacity while simultaneously delivering MDD and maintaining 20 psi throughout the distribution system. The system should meet this criterion with operational storage in the City's reservoirs depleted.

Distribution Main Criteria

In general, distribution system main flow velocities should not exceed 8 feet per second (fps) under fire flow conditions and 5 fps under normal demand conditions. Per the City's 2015 *Public Works Design and Construction Standards*, Class 52 ductile iron is the City's standard water main pipe material. The minimum pipe size is 8-inch diameter for new permanently dead ended residential water mains and primary feeder mains in residential areas.

Water Quality

In Oregon, drinking water quality standards for 95 primary and 12 secondary contaminants are established under the Oregon Drinking Water Quality Act (OAR 333-061) which includes implementation of national drinking water quality standards. To maintain public health, each contaminant has either an established maximum contaminant level (MCL) or a recommended treatment technique.

Source Water

Potential for pathogens in groundwater sources like the City's wells are regulated by the Groundwater Rule (GWR). The City's existing wells have high levels of dissolved iron in the water. Iron is a secondary contaminant which causes metallic taste, discoloration, sediment and staining but is not a threat to human health. Dissolved iron is removed from the source

water at the City's WTP. Other regulated contaminants are monitored as required by the State's drinking water quality standards.

Distribution System

There are three drinking water quality standards and potential contaminants that may be exasperated or originate in the distribution system. Specifically, microbial contaminants (Total Coliform Rule), lead and copper (Lead and Copper Rule) and disinfection byproducts (Disinfectants and Disinfection Byproducts Rule).

Total Coliform Rule

There are a variety of bacteria, parasites, and viruses which can cause health problems when ingested. Testing water for each of these germs would be difficult and expensive. Instead, total coliform levels are measured. The presence of any coliforms in the drinking water suggests that there may be disease-causing agents in the water also. A positive coliform sample may indicate that the water treatment system isn't working properly or that there is a problem in the distribution system. Although many types of coliform bacteria are harmless, some can cause gastroenteritis including diarrhea, cramps, nausea and vomiting. This is not usually serious for a healthy person, but it can lead to more serious health problems for people with weakened immune systems.

The Total Coliform Rule applies to all public water systems. Total coliforms include both fecal coliforms and *E. coli*. Compliance with the MCL is based initially on the presence or absence of total coliforms in a sample, then a focus on the presence or absence of *E.coli*. For Newberg, the MCL is exceeded if more than five percent of the 30 required monthly samples have total coliforms present. A water system must collect a set of repeat samples for each positive total coliform result and have it analyzed for total coliforms and *E.coli*.

Lead and Copper and Corrosion Control

Lead and copper enter drinking water primarily through corrosion of plumbing materials most commonly caused by a chemical reaction with the water which may be due to dissolved oxygen, low pH or low mineral content. Exposure to lead and copper may cause health problems ranging from gastroenteritis to brain damage. In 1991, the national Lead and Copper Rule (LCR) established action levels for lead and copper concentrations in drinking water. Under the Oregon Drinking Water Quality Act, water utilities are required to implement optimal corrosion control treatment that minimizes the lead and copper concentrations at customers' taps, while ensuring that the treatment efforts do not cause the water system to violate other existing water regulations. It should be noted that an update to the LCR is currently being considered, though implications to the City's water system are anticipated to be minimal.

Utilities are required to conduct monitoring for lead and copper from taps in customers' homes. Samples are currently required to be taken every three years at 30 sampling sites. The

action level for either compound is exceeded when, in a given monitoring period, more than 10 percent of the samples are greater than the action level.

Disinfectants and Disinfection Byproducts (DBP) Rule

DBPs form when disinfectants, like chlorine, used to control pathogens in drinking water react with naturally occurring materials in source water. DBPs have been associated with increased cancer risk. The City is required to sample four locations in the distribution system on a quarterly basis.

Storage Volume

Water storage facilities are typically provided for three purposes: operational storage, fire storage, and emergency storage. A brief discussion of each storage element is provided below. Recommended storage volume is the sum of these three components. Adequate storage capacity must be provided for each pressure zone which is supplied by gravity. Storage volume for pressure zones served through pressure reducing valves (PRVs) or by constant pressure pump stations is provided in the upstream pressure zone supplying the PRV or pump station.

Operational Storage

Operational storage is the volume of water needed to meet water system demands in excess of delivery capacity from the WTP to system reservoirs under PHD conditions. Operational storage capacity is evaluated based on the equalizing storage method from the Washington State Department of Health's *Water System Design Manual* (December 2009). This method defines minimum storage as the volume required to meet PHD for 2.5 hours with all non-emergency pumps serving the zone at full capacity.

Fire Storage

Fire storage should be provided to meet the single most severe fire flow demand within each zone. The fire storage volume is determined by multiplying the recommended fire flow rate by the expected duration of that flow consistent with the 2014 *Oregon Fire Code*. Specific fire flow and duration recommendations are discussed later in this section.

Emergency Storage

Emergency storage is provided to supply water from storage during emergencies such as pipeline failures, equipment failures, power outages or natural disasters. The amount of emergency storage provided can be highly variable depending upon an assessment of risk and the desired degree of system reliability. Provisions for emergency storage in other systems vary from none to a volume that would supply a maximum day demand or higher. Newberg has a single supply source from the City's well field and WTP which may become temporarily unavailable in the event of a major transmission main break or natural disaster.

Due to this potential vulnerability, the City's emergency storage criterion is 100 percent of MDD.

Pump Station Capacity

Pumping capacity requirements vary depending on how much storage is available, the number of pumping facilities serving a particular pressure zone, and the zone's maximum fire flow requirement. Pumping recommendations are based on firm capacity which is defined as a pump station's capacity with the largest pump out of service.

Pump Station supplying Pressure Zone with Gravity Storage

For pump stations supplying pressure zones with gravity storage available the station must have adequate firm capacity to supply MDD for the zone.

Pump Station supplying Constant Pressure to Zone

Although it is desirable to serve water system customers by gravity from storage, constructing and maintaining a reservoir for a small group of customers may be prohibitively expensive and lead to water quality issues associated with slow reservoir turnover during low demand times. Constant pressure pump stations supply a pressure zone without the benefit of storage and are commonly used to serve customers at the highest elevations in a water service area where only an elevated reservoir would be capable of providing the necessary head to achieve adequate service pressures by gravity. Pump stations supplying constant pressure service should have firm pumping capacity to meet PHD while simultaneously supplying the largest fire flow demand in the zone. Constant pressure pump stations are only recommended for areas with a small number of customers and low water demand with limited potential for future looping with adjacent pressure zones.

Standby Power

Standby power facilities are needed for constant pressure stations and for pump stations serving pressure zones with inadequate emergency storage capacity. Standby power is typically provided in the form of an on-site backup generator sized to operate the pump station at firm capacity with automatic transfer switches and on-site fuel storage.

Fire Flow Recommendations

The amount of water recommended for fire suppression purposes is typically associated with the local building type or land use of a specific location within the distribution system. Fire flow recommendations are typically much greater in magnitude than the MDD in any local area. Adequate hydraulic capacity must be provided for these potentially large fire flow demands.

Fire protection within the current water service area is provided by the Newberg Fire Department or Tualatin Valley Fire and Rescue (TVFR). Fire flow requirements for

individual facilities are determined by the Fire Marshal consistent with the 2014 *Oregon Fire Code*. The City's 2015 *Public Works Design and Construction Standards* specify a distribution system design capacity of 4,500 gpm in commercial and industrial areas and 1,000 gpm in residential areas. A summary of fire flow for each land use type and approximate fire hydrant spacing is presented in **Table 3-1**.

Table 3-1
Summary of Recommended Fire Flows

Land Use Type (City zoning designations)	Fire Flow (gpm)	Duration (hours)	Average Fire Hydrant Spacing (feet)
Low Density Residential: (AR, R-1, SD/LDR)	1,000 ¹	2	500
Medium Density Residential: (R-2, SD/MRR)	1,500	2	500
High Density, Manufactured Dwelling and Professional Residential: (R-3, R-4, R-P)	2,000	2	450
Neighborhood Commercial: (C-1, SD/NC)	2,000	2	450
Community, Central Business District and Employment Commercial: (C-2, C-3, C-4, SD/E, SD/V)	3,000	3	400
Limited Industrial (M-1)	3,000	3	400
Light, Heavy and Airport Industrial: (M-2, M-3, M-4, AI)	4,500 ²	4	300
Institutional and Hospitality: (I, SD/H)	4,500 ²	4	300

Notes:

1. For homes over 3,600 square feet the 2014 *Oregon Fire Code* requires a minimum 1,500 gpm fire flow.
2. Maximum fire flow per 2015 *Public Works Design and Construction Standards* for commercial or industrial areas.

Summary

The criteria developed in this section are used in **Section 4** and **Section 5** to assess the supply and distribution system's ability to provide adequate water service under existing conditions and to guide improvements needed to provide service for future water needs. Planning criteria for the City's booster pump stations, distribution system, pressure zones, and storage facilities are summarized as follows:

- **Supply:** All supply components; source, transmission, treatment and high service pumps should be capable of providing MDD at firm capacity
- **Redundant Supply:** One day of wintertime average demand should be available preferably from a source on the north side of the Willamette River
- **Service Pressure:**
 - Normal range under ADD conditions: 40 to 80 psi
 - Maximum per *Oregon Plumbing Specialty Code*: 80 psi
 - Minimum under PHD conditions: 75 percent of normal range
 - Minimum under emergency or fire flow conditions per OHA requirements: 20 psi
- **Distribution Mains:**
 - Maximum velocity under normal operating conditions: 5 fps
 - Maximum velocity under emergency or fire flow conditions: 8 fps
- **Storage Volume:** Recommended storage volume capacity is the sum of the operational, fire and emergency storage volume components.
- **Pump Station Capacity:** Pump stations pumping to gravity storage facilities should have adequate firm capacity to provide MDD to the zone. Pump stations supplying constant pressure service without the benefit of storage should have firm pumping capacity to meet PHD while simultaneously supplying the largest fire flow demand in the pressure zone.
- **Fire Flow:** The distribution system should be capable of supplying the recommended fire flows while maintaining minimum residual pressures everywhere in the system of 20 psi.

SECTION 4

WATER SUPPLY ANALYSIS

This section presents an assessment of the City of Newberg's (City's) current water supply system, a summary of existing water rights and analysis of future supply development options. Although the City does not have an immediate need to develop additional source and treatment capacity to meet projected future water demands presented in **Section 2**. The City should consider development of water supply redundancy to address existing supply vulnerability and for long-term water system resiliency.

Existing Supply Assessment

Existing Groundwater Wells

Newberg's current water supply source consists of groundwater production wells located in the City's well field on the south side of the Willamette River, across the river from the City's water treatment plant (WTP). Currently five of the City's nine wells are in operation, and the new production Well 9 will be brought on-line in early 2017. The wells generally produce water that is high in iron, and clogging by iron-reducing bacteria has been observed. To combat clogging and maintain production capacity, the City performs scheduled redevelopment of the operational wells every seven to ten years. General observations of the condition and production capacities of the existing wells are discussed below.

Wells 1 and 2

Well 1 was constructed in 1948, and Well 2 was constructed in 1951. Each well is approximately 90 feet deep and consists of a 12-inch diameter steel casing and approximately 6 feet of perforations for the open interval. Other details of the construction, such as the seal are unknown. The tested capacity of Wells 1 and 2 was 1,500 gallons per minute (gpm) when they were constructed, and the capacity of the original pumping systems was reported to be 750 gpm. The performance history of each well is unknown. Declining yield and lack of improvement following repeated rehabilitation efforts led the City to remove the Wells 1 and 2 from operation in 2013 and 2012, respectively.

Well 3

Well 3 was constructed in 1964, and consists of an 18-inch diameter steel casing installed to a depth of 103 feet. The well has a bentonite sanitary seal from ground surface to a depth of 24 feet. The open interval consists of two sets of perforations totaling 27 feet in gravel and sand formation. The tested capacity of the well when initially constructed was 1,800 gpm with 9 feet of drawdown over a 12-hour period; however, it produced excessive sand when in operation. Because of sand production and declining yield, Well 3 was removed from operation in 1980.

Well 4

Well 4 was constructed in 1970 and consists of a 16-inch diameter production casing to a depth of 80 feet and a 14-inch diameter (nominal) screen assembly to a depth of 96 feet. The well was constructed with a 20-foot cement surface seal. The open interval consists of 10 feet of 250-slot (0.25-inch slot size) stainless steel wire-wrap screen in gravel and sand formation. The original tested capacity of the well was 1,300 gpm with 12 feet of drawdown over a 30-hour period. Despite the use of stainless steel well screen in its construction and lower iron concentrations than those observed at other City wells, Well 4 produces some sand during operation and has declined in capacity over its operational history. The most recent rehabilitation of the well, completed in 2014, resulted in minimal improvement to the Well 4 production capacity. The City continues to operate Well 4 as a supplemental supply well for the well field. Well 4 is equipped with a variable frequency drive (VFD) pump motor and currently produces between 350 and 400 gpm.

Well 5

Well 5 was constructed in 1980 and was originally tested at 1,800 gpm with 13 feet of drawdown over 24 hours. The well consists of a 16-inch diameter production casing to a depth of 64 feet and a 14-inch diameter (nominal) screen assembly from 56 to 88.5 feet. The well is constructed with a cement surface seal to a depth of 34 feet. The open interval consists of stainless steel screen from 64.5 to 82.5 feet and perforated steel casing from 83.5 to 86.5 feet in gravel and sand formation. Historically, Well 5 experienced a great deal of interference from pumping at Wells 1, 2, and 3, and the pumping water level consistently fell to the level of the pump intake during the summer. Under current operations Well 5 sees interference from pumping at Well 6 and, to a lesser extent, at Wells 7 and 8. Well 5 has declined in capacity over its operational history. The most recent rehabilitation of this well, completed in 2014, resulted in minimal improvement. The City continues to operate Well 5 as a supplemental supply well for the well field. Well 5 is equipped with a VFD and currently produces between 400 and 425 gpm.

Well 6

Well 6 was constructed in 1980 and was originally tested at a rate of 2,575 gpm with 16 feet of drawdown after 24 hours. The well consists of 16-inch production casing to a depth of 70.5 feet, and a 14-inch (nominal) screen assembly from 62 feet to 95.5 feet. The well was constructed with a cement surface seal to a depth of 34 feet. The open interval consists of stainless steel wire-wrap screen between 70.5 feet and 90.5 feet in gravel and sand formation. The well has exhibited only minor reduction in capacity over its operational history and is scheduled for rehabilitation in 2016. Due to its central location in the well field, Well 6 sees interference from pumping at all of the operational wells. Well 6 is equipped with a VFD and is currently operated at rates between 900 and 1,600 gpm.

Well 7

Well 7 was constructed in 2000 and was originally tested at a rate of 1,500 gpm with 11 feet of drawdown over a 73 hour period. The well consists of a 16-inch diameter production casing to a depth of 65 feet and a 14-inch diameter (nominal) screen assembly between 56 feet and 89 feet. The well was constructed with a cement surface seal to a depth of 46 feet. The open interval consists of stainless steel wire-wrap screen from 67 to 77 feet and 83 to 89 feet in gravel and sand formation. The well has exhibited very minor reduction in capacity over its operational history, and the most recent well rehabilitation was completed in 2012. Well 7 sees interference from pumping at Wells 6 and 8. Well 7 is equipped with a VFD and is currently operated at rates between 1,000 and 1,700 gpm.

Well 8

Well 8 was constructed in 2006 and was originally tested at a rate of 4,000 gpm with 17 feet of drawdown over a 47 hour period. Based on the testing results and estimated interference, the recommended long-term design operational rate for the well was 2,500 gpm. The well consists of a 20-inch diameter production casing to a depth of 60 feet, and an 18-inch diameter (nominal) screen assembly. The well was constructed with a cement seal from 13 feet to 53 feet and bentonite from 4 feet to 13 feet. The open interval consists of stainless steel wire-wrap screen from 53 to 79 feet and 89 to 95 feet in gravel and sand formation. The well has exhibited very minor reduction in capacity over its operational history, and the most recent well rehabilitation was completed in 2013. Well 8 sees interference from pumping at Wells 6 and 7. Well 8 is equipped with a VFD and is currently operated at rates between 1,700 and 2,300 gpm.

Well 9

Well 9 was completed in 2016 with a design similar to Wells 7 and 8 and production capacity of approximately 1,800 gpm. It is anticipated that Well 9 will experience interference from pumping at the other operational wells, and pumping at Well 9 will likewise cause additional interference at the other operational wells. Well 9 is not equipped with a VFD. The operational pumping rates of the nearby wells are likely to be reduced as a result of the additional well interference and the non-varying production rate at Well 9.

Current Source Capacity Estimates

The total well field capacity is sensitive to changes in groundwater levels because the source aquifer beneath the well field is relatively shallow. In addition to the natural variation of the groundwater level of the aquifer due to changes in the Willamette River level (stage) and seasonal variations in precipitation (higher in the winter and lower in the summer), the groundwater level is also affected by the rate and volume of groundwater withdrawn from the City's well field.

At each production well there is a limited amount of available drawdown. Drawdown is the difference between the water level in the well and the top of the open interval of the well. During pumping, the available drawdown in the well decreases as the water level in the well falls. In addition, each pumping well creates a cone of drawdown that expands laterally away from the well as pumping continues. The decrease in available drawdown at a well caused by the pumping at another well is called interference. Interference is generally greater in wells that are constructed close together. Over longer periods of pumping, the cone of drawdown can expand to the lateral extent of the aquifer or to areas that are less productive, called boundaries, which can affect the rate of drawdown at the wells.

Available operational data indicate that the total well field capacity decreases after several days of continuous pumping due to the cumulative effects of interference and aquifer boundary conditions. For this reason, estimates of maximum source capacity were developed for one day and three days based on typical peak demand operational scenarios. Source capacity estimates include projections for Well 9, assuming a specific capacity similar to Well 7 and a non-varying flow rate of 1,800 gpm which is the capacity of the pump to be installed at Well 9. Firm source capacity estimates assume Well 8 is non-operational. Firm capacity is defined as total source capacity with the largest source, Well 8, out of service. Capacity estimates presented herein use conservative Willamette River stage levels to estimate available drawdown. More or less capacity may be available at any given time, depending on aquifer conditions and well performance. Estimates of maximum and firm source capacities, in million gallons per day (mgd), are presented in **Table 4-1**.

Table 4-1
Source Capacity Estimates

Aquifer Conditions	Capacity (mgd)			
	1-Day Max	1-Day Firm	3-Day Max	3-Day Firm
Summer (Low-Water)	11.6	8.5	9.0	8.4
Winter (High-Water)	11.8	8.5	10.6	8.5

Water Rights Summary

The City holds six municipal groundwater rights, including four water right certificates, one permit, and one groundwater registration. All of these water rights authorize use of groundwater from the City's well field located in the alluvial aquifer adjacent to the Willamette River, and in combination authorize 35.16 cubic feet per second (cfs) or 15,779 gpm of water right appropriation rate. The majority of the City's water rights are relatively free of water use conditions, and the City is in compliance with the few water use conditions that are attached to its water rights.

Groundwater Registration GR-63, the City's oldest water right, authorizes the use of 1,000 gpm (2.228 cfs) from each of the City's original two water supply wells, Well 1 and Well 2 (2,000 gpm in total). The City does not currently use these wells for supply because of diminished capacity and sand pumping.

Certificates 68620 and 82595 authorize a combined appropriation rate of 1,800 gpm (4.01 cfs) from Well 5. Although the production capacity of Well 5 was once sufficient for appropriating the full rate of these water rights, the capacity of Well 5 has declined over time to a current rate of 425 gpm.

Certificates 48100 and 82600, authorize an appropriation rate of 1,203 gpm (2.68 cfs) from Well 4 and 1,800 gpm (4.01 cfs) from Well 6, respectively. Similar to Well 5, the production capacity of Well 4, and to a lesser degree Well 6, have declined over time and the City can no longer appropriate the full water right rate from these wells.

The City's remaining water right, Permit G-17583 (formerly G-13876), authorizes the appropriation of up to 8,977 gpm (20.0 cfs) from six wells, including one collector well. Three of the six wells, Wells 7, 8, and 9, have been constructed and the City currently appropriates a combined total of up to 5,800 gpm from these wells under this permit (65% of the permit authorized rate). The City has an approved extension of time for this permit that extends the date to complete construction to October 1, 2054 and the date to apply water to full beneficial use to October 1, 2055. The City is authorized to appropriate up to 7,917 gpm (17.64 cfs) of the total permit authorized rate under its currently approved Water Management and Conservation Plan (WMCP). Access to additional rate under the permit, up to the maximum authorized rate, will require an update of the City's WMCP justifying the need for the additional rate. An updated WMCP must be submitted to the Oregon Water Resources Department (OWRD) by July 17, 2019 per a condition of the final order approving the City's current WMCP.

Table 4-2 provides an inventory of the City's water rights. **Table 4-3** provides a summary of the City's current well production capacity and the allocation of the City's water right capacity by well.

Table 4-2
City of Newberg Water Rights for Use of Groundwater

Application	Permit	Certificate or Registration	Aquifer	Associated Wells	Authorized Use	Priority Date	Authorized Rate	
							(cfs)	(gpm)
--	--	GR-63	Alluvial	Well 1 and Well 2	Municipal	9/30/1951 (Well 1) 5/31/1948 (Well 2)	2.228 (Well 1) 2.228 (Well 2)	1000 (Well 1) 1000 (Well 2)
G-5277	G-5277	68620	Alluvial	Well 5	Municipal	8/5/1970	3	1346
G-5254	G-5276	48100	Alluvial	Well 4	Municipal	7/20/1970	2.68	1203
G-9638	G-10067	82595	Alluvial	Well 5	Municipal	3/28/1980	1.01	453
G-9805	G-10068	82600	Alluvial	Well 6	Municipal	6/23/1980	4.01	1800
G-12515	G-17583		Alluvial	Well 7, 8 and 9 (existing) Well 10 and 11 (proposed) Collector Well (proposed)	Municipal	5/3/1991	20	8977

Table 4-3
Allocation of Water Right Capacity - Groundwater

Water Right ►				GR-63	68620 T-4547 48101 Per. G-5277 App. G-5277	48100 Per. G-5276 App. G-5254	82595 Per. G-10067 App. G-9638	82600 Per. G-10068 App. G-9805	Per. G-13876 T-12202 (submitted 11/16/2015) T-9098 (approved) App. G-12515
Priority date				9/30/1951 (Well 1) 5/31/1948 (Well 2)	8/5/1970	7/20/1970	3/28/1980	6/23/1980	5/3/1991
Certificate date				n/a	10/10/1995	5/25/1979	11/3/2006	11/3/2006	n/a
Appropriation Rate Authorized (cfs)				2.228 (Well 1) 2.228 (Well 2)	3.00	2.68	1.01	4.01	20.00
Appropriation Rate Authorized (gpm)				2,000	1,346	1,203	453	1,800	8,977
Authorized Type of Use				Municipal	Municipal	Municipal	Municipal	Municipal	Municipal

Well Name	Well Log	Aquifer	Well Production Capacity ¹ (gpm)	Water Right Use Allocated by Well (gpm)						Well Production Capacity Allocated (gpm)	Well Production Capacity Remaining (gpm)
Well 1	MARI 191/194	Alluvial	0	0	n/a	n/a	n/a	n/a	n/a	0	0
Well 2	MARI 190/192	Alluvial	0	0	n/a	n/a	n/a	n/a	68620 and	0	0
Well 3	MARI 185	Alluvial	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0
Well 4	MARI 188	Alluvial	400	n/a	n/a	400	n/a	n/a	n/a	400	0
Well 5	MARI 182	Alluvial	425	n/a	425	n/a	0	n/a	n/a	425	0
Well 6	MARI 181	Alluvial	1600	n/a	n/a	n/a	n/a	1600	n/a	1600	0
Well 7	YAMH 51996	Alluvial	1700	n/a	n/a	n/a	n/a	n/a	1700	1700	0
Well 8	MARI 59721	Alluvial	2300	n/a	n/a	n/a	n/a	n/a	2300	2300	0
Well 9	Proposed	Alluvial	0	n/a	n/a	n/a	n/a	n/a	0	0	0
Well 10	Proposed	Alluvial	0	n/a	n/a	n/a	n/a	n/a	0	0	0
Well 11	Proposed	Alluvial	0	n/a	n/a	n/a	n/a	n/a	0	0	0
Collector Well	Proposed	Alluvial	0	n/a	n/a	n/a	n/a	n/a	0	0	0
Appropriation Rate Allocated (gpm)				0	425	400	0	1600	4000	6425	0
Appropriation Rate Remaining (gpm)				2000	921	803	453	200	4977	9354	

Notes:

¹ Based on Well Field Flow Combinations_2015 March.pdf

Transmission

Transmission of raw (untreated) water from the City's groundwater wells across the Willamette River to the WTP is provided by two parallel transmission mains.

The older 24-inch diameter cast iron main is suspended from a decommissioned highway bridge. The approaches to the former Highway 219 bridge have been demolished and the bridge is now owned and maintained by the City for the sole purpose of carrying the water transmission main from the well field to the WTP. The City does not have a formal maintenance or inspection program for the bridge structure. In 2016, a river bank failure occurred next to the bridge's northern end. The City is currently investigating any impact to the transmission main from this event and conducting an assessment of potential slope instability and mitigation strategies at the bridge crossing. The 24-inch bridge transmission main is assumed to be vulnerable to failure during a seismic event due to either potential failure of steel structural members in the existing bridge or slope instability.

A second 30-inch diameter high density polyethylene (HDPE) transmission main, constructed downstream of the bridge crossing in 2006, carries water from the well field under the Willamette River to the WTP. This crossing is considered more resistant to a seismic event due to the flexibility of the pipe material. Flexible joints, which allow slight pipe displacement during a seismic event were not incorporated into the pipeline design at either end of the river crossing. All existing fittings and joints are restrained.

Treatment

The City's existing WTP has a nominal capacity of 9 mgd. Overall plant capacity is currently limited by dual 12-inch diameter piping between the well field transmission mains and WTP settling basins. If the WTP is operated at 9 mgd, water flows from the dual 12-inch diameter mains into the settling basins at high velocity causing it to splash back over the settling basin wall. To mitigate this splash back and ensure proper mixing in the settling basin, the WTP is operated at a maximum capacity of approximately 8 mgd. The existing 8 mgd effective WTP capacity is adequate to meet projected demands of 7.78 mgd through the 20-year planning horizon.

Future Supply

As presented in **Section 3**, the City's current water supply system relies solely upon the well field source water piped across the Willamette River to treatment and customers. Both the well field and at least one transmission main may be vulnerable to flooding, ground movement, seismic activity or other natural disasters. Given these potential vulnerabilities it is recommended that the City assess redundant supply options on the north side of the Willamette River.

Any potential drinking water supply system has three primary components: source, transmission and treatment. Transmission must be provided for both raw water, from the

source to treatment and finished water, from treatment to storage and customers. For a water supply system to be feasible each of these three primary components must be analyzed for their capacity, location and cost. Potential sources are also evaluated for their water quality as this impacts the needed treatment. As illustrated in **Figure 4-1** at the end of this section, a fatal flaw at any one of these evaluation steps may lead to elimination of a proposed source as a feasible option.

Required Capacity

It is recommended that the City evaluate redundant supply sources based on a required capacity of one day of wintertime (non-peak) average daily demand. Based on historical water production records from the WTP, current wintertime average demand is approximately 2 mgd.

Groundwater Source Expansion Assessment

Several alternatives for groundwater source expansion were evaluated on the basis of favorable hydrogeology and the availability of water rights. A detailed discussion of the evaluation is provided in **Appendix C**, and the key outcomes are summarized below.

Hydrogeology

The four major geologic units present in the Newberg area (shown in **Appendix C, Figure 1**) were evaluated for potential to develop a new groundwater source:

1. The marine sediment unit was eliminated from further consideration for a new groundwater source because of poor water quality and low well yields.
2. The nature and distribution of Columbia River Basalt Group (CRBG) aquifers are not well characterized in the Newberg area. The CRBG aquifers outside and in the northern part of the City, where known to be present, are compartmentalized and have low to medium yields and declining water levels. The presence, thickness, and productivity of the CRBG in the southern portion of the City is unknown, and exploration would require a significant investment. The CRBG aquifers were eliminated from further consideration for a new groundwater source.
3. The basin-fill sediment unit was eliminated from further consideration for a new groundwater source because of low well yields.
4. The younger alluvium unit consists of sediments deposited within the floodplain of the Willamette River. The coarser section of the unit comprises the alluvial aquifer, the most productive aquifer in the Newberg area, and is the source of supply for the City's well field. The highest-potential alternative for developing a new, high-capacity groundwater source is to target the coarse material found in the younger alluvium near the Willamette River.

Water Rights

Four different alternatives for obtaining authorization to appropriate water from a new source were evaluated:

1. Obtain a new surface water right, should the City desire to develop a new surface source
2. Acquire an existing surface water right
3. Obtain a new groundwater right
4. Utilize (transfer) the City's existing groundwater rights

All four of the alternatives were found to be feasible, with availability of groundwater rights (new or transferred) limited to the alluvial aquifer present near the Willamette River.

Aquifer Storage and Recovery (ASR)

In addition to the considered alternatives for developing a new groundwater source, ASR also was considered as a strategy for enhancing supply capacity during periods of high demand. ASR is the underground storage of treated drinking water in a suitable aquifer and the subsequent recovery of the water from the same well or wells, generally requiring no re-treatment other than disinfection. The specific alternative evaluated was an ASR system using treated alluvial groundwater from the WTP as the injection source and using the CRBG as the storage aquifer. As discussed above, the presence, structure, and productivity of the CRBG in the Newberg area is highly uncertain. The ASR alternative was not considered further in this evaluation because of the high cost to develop and test an ASR site and the high uncertainty regarding the suitability of the CRBG aquifers in the area for ASR.

Source Expansion Alternatives

The preliminary expansion assessment indicated that the alluvial aquifer provides the best opportunity for developing additional groundwater source capacity. Two overall alternatives for developing additional source capacity in the alluvial aquifer are available to the City:

- **Alternative 1** – expand existing well field capacity
- **Alternative 2** – develop capacity on the north side of the Willamette River

Two targeted options (Option A and B) were identified and evaluated within each of these alternatives.

Alternative 1 - Well field Capacity Expansion

The City has completed several studies since 1980 to evaluate the potential to develop groundwater supplies from the alluvial aquifer within the floodplain on the south side of the Willamette River. The outcome of these studies was continued expansion of the City's Marion County well field, centered on the thickest known section of saturated aquifer. The City has fully developed the pumping capacity of the majority of this channel feature, although the capacities of two wells (4 and 5) have diminished over time. While the aquifer becomes appreciably thinner northwest and south of the existing well field (**Appendix C, Figure 2**), the thickness and nature of the aquifer and potential presence of additional channel features have not been fully explored on the south end of the City's parcel, nor in the northerly portions of the adjacent parcel. The presence of undeveloped alluvial aquifer on the City's parcel and adjacent areas, and the diminished capacity of the City's older wells present a couple of options for developing additional capacity on the south side of the river. These options could be implemented independently or collectively:

- **Option 1A** - Evaluate whether the capacities of Well 4 and Well 5 can be restored and/or whether replacing Well 4 would be beneficial
- **Option 1B** - Fully explore the City's parcel and nearby areas, and drill a new well(s) based on the results of this exploration

Option 1A Improve or Replace Existing Wells in the Well field

This option would involve evaluating whether the performance of older existing Wells 4 and 5 could be restored to improve overall source capacity, and if not, whether the City should consider replacing Well 4. The performance and capacities of Wells 4 and 5 have been significantly diminished since originally installed. Recent advances in well assessment and rehabilitation methods may better inform the City whether to continue to operate these assets as-is or consider implementing a thorough and structured rehabilitation program to restore their capacity. One possible conclusion of the assessment would be that completing a comprehensive rehabilitation program would not be worthwhile. The assessment could also include an evaluation of whether replacing Well 4 would significantly improve overall source capacity given that Well 4 is located at a sufficient distance from the remainder of the wells to be less affected by interference.

Advantages:

- The existing well locations have been well-characterized.
- The City owns the property occupied by the existing wells and has land use approvals to use the parcel for municipal drinking water.
- The City holds undeveloped water right capacity for this aquifer. Changes to the City's water rights to add or move well locations should be relatively simple.
- Much of the access, power and conveyance infrastructure necessary to add capacity is already in place.

Disadvantages:

- Option 1A does not address the objective of developing supply redundancy on the north side of the river.

Option 1B Develop New Wells in the Well field or on Adjacent Parcel

A 1992 study for the City of Newberg by CH2M Hill estimated the capacity of a new well drilled within the thinner (~20 feet) section of the alluvial aquifer to be between 450 and 700 gpm. However, the well capacity potential for certain portions of the City's parcel and the adjacent western parcel is not fully understood because the depth, thickness and nature of the alluvial aquifer has not been fully explored. Option 1B would involve exploration to fill-in information gaps about the thickness of the alluvial aquifer on the City's parcel. The desired capacity increment would then be developed by installing wells in the most advantageous locations. Locations would be identified based on capacity, property, permitting, and infrastructure (power and conveyance) costs.

Advantages:

- The City owns the property occupied by the existing wells and has land use approvals to use the parcel for municipal drinking water.
- The City holds undeveloped water right capacity for this aquifer. Changes to the City's water rights to add or move well locations should be relatively simple.
- Much of the access, power and conveyance infrastructure necessary to add capacity is nearby.

Disadvantages:

- Option 1B does not address the objective of developing supply redundancy on the north side of the river.
- The yield of individual wells may be significantly lower than the City's existing wells, resulting in a higher cost per unit capacity.
- The City does not own the adjacent parcel.

Alternative 2 - North Side Capacity Development

This alternative involves developing source capacity through new wells in the alluvial aquifer on the north side of the Willamette River. Target areas (options) for exploring the presence and nature of the alluvial aquifer include: They are illustrated in **Appendix C, Figures 1 and 3.**

- **Option 2A Gearns Ferry Area** - floodplain in the vicinity adjacent to Highway 219
- **Option 2B Southwest Area** - floodplain between Rogers Landing County Park (County Park) and the City of Dundee

Option 2A Develop New Wells in the Gearns Ferry Area

The Gearns Ferry Area was identified during previous groundwater supply studies as having potentially favorable conditions for developing a groundwater supply source from the alluvial aquifer (CH2M Hill, 1997). The Gearns Ferry Area includes two parcels owned by Chehalem Parks and Recreation District (CPRD) adjacent to the east and west sides of Highway 219. The remainder of the Gearns Ferry Area is privately-owned. Nearly all of the floodplain is in cultivation and the land is designated exclusive farm use (EFU).

The City completed a limited evaluation of the groundwater supply potential of the eastern portion of the CPRD property in 2006 (GSI, 2006). The evaluation was based on the identification of productive aquifer conditions in two irrigation wells located on the Willamette Farms property to the east of the CPRD parcel and an irrigation/domestic well located to the west (**Appendix C, Figure 4**). The investigation included drilling an exploratory borehole on the east edge of the CPRD property and water quality testing of the Willamette Farms wells. Although the test borehole did not intercept a thick sequence of productive material, the majority of the CPRD property remains unexplored and appears to have potential to host a thicker sequence of productive alluvial aquifer materials. The 2006 investigation did identify the presence of cyanide in a sample from one of the Willamette Farms wells, likely a residue from agricultural chemical use. Consequently, additional investigation of groundwater quality and current agricultural practices at the Willamette Farms and CPRD parcels, as well as water quality testing on the CPRD site, would be necessary to assess the risks to source water quality prior to investing in a supply source at this location.

Advantages:

- Option 2A addresses the City's objective of developing redundant capacity on the north side of the river to improve system resiliency.
- Some property is publicly owned.
- Water rights currently held by the City could be used for wells completed in the alluvial aquifer.
- Wells in the vicinity indicate productive aquifer materials are present nearby.

Disadvantages:

- Potential well yields and water quality are uncertain because the area has not been adequately explored.
- Land use related risks to water quality must be evaluated.
- The area is distant from existing conveyance infrastructure.

Option 2B Develop New Wells in the Southwest Area

The Southwest Area, encompassing the floodplain between County Park and the City of Dundee, is the other proximal area with potentially-favorable hydrogeologic conditions for development of a groundwater source in the alluvial aquifer on the north side of the river

(Appendix C, Figure 5). However, this particular area has several challenges, and thus is less favorable than the Gearns Ferry Area in Option 2A.

Similar to the CPRD property, further investigation is necessary to evaluate the feasibility of developing a groundwater source in the Southwest Area. Two primary data gaps must be addressed: (1) verify the presence and pumping capacity of the aquifer, and estimate well yields; and (2) evaluate groundwater quality, potential landfill impacts, and current and potential future agricultural practices to assess risks to source water quality.

Advantages:

- Option 2B addresses the City’s objective of developing redundant capacity on the north side of the river to improve system resiliency.
- Water rights currently held by the City could be used for wells completed in the alluvial aquifer.

Disadvantages:

- Very little information is available to assess the yield potential in the area.
- The proximity of the closed landfill may have negative implications for water quality, and the risk of contamination must be evaluated thoroughly.
- Privately held agricultural land designated EFU may present access and land use challenges.
- The area is distant from existing conveyance infrastructure.

Source Conclusion

The groundwater source expansion assessment identified two overall alternatives for developing additional source capacity in the alluvial aquifer, and for each of the two alternatives, the two best options were evaluated:

- Alternative 1 – expand existing well field capacity
 - Option 1A – improve or replace existing wells in the well field
 - Option 1B – develop new wells in the well field or on adjacent parcel
- Alternative 2 - develop capacity on the north side of the Willamette River
 - Option 2A – develop new wells in the Gearns Ferry Area
 - Option 2B – develop new wells in the Southwest Area

While Options 1A and 1B hold significant advantages, such as, a well-characterized aquifer, existing land use approvals, simple water right transactions, and proximity to infrastructure, they do not address the City’s high-priority objective of developing supply redundancy on the north side of the Willamette River.

Options 2A and 2B address this important objective, and they share several advantages and disadvantages, such as, similar water rights framework, little information to predict well

yields, and distance to existing infrastructure. Option 2B is considered less favorable than Option 2A because there is less available information to assess potential yield, there is greater uncertainty about water quality, and there is no publicly-owned land in the vicinity.

Based on this analysis, the best source expansion option is Option 2A. This option meets the objective of developing redundant supply on the north side of the Willamette River. The information related to existing wells in this area indicates the alluvial aquifer has productive material here. The City's existing water rights could be used for wells in the alluvial aquifer in the Earns Ferry Area, and some property is publicly owned by the CPRD.

In addition to further exploration to identify alluvial aquifer characteristics in the area, impacts to water quality from surface activities such as agriculture must also be evaluated.

Although this appears to be the most feasible option for redundant supply currently, it is anticipated that the City will evaluate other source water options as opportunities arise.

Transmission and Treatment for Redundant Supply

It is anticipated that new wells developed in the alluvial aquifer would require treatment for high levels of iron and manganese consistent with the City's existing wells. Based on a proposed north side well location in the Earns Ferry Area (Option 2A), approximately 2 miles of transmission mains would be needed to carry raw water from a proposed well to the existing WTP. Alternatively, water could be treated at the well site using oxidation and a pressure filter system for iron and manganese followed by on-site disinfection. Approximately 1.3 miles of finished water transmission mains along Highway 219 would then carry the treated water to existing distribution at NE Wynooski Road. Treatment at the proposed well site is the recommended option for planning purposes because less transmission piping is required and a separate treatment system makes the proposed well a truly independent redundant supply. Much of the recommended exploration area is within the 100-year flood plain. Depending on the final well site selected, siting treatment facilities on nearby parcels of higher ground out of the flood plain may be an important consideration in developing this redundant supply.

Redundant Supply Estimated Cost

The City should pursue a redundant supply in the Earns Ferry area on the north side of the Willamette River near the current Highway 219 bridge. The redundant supply, with an approximate capacity of 2 mgd, would consist of a new groundwater well, on-site treatment for iron and manganese, on-site disinfection and approximately 1.3 miles of 12-inch diameter transmission mains from the new well to existing distribution at Highway 219 and NE Wynooski Road. **Table 4-4** summarizes planning level costs for each of these supply components. As described under **Source Expansion Alternatives** earlier in this section, additional exploration is needed in the Earns Ferry area to confirm hydrogeology and water quality prior to selecting a final well site. Costs for this additional exploration are also included in **Table 4-4**.

**Table 4-4
Redundant Supply Cost Estimate Summary**

Supply Component	Development Phase or Facility	Item Description	Assumptions	Total Cost
Source	Feasibility and Exploration	Water Rights Evaluation	Review water rights and permitting alternatives, meet with OWRD to determine next steps for permitting	\$ 2,500
		Geophysical Explorations	Two field days, consultant provides field support for contractor	\$ 27,500
		Subsurface Investigation and Testing	Sonic borings, 6-inch test well with two 2-inch monitoring wells	\$ 128,000
		Water Quality Assessment	Three water quality samples submitted for metals, pesticides and cyanide	\$ 5,000
	Well Development	2 mgd Production Well	One well only	\$ 360,000
		Water Rights Preparation		\$ 5,000
	Well house and well head Improvements			\$ 500,000
Treatment	Iron and Manganese	On-site oxidation and filtration	Sodium hypochlorite injection for oxidation, manganese dioxide media pressure filter for filtration	\$ 450,000
	Disinfection	On-site injection of sodium hypochlorite	Bulk sodium hypochlorite delivered to site, no on-site generation	\$ 150,000
Transmission	Finished Water Transmission Main	12-inch diameter ductile iron		\$ 1,991,000
TOTAL Redundant Supply Development Cost				\$ 3,619,000

SECTION 5

WATER DISTRIBUTION SYSTEM ANALYSIS

This section presents an analysis of the City of Newberg's (City's) water distribution system based on criteria outlined in **Section 3**. The water demand forecasts summarized in **Section 2** are used in conjunction with analysis criteria to assess water system characteristics including service pressures, storage and pumping capacity and emergency fire flow availability. This section provides the basis for the recommended Capital Improvement Program (CIP) presented in **Section 7**.

Pressure Zone Analysis

Pressure zones are defined by ground topography. Their hydraulic grade lines (HGLs) are determined by overflow elevations of water storage reservoirs, discharge pressures of pump stations or outlet settings of pressure reducing facilities serving the zone. The City's two existing pressure zones provide adequate service pressure to all customers. A third pressure zone is recommended within the 20-year planning horizon to supply potential new development at higher elevations northeast of the existing service area. Beyond 20 years it is anticipated that a fourth pressure zone will be needed to serve customers at the highest elevations in the City's North Hills Urban Reserve Area (URA). Proposed Zone 4 is not explicitly addressed in the distribution system analysis as it is outside of the 20-year service area for this Master Plan. Existing and proposed future pressure zones are illustrated on the water system maps in **Appendix A**.

Existing Pressure Zones

The City's existing distribution system is almost entirely served from Zone 1 which is supplied by the Water Treatment Plant (WTP) and the North Valley and Corral Creek Reservoirs at approximate HGL of 403 feet. Zone 1 provides adequate service pressure to customers below approximately 310 feet elevation. Zone 2, serving the Oak Knoll neighborhood at the northern edge of Newberg, is supplied by constant pressure pumping from the Oak Knoll Pump Station. Zone 2, with an approximate HGL of 470 feet, currently provides adequate service pressure to customers between approximately 310 and 350 feet elevation.

Zone 2 North Expansion to Veritas School Site

The City has entered an agreement to expand Zone 2 water service from the Oak Knoll Pump Station north on N College Street to the proposed Veritas School property at the intersection of N College Street and NE Bell Road. An 8-inch diameter main was recently completed from Oak Knoll Pump Station along N College Street to the school property. In addition to the school, other properties north of the Zone 2 boundary including the North Valley Friends Church and a proposed 11-unit residential development at 4016 N College (Rourke Property) are expected to connect to City water service from this 8-inch main. For the purposes of this

analysis, completion of these additional Zone 2 customer connections is assumed to occur within the next 5 years as reflected in the future water demand by pressure zone summarized in **Table 2-4** in **Section 2**.

Required fire flow has yet to be determined by the Newberg Fire Marshal for these proposed Zone 2 future customers as they are currently outside of the city limits. For this analysis it is assumed that the maximum fire flow required in Zone 2 will continue to be 1,000 gpm. However, to be consistent with the City's 2015 *Public Works Design and Construction Standards*, when the properties are annexed into the City of Newberg, it is likely the required fire flow without automatic fire sprinklers for the church and school will be at least 3,000 gpm and up to 4,500 gpm. The existing Oak Knoll Pump Station does not have adequate capacity under any conditions to supply a fire flow requirement larger than 1,260 gpm, which is the current nominal capacity of the station with all pumps operating.

Proposed Future Pressure Zones

As development continues in the Urban Growth Boundary (UGB) and the City's water service area expands to the northeast, a new Zone 3 is proposed to serve new development at higher elevations. The proposed Zone 3 would supply customers between approximately 310 and 440 feet elevation around NE Zimri Drive north of the Allison Inn.

Although initial development in Zone 3 could be independently served by a constant pressure pump station, it is recommended that the City pursue long-term development of a storage reservoir to supply Zone 3 customers by gravity. The proposed reservoir would ultimately serve future customers in the City's largest URA, the North Hills URA, which is anticipated to develop beyond the 20-year planning horizon of this Master Plan.

Customers in the North Hills URA below approximately 440 feet elevation will be served from proposed Zone 3. Customers between approximately 440 and 560 feet are assumed to be served by a future Zone 4. It is assumed that the proposed reservoir will be designed to operate at an HGL to serve future Zone 3 customers by gravity. Future Zone 4 customers would then be served by constant pressure pumping from Zone 3. Zone 4 is anticipated to develop beyond the 20-year planning horizon, thus no further analysis of Zone 4 water service is included in this Plan.

For this analysis, it is assumed that Zone 2 customers will ultimately be served from Zone 3 following construction of the proposed reservoir and necessary transmission piping beyond the 20-year planning horizon.

Storage Capacity Analysis

Storage facilities are provided for three purposes: operational storage, fire storage and emergency storage. As presented in **Section 3**, the total storage required in each pressure zone is the sum of these three elements.

- **Operational Storage** – volume needed to meet peak hour demand (PHD) for 2.5 hours with all non-emergency pumps supplying the zone
- **Fire Storage** – the most severe fire flow requirement in the zone multiplied by the duration of that flow specified in the 2014 *Oregon Fire Code*
- **Emergency Storage** – 100 percent of maximum daily demand (MDD) in the zone

Storage reservoirs must have adequate capacity to meet demands within the pressure zone being supplied by gravity as well as demands in any constant pressure zones pumping out of the gravity zone. In the existing Newberg water system, this means adequate storage must be available in Zone 1 reservoirs to meet storage requirements for Zone 1 customers who are served by gravity and Zone 2 customers who are supplied constant pressure from the Oak Knoll Pump Station. Constant pressure zones, like Zone 2, cannot be adequately supplied fire flow from a lower-elevation reservoir and must have adequate pumping capacity to meet fire flow requirements as presented later in this section. Existing and projected future storage capacity requirements are summarized in **Table 5-1**.

Existing Storage Capacity Findings

Existing Zone 1 storage reservoirs have adequate capacity to meet storage requirements under existing and projected future demand conditions through the 20-year planning horizon.

Proposed Bell Road Reservoir

As discussed earlier in this section, continued development northeast of the City's existing service area will require a new Pressure Zone 3 to serve customers above approximately 310 feet elevation within the UGB and the North Hills URA. The proposed Zone 3 within the UGB would initially be served by constant pressure pumping.

As development warrants beyond the 20-year planning horizon, it is recommended the City construct a new storage reservoir on City-owned property north of Bell Road near the intersection with Zimri Drive. The proposed Bell Road Reservoir will ultimately serve Zone 3 customers within the current UGB, future Zone 3 and 4 customers within the North Hills URA and Zone 2 customers following construction of the proposed reservoir and necessary distribution piping. It is assumed that the proposed Bell Road Reservoir will be designed to operate at an HGL to serve future Zone 3 customers by gravity.

Bell Road Reservoir Capacity

The proposed Bell Road reservoir has an estimated 20-year storage need of approximately 0.24 MG to serve future Zone 3 customers within the UGB. A total storage capacity of 1.69 MG is needed to serve Zone 2 and proposed Zones 3 and 4 beyond the 20-year planning horizon when and if development occurs in the North Hills URA. The total recommended storage capacity for the Bell Road Reservoir is 1.7 MG.

Estimates of proposed Bell Road storage capacity assume a maximum residential fire flow requirement of 1,500 gpm based on potential medium density residential development in future Zones 3 and 4. If the fire flow requirement for the Veritas School in Zone 2 is higher than 1,500 gpm it will impact required storage capacity, adding up to an additional 0.9 MG at a required fire flow of 4,500 gpm which is the maximum requirement from the City's 2015 *Public Works Design and Construction Standards*.

Estimates of proposed Bell Road storage capacity also assume the reservoir will ultimately be supplied by two pump stations, a proposed Bell East Pump Station on Zimri Drive just north of the Allison Inn and a proposed Bell West Pump Station on N College Street near the existing Oak Knoll Pump Station. These proposed pump stations are discussed in more detail in the following paragraphs. It is assumed that the City will re-evaluate the proposed Bell Road Reservoir capacity during reservoir pre-design based on the actual timing and character of development in the UGB and URA.

**Table 5-1
Storage Capacity Analysis**

Pressure Zone	Timeframe	Other Zones Served ¹	Required Storage (MG)				Existing Reservoirs	Existing Storage (MG)	Additional Storage Need (MG)
			Operational	Fire ²	Emergency	Total			
Zone 1	Current	Zone 2	-	1.08	4.79	5.87	North Valley 1 & 2 and Corral Creek	12.00	-
	5-year (2020)		-	1.08	5.70	6.78		12.00	-
	10-year (2025)		-	1.08	6.47	7.55		12.00	-
	20-Year (2035)		-	1.08	7.72	8.80		12.00	-
Zone 3	5-year (2020)	None	-	0.18	0.02	0.20	None	-	0.20
	10-year (2025)		-	0.18	0.05	0.23		-	0.23
	20-Year (2035)		-	0.18	0.06	0.24		-	0.24
	Beyond 20 years	Zone 2 and Zone 4	0.09	0.18	1.42	1.69		-	1.69

Notes:

1. Zone 2 is currently supplied by constant pressure pumping from Zone 1, thus Zone 1 storage must have adequate capacity to serve Zone 2. After construction of the proposed Zone 3 reservoir, assumed to occur beyond the 20-year planning horizon, Zone 2 customers would be served by gravity from the new Zone 3 storage reservoir.
2. Required maximum fire flow for Zone 2 is assumed to be the current 1,000 gpm and proposed Zones 3 and 4 is assumed to be 1,500 gpm. If the fire flow requirement for the Veritas School or other structures in these future zones is determined to be larger than 1,500 gpm it will impact the storage needed up to an additional 0.9 MG with a required flow of 4,500 gpm. This is the maximum requirement from the City's 2015 *Public Works Design and Construction Standards*.

Pumping Capacity Analysis

Pumping capacity requirements are estimated based on available storage, the number and size of pumps serving each pressure zone and the zone's maximum fire flow requirement. Recommendations are based on firm capacity which is defined as a pump station's capacity with the largest pump out of service, measured in gallons per minute (gpm).

In pressure zones supplied by gravity, like Zone 1, operational and fire storage provided by reservoirs make it unnecessary to plan for fire flow or peak hour capacity from pump stations, assuming adequate storage is available. Pump stations supplying gravity zones must have sufficient firm capacity to meet the maximum day demand for all customers in the zone and any higher zones supplied from the primary zone.

Constant pressure pump stations supply a pressure zone without the benefit of storage, like Zone 2. Zones served by constant pressure pumping present a higher level of risk for water providers as a total loss of service pressure could occur with a power outage or main break in the zone. This loss of pressure temporarily leaves customers without water in their homes or for fire suppression and may result in a boil water advisory. However, constant pressure stations may be the only cost-effective way to serve some areas in the distribution system which would otherwise require an elevated reservoir to provide pressure by gravity. Due to these potential risks, these stations are only recommended for areas with few services and low water demand. Pump stations supplying constant pressure service must have firm pumping capacity to meet peak hour demands while simultaneously supplying the largest fire flow demand in the zone. The pumping capacity analysis is summarized in **Table 5-2**.

**Table 5-2
Pumping Capacity Analysis**

Pressure Zone	Timeframe	Other Zones Served	Criteria	Req'd Firm Capacity (gpm)	Existing Pumps	Firm Capacity (gpm)	
						Existing	Additional Need
Zone 1	Current	Zone 2	MDD	3,327	WTP High Service	6,900	-
	5-year (2020)	Zone 2 & Zone 3		3,972			-
	10-year (2025)			4,528			-
	20-Year (2035)			5,403			-
Zone 2	Current	-	PHD + Fire Flow ²	1,049	Oak Knoll	260	789
	5-year (2020)			1,639			1,379
	10-year (2025)			1,639			1,379
	20-Year (2035)			1,639			1,379
	Beyond 20 years	MDD	375	None ¹	-	375	
Zone 3	5-year (2020)	-	PHD + Fire Flow	1,521	None	-	1,521
	10-year (2025)			1,562			1,562
	20-Year (2035)			1,569			1,569
	Beyond 20 years	Zone 4	MDD	612			612

Notes:

- Existing Oak Knoll Pump Station is assumed to be abandoned following construction of proposed Bell West Pump Station to serve Zone 2 and ultimately proposed Bell Road Reservoir.
- Required maximum fire flow for Zone 2 is assumed to be the current 1,000 gpm requirement. If the fire flow requirement for the Veritas School or other structures included in the Zone 2 north expansion is determined to be larger than the current 1,000 gpm requirement, it will impact the firm pumping capacity needed within the 20-year timeframe up to an additional 3,500 gpm with a total required flow of 4,500 gpm. This is the maximum requirement from the City's 2015 *Public Works Design and Construction Standards*.

Existing Pumping Capacity Findings

The existing Water Treatment Plant (WTP) High Service Pumps have adequate capacity to supply projected system-wide demands through the 20-year planning horizon. The Oak Knoll Pump Station, serving Zone 2, is not currently equipped with a redundant high capacity pump to meet fire flow demands. The station's existing high capacity pump is sized for a flow of 1,000 gpm.

Proposed Pump Stations

To supply future customers at higher elevations north of the City's existing service area additional high elevation pressure zones are needed. Development in these areas is anticipated to be incremental with many new customers connecting to the City water system beyond the 20-year planning horizon from new development in the North Hills URA. Thus, a phased approach to pumping and storage facilities is needed to provide water service while distributing capital improvement costs and maintaining adequate water circulation for water quality throughout the system. It is recommended that high elevation service areas initially be served by constant pressure pump stations, transitioning to gravity service following construction of the proposed Bell Road Reservoir beyond the 20-year planning horizon.

Bell East Pump Station

For the purposes of this Master Plan it is assumed that Zone 3 development within the UGB will be served by constant pressure pumping from the proposed Bell East Pump Station through the 20-year planning horizon.

Concurrent with construction of the Bell Road Reservoir, Bell East Pump Station will be modified to supply the reservoir which will then serve customers by gravity. The proposed pump station, located on Zimri Drive just north of the Allison Inn will draw suction supply from existing 24-inch diameter Zone 1 distribution mains on Zimri Drive.

Bell East Capacity

As shown in **Table 5-2**, Bell East has a proposed firm capacity of approximately 1,600 gpm through the 20-year planning horizon to provide PHD and residential fire flow to future Zone 3 customers within the UGB.

Following construction of the Bell Road Reservoir beyond 20 years, Bell East Pump Station would need a firm capacity of approximately 700 gpm to fill the reservoir at a rate approximately equal to the MDD for future Zone 3 and 4 customers within the UGB and North Hills URA.

Bell West Pump Station

The proposed Bell West Pump Station will serve existing Zone 2 customers and the Zone 2 expansion to the Veritas School by constant pressure pumping through the 20-year planning horizon. It is anticipated the existing Oak Knoll Pump Station will be abandoned following construction of Bell West.

Following construction of the Bell Road Reservoir and approximately 6,000 linear feet (1.1 miles) of transmission main along Bell Road between Zimri Drive and N College Street, Bell West Pump Station will be modified to supply the reservoir which will then serve former Zone 2 customers by gravity. The proposed pump station, located on N College Street near the Madison Drive alignment will draw suction supply from 18-inch diameter Zone 1 mains supplying the North Valley Reservoirs at N College Street and N Terrace Drive.

Bell West Capacity

As shown in **Table 5-2**, Bell West has a proposed firm capacity of approximately 1,400 gpm through the 20-year planning horizon to provide PHD and a residential 1,000 gpm fire flow to Zone 2 including expansion to the Veritas School. If the fire flow requirement for the Veritas School in Zone 2 is higher than 1,000 gpm it will impact required pumping capacity, adding up to an additional 3,500 gpm.

Following construction of the Bell Road Reservoir beyond 20 years, Bell West Pump Station will need a firm capacity of approximately 400 gpm to fill the reservoir at a rate approximately equal to the projected MDD for Zone 2.

Back-Up Power

At least two independent power sources are recommended for the City's pump stations. It is recommended that pump stations supplying gravity storage reservoirs include, at a minimum, manual transfer switches and connections for a portable back-up generator. The emergency storage volume in each reservoir will provide short term water service reliability in case of a power outage at the pump station. Back-up power is particularly critical for stations which provide constant pressure service. On-site standby power generators with automatic transfer switches are recommended for constant pressure pump stations serving zones without the benefit of gravity storage.

An on-site back-up power generator is installed at the existing WTP which is capable of operating the high level pumps to fill Zone 1 reservoirs. The existing Oak Knoll Pump Station also has a back-up power generator.

It is recommended that proposed Bell East and Bell West Pump Stations have back-up power generators incorporated into their design.

Distribution Capacity and Hydraulic Performance

Hydraulic Model

A steady-state hydraulic network analysis model was used to evaluate the performance of the City's existing distribution system and identify proposed piping improvements based on hydraulic performance criteria, such as system pressure and flow velocity, described in **Section 3**. The purpose of the model is to determine pressure and flow relationships throughout the distribution system for average and peak water demands under existing and projected future conditions. Modeled pipes are shown as “links” between “nodes” which represent pipeline junctions or pipe size changes. Diameter, length and head loss coefficients are specified for each pipe and an approximate ground elevation is specified for each node.

The hydraulic model was developed for this Master Plan using the InfoWater modeling software platform with geographic information system (GIS) base mapping and operations data provided by the City. The model was calibrated using fire hydrant flow test data and analysis scenarios were created to evaluate existing and projected 20-year demands.

For distribution system modeling, the City's WTP High Service Pumps are assumed to be off. Zone 1 storage reservoirs are modeled approximately two-thirds full under peak demand conditions based on input from City staff regarding summertime operating levels.

Modeled Water Demands

Existing and projected future demands are summarized in **Section 2, Tables 2-2 and 2-4**. Within the existing water service area, demands are assigned to the model based on current customer billing address and billed water consumption. Future demands in water service expansion areas are assigned uniformly over each proposed pressure zone area illustrated on the water system maps in **Appendix A**.

Model Calibration

Model calibration typically involves adjusting the model parameters such that pressure and flow results from the model more closely reflect those measured at the City's fire hydrants. This calibration process tests the accuracy of model pipeline friction factors, demand distribution, valve status, network configuration, and facility parameters such as tank elevations and pump curves. The required level of model accuracy can vary according to the intended use of the model, the type and size of water system, the available data, and the way the system is controlled and operated. Pressure and flow measurements are recorded for the City's fire hydrants through a process called fire flow testing.

Fire Flow Testing

Fire flow testing consists of recording static pressure at a fire hydrant and then “stressing” the system by flowing an adjacent hydrant. While the adjacent hydrant is flowing, residual

pressure is measured at the first hydrant to determine the pressure drop that occurs when the system is “stressed”. Boundary condition data, such as reservoir levels and pump on/off status, must also be known to accurately model the system conditions during the time of the flow test. For this Master Plan, hydrant flow tests were conducted on April 6, 2016. The recorded time of each fire hydrant flow test was used to collect boundary condition information from the City’s supervisory control and data acquisition (SCADA) system.

Steady-State Calibration Results

For any water system, a portion of the data describing the distribution system will be missing or inaccurate and assumptions will be required. This does not necessarily mean the accuracy of the hydraulic model will be compromised. Depending on the accuracy and completeness of the available information, some pressure zones may achieve a higher degree of calibration than others. Models that do not meet the highest degree of calibration can still be useful for planning purposes.

Pump discharge flow and pump curves were not available for the Oak Knoll Pump Station, serving the City’s Pressure Zone 2 through constant pressure pumping. The absence of accurate flow data for constant pressure zones makes it difficult to accurately model the Oak Knoll Pump Station. Flows were approximated based on the assigned demands in the model, City-provided pump nominal capacities and discharge pressure measured at the station.

The model calibration’s confidence level was evaluated based on the difference between modeled and field-measured pressure drops during fire hydrant flow testing, in pounds per square inch (psi), as summarized in **Table 5-3**. Overall system calibration confidence is considered high.

**Table 5-3
Calibration Confidence**

Confidence Level	Field-Measured vs. Modeled Pressure Drop Difference
High	+5 psi
Medium	+ 5-10 psi
Low	>10 psi

Fire Flow Analysis

Fire flow scenarios test the distribution system’s ability to provide required fire flows at a given location while simultaneously supplying MDD and maintaining a minimum residual service pressure of 20 psi at all services. Required fire flows are assigned based on the zoning surrounding each hydrant as summarized in **Section 3, Table 3-1**.

The City's existing distribution mains are well looped with adequate fire flows available in most areas and relatively few piping improvements recommended for fire flow. Piping improvements are primarily needed in older parts of the water system including smaller diameter water mains adjacent to George Fox University and undersized 1- and 2-inch mains with few interconnections serving E Hancock Street (Highway 99W) between N Grant and N Edwards Streets downtown.

Peak Hour Demand Analysis

Distribution system pressures were evaluated under peak hour demand conditions to confirm identified piping improvements. Peak hour demands were estimated as 1.7 times the maximum day demand. No additional pressure deficiencies were identified under these conditions.

Distribution System Water Quality

The City of Newberg meets all current drinking water quality regulations. This analysis focuses on microbial contaminants (Total Coliform Rule), lead and copper (Lead and Copper Rule) and disinfection by-products (Stage 2 Disinfectants and Disinfection Byproducts Rule) which may be exacerbated or originate in the distribution system.

Total Coliform Rule Compliance

The City is currently meeting all applicable requirements for the Total Coliform Rule. It is important to maintain active circulation of water throughout the distribution system, in both pipes and reservoirs in order to retain a chlorine residual. The absence of chlorine residual and accumulation of sediments contribute to bacterial growth, which in turn can result in failure to comply with this rule.

Lead and Copper Rule Compliance

The City uses caustic soda to raise the pH of treated water leaving the WTP. Newberg has been in compliance with the Lead and Copper Rule since 1997 when this pH adjustment system was installed. There appear to be no concerns with future compliance with the Lead and Copper Rule.

Stage 2 Disinfectants and Disinfection Byproducts Rule (D/DBPR) Compliance

Currently, the City conducts quarterly sampling for DBP at the following four sample sites, all of which are currently in compliance:

- North Valley Reservoirs (25600 North Valley Road)
- Corral Creek Reservoir (31451 Corral Creek Road)
- 3743 Dahlia Street
- 210 The Greens

Summary

This section presented an analysis of the City of Newberg's water distribution system based on projected future water demands presented in **Section 2** and performance criteria outlined in **Section 3**. This water system assessment includes service pressures and zone boundaries, storage and pumping capacity and emergency fire flow availability. This section provides the basis for recommended distribution system improvements presented in **Section 7** Capital Improvement Program.

SECTION 6

OPERATIONS AND MAINTENANCE

This section assesses the City of Newberg's (City's) Operations and Maintenance (O&M) program for its water system. The assessment is based on information from City staff compared with American Water Works Association (AWWA) standards, the O&M practices of similarly sized utilities, and pertinent regulatory requirements. Recommendations for improvements to the City's O&M program, described at the end of this section, are based on the results of this assessment.

Existing O&M Structure

The City's Public Works Department staff are responsible for the maintenance and operation of the water distribution and treatment systems. Newberg Public Works is structured into three major divisions; Operations, Maintenance, and Engineering. This section focuses on the work of the Operations and Maintenance divisions. Within these divisions staff are charged with O&M for a variety of public facilities including both water and wastewater utilities, fleet maintenance, street repair and grounds maintenance. This generalized structure allows staff to support multiple facilities and for administrative functions to be shared across utilities. Water utility responsibilities for each division are as follows:

Operations Division

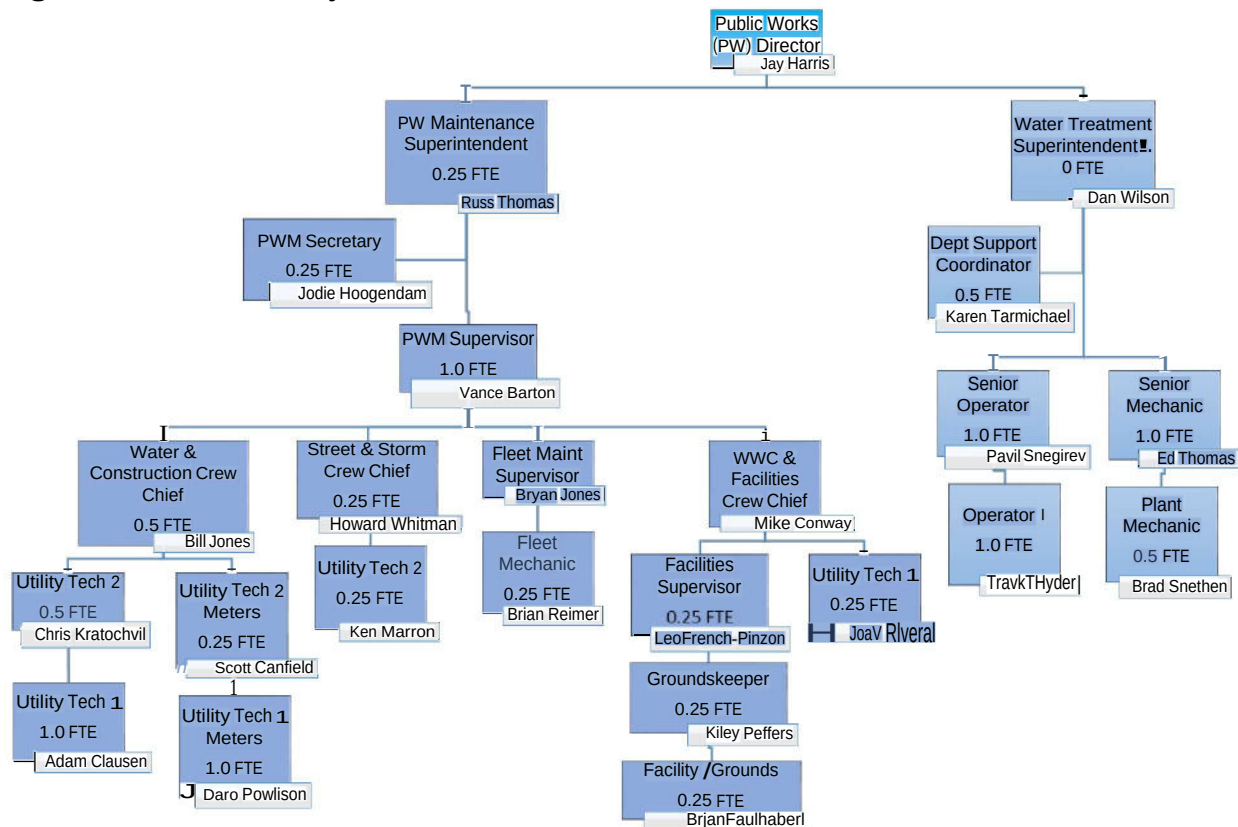
- Water Treatment Plant
- Well field
- Storage reservoirs
- Pump stations

Maintenance Division

- Distribution main flushing & repair
- Valves & hydrants
- Meter reading
- Investigate & address customer complaints

The water utility has budgeted staff time of 5 full-time equivalent employees (FTEs) from the Operations Division and 6.5 FTEs from the Maintenance Division. **Figure 6-1** shows the organizational structure for O&M staff whose time is allocated to the water system. The City is currently evaluating the Maintenance Division organizational structure. Anticipated changes include a move towards more defined crews for each utility rather than, for instance, a general public works construction crew.

Figure 6-1 Water Utility Public Works Staff FTE



O&M Regulations and Guidelines

Oregon Administrative Rules (OAR) 333-061-0065 govern O&M of public water systems with the primary directive that they be “operated and maintained in a manner that assures continuous production and distribution of potable water”. These rules establish general requirements for leak repair, proper and functioning equipment, emergency planning, and current documentation.

The AWWA G200 Distribution Systems Operation and Management standard provides recommendations for routine maintenance programs, handling customer complaints, and record keeping which address the O&M goals and requirements of the OAR.

The City has also established ordinances regarding connection to the water system, cross-connection, backflow prevention, and water conservation and curtailment as described in Newberg Municipal Code Chapter 13.15.

Operator Certification

OAR 333-061-0200 defines requirements for water system operator certification. Personnel in charge of operations for all community water systems, like Newberg's water system, are required to be certified through the Oregon Water System Operator's Certification Program. Water distribution and water treatment operators must receive certification in accordance with the classification of the system they operate. The City's classifications are:

- **Water Treatment 2** – based on the complexity of water treatment required
- **Water Distribution 3** - based on a service area population between 15,000 and 50,000 people, Newberg's service population is approximately 22,900

State guidelines also require water suppliers to identify an operator with these levels of certification as being in "direct responsible charge" (DRC) of the treatment and distribution systems. In Newberg, these roles are filled by the Water Treatment Superintendent and the Maintenance Superintendent respectively. **Table 6-1** summarizes current Oregon water operator certification levels held by Newberg public works staff.

Table 6-1
Certification Status of Personnel

Certification Number	Name	Job Title	Certification
D-5076, T-5076	Dan Wilson	Water Treatment Superintendent / Cross Connection Specialist – DRC treatment	WD-2, WT-3
D-08243, T-08150	Pavil Snegirev	Senior Water Treatment Operator	WD-3, WT-3
D-1533	Russ Thomas	Maintenance Superintendent – DRC distribution	WD-3
D-6191	Vance Barton	Maintenance Supervisor	WD-3
D-6283	Michael Conway	Facilities & Field Ops Lead/Crew Chief	WD-2
D-6021	Scott Canfield	Maint Tech 2 – Cartograph / Meter Service	WD-2
D-08442	Chris Kratochvil	Maint Tech 1	WD-2

Current O&M Practices and Procedures

Both the Operations and Maintenance divisions implement procedures to ensure that the water system facilities function efficiently and meet level-of-service requirements (e.g., water quality and adequate service pressure). Routine procedures include visual inspection of system facilities, monitoring flow- and reservoir-level recording, and responding to customer inquiries and complaints. City staff handle the majority of O&M duties; however, tasks such as major water main repairs, well rehabilitation and reservoir painting are sourced to outside contractors.

System Operation

The City maintains and operates all facilities and appurtenances within the system, including customer meters. The customer is responsible for maintaining the water service line beyond the meter, typically located at the curb or near the property line. Meter reading is performed using a mobile Automatic Meter Reading (AMR) system and requires approximately 16 staff hours monthly to complete.

Each facility is typically inspected one to two times weekly to ensure security, proper operation and site maintenance. Chlorine residual and water pH in each finished water storage reservoir are checked twice a week. Well water levels are hand measured bi-monthly to verify well level indicators are reading accurately.

Field personnel monitor the water system's performance every day. Supervisory Control and Data Acquisition (SCADA) equipment at the City's the Water Treatment Plant (WTP) records the water pressure and metered flow at all wells, pressure at the Oak Knoll booster pump station, and water levels in the City's finished water storage reservoirs and WTP clearwell. Flow out of the WTP to distribution mains and storage reservoirs is recorded at the High Service Pumps. The volume of water produced at the WTP is totaled and recorded. Water personnel can use this data to detect any major abnormalities in the water system.

Water quality monitoring, as described in **Section 5**, is also performed by operations staff.

System Preventive Maintenance

The City's current preventive maintenance program consists of regularly servicing pumps and flushing water mains.

The City's water system includes well pumps, finished-water High Service Pumps at the WTP, raw water pumps at Otis Springs and booster pumps at the Oak Knoll Pump Station. Annual pump maintenance activities at one or more pump stations include:

- Clean variable frequency drives (VFDs)
- Test well pump output

- Test flow meters
- Change pump motor oil
- Inspect and, if needed, replace impellers
- Clean pump screens
- Fire pump testing (monthly)

Flushing is currently performed annually during the low demand winter season for a portion of the distribution system. With this annual flushing, the entire system is flushed on an approximately 4- to 5-year rotation. Dead ends are flushed every one to two years. Local flushing is also performed, as needed, in response to customer complaints.

The City does not currently have a formal valve exercising or hydrant maintenance program. Valves and hydrants are checked during flushing. Hydrants are repainted every 5 to 8 years using seasonal labor.

Other maintenance activities regularly performed by City staff include:

- Maintain grounds around City facilities
- Address customer complaints
- Exercising valves at system reservoirs, wells and pump stations
- Sodium hypochlorite generation cell service at WTP (semi-annually)
- Polymer pump maintenance
- Checking for leaks in bridge-mounted raw water transmission main

Record Keeping

Current water system mapping is maintained by the Engineering Division using Geographic Information Systems (GIS). Public Works Maintenance staff have access to view current mapping electronically. All mapping changes are processed by the Engineering Division's GIS Analyst based on paper mark-ups or as-builts provided by Maintenance.

The City manages water system assets using Cartegraph software. Cartegraph is used to record customer complaints and generate work orders for repair and maintenance activities. The current software will no longer be updated in 2017, and support will end in 2018. City staff are investigating options to update or convert to another asset management system.

Customer Complaints

Customers may call or email to file a complaint with any member of City staff. The initial contact forwards the complaint to the correct department and, depending on the nature of the complaint, it is investigated immediately to several days later. Complaints are addressed in the order of their severity and major issues are recorded in the City's current asset management software.

Conclusions and Recommendations

An effective O&M program addresses issues with customer interaction, water quality and infrastructure operations and maintenance. The City's current O&M program does not include some common best management practices of water utilities in the region. The City is currently evaluating water maintenance programs and assessing the need for additional routine maintenance.

Distribution System

Water distribution system O&M programs typically include the following maintenance programs:

- Dead-end main and hydrant flushing.
- Valve exercising.
- Leak detection.

It is difficult for water providers to address each item listed above. Consequently, it is important to prioritize maintenance of the critical infrastructures necessary to maintain effective service during an emergency. To accomplish this, the City should ensure adequate resources. Currently the City is completing dead-end main and hydrant flushing on a routine basis, and based on the limited number of water quality complaints and observed performance of hydrants during flow testing for this Master Plan, changes to the City's hydrant flushing program are not recommended.

To maintain a high level of service, the City should assess and identify critical components of the distribution system. To improve water distribution system O&M, it is recommended that the City develop the following programs:

1. A pipe replacement program based on a 100-year cycle as presented in **Section 5**.
2. A valve exercising program that operates all distribution valves on a 5-year basis to maintain the reliability of their service. If properly operated, most valves require less maintenance and will last a long time. Focus should be on critical isolation valves within the distribution system.
3. A leak-detection program may provide value to the City. At this point, the City is unable to perform an accurate comparison of water production and consumption to quantify water losses, thus, the value of a leak detection program is unclear. The City should invest in resolving this data discrepancy to determine if investment in leak detection is warranted. Typically, a leak detection program will provide value for systems with water loss rates in excess of 10 percent of annual water production.

Water Storage Tanks

To ensure a long tank life and good water quality, water storage tanks must be periodically inspected and maintained at least every five years, depending on the structure. Routine inspections aid in assessing the coating system and potential required repairs.

The following recommendations will allow the City to expand its water system maintenance program and improve its water storage tank operations and maintenance program:

4. Implement a water storage tank inspection and cleaning program to assess every storage tank within the system every 5 years. The City could consider contracting with an independent certified inspection company.

Staffing

The implementation of any of the recommendations presented above will result in a need for evaluation of staffing levels within the Maintenance department. In particular, staff availability to increase time dedicated to the water utility relative to other utility requirements will need to be considered.

SECTION 7

RECOMMENDATIONS AND CAPITAL IMPROVEMENT PROGRAM (CIP)

This section presents recommended improvements and capital maintenance for the City of Newberg's (City's) water system based on the analysis and findings presented in **Sections 4 and 5**. These improvements include supply, storage reservoir, pump station and water main projects. The capital improvement program (CIP) presented in **Table 7-5** later in this section summarizes recommended improvements and provides an approximate timeframe for each project. Proposed supply and distribution system improvements are illustrated on **Plate 1** in **Appendix A**.

Cost Estimating Data

An estimated project cost has been developed for each improvement project recommended in this section. Cost estimates represent opinions of cost only, acknowledging that final costs of individual projects will vary depending on actual labor and material costs, market conditions for construction, regulatory factors, final project scope, project schedule and other factors. The Association for the Advancement of Cost Engineering International (AACE) classifies cost estimates depending on project definition, end usage and other factors. The cost estimates presented here are considered Class 4 with an end use being a study or feasibility evaluation and an expected accuracy range of -30 percent to +50 percent. As the project is better defined, the accuracy level of the estimates can be narrowed.

Estimated project costs are based upon recent experience with construction costs for similar work in Oregon and southwest Washington and assume improvements will be accomplished by private contractors. Estimated project costs include approximate construction costs and an aggregate 44 percent allowance for administrative, engineering and other project related costs. Estimates do not include the cost of property acquisition. Since construction costs change periodically, an indexing method to adjust present estimates in the future is useful. The Engineering News-Record (ENR) Construction Cost Index (CCI) is a commonly used index for this purpose. For purposes of future cost estimate updating; the current ENR CCI for Seattle, Washington is 10623 (October 2016).

Water System Capital Improvement Program

A summary of all recommended improvement projects and estimated project costs is presented in **Table 7-5**. This CIP table provides for project sequencing by showing prioritized projects for the 5-year, 10-year and 20-year timeframes defined as follows:

- 5-year timeframe - recommended completion before 2022
- 10-year timeframe - recommended completion between 2022 and 2027
- 20-year timeframe - recommended completion between 2027 and 2037.

CIP Cost Allocation to Growth

Water system improvement projects are recommended to mitigate existing system deficiencies and to provide capacity to accommodate growth and service area expansion. Projects that benefit future water system customers by providing capacity for growth may be funded through system development charges (SDCs). To facilitate this SDC evaluation a preliminary percentage of the cost of each project which benefits future water system growth is allocated in the CIP table. The basis for percentages allocated to growth are described later in this section for each recommended facility and summarized in the CIP **Table 7-5**.

Projects such as water supply improvements are considered water system performance improvements which benefit all existing and future customers. The estimated costs of these improvements are allocated 44 percent to future growth based on the ratio of current to projected future system-wide maximum day demands (MDD) beyond 20 years including the City's Urban Growth Boundary (UGB) and North Hills Urban Reserve Area (URA).

Supply

Redundant Supply

As presented in **Section 4**, it is recommended that the City pursue development of a redundant water supply to address existing supply vulnerability and for long-term water system resiliency. The proposed redundant source is a new alluvial-aquifer well in the Gearns Ferry area on the north side of the Willamette River near the current Highway 219 bridge crossing.

The redundant supply, with an approximate capacity of 2 million gallons per day (mgd), would consist of a new groundwater well, on-site treatment for iron and manganese, on-site disinfection and approximately 1.3 miles of 12-inch diameter transmission mains from the new well to existing distribution at Highway 219 and NE Wynooski Road. Estimated project costs for supply development also include water rights permitting as well as geophysical and water quality exploration of the area to identify feasible well sites. It is assumed that exploration and supply development will take place over the next 10 years.

Although a new well in the Gearns Ferry area appears to be the most feasible option for redundant supply currently, it is anticipated that the City will evaluate other source water options as opportunities arise.

Treatment

The City currently uses sodium hypochlorite for disinfection at the Water Treatment Plant (WTP). The existing hypochlorite generator is showing signs of deterioration, such as, warped cell plates. City staff previously identified the need to replace the existing hypochlorite generator with new equipment. This improvement is expected to occur in the next two years.

Storage Reservoir

Based on projected future storage capacity deficiency presented in **Section 5, Table 5-1**, a new finished-water storage reservoir is recommended to serve future Zone 3 customers within the UGB. The proposed Bell Road Reservoir (CIP No. R-1) will ultimately serve Zone 2 and proposed Zones 3 and 4 beyond the 20-year planning horizon when and if development occurs in the North Hills URA. The proposed 1.7 million gallon (MG) reservoir is recommended for construction beyond 20-years. It is anticipated that the City will begin reservoir design within the 20-year timeframe. A portion of the estimated project cost is allocated to the 20-year timeframe in CIP **Table 7-5** based on the ratio of storage capacity needed to meet 20-year projected demands (0.24 MG) and the ultimate 1.7 MG recommended capacity.

Pump Stations

Based on the pumping capacity analysis presented in **Section 5, Table 5-2**, two new pump stations, Bell East (CIP No. P-1) and Bell West (CIP No. P2) are recommended to supply future Zone 3 and Zone 2 customers respectively. In the short term, both pump stations would supply constant pressure service to a small number of customers too high in elevation to be supplied by existing Zone 1. Following completion of the proposed Bell Road Reservoir (CIP No. R-1) and related transmission mains beyond the 20-year planning horizon, both stations would be converted to supply the reservoir.

The Bell West Pump Station is recommended for construction within the 5-year timeframe and Bell East within the 10-year timeframe. The Bell West Pump Station is needed to supply adequate fire flow to the Zone 2 expansion to Veritas School if the fire flow requirement at the school is determined to be greater than the existing 1,000 gallons per minute (gpm) available from the Oak Knoll Pump Station. The Bell East Pump Station will be needed as development occurs within the UGB along Zimri Drive north of the Allison Inn.

Distribution Mains

Table 7-2 and **7-3** present recommended water main projects for fire flow capacity and system expansion respectively. All recommended water main projects are illustrated on **Plate 1** in **Appendix A**.

Distribution Main Cost Estimates

Water main project costs are estimated based on unit costs by diameter shown in **Table 7-1**.

Table 7-1
Unit Cost for Water Main Projects

Pipe Diameter	Cost per Linear Foot (\$/LF)
8-inch	\$245
12-inch	\$290
18-inch	\$360

Assumptions:

1. Includes approximately 45 percent allowance for administrative, engineering and other project related costs
2. Ductile iron pipe with an allowance for fittings, valves and services
3. Surface restoration is assumed to be asphalt paving
4. No rock excavation
5. No dewatering
6. No property or easement acquisitions
7. No specialty construction included

Distribution Main Improvements for Fire Flow (M-1 to M-8, M-18)

As presented in **Section 5**, analysis using the City's water system hydraulic model revealed few piping improvements are needed to provide sufficient fire flow capacity and adequate service pressure within the existing water service area under existing and projected future demand conditions. Water main projects M-1 to M-8 and M-18 are recommended to address fire flow deficiencies under existing conditions. Project M-1 is recommended to replace several non-looped sections of 1- and 2-inch diameter mains along Hancock Street/Highway 99W through downtown Newberg. Several fire flow deficiencies and inadequate fire hydrant spacing and coverage were identified in this area. Water main improvements for fire flow are recommended for completion within the 5-year timeframe.

Estimated costs for these Zone 1 water main projects are allocated 34 percent to future growth based on the ratio of current to projected future Zone 1 MDD beyond 20 years including the City's UGB and North Hills URA.

**Table 7-2
Distribution Main Improvements for Fire Flow**

Project No.	Location	Diameter (inches)	Length (LF)	Estimated Project Cost
M-1	Downtown - Hancock St/Highway 99W from N Grant to Edwards St interconnect with existing side street mains, abandon existing 1-inch and 2-inch mains	8	2,250	\$552,000
M-2	NE Dayton Ave from W Johanna Ct south to existing hydrant – upsize 4-inch	8	410	\$101,000
M-3	Mission Dr from N College St west to existing hydrant at Mission Ct - upsize 6-in	8	940	\$231,000
M-4	Vittoria Square Apartments - Vittoria Way to Aquarius Blvd - upsize 4-inch	8	600	\$147,000
M-5	141 N Elliott Rd - upsize 6-inch fire line and loop with Highway 219	8	640	\$157,000
M-6	E North and Sherman Streets west of Villa Rd surrounding George Fox University Roberts Center and residence halls - upsize 4- and 6-inch mains	8	1,410	\$346,000
	East of Roberts Hall between E North and Sherman Streets - new 8-inch main loop			
M-7	South of Mountainview Dr between N Alice Way and Esther - upsize 6-inch	12	590	\$ 172,000
M-8	Wynooski Rd to Wastewater Treatment Plant hydrant	12	330	\$ 96,000
M-18	W Illinois St/Highwy 240, existing dead end near N Morton St to NE Chehalem Dr	8	832	\$ 400,000
Total Main Improvements for Fire Flow				\$ 2,202,000

Projects for Future System Expansion (M-9, M-14 to M-17, M-19)

Existing distribution main extensions and large diameter loops will be needed to serve new development areas within the City's UGB and North Hills URA including:

- Proposed Zone 3 water service within the UGB along NE Zimri Dr north of the Allison Inn (CIP No. M-9)
- Suction and discharge piping for proposed Bell West Pump Station (CIP No. P-2) to supply Zone 2 expansion north to Veritas School (CIP No. M-14 and M-15)
- Supply to proposed Bell Road Reservoir (CIP No. R-1) from Bell East and Bell West Pump Stations (CIP Nos. M-16 and M-17)
- Chehalem Drive water system extension (CIP No. M-19). This water main project was previously identified by the City to extend City water service from W Illinois/Hwy 240 north on NE Chehalem Drive to Columbia Drive.

Although many of these piping improvements will be constructed only as development warrants it is prudent for the City to have a long-term plan which sizes proposed facilities for the ultimate anticipated capacity need.

**Table 7-3
Distribution Main Improvements for System Expansion**

Project No.	Location	Diameter (inches)	Length (LF)	Estimated Project Cost	Timeframe
M-9	NE Zimri Drive from proposed Bell East PS (P-1) north to UGB	18	960	\$ 346,000	5-year
M-14	N College St from N Terrace Ct to proposed Bell West Pump Station (P-2)	12	830	\$ 241,000	5-year
M-15	N College St from proposed Bell West PS (P-2) to Veritas School	12	660	\$ 192,000	5-year
M-16	Bell East PS (P-1) to Bell Road Reservoir (R-1)	18	5,130	\$1,847,000	20-year and beyond
M-17	Bell West PS (P-2) to Bell Road Reservoir (R-1)	12	5,950	\$1,726,000	20-year and beyond
M-19	Chehalem Drive water system extension to Columbia Drive	8		\$600,000	5-year
Total Main Improvements for System Expansion				\$4,952,000	

Routine Main Replacement Program

In addition to distribution main projects to address capacity deficiencies and growth, the City should plan for routine replacement of pipes less than 6-inch diameter and aging pipes based on a 100-year life cycle. The goal of a routine pipe replacement program is to maintain reliable operation, without significant unexpected main breaks and leaks. Dead-end water mains under 6-inch diameter and less than 300 feet long with no fire hydrants are not recommended for replacement solely based on their diameter. **Figure 7-1** at the end of this section illustrates existing mains recommended for replacement within the 20-year planning horizon. Mains are assigned a first, second or third replacement priority based on the following:

- **Priority 1 Small and old** - mains both under 6-inch dia. and installed prior to 1936
- **Priority 2 Small** - mains under 6-inch diameter
- **Priority 3 Old** - mains installed prior to 1936

Table 7-4 summarizes the 20-year recommended pipe replacement program including total length of pipe for each diameter (size), the replacement diameter and estimated cost to replace. While costs will vary for each individual main depending on the piping location, surface conditions, and other constructability issues, this analysis provides a preliminary estimate of the required capital budget to execute an effective and proactive water main replacement program.

The average annual cost for the first 20 years of a 100-year replacement program is approximately \$736,000 annually. While it is understood that funding at this level for pipeline replacement may not be feasible today, it should be recognized that an adequately funded main replacement program is necessary to minimize the risk of failure for critical water system components that will result in significantly greater costs to repair and replace in the future. The routine main replacement cost included in the proposed CIP **Table 7-5** is the level of funding City staff determined to be available annually for this program.

Table 7-4
20-Year Distribution Main Replacement Cost Summary

Diameter (in)	Approx. Length (feet)	Replacement Diameter (in)	Estimated Replacement Cost
Less than 2	3,200	8	\$ 11,137,000
2	7,100		
4	13,900		
6	15,400		
8	5,800		
10	9,200	12	\$ 3,560,000
12	3,100		
18	60	18	\$ 21,000
Total Length	57,760	Total Cost	\$ 14,718,000

Planning Studies and Facility Assessments

Based on recent ground movement around the City's water transmission bridge crossing at the WestRock property and subsequent slope evaluation by Northwest Geotech, Inc. the City has identified the need for further evaluation of slope stability on the north bank of the Willamette River from the transmission main bridge crossing at the WestRock Property east to the WTP. This WTP and Bridge Transmission Main Slope Stability Study is recommended in the next year.

A water system Seismic Resilience Study for the City is recommended in the next one to five years. The study is intended to analyze specific seismic hazards in the area based on local geology and topography, identify critical water system facilities and their vulnerabilities to these hazards, and map out a plan to strengthen existing facilities to withstand seismic hazards and/or develop redundant water facilities. The City's seismic resilience study should be guided by the seismic response and recovery goals for water utilities presented in the Oregon Resilience Plan.

To comply with Oregon Water Resources Department (OWRD) requirements for water permit holders Newberg is required to complete an update of their Water Management and Conservation Plan (WMCP) every 10 years.

It is recommended that the City update this Water Master Plan (WMP) within the next 10 to 20 years. An update may be needed sooner if there are significant changes to the City's water service area, supply or distribution system which are not currently anticipated.

Future water system planning projects are considered water system performance improvements which benefit all customers. Their estimated costs are allocated 44 percent to future growth based on the ratio of current to projected future system-wide MDD beyond 20 years including the City's UGB and North Hills URA.

Other

Non-potable Distribution System

As briefly discussed in **Section 1**, Newberg maintains a non-potable "purple pipe" distribution system for irrigation. The system can be supplied from either the City's Otis Springs source or reuse water from the Newberg Wastewater Treatment Plant (WWTP) effluent. Both non-potable sources are delivered to the Chehalem Glenn Golf Course pond and irrigation system. The publicly-owned golf course is the only existing customer of the City's reuse system. Reuse pipes have been installed in parallel with other infrastructure and road projects at various locations within the Newberg water service area. However, the majority these non-potable mains are isolated pending future opportunities to connect and expand the reuse system.

As documented in **Appendix B**, expansion of the existing reuse system was evaluated considering both potential new customers with high irrigation use and most efficient interconnection of existing non-potable mains. It was determined that installation of new non-potable water piping from the Otis Springs supply line to serve existing and new development on the north end of the City would be a feasible extension of the existing non-potable system.

Construction of the proposed north non-potable water line could be completed in segments, the first of which would allow Otis Springs supply to serve the proposed Springbrook development. Once piping is complete through the Springbrook development, it may be connected to non-potable mains previously installed by the City in the immediate area. Installation for the first segment of approximately 4,500 linear feet (LF) of 8-inch diameter PVC piping is anticipated within the next 10 years.

Non-potable pumping improvements at Otis Springs are recommended to replace and upgrade aging infrastructure and allow for a constant pressure pumping configuration to serve the expanded non-potable service area.

Public Works Maintenance Facility Improvements

Prior to this Master Plan, the City had identified improvements to Public Works maintenance facilities needed to perform necessary operations and maintenance functions for Newberg's streets, wastewater, storm and water utilities. Costs and timelines for these phased improvements are described in the *Public Works Maintenance Facility Master Plan*. Work on these improvements is anticipated to begin next year and be completed by 2022.

Planned maintenance facility improvements are considered water system performance improvements which benefit all customers. Their estimated costs are allocated 44 percent to future growth based on the ratio of current to projected future system-wide maximum day demands beyond 20 years including the City's UGB and North Hills URA.

CIP Funding

The City may fund the water system CIP from a variety of sources including; governmental grant and loan programs, publicly issued debt and cash resources and revenue. The City's cash resources and revenue available for water system capital projects include water rate funding, cash reserves, and SDCs.

Water Rates

Currently, the City's Rate Review Committee evaluates water rates every two years based on the proposed 5-year CIP. An evaluation of water rates in support of the water system CIP will be completed as follow-on work to this WMP in concert with the next Rate Review Committee evaluation.

System Development Charges (SDCs)

An evaluation of SDCs in support of the proposed water system CIP was conducted as part of this WMP. A description of SDCs, their role in funding capital projects and a summary of the SDC evaluation is presented in the following paragraphs. The full text of the revised SDC Methodology is presented in **Appendix D**.

What is an SDC?

SDCs are sources of funding generated through development and system growth and are typically used by utilities to support capital funding needs. The charge is intended to recover a fair share of the costs of existing and planned facilities that provide capacity to serve new growth.

Oregon Revised Statutes (ORS) 223.297 – 223.314 defines SDCs for the State of Oregon and provides guidelines on the calculation and modification of SDCs, accounting requirements to track SDC revenues, and the adoption of administrative review procedures.

SDCs can be structured to include one or both of the following two components:

1. *Reimbursement Fee* – Intended to recover an equitable share of the cost of facilities already constructed or under construction.
2. *Improvement Fee* – Intended to recover a fair share of future, planned, capital improvements needed to increase the capacity of the system.

The reimbursement fee methodology must consider such things as the cost of existing facilities and the value of unused capacity in those facilities. The calculation must also ensure that future system users contribute no more than their fair share of existing facilities costs. Reimbursement fee proceeds may be spent on any capital improvements or debt service repayment related to the system for which the SDC is applied. For example, water reimbursement SDCs must be spent on water improvements or water debt service.

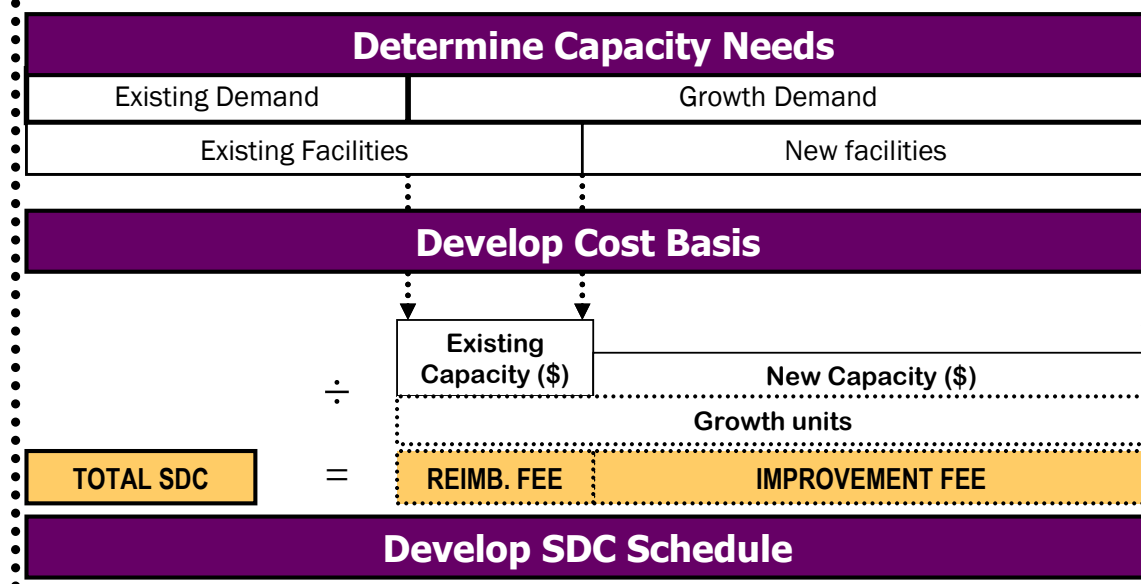
The improvement fee methodology must include only the projected cost of capital improvements needed to increase system capacity as identified in an adopted plan or list, like the water system CIP in this WMP. In other words, the cost of planned projects that correct existing deficiencies, or do not otherwise increase capacity, may not be included in the improvement fee calculation. Improvement fee proceeds may be spent only on capital improvements or related debt service that increase the capacity of the system for which they were applied.

The methodology for establishing or modifying improvement or reimbursement fees shall be available for public inspection 60 days prior to a public hearing.

Revised SDC Methodology Overview

The general methodology used to calculate water SDCs in Newberg is illustrated in **Figure 7-2**. It begins with an analysis of system planning and design criteria to determine growth's capacity needs, and how they will be met through existing system available capacity and capacity expansion. Then, the capacity to serve growth is valued to determine the "cost basis" for the SDCs, which is then spread over the total growth capacity units to determine the system wide unit costs of capacity. The final step is to determine the SDC schedule, which identifies how different developments will be charged, based on their estimated capacity requirements.

Figure 7-2 Overview of SDC Methodology



Growth Capacity Needs

Capacity requirements are generally evaluated based on the following system design criteria:

- **Maximum Day Demand (MDD)** – The highest daily recorded rate of water production in a year. Used for allocating source, pumping and delivery facilities.
- **Storage Requirements** – Storage facilities provide three functions: operational storage, emergency storage and fire protection storage. Used for allocating storage facility costs.

System MDD is currently about 4.9 mgd, including both potable and non-potable use. Growth in MDD is projected to be about 3.9 mgd over the study period. For supply and delivery purposes, the potable and non-potable systems are evaluated on a combined basis, as collectively the systems will be used to meet future MDD.

Storage requirements are about 5.6 MG currently, and are limited to the potable system. Future storage requirements are expected to be 8.8 MG in Zone 1, and 1.7 MG in Zone 2. Pumping and storage requirements are evaluated separately for each zone.

Develop Cost Basis

The capacity needed to serve new development will be met through a combination of existing available system capacity (reimbursement fee) and additional capacity from planned system improvements (improvement fee). The value of capacity needed to serve growth in aggregate within the planning period is referred to as the “cost basis”.

Reimbursement Fee

The City’s historical investment in water system facilities totals about \$39 million (excluding vehicles and minor equipment costs). The growth share for each asset type is based on capacity needs described in the SDC methodology report in **Appendix D**. The reimbursement fee cost basis excludes any assets (like the sodium hypochlorite equipment) that will be replaced by planned capital improvements. The reimbursement fee cost basis totals \$16.3 million.

Improvement Fee

As with the existing facility costs, the costs of most planned improvements are allocated in proportion to future demands. The total improvement fee cost basis is about \$15 million.

Develop Unit Costs

The system-wide unit costs of capacity are determined by dividing the respective cost bases by the system-wide growth-related capacity requirements. The system-wide unit costs are then multiplied by the capacity requirements per equivalent dwelling unit (EDU) to yield the fees per EDU. In this case an EDU represents the base size meter (3/4-inch) in the City’s water system with an estimated capacity requirement of 605 gallons per day/EDU. This is the standard meter size for a single-family residential service.

Revised SDC

Based on the methodology described above, separate SDCs were established for potable and non-potable customers. The potable SDCs include the full unit cost per EDU, while the non-potable SDCs exclude the costs of storage, upper elevation pumping and other improvements which do not benefit potable system customers.

The total SDC per EDU (3/4-inch meter) for potable and non-potable are \$4,896 and \$3,216, respectively. The SDCs for larger meter sizes are scaled up based on the hydraulic capacity factors as summarized in **Table 5 in Appendix D**.

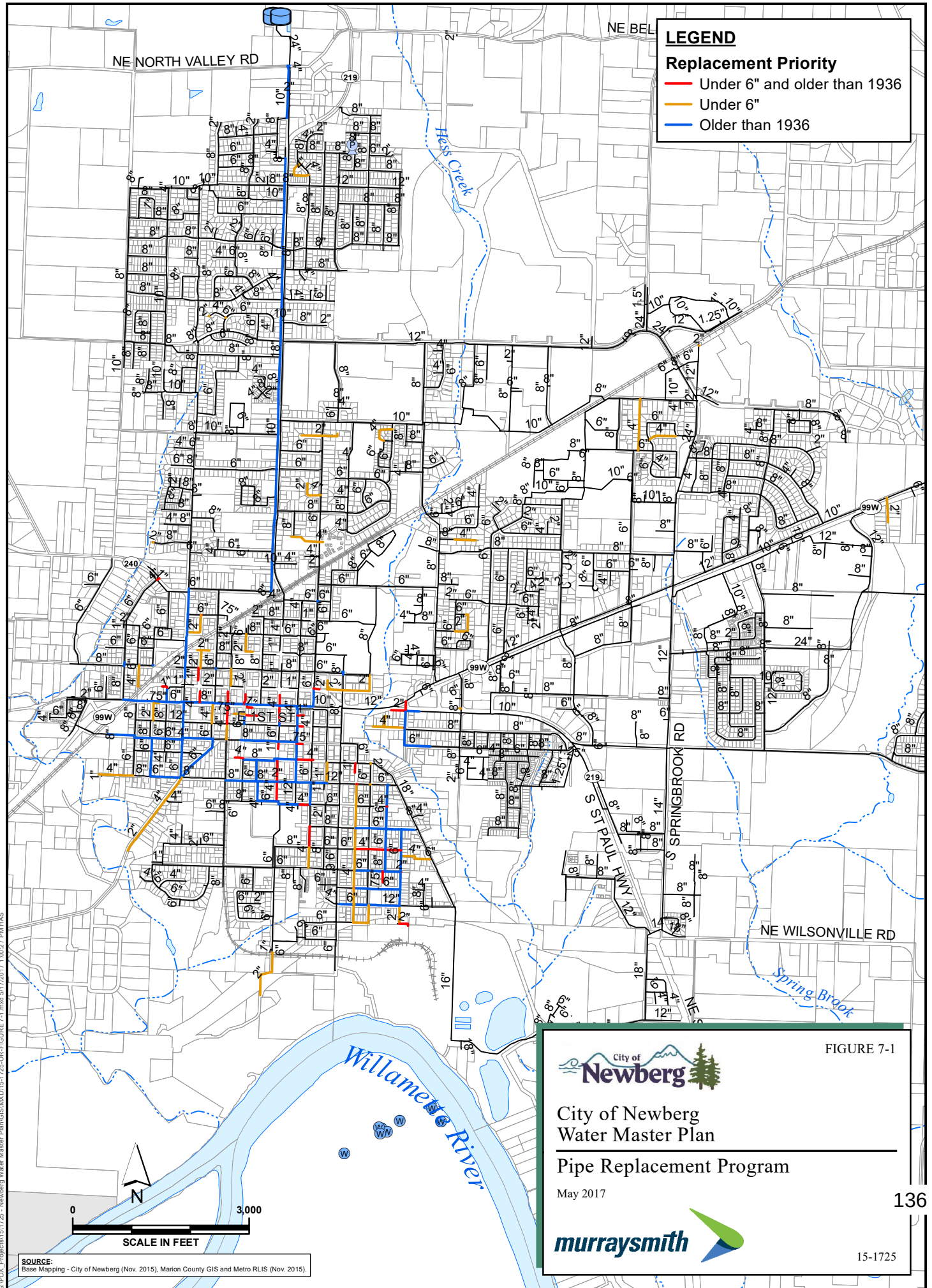
Summary

This section presented recommendations for improvement and expansion projects in the City's water distribution system. As presented in **Table 7-5**, the total estimated cost of these projects is approximately \$21.9 million through the 20-year planning horizon.

Approximately \$16.9 million of the total estimated cost is for projects needed within the 10-year timeframe and \$11.2 million of these improvements are required in the next 5 years.

Table 7-5
Proposed Capital Improvement Program (CIP) Summary

Improvement Category	CIP No.	Project Description	CIP Schedule and Project Cost Summary					Preliminary Cost % to Growth
			5-year	10-year	20-year	Beyond 20 years	Estimated Project Cost	
			2017-2022	2022-2027	2027-2037			
Supply		2 mgd redundant supply development	\$ 2,537,150	\$ 1,081,850			\$ 3,619,000	44%
		Hypochlorite generator	\$ 500,000				\$ 500,000	44%
		Subtotal	\$ 3,037,150	\$ 1,081,850	\$ -	\$ -	\$ 4,119,000	\$ 1,812,360
Pump Stations	P-1	Bell East Pump Station - Zone 3 constant pressure	\$ 725,000	\$ 725,000			\$ 1,450,000	97%
	P-2	Bell West Pump Station - Zone 2 constant pressure	\$ 1,450,000				\$ 1,450,000	97%
		Subtotal	\$ 2,175,000	\$ 725,000	\$ -	\$ -	\$ 2,900,000	\$ 2,813,000
Distribution Mains	M-1 thru M-8, M-18	Upsize existing mains and construct new distribution loops to improve fire flow capacity	\$ 2,202,000				\$ 2,202,000	34%
	M-9	NE Zimri Drive Zone 3 distribution backbone within UGB		\$ 346,000			\$ 346,000	97%
	M-14 and M-15	N College Street - N Terrace Street - proposed Bell West P.S. (P-2) - Veritas School	\$ 433,000				\$ 433,000	97%
	M-19	Chehalem Drive water system extension north to Columbia Drive	\$ 600,000				\$ 600,000	100%
		Routine Main Replacement Program	\$ 1,702,000	\$ 1,500,000	\$ 3,000,000	\$ 133,798,000	\$ 140,000,000	0%
		Subtotal	\$ 4,937,000	\$ 1,846,000	\$ 3,000,000	\$ 133,798,000	\$ 143,581,000	\$ 2,104,310
Future High Elevation Water Infrastructure	R-1	1.7 MG Bell Road Reservoir - Zone 3			\$ 339,000	\$ 2,061,000	\$ 2,400,000	88%
	M-16	Zimri Drive East transmission main to Bell Road Reservoir			\$ 815,000	\$ 1,032,000	\$ 1,847,000	97%
	M-17	Bell Road west transmission main - N College Street to			\$ 761,000	\$ 965,000	\$ 1,726,000	97%
		Subtotal	\$ -	\$ -	\$ 1,915,000	\$ 4,058,000	\$ 5,973,000	\$ 5,577,810
Planning		WTP and Bridge Transmission Main Slope Stability Study	\$ 150,000				\$ 150,000	44%
		Seismic Resilience Study	\$ 150,000				\$ 150,000	44%
		Water Management & Conservation Plan update		\$ 100,000			\$ 100,000	44%
		Water Master Plan update		\$ 250,000			\$ 250,000	44%
		Subtotal	\$ 300,000	\$ 350,000	\$ -	\$ -	\$ 650,000	\$ 286,000
Other		North non-potable water line and Otis Springs pumping improvements		\$ 1,750,000			\$ 1,750,000	100%
		Public Works Maintenance Facility Master Plan	\$ 737,500				\$ 737,500	44%
		Subtotal	\$ 737,500	\$ 1,750,000	\$ -	\$ -	\$ 2,487,500	\$ 2,074,500
Capital Improvement Program (CIP) Total			\$ 11,186,650	\$ 5,752,850	\$ 4,915,000	\$ 137,856,000	\$ 159,710,500	\$ 14,667,980
			Annual Average CIP Cost					
			\$2,237,330 5-year	\$1,693,950 10-year	\$1,092,725 20-year			



LEGEND

- Proposed Reservoir
- Proposed Pump Station
- Proposed Water Main
- Proposed Developer-Constructed Main
- Existing Reservoir
- Existing Pump Station
- Existing Supply Well
- Water Treatment Plant
- Existing Water Main
- Existing Raw Water Transmission
- Railroad
- City Limits
- Independent Water Districts
- Urban Growth Boundary (UGB)
- Urban Reserve Area (URA)

Pressure Zones:

- Zone 1
- Zone 2
- Zone 3
- Zone 4

City of Newberg

City of Newberg Water Master Plan

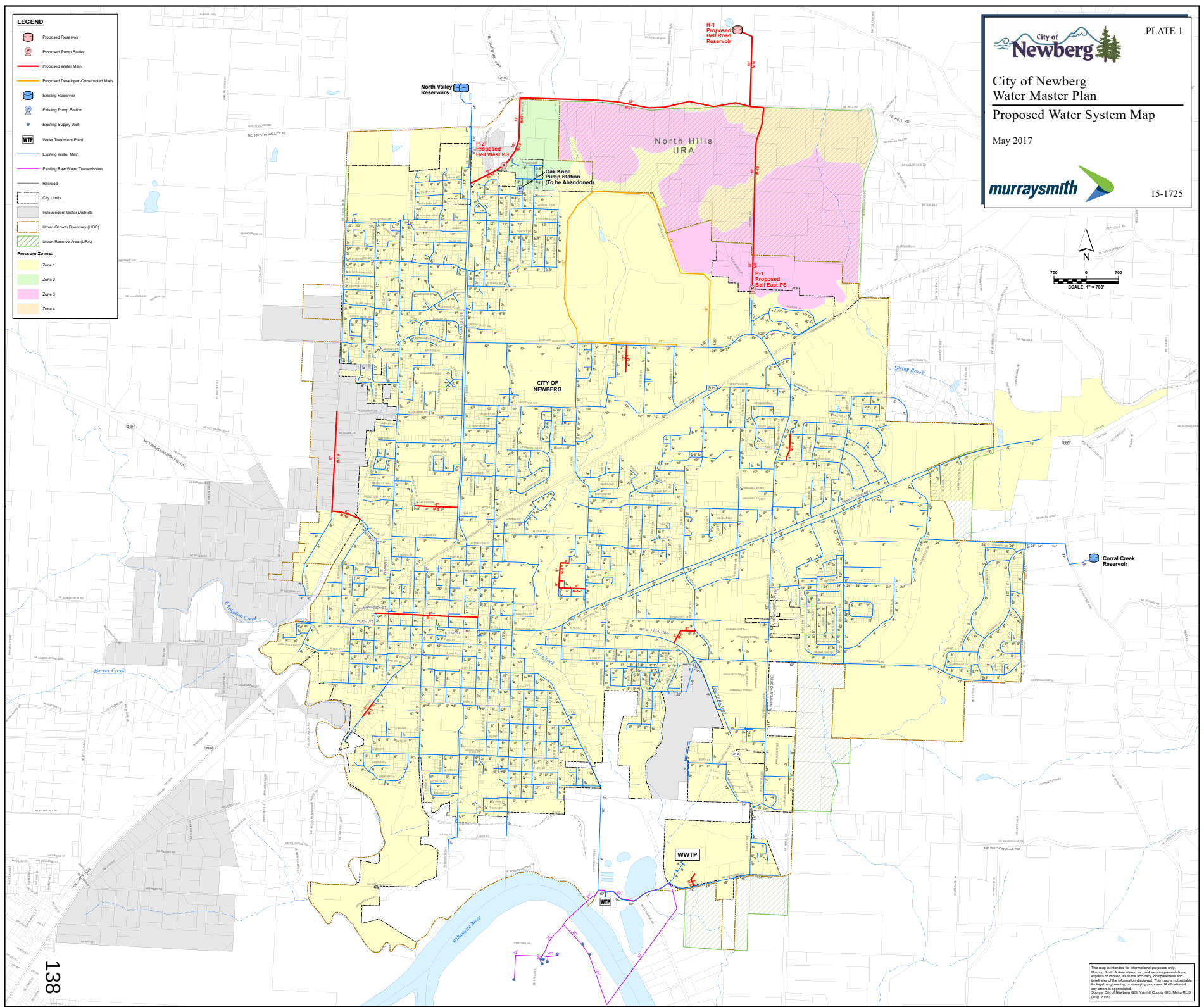
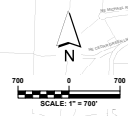
Proposed Water System Map

May 2017

murraysmith

15-1725

PLATE 1



This map is intended for informational purposes only. Murray Smith & Associates, Inc. makes no representations, express or implied, as to the accuracy, completeness and timeliness of the information displayed. This map is not suitable for legal, engineering, or surveying purposes. Notification of any errors is appreciated.

Prepared by: City of Newberg, GIS / Vander County GIS, Mike Peltz, Aug. 2016

APPENDIX B

RECYCLED WATER USE EVALUATION

FOR

CITY OF NEWBERG

MAY 2017



Murraysmith
888 SW 5th Ave, Suite 1170
Portland, OR 97204
503.225.9010

SECTION B1

INTRODUCTION AND RECYLCED WATER SYSTEM

Purpose

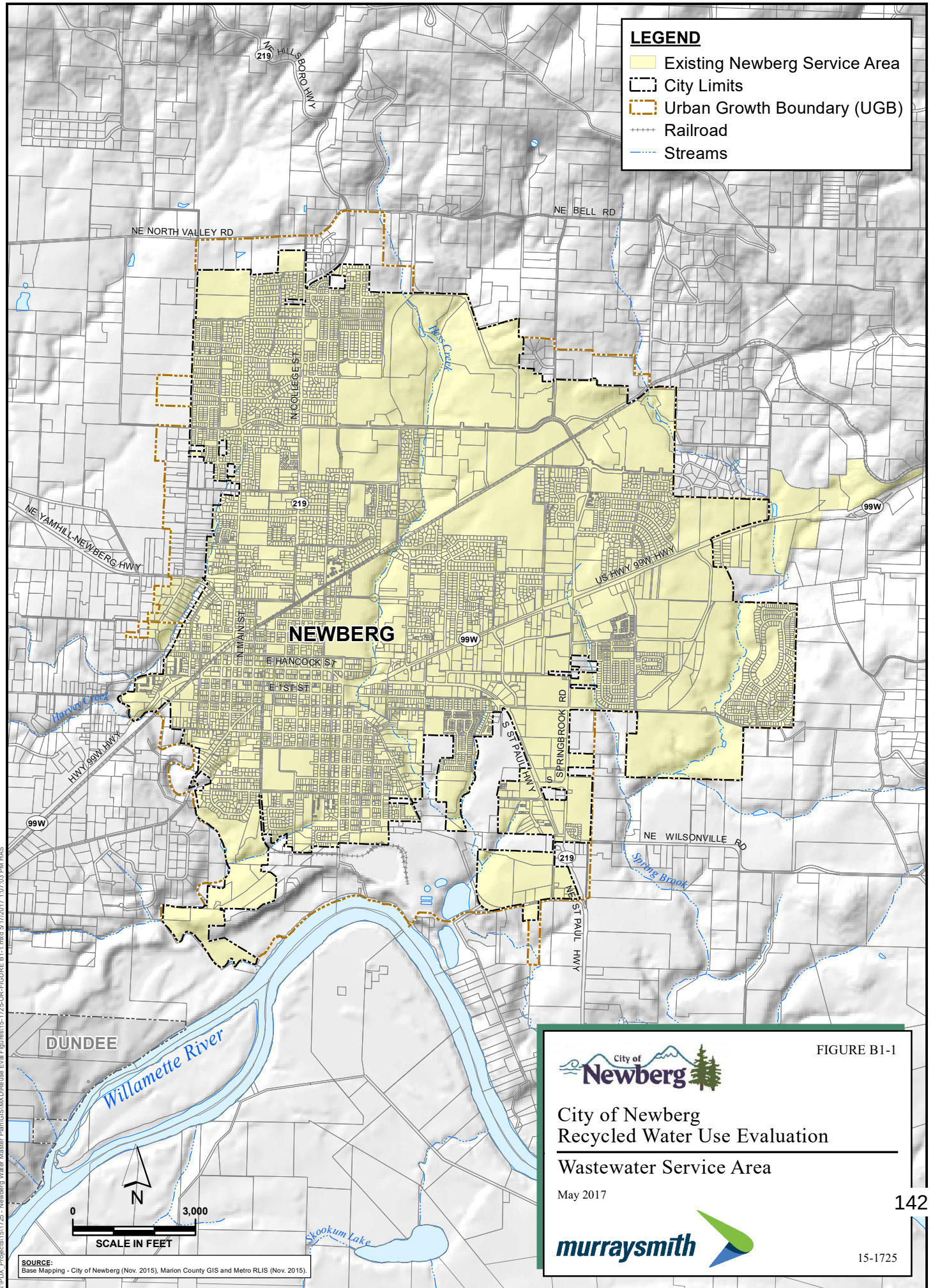
The City of Newberg (City) has requested Murraysmith prepare this report to document the City's existing recycled water (reuse) treatment and distribution facilities, as well as to review and summarize current regulations dictating allowable uses for non-potable water generated from its wastewater treatment plant (WWTP). This report documents an evaluation of possible expansion of the existing recycled water facilities, including a conceptual level plan of the piping network required to supply recycled water to potential future customers. Conceptual level project cost estimates for development of the build-out recycled water system are also included for planning purposes.

Background

The City owns and operates a secondary wastewater treatment plant (WWTP) located at 2301 Wynooski Road in Newberg, Oregon. The WWTP has been in service since 1987. The facility provides wastewater collection and treatment services for residential, commercial, and industrial customers located within the city limits. A small number of residences located outside of the city limits are also served by the WWTP. A map of the City's service area limits is presented in **Figure B1-1**.

The WWTP is a Class IV oxidation-ditch type facility. The secondary treatment facility produces Class A compost product from its biological activated sludge plant, which the City sells under the name NEWGROW to the public throughout the year. Treated water discharged from the WWTP is either directed to the Willamette River or routed for additional treatment onsite to produce tertiary treated, recycled water. The tertiary membrane filtration reuse facility at the WWTP produces Class A effluent waters suitable for irrigating golf courses, school yards, and residential landscaping with minimal regulatory restrictions. Beneficial reuse of effluent is seasonal, because irrigation demands typically run from May through the first half of September.

Currently, the Chehalem Glenn Golf Course, located approximately one and a half miles northeast of the WWTP, is the sole recipient of the City's recycled water. Treated effluent is pumped from the WWTP through a dedicated 10-inch diameter recycled water main directly to a meter and associated private line to storage facilities on the golf course. Dedicated mains for recycled water are constructed of purple polyvinyl chloride (PVC) piping, termed in the industry as purple pipe; these purple pipes are not cross-connected with existing potable water mains. The City has been constructing limited segments of new purple pipe in association with all new underground utility installation projects.



Wastewater Treatment Facilities

The City's secondary treatment facilities at the WWTP consist of a raw influent pump station, headworks, activated sludge oxidation ditches, secondary clarifiers, chlorine disinfection, dechlorination, effluent outfall, and biosolids composting. Disinfection of the effluent is performed with chlorine gas. Treated and disinfected effluent is dechlorinated with sodium bisulfite prior to flow measurement and discharge. Treatment plant effluent is discharged to the Willamette River or routed to an onsite tertiary membrane filtration facility for beneficial reuse.

The City constructed a tertiary membrane filtration reuse facility, called the Reuse Building, at the WWTP in 2008. The facility is designed to produce Class A recycled water meeting the standards defined in Oregon Administrative Rule (OAR) 340-55. The current capacity for the facility is 1 million gallons per day (mgd).

Existing Tertiary Water Treatment Facilities

The existing recycled water treatment system is comprised of a retrofitted chlorine contact basin at the end of the WWTP's secondary treatment chain; membrane raw water supply pumps; membrane filtration package system skids; membrane filter backwash systems; a single recycled water storage tank; and recycled water effluent pumps. The entire recycled water treatment system has been integrated into the City's Supervisory Control and Data Acquisition (SCADA) system to allow for optimizing controls. Individual components of the recycled water treatment system are discussed in further detail as follows. A schematic overview of the recycled water system is provided in **Figure B1-2**.

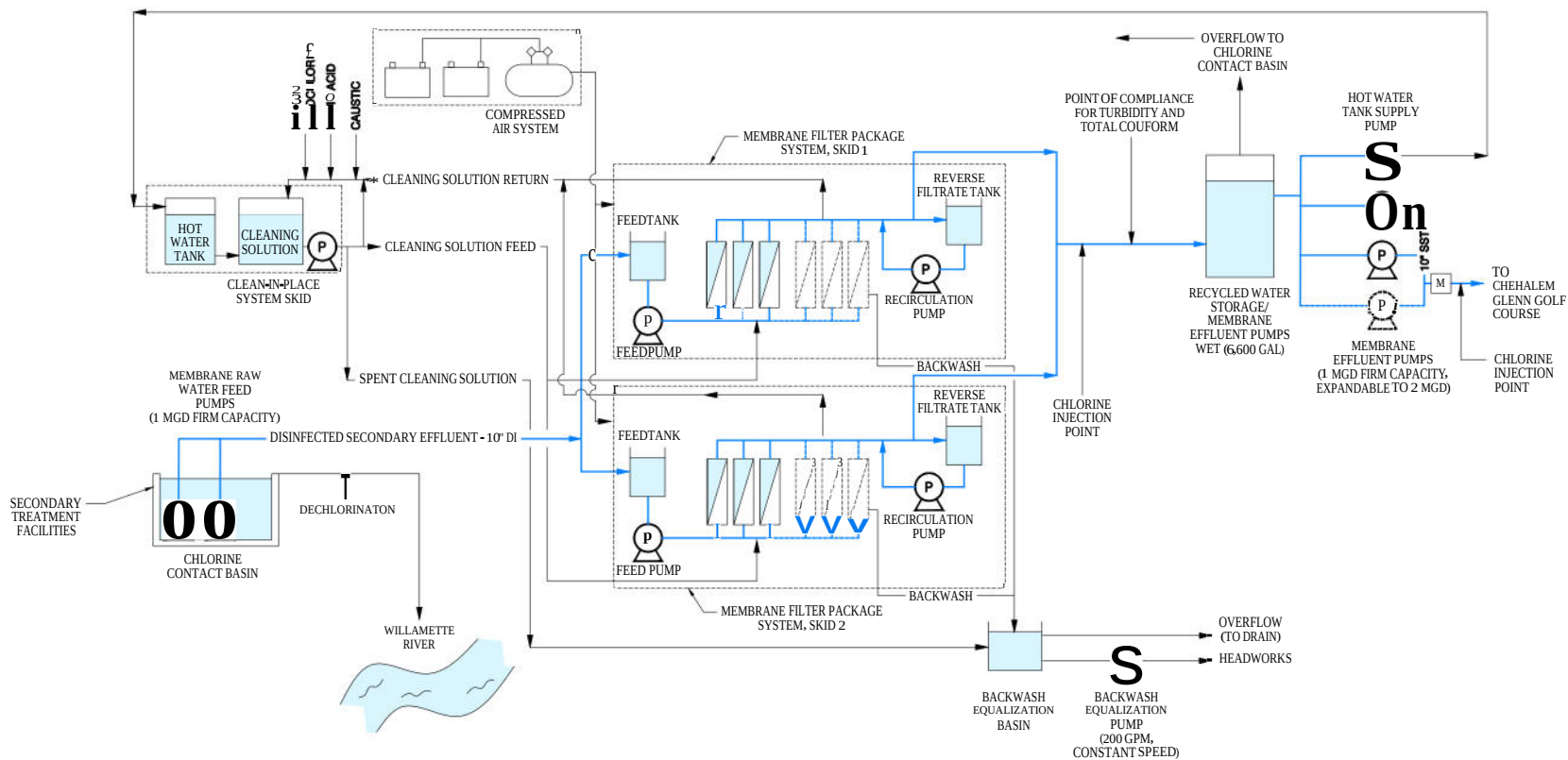
Chlorine Contact Basin

Following secondary clarification at the WWTP, plant flows are directed to a chlorine contact basin (CCB). Flows travel the length of the CCB at a rate designed to allow for sufficient chlorine contact time prior to discharging effluent to the downstream system. An overflow weir at the far end of the CCB directs flows through a dechlorination metering system prior to effluent discharge to the Willamette River. Membrane raw water feed pumps located within an existing pump wet well at the far end of the CCB provide supply to the WWTP's tertiary treatment facilities.

An operator-selected LOW setpoint at the CCB outfall weir and a HIGH setpoint below the top of CCB wall maintain desired water elevations within the CCB. An additional hard-coded LOW-LOW level setpoint has been provided to maintain an acceptable water surface level above the membrane raw water feed pumps to minimize the potential for pump damage.

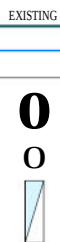
Membrane Raw Water Supply Pumps

Two constant speed vertical turbine pumps installed within the CCB act as the membrane raw water feed pumps. The pumps provide a firm capacity of approximately 700 gallons per



LEGEND

MAIN PROCESS FLOW
SUPPORTING PROCESS FLOW
PUMP
ELECTROMAGNETIC FLOW METER
MEMBRANE FILTER



ABBREVIATIONS

DI DUCTILE IRON
GAL GALLONS
GPM GALLONS PER MINUTE
MGD MILLION GALLONS PER DAY
SST STAINLESS STEEL



FIGURE B1-2

CITY OF NEWBERG

TERTIARY TREATMENT
PROCESS FLOW DIAGRAM
May 2017



15-1725

minute (gpm) (1 mgd). The pumps discharge flows to two membrane filtration package system skids, located in the neighboring Reuse Building, via a 10-inch diameter ductile iron (DI) header pipe for further treatment.

Raw water pumping rates are determined by reuse water production rates input into the SCADA system by the operator. The pumps will stop once SCADA no longer receives the raw water production request or the hard-coded LOW-LOW alarm in the CCB is reached. If the pumps are stopped from a programmed shutoff, they will remain off until the water level within the CCB rises to a hard-coded setpoint above the pumps.

Membrane Filtration Package System Skids

Chlorinated secondary effluent pumped from the CCB to the Reuse Building is delivered to two membrane filtration package system skids installed in parallel off of the 10-inch diameter DI header supply line. The two expandable membrane filter trains share a single control panel to manage all filtration and cleaning processes. The system is currently programmed to produce 200 to 800 gpm (0.3 to 1.15 mgd) of recycled water.

The first component for each of the package systems is an open-air membrane filter feed tank. From this tank, a feed pump provides pressurized flow to the membrane filtration systems. Each membrane module contains thousands of hollow tubes, which are the filtration membranes. Once passed through the filtration membranes, the treated water is delivered to an open-air reverse filtrate tank at the end of each package skid or to the recycled water storage tank. The filtrate tank supplies a recirculation pump, which provides pressurized water for backwashing the filtration membranes, as needed.

Each membrane module is backwashed at regular intervals throughout the day to dislodge and remove residual material left on the outside of the membrane. Compressed air is run from the inside of the filtration membrane installation during backwash to aid in the cleaning. Similar, though more intense, cleaning cycles are performed several times a day, and an even stronger clean-in-place (CIP) chemical cleaning of the membranes is conducted on a monthly basis. The CIP process is supplemented by hot water (90 to 100 degrees F) provided via a system consisting of a hot water storage tank with an internal electrical heating system provided by the membrane filter supplier. Backwash and cleaning cycles for filtration membranes are initiated by pressure loss across the membranes and controlled by the membrane filter system package control panels. Filter backwash flows are directed to a backwash equalization basin, where flows are pumped back to the WWTP headworks via a 200 gpm constant speed submersible pump.

Recycled Water Storage Tank

Tertiary treated effluent from both membrane filtration package treatment skids is combined into a single pipe for delivery to the recycled water storage tank. This combined effluent pipe is the regulatory point of compliance for recycled water quality produced by the facility. The effluent pipe is equipped with a turbidity meter and a grab sample valve for monitoring total coliforms. In the event of high turbidity in the recycled water, the downstream

membrane effluent pumps will shut down. Chlorine solution may be injected into this line to provide a chlorine residual in the effluent water, as well as to control water quality within the recycled water storage tank.

The recycled water storage tank is approximately 6,600 gallons in volume. The tank is located outside and adjacent to the Reuse Building. The tank functions as the wet well for the membrane effluent pumps.

Water failing to meet regulatory standards and overflows from the recycled water tank are routed back to the inlet structure of the CCB. Water level in the tank is monitored by a pressure differential transmitter and relayed by SCADA, which will alarm at operator-selected HIGH and LOW setpoints. Float level switches provide redundant monitoring of water level in the tank.

Membrane Effluent Pumps

Two dry pit centrifugal horizontal end suction pumps are installed adjacent to the recycled water storage tank for distributing membrane filter effluent. The pumps provide a firm capacity of up to approximately 700 gpm (1 mgd). The pumps are adjustable speed and can be set by operators to maintain a constant level in the recycled water storage tank. The pumps discharge to a 10-inch diameter stainless steel header before combining in a single 10-inch diameter recycled water pipeline to provide irrigation water to Chehalem Glenn Golf Course.

If the pumps fail or are turned off, flows will back up into the recycled water storage tank. Tank overflows are routed back to the inlet structure for the CCB. Flows from the membrane filter effluent pumps are measured by an electromagnetic flow meter as prior to leaving the WWTP site. Chlorine solution may be added to the membrane filter effluent pump discharge/recycled water pipeline to provide a chlorine residual in the recycled water supplied to the Chehalem Glenn Golf Course.

Standby Power Generator

The Reuse Building is connected to an onsite 2 megawatt (MW) standby power generator, allowing the facility to remain completely functional in the event of power outage. The generator has been provided to meet with DEQ requirements for emergency power generation for recycled water treatment facilities. In the event the power generation facilities should fail, the recycled facility will not be operational. Recycled water will not be provided to customers, nor will it leave the facility unwanted, as the tertiary treated effluent must be discharged through the membrane effluent pumps to reach its customers.

Improvements for Expansion

The WWTP's tertiary treatment facilities were designed to allow for future expandability, upgrading capacity from the current 1 mgd to a future 2 mgd. For the City to reach this future

maximum capacity for providing reused water, the various improvements to the existing facilities which follow will be necessary.

Membrane Raw Water Supply Pumps

The two existing 1 mgd membrane raw water supply pumps will need to be removed and replaced with two new pumps sized with an individual capacity of 2 mgd. It is understood the existing pumping pit within the CCB is not of sufficient size to allow for a third pump installation to boost the current capacity. Replacement of the existing pumps will provide the City with 2 mgd of firm raw water pumping capacity.

Membrane Filtration Package System Skids

The existing membrane filtration package system skids have expandable membrane filter trains. As the two package systems combine to currently produce a maximum of 800 gpm (1.15 mgd) of recycled water, the amount of membrane filtration will need to nearly double. As the system build-out capacity of 2 mgd was noted in design of the system skids, there should be adequate capacity in the skids to accommodate this capacity upgrade.

Membrane Effluent Pumps

An additional pump with a capacity of approximately 700 gpm (1 mgd) will need to be installed adjacent to the two existing membrane effluent pumps to provide a firm recycled water pumping capacity of 2 mgd. Accommodations will need to be made at the existing 10-inch diameter stainless steel discharge header to allow for the third pump.

The existing 10-inch diameter reuse water pipeline which provides irrigation water to Chehalem Glenn Golf Course has been previously sized to accommodate the future 2 mgd membrane effluent pumps discharge. Maximum flows may be anticipated to be approximately 6 feet per second in this line.

Summary

This section provided documentation of the City's existing wastewater treatment facilities, including a schematic overview and detailed discussion on the various components of the recycled water system. Existing tertiary treatment facilities are expandable from 1 mgd to 2 mgd should future demands require.

SECTION B2

REGULATORY JURISDICTION

The design, construction, and operation of the City of Newberg's (City's) wastewater treatment plant (WWTP) and effluent reuse system fall under the jurisdiction of the State of Oregon's Department of Environmental Quality (DEQ). The DEQ regulates the City's WWTP under an existing National Pollution Discharge Elimination System (NPDES) waste discharge permit issued in 2004. The permit was modified in 2008 to include reuse of treated effluent for golf course irrigation at the Chehalem Glenn Golf Course and impose thermal loading limits for discharge to the Willamette River. The City's existing NPDES permit expired May 31, 2009 and is currently on administrative extension, as no additional modifications to the prior permit have been requested by the City.

The WWTP's tertiary treatment facility is designed to produce Class A recycled water meeting the standards defined in Oregon Administrative Rule (OAR) 340-55 and summarized as follows.

Treatment

Class A recycled water must be oxidized, filtered, and disinfected prior to distribution. The recycled water must meet the quantitative criteria following treatment as follows.

Turbidity

Prior to disinfection, the wastewater must be treated with a filtration process. Turbidity of the water must not exceed an average of 2.0 nephelometric turbidity units (NTU) within a 24-hour period, 5 NTU for more than five percent of the time within a 24-hour period, and 10 NTU at any time.

Monitoring for turbidity must occur, at a minimum, on an hourly basis during recycled water production.

Total Coliforms

Following disinfection, Class A recycled water must not exceed a median of 2.2 total coliform organisms per 100 milliliters (mL), based upon results of the previous seven days in which analysis has been completed. No single sample shall have more than 23 total coliform organisms per 100 mL.

Monitoring for total coliform organisms must occur, at a minimum, on a once per day basis during recycled water production.

Additional Monitoring Requirements

The DEQ has requested the City monitor the following water quality parameters daily during the production of recycled water:

- Flow volume
- Chlorine residual
- pH
- Nutrient content

Beneficial Purposes

It is the policy of the DEQ to encourage the use of recycled water for domestic, agricultural, industrial, recreational, and other beneficial purposes in a manner which protects public health and the environment of the state. The term beneficial purpose is defined by the DEQ as a purpose where recycled water is utilized for a resource value, such as nutrient content or moisture, to increase productivity or to conserve other sources of water.

Class A recycled water is the highest quality of recycled water which may be produced, acceptable for use in all beneficial purposes which lower quality Class B, C, and D recycled water are allowable. Class A recycled water may be used for the following beneficial purposes where all other rules of OAR 340-55 are met:

- Irrigation of any agricultural or horticultural use, including the following:
 - Processed food crops
 - Orchards or vineyards, if an irrigation method is used to apply recycled water directly to the soil
 - Firewood, ornamental nursery stock, Christmas trees, sod, or pasture for animals
 - Growing fodder, fiber, seed crops, or commercial timber
- Landscape irrigation of parks, playgrounds, school yards, residential landscapes, golf courses, cemeteries, highway medians, industrial or business campuses, or other landscapes accessible to the public
- Commercial car washing or fountains when the water is not intended for human consumption
- Water supply source for restricted and non-restricted recreational impoundments
- Artificial groundwater recharge by surface infiltration methods or by subsurface injection in accordance with OAR Chapter 340, division 44
- Stand-alone fire suppression systems in commercial and residential buildings, non-residential toilet or urinal flushing, or floor drain trap priming
- Industrial, commercial, or construction uses limited to: industrial cooling, rock crushing, aggregate washing, mixing concrete, dust control, non-structural firefighting using aircraft, street sweeping, or sanitary sewer flushing

It should be noted where sprinkler irrigation is to use Class A recycled water, recycled water must not be sprayed onto an area where food is being prepared or served, or onto a drinking fountain. Additionally, when recycled water is to be used for agricultural, horticultural or landscape purposes where spray irrigation may be used, or for an industrial, commercial, or construction purposes, the public and personnel at the use area must be notified and signage must be posted noting recycled water is being used and that is not safe for drinking.

Operational Requirements

The operations of a recycled water facility must meet certain requirements set forth by the DEQ, which are summarized as follows.

Recycled Water Use Plan

All use of recycled water must conform to a recycled water use plan approved by DEQ. A recycled water use plan details how the wastewater treatment system owner will comply with the requirements of OAR 340-055. Existing treatment systems and methods must be detailed in the plan. Monitoring and sampling procedures must be documented, operational contingency plans are to be detailed, and estimates for recycled water production are to be documented in the plan.

The City is currently operating under the DEQ-approved *Recycled Water Use Plan for the Chehalem Glenn Golf Course* (CH2M Hill, August 2008). Should the City wish to modify existing systems and/or methods for treatment of its recycled water, or should the City want to add new customers or distribution systems to its existing recycled water system, an updated recycled water plan would be required for review and approval by DEQ.

Facility Requirements

Facilities treating and distributing recycled water must have the following systems in place for DEQ approval.

- *Alarm devices.* In the event of power loss or failure of process equipment essential to the proper operation of the treatment system, alarm devices are required to provide warning.
- *Standby power.* A recycled water treatment system must have sufficient standby power to fully operate all essential treatment processes, unless otherwise approved in writing by DEQ.
- *Redundancy.* A sufficient level of redundant systems and monitoring equipment must be in place to prevent inadequately treated water from being used or discharged from the facility.
- *Cross-connection control.* Connection between a potable water supply system and a recycled water distribution system is not authorized, unless the connection is provided through a DEQ-approved air gap separation. Additionally, all piping and appurtenances associated with a recycled water use system which is outside the

treatment building must be constructed and marked in a manner which prevents cross-connection to a potable water system.

Blending Recycled Water

The DEQ may approve on a case-by-case basis blending recycled water with other water for distribution to non-potable water systems. Before blending recycled water, the wastewater treatment system owner must obtain written authorization from DEQ. In obtaining authorization, the wastewater treatment system owner must submit the following information for review and approval:

- An operations plan
- A description of any additional treatment process
- A description of blending volumes detailed by source
- A range of final recycled water quality at the compliance point identified in the NPDES permit

Waters of the State

No discharge of recycled water is allowed to waters of the state. All recycled waters are to be stored and/or distributed for beneficial purposes. Waters of the state are defined by DEQ as lakes, bays, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Pacific Ocean within the territorial limits of the State of Oregon, and all other bodies of surface or underground waters, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters which do not combine or effect a junction with natural surface or underground waters) that are located wholly or partially within or bordering the state or within its jurisdiction.

Summary

The WWTP's tertiary treatment facility is designed to produce Class A recycled water, as defined in OAR 340-55. Class A recycled water is the highest quality of treated water which may be produced, acceptable for many beneficial uses. The operational requirements and beneficial purposes for recycled water production have been provided in this section.

SECTION B3

EXISTING AND FUTURE DEMANDS FOR NON-POTABLE WATER

This section presents existing and projected future non-potable water demands for the City of Newberg's (City's) service area. Demand forecasts are developed from review of historic water use records, as well as from discussions with City staff, to determine likely future non-potable water customers. Potential future demands focus on supplying water for irrigation of residential, industrial and commercial customers.

Service Area

Existing

The sole customer for the City's non-potable water is the Chehalem Glenn Golf Course. The course's 18 holes and driving range total approximately 188 acres, with about 120 acres of the facility being irrigated turf. The golf course's irrigation system has been installed such that it may receive water from any combination of three available sources: recycled water from the City's wastewater treatment plant (WWTP), non-potable water from Otis Springs, and City potable water.

Future

The study area for potential future non-potable water uses include all areas within the city limits and the urban growth boundary (UGB). Areas located outside of the UGB were not investigated, as the City has no reasonable timetable for bringing these properties into the service area.

Non-Potable Water Resources

Wastewater Treatment Plant

Current production capacity at the City's WWTP for recycled, or tertiary treated, water is approximately 1 million gallons per day (mgd). The facility was designed and constructed to allow for expansion of capacity up to 2 mgd.

Otis Springs

Otis Springs is located northeast of Newberg's city limits, directly north of Highway 99E at the foot of Rex Hill. The spring was once used as a supply source for the City's potable water system; however, the Department of Environmental Quality (DEQ) determined Otis Springs to be surface water influenced, and it is no longer connected to the City's potable water system. Pumps at Otis Springs are run based on water level of the irrigation water storage ponds at the Chehalem Glenn Golf Course, and production is metered at both the spring and the golf course. The City reports a production capacity for Otis Springs of up to 0.5 mgd, though maximum flows seen in historical records approach only 0.3 mgd.

Historical Non-Potable Water Demand

The only purchaser to date for the City's non-potable water is the Chehalem Glenn Golf Course. The golf course's non-potable water demand is solely for irrigation of turf. The facility's irrigation demand is met by a combination of the WWTP's recycled water and flows from Otis Springs.

Production records from the City's two non-potable water sources were evaluated to determine historical non-potable water system demands. Daily recycled water production figures from the WWTP were available from the City's Supervisory Control and Data Acquisition (SCADA) system. In the absence of daily production records for Otis Springs, daily production rates were calculated for individual months by averaging total monthly supply over the number of days in each month. Records indicate non-potable water irrigation demands typically begin on or around the start of June and continue through the middle of September, making for an average duration of approximately 16 weeks, or 112 days, for the irrigation season. **Figure B3-1** provides a graphical representation of the daily non-potable water demands for the golf course over full irrigation seasons for the years 2013-2015, with total demand also being separated by individual sources.

The graphs in **Figure B3-1** demonstrate the highly variable nature of non-potable water demand over an irrigation season. The data shows a typical seasonal peak day of approximately 0.6 mgd, with most of these flows being provided as WWTP recycled water. Large spikes in demand seen in July may be accounted for in the golf course banking irrigation water at its onsite storage ponds in preparation of ceasing flows from Otis Springs in the following month of August. A minor modification in the golf course's operations would allow them to begin banking non-potable water for irrigation earlier in the season, likely resulting in a more even distribution of peak demands over the season. Average irrigation season demands total approximately 42 million gallons (MG), with an average daily demand of 0.4 mgd.

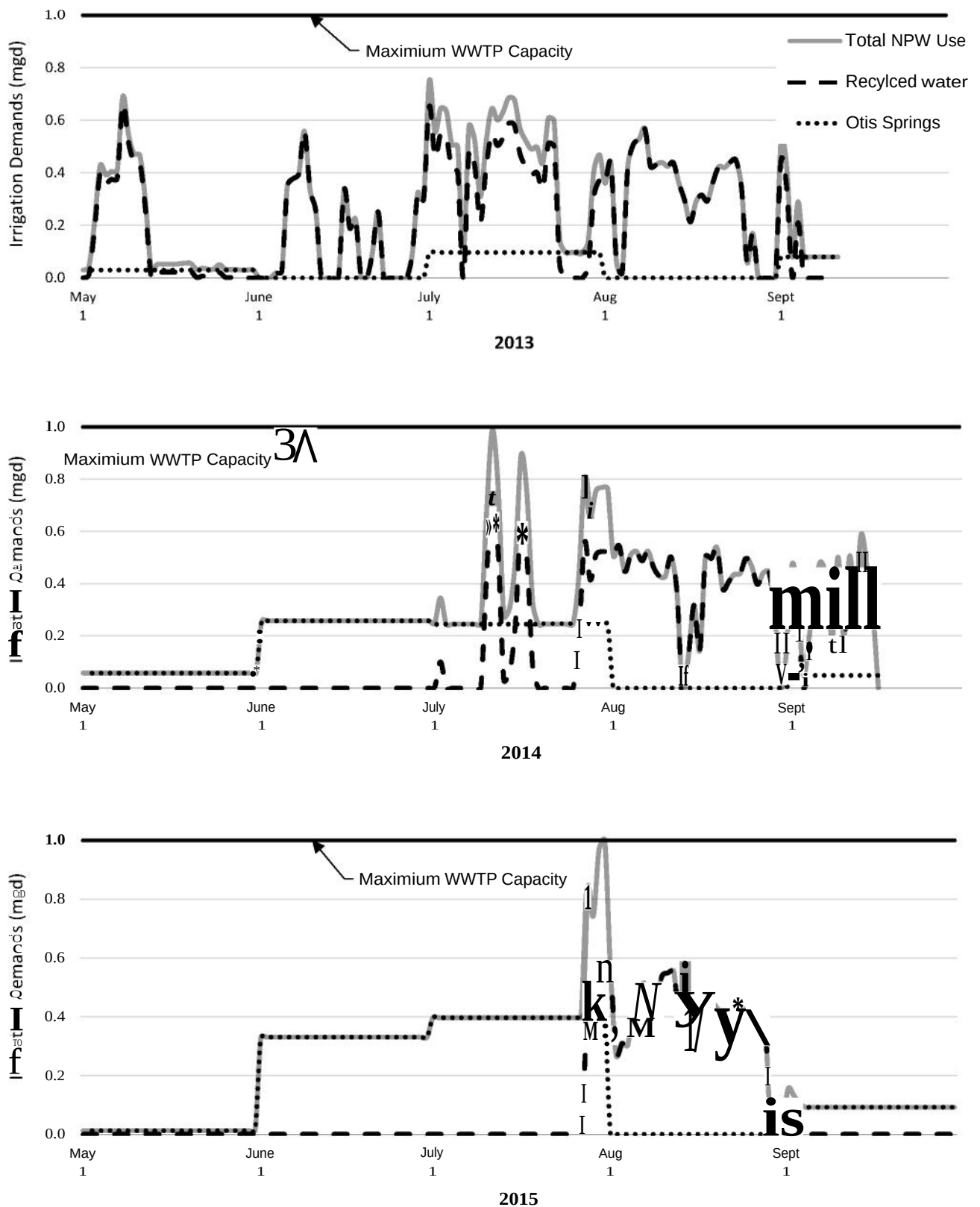


Figure B3-1: Irrigation demands, 2013 - 2015

Future Non-Potable Water Customers and Demand Forecast

Demand forecasts for the City's non-potable water have been developed from a review of historic irrigation water service meter records to determine likely future non-potable water distribution system customers. Those potable water service customers which have existing water meters classified by the City solely for irrigation purposes were examined to determine an overall irrigation demand which may be satisfied using non-potable water. Discussions with City staff were then used to determine the likelihood of an existing irrigation water meter owner to take part in any future expanded non-potable water distribution system. Additionally, a property's vicinity to existing non-potable water distribution infrastructure was used as part of this evaluation.

In reviewing irrigation water service meter records for the individual 2013, 2014, and 2015 seasons, it was determined overall irrigation demands remain consistent on a year-to-year basis. For the purpose of this evaluation and determining potential future irrigation water demands, it has been assumed future irrigation demands for individual properties will remain similar to those currently being recorded. Subsequently, for this evaluation, overall demands for the City's non-potable water will only increase with the addition of new irrigation customers along any new distribution system.

The City has approximately 100 water meters classified for irrigation use. This evaluation looked at those irrigation water services with annual metered use of approximately 450,000 gallons (average daily demand of 3,250 gallons per day) or greater. Irrigators using a minimum of 450,000 gallons annually are within the top 40 percent of the City's irrigation water users, with flows of a high enough volume to warrant interest in any expansion of the City's non-potable water program. In instances where one owner had multiple irrigation water service meters distributed over a single location, individual meter flows were summed into one total demand figure. For instance, George Fox University has 8 irrigation meters across a single large campus, and this customer's use is reported as a single irrigation demand.

Irrigation water demands for the City's top users are summarized in **Table B3-1** for the 2013, 2014, and 2015 seasons. Information on the City's top irrigators provided in **Table B3-1** includes a ranked listing of users from high to low annual consumption, City water meter account number, property owner, physical location of water meter, and total consumption of water in gallons per year. The City's top irrigators, including the Chehalem Glenn Golf Course, account for approximately 89 MG (0.80 mgd) in current irrigation water and potential non-potable water demand. With the addition of the proposed Springbrook Development within the north end of the city limits, which has the potential to become the City's second largest non-potable water consumer, total irrigation season demands increase to nearly 100 MG (0.89 mgd).

**Table B3-1
Irrigation Water Demand Summary**

User Ranking	City Account No.	Owner	Physical Address	2013 Consumption (gallons)	2014 Consumption (gallons)	Consumption (cf) (sum for 2015)	2015 Consumption (gallons)	Average Annual Consumption (gallons)
1	018486-000	CHEHALEM GLENN GOLF COURSE, RECYCLED WATER SOURCE	4501 E FERNWOOD RD	31,463,872	24,093,828	1,944,600	14,545,608	23,367,769
	014711-000	CHEHALEM GLENN GOLF COURSE, OTIS SPRINGS SOURCE	4501 E FERNWOOD RD	5,473,385	18,878,383	4,218,558	31,554,814	18,635,527
2	--	SPRINGBROOK DEVELOPMENT	--	--	--	--	--	10,860,000
3	Multiple	BPM HOA MANAGEMENT	SPRINGBOOK OAKS	6,654,208	6,534,528	716,400	5,358,672	6,182,469
4	Multiple	GEORGE FOX UNIVERSITY	414 N MERIDIAN ST	5,434,220	4,123,724	526,500	3,938,220	4,498,721
5	Multiple	NEWBERG S.D. / NEWBERG HIGH SCHOOL	2400 DOUGLAS AVE, ATHLETIC FIELD	3,837,988	3,880,624	350,500	2,621,740	3,446,784
6	000265-001	CHEHALEM PARK & REC / DARNELL WRIGHT SOFTBALL COMPLEX.	303 W FOOTHILLS DR	2,487,100	3,547,016	399,400	2,987,512	3,007,209
7	009758-000	FRIENDSVIEW MANOR	1301 E FULTON ST UNIT C	2,597,056	2,871,572	436,600	3,265,768	2,911,465
8	001936-000	HAZELDEN BETTY FORD FOUNDATION	1901 ESTHER ST	2,951,608	1,327,700	329,300	2,463,164	2,247,491
9	019966-000	EMERITUS LIVING	3802 HAYES ST	2,700,280	1,322,464	336,700	2,518,516	2,180,420
10	019222-000	ARBOR OAKS MEMORY CARE	317 WERTH BLVD	1,605,208	2,462,416	172,900	1,293,292	1,786,972
11	010588-000	NEWBERG S.D. / JOAN AUSTIN ELEMENTARY	2200 N CENTER ST	2,561,900	2,062,984	96,000	718,080	1,780,988
12	000090-000	NEWBERG S.D. / CHEHALEM VALLEY MIDDLE SCH	403 W FOOTHILLS DR	3,286,712	946,968	107,900	807,092	1,680,257
13	002096-001	NEWBERG S.D. / MT VIEW MID SCHOOL	2015 EMERY DR	2,143,020	1,673,276	120,500	901,340	1,572,545
14	018955-000	ALLISON INN AND SPA	2525 ALLISON LANE-ZIMRI DR-2" METER	362,032	3,186,480	61,100	457,028	1,335,180
15	001201-003	CHEHALEM PARK & REC / J JAQUITH FIELDS	1215 N COLLEGE ST	880,396	1,403,248	180,800	1,352,384	1,212,009
16	004804-000	FRED MEYER	3300 PORTLAND RD	1,095,820	1,306,008	146,200	1,093,576	1,165,135
17	004974-000	PGE	1101 WILSONVILLE RD	783,156	828,036	230,200	1,721,896	1,111,029
18	014221-000	OAK MEADOWS @ NEWBERG	3897 OAK MEADOWS LP	1,013,540	1,075,624	121,900	911,812	1,000,325
19	023433-001	NO OWNER ON RECORD	NO ADDRESS ON RECORD		759,220	132,800	993,344	584,188
20	Multiple	VITTORIA SQUARE	3300 VITTORIA WAY	607,376	759,968	167,100	1,249,908	872,417
21	004467-000	NEWBERG S.D. / EDWARDS ELEMENTARY	715 E 8TH ST	1,293,292	479,468	101,900	762,212	844,991
22	015302-000	WERTH FAMILY, LLC	TRACT A, WERTH BLVD	638,792	797,368	124,200	929,016	788,392
23	014252-000	OAK MEADOWS @ NEWBERG	DETENTION POND @ OAK MEADOWS	698,632	769,692	82,300	615,604	694,643
24	011226-001	THE GREENS @ FERNWOOD RD, NW CORNER @ WTR FOUNTAIN	GREENS AVE	708,356	667,216	88,600	662,728	679,433
25	004935-000	CANYON RIDGE APT	401 S EVEREST RD	790,636	444,312	101,500	759,220	664,723
26	004948-000	PARR LUMBER	200 N ELLIOTT RD	590,172	583,440	104,200	779,416	651,009
27	010431-002	NO OWNER ON RECORD	NO ADDRESS ON RECORD	297,704	575,212	117,500	878,900	583,939
28	014761-002	NO OWNER ON RECORD	NO ADDRESS ON RECORD	392,700	742,764	76,200	569,976	568,480
29	001745-000	SPRINGBROOK APARTMENTS	1401 SPRINGBROOK RD	579,700	563,992	61,000	456,280	533,324
30	003896-002	CHEHALEM PARK AND REC / REC CENTER	502 E 2ND ST	256,564	430,848	111,700	835,516	507,643
31	015301-001	WERTH FAMILY, LLC	TRACT C, PROVIDENCE DR	488,444	386,716	67,000	501,160	458,773
32	001753-000	A-DEC	2601 CRESTVIEW DR - BLDG	296,208	491,436	75,600	565,488	451,044
Total Annual Consumption(gallons):				84,970,077	89,976,531	11,907,658	89,069,282	98,865,297
Total Annual Consumption(mgd):				0.76	0.80	0.11	0.80	0.88

Springbrook Development

Potential non-potable demand projections include the proposed Springbrook Development, to be sited within the north end of the city limits. The new development will be approximately 50 acres in size. Current plans for development provide for multiple community parks and individual residential lawns. Based upon discussions with the City, it has been estimated 50% of the development will require consistent irrigation.

To estimate irrigation demands within the Springbrook Development, the City's historical irrigation season of approximately 16 weeks is used. Using historical weekly watering data for the Newberg area as obtained from the Regional Water Providers Consortium, an average application rate of approximately 1 inch per week will be required to sufficiently irrigate turf and ornamental plants during this season. Maintaining an application rate of 1 inch per week for a full 16-week irrigation season will be equivalent to applying 1.33 feet of water over the planned irrigated areas.

Total irrigation water demands for the development may be calculated as follows:

$$\begin{aligned}\text{Annual volume of water} &= 50\% (50 \text{ acres} \times 43,560 \text{ SF/acre}) \times 16''/12 \text{ of water applied} \\ &= 50\% (2,178,000 \text{ SF}) \times 1.33 \text{ feet of water applied} \\ &= 1.45 \text{ million cubic feet } (\sim 11 \text{ MG})\end{aligned}$$

Averaged over the irrigation season, this equates to a daily demand of nearly 0.1 mgd.

Summary

This section presents existing and projected future non-potable water demands for the City's service area. Demand forecasts are developed from review of historic water use records, as well as from discussions with City staff, to determine likely future non-potable water customers. The focus of determining future demands is to estimate the potential to supply non-potable water for irrigation of residential, industrial and commercial customers.

SECTION B4

NON-POTABLE WATER DISTRIBUTION SYSTEM

This section presents alternatives for an expanded non-potable water distribution system within the City of Newberg's (City's) service area.

Existing Non-Potable Water Distribution System

The sole customer for the City's non-potable water is the Chehalem Glenn Golf Course, owned and operated by the Chehalem Park & Recreation District (CPRD). The golf course receives non-potable water from both Otis Springs and the City's waste water treatment plant (WWTP). Otis Springs water is delivered to the north end of the golf course through approximately 4,750 linear feet (LF) of 8-inch diameter pipe. Recycled water from the WWTP is routed to the southern end of the golf course through approximately 7,500 LF of City-owned 10-inch diameter pipe and 1,500 LF of privately-owned CPRD 8-inch diameter main.

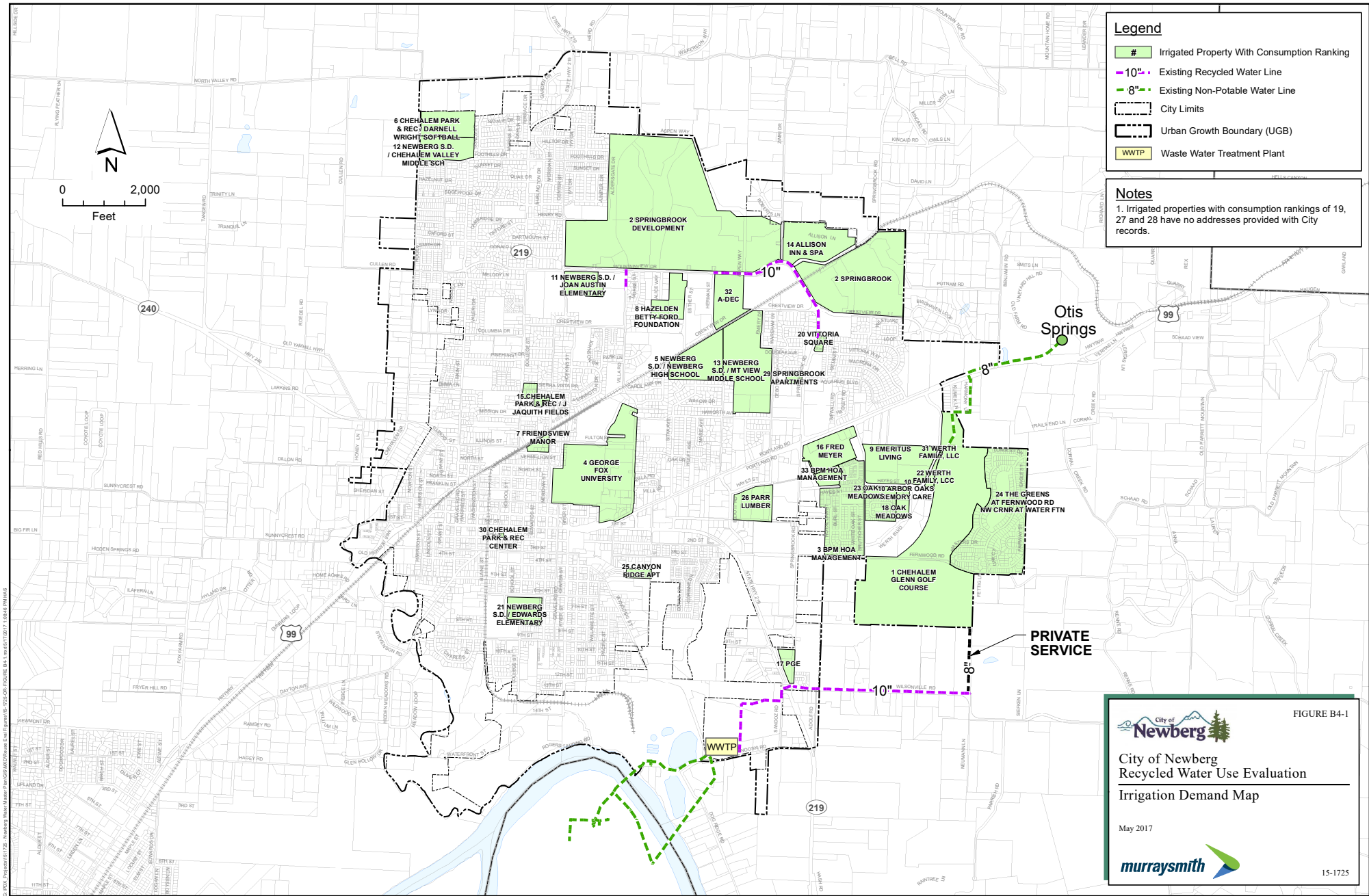
The City has also constructed numerous sections of America Water Works Association (AWWA) C900 PVC pressure pipe, colored purple to denote non-potable water use, within the northern end of the city. These sections of purple pipe have been installed over the course of several years as part of other utility improvement work completed by the City. The intention in constructing this piping has been to integrate it into a larger non-potable water distribution network in the future.

Expansion of Non-Potable Water Distribution System

The City is interested in opportunities to connect existing metered irrigation customers supplied with potable water to an expanded non-potable water system.

The locations for the City's top irrigators, including the proposed Springbrook Development, and existing non-potable water infrastructure are shown in **Figure B4-1**. Each of these properties, apart from the Chehalem Glenn Golf Course, receive irrigation water from connections to the City's potable water distribution system. Most of the properties are in the east and north sections of the city, in relatively close proximity to the City's existing non-potable water distribution system infrastructure. Expansion of the existing non-potable water distribution system should look to maximize development near existing infrastructure.

It should be noted, following any potential expansion of the City's non-potable water distribution system, there is no requirement in the City's development code for property owners to connect to this system. Since non-potable water cannot be mixed with potable water, connecting existing metered irrigation customers to an expanded non-potable water system would require improvements between meters and new and existing distribution mains. Construction costs estimated in this Section include only work associated with main line improvements and do not include improvements at meters or from new main to customer meters.



Legend

- # Irrigated Property With Consumption Ranking
- 10" Existing Recycled Water Line
- 8" Existing Non-Potable Water Line
- City Limits
- Urban Growth Boundary (UGB)
- WWTP Waste Water Treatment Plant

Notes

1. Irrigated properties with consumption rankings of 19, 27 and 28 have no addresses provided with City records.

City of **Newberg**

City of Newberg
Recycled Water Use Evaluation
Irrigation Demand Map

May 2017

murraysmith

FIGURE B4-1

15-1725

Expansion Options

An evaluation was completed for the proposed expansion of the City's non-potable water distribution system. Four options for the expansion of the system were investigated. A preferred final option is provided that minimizes construction complexities, installation costs, and future operation and maintenance costs.

Option A: Do Nothing

Under this option, the City would continue to serve the Chehalem Glenn Golf Course using recycled water generated at the WWTP in combination with non-potable water from Otis Springs. No new infrastructure would be constructed, and existing capacity for recycled water production at the WWTP would not be improved. Future users near the existing non-potable water piping and supply sources may be connected to the system over time based upon their interests and willingness to pay for improvements.

There are no additional capital costs incurred by the City under this option.

Option B: Expand Supply from Otis Springs

This option includes installation of additional piping from the Otis Springs supply line to serve existing and new development on the north end of the City, as shown in **Figure B4-2**. Average annual consumption for these properties totals approximately 22.5 million gallons (MG) or 0.2 million gallons per day (mgd). Recycled water from the WWTP would be the sole source to supply irrigation water to the Chehalem Glenn Golf Course.

Construction of the non-potable piping improvements could be completed in segments, labeled as A through C in **Figure B4-2**. Proposed piping improvements are shown within existing public right-of-way. Construction of Segment A would allow for Otis Springs supply to the proposed Springbrook Development. It is understood from discussions with City staff that conditions for development of this community would require the installation of non-potable water distribution piping to serve its various parks and residential lawns. Once the piping is installed through Springbrook Development, it may be connected to purple pipe previously installed by the City in the immediate area. Construction of Segments B and C may occur at later dates, as may be desired.

Pumping improvements at Otis Springs are recommended to replace and upgrade aged infrastructure and allow for a constant pressure pumping configuration. As the anticipated demand is well under the springs' production capacity of 0.5 mgd, there appears to be no need to construct storage onsite.

Estimated costs associated with expanding supply from Otis Springs are provided in **Table B4-2**. Full build out of this option is estimated to cost approximately \$3.6 million.

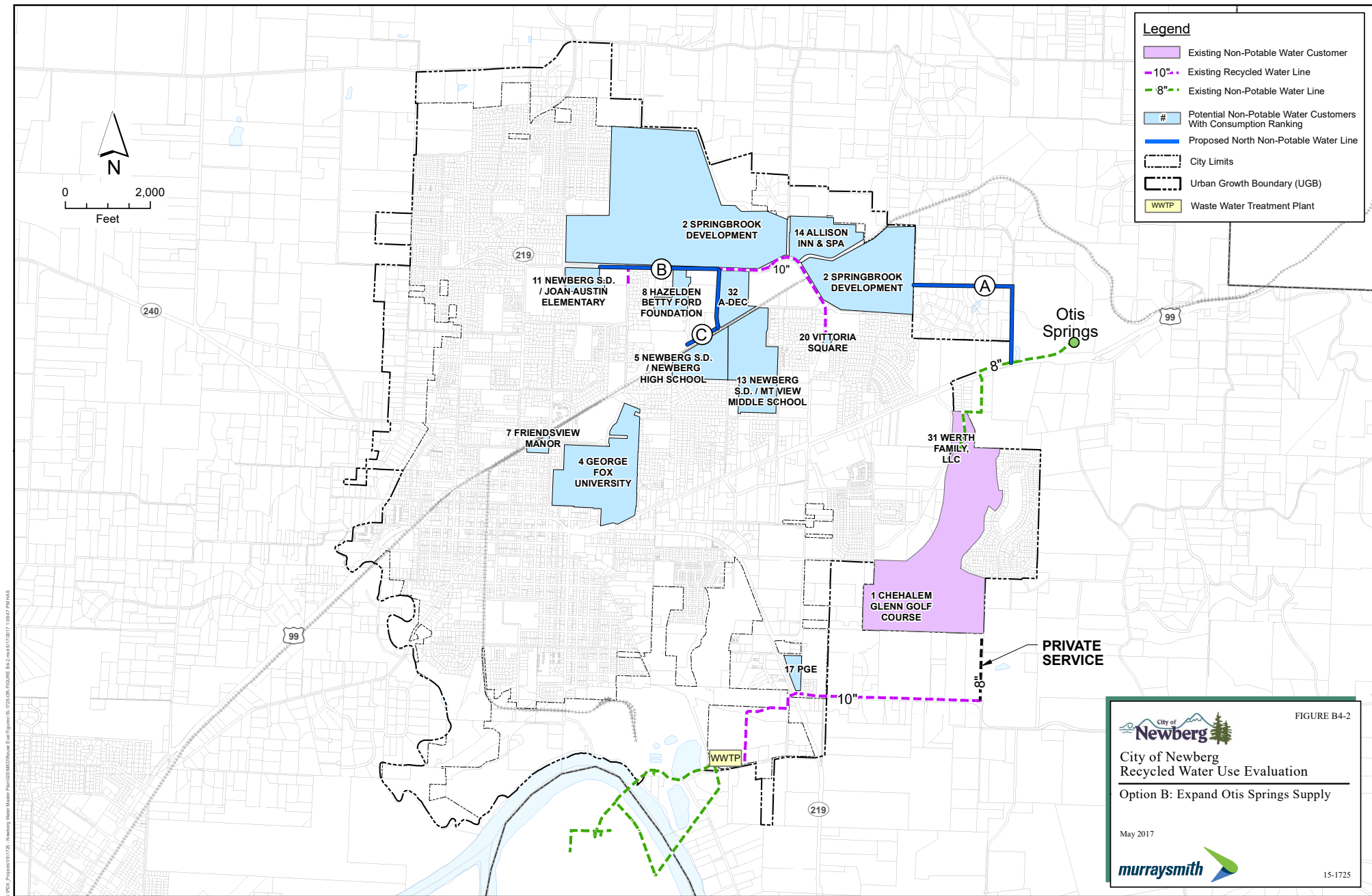


Table B4-2
Costs for Expansion Option B

Improvements	Segment A	Segment B	Segment C	Totals
Piping ¹	\$1,350,000 (approx. 4,500 LF)	\$1,050,000 (approx. 3,500 LF)	\$750,000 (approx. 2,500 LF)	\$3,150,000
Pumping	\$400,000	--	--	\$400,000
Storage	--	--	--	--
Subtotal	\$1,750,000	\$1,050,000	\$750,000	\$3,550,000

Notes:

1: Cost estimates assume installation of 8-inch diameter AWWA C900 DR18 purple PVC piping, including appurtenances, trench backfill and surface restoration, at \$300/LF.

Option C: Expand Supply from Otis Springs and WWTP

This option includes installation of piping from the Otis Springs supply line to serve existing and new development on the north end of the City, as discussed with non-potable water expansion Option B. This option also includes extending CPRD's existing private line to the Chehalem Glenn Golf Course to connect with the existing Otis Springs supply at the north end of the golf course. Piping improvements proposed with this option are shown in **Figure B4-3**. Average annual consumption for these properties, including the golf course, totals approximately 78 MG (0.7 mgd). Recycled water from the WWTP would be used in combination with Otis Springs to meet non-potable water irrigation demands for both the Chehalem Glenn Golf Course and existing residential, industrial and commercial customers.

The proposed North Non-Potable Water Line could be constructed in segments, as discussed in detail for Option B. Additional piping to reach potential customers at the far west terminus of the line may require an agreement to place the line within railroad property or a re-routing of the alignment from that currently shown. Additional non-potable water irrigation customers could be added to the system following an extension of the CPRD line through the golf course.

Pumping improvements at Otis Springs are recommended to replace and upgrade aged infrastructure and allow for a constant pressure pumping configuration. Additionally, at such a time as CPRD line is extended through the golf course, modifications to existing recycled water effluent pumps may be considered. As the anticipated demand for the system is well under the combined WWTP and springs' production capacity of 1.5 mgd, there appears to be no need to construct storage at either location.

Estimated costs associated with expanding supply from Otis Springs and the CPRD supply line are provided in **Table B4-3**. Full build out of this option is estimated to cost approximately \$6.7 million. Estimates do not incorporate costs to connect existing irrigation customers to the non-potable water main improvements. Extensive service piping to individual meters may be required to serve potential customers adjacent to the golf course.

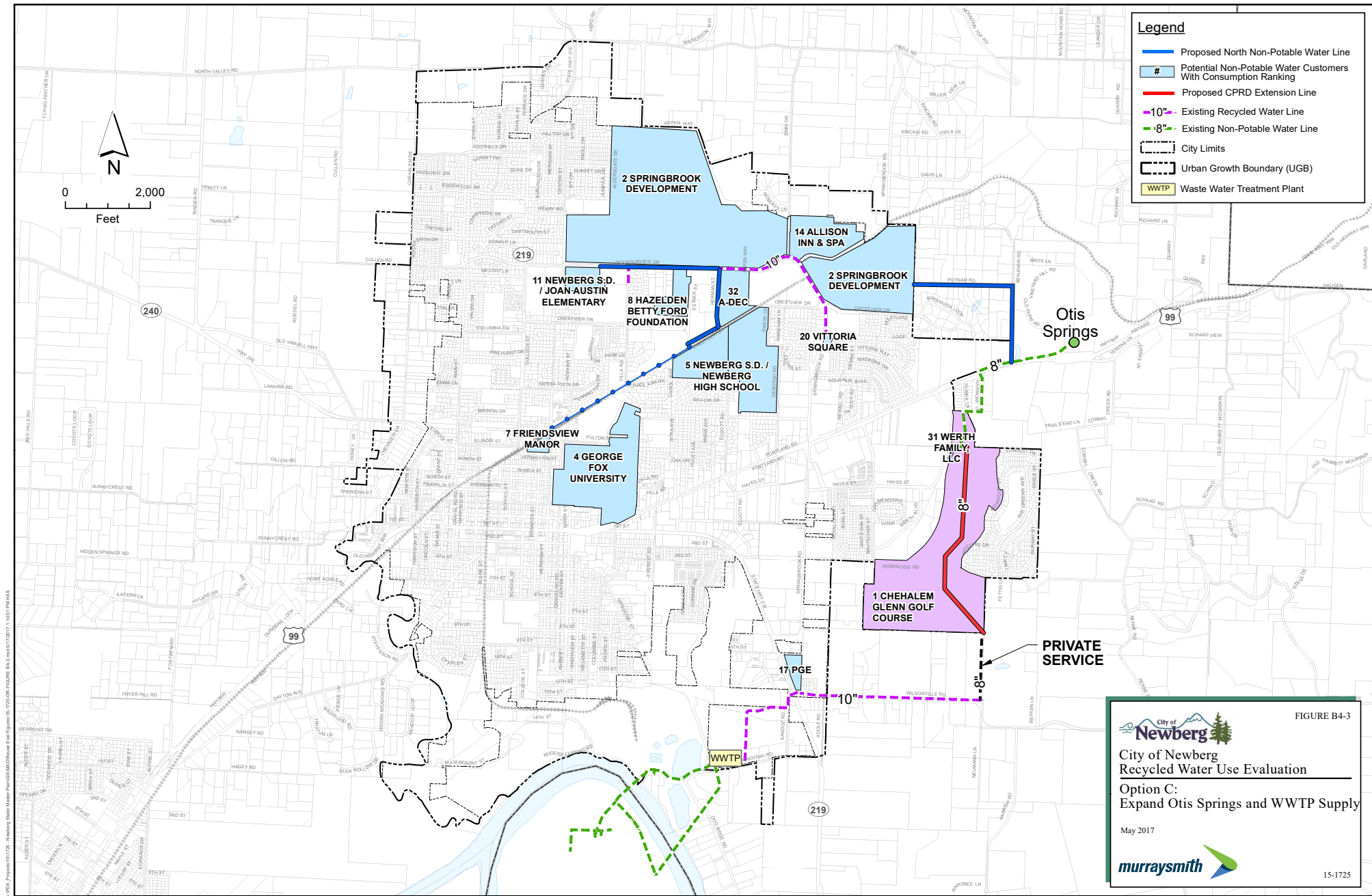


FIGURE B4-3

City of Newberg

City of Newberg
Recycled Water Use Evaluation
Option C:
Expand Otis Springs and WWTP Supply

May 2017

murraysmith

15-1725

G:\GIS\Projects\151725 - Newberg Water Master Plan\GIS\B4-3\Figure B4-3.mxd 5/11/2017 1:05:11 PM AMH

Table B4-3
Costs for Expansion Option C

Improvements	North Line (Segments A - C)	North Line Extension	CPRD Line Extension	Totals
Piping ¹	\$3,150,000	\$1,200,000 (approx. 4,000 LF)	\$1,500,000 (approx. 5,000 LF)	\$5,850,000
Pumping	\$400,000	--	\$400,000	\$800,000
Storage	--	--	--	--
Subtotal	\$3,550,000	\$1,200,000	\$1,900,000	\$6,650,000

Notes:

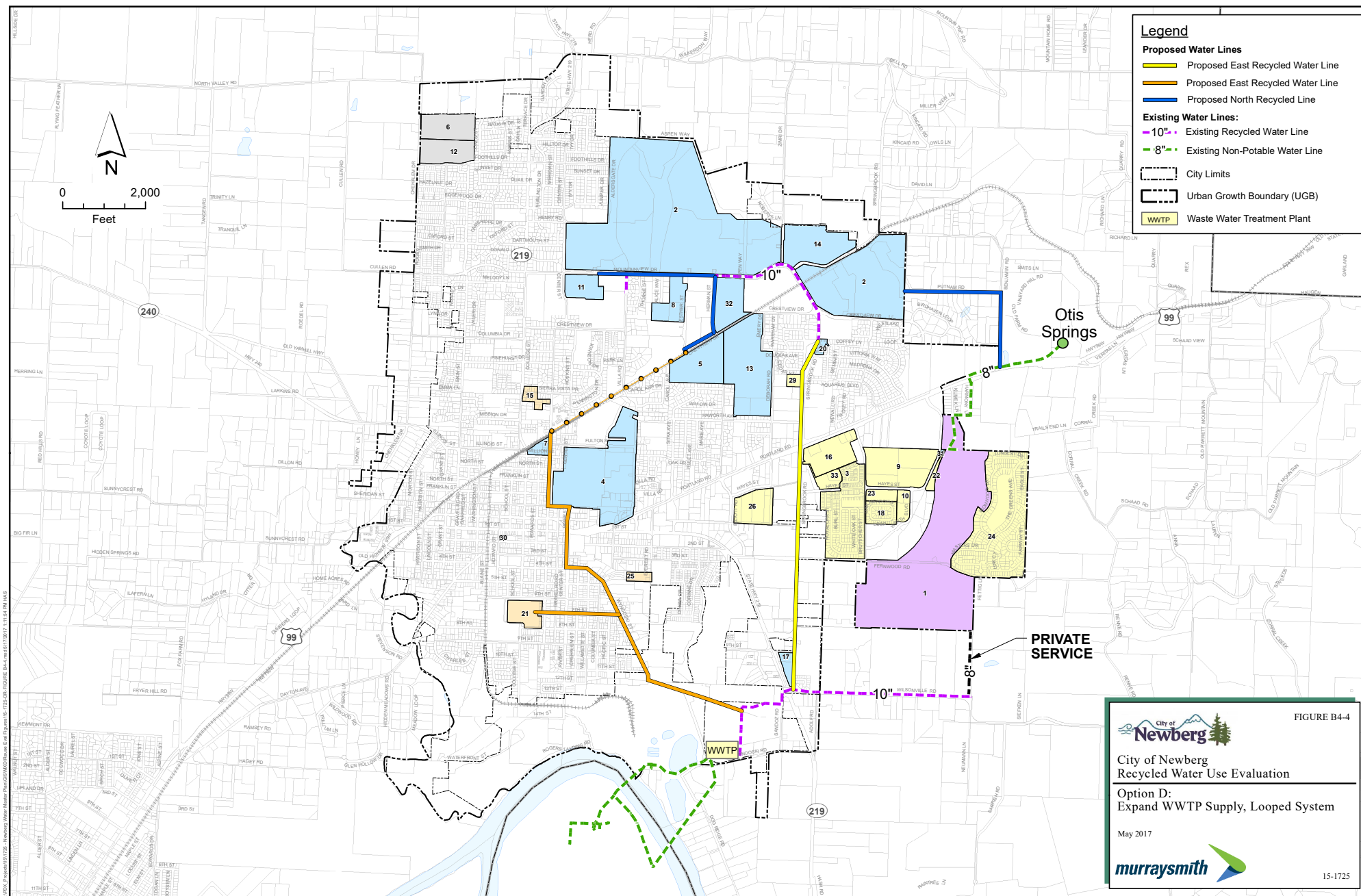
1: Cost estimates assume installation of 8-inch diameter AWWA C900 DR18 purple PVC piping, including appurtenances, trench backfill and surface restoration, at \$300/LF.

Option D: Expand WWTP Supply, Looped System

This option for expansion of the City's non-potable water system includes development of a looped distribution network to, eventually, service all the City's top irrigators, as shown in **Figure B4-4**. Average annual consumption of this distribution network, excluding the golf course, totals approximately 50 MG (0.45 mgd); with the golf course included, average annual consumption for the build-out non-potable water distribution system is approximately 92 MG (0.8 mgd). Under this option, Otis Springs would only provide service to the golf course.

Construction of the non-potable piping improvements will be completed in segments. Proposed piping improvements are shown within existing public right-of-way, except the western portion of the North (Blue) Recycled Water Line. In the current alignment shown for the North Recycled Water Line, an agreement to place the line within railroad property or a re-routing of the alignment will be required. The largest annual irrigation demands are found along the proposed North Recycled Water Line at approximately 23 MG (0.2 mgd). To supply the North Recycled Water Line, though, either the proposed West or East Recycled Water Line would first need to be constructed. The East (Yellow) Recycled Water Line has average annual irrigation demands of approximately 18 MG (0.15 mgd), almost twice the volume of the West (Orange) Recycled Water Line's demands of approximately 9.5 MG (0.1 mgd). Additionally, constructing the East Recycled Water Line to supply the North Recycled Water Line distributes the greatest amount of non-potable water to customers at the lowest costs and delays the need for finding a means to connect the West Recycled Water Line to the North Recycled Water Line.

Demands for the build-out of this scenario, with or without the inclusion of supply to the golf course, do not surpass the existing 1.0 mgd capacity of the WWTP's recycled water production facility. Upgrades to the WWTP's recycled water production capacity, then, are not readily required under this option. However, existing recycled water effluent pumps would likely need to be reconfigured or replaced to serve the larger distribution system. If the City desires to provide a reliable source for non-potable water to irrigators under this option, it is recommended two days' worth of storage for the system be provided at approximately



1.6 MG. Capital costs associated with pumping and storage improvements may be phased with construction of new non-potable water distribution piping.

Estimated costs associated with expanding non-potable water supply from the WWTP are provided in **Table B4-4**. Full build out of this option is estimated to cost approximately \$11.7 million.

Table B4-4
Costs for Expansion Option D

Improvements	East (Yellow) Line	North (Blue) Line	West (Orange) Line	Totals
Piping ¹	\$2,550,000 (approx. 8,500 LF)	\$1,800,000 (approx. 6,000 LF)	\$4,500,000 (approx. 15,000 LF)	\$8,850,000
Pumping	\$400,000	\$400,000	--	\$800,000
Storage	\$1,000,000	\$1,000,000	--	\$2,000,000
Subtotal	\$3,950,000	\$3,200,000	\$4,500,000	\$11,650,000

Notes:

1: Cost estimates assume installation of 8-inch diameter AWWA C900 DR18 purple PVC piping, including appurtenances, trench backfill and surface restoration, at \$300/LF.

2: Storage estimates assume a ground-level welded steel tank.

Preferred Expansion Option

Based on the evaluation of four options for expansion of the City's non-potable water distribution system, it appears Option B provides the City with minimal construction complexities, installation costs, and future operation and maintenance costs in comparison to other alternatives. Option B also allows the City to reconsider Option D or other expansions of the system if future opportunities for non-potable water use arise.

Summary

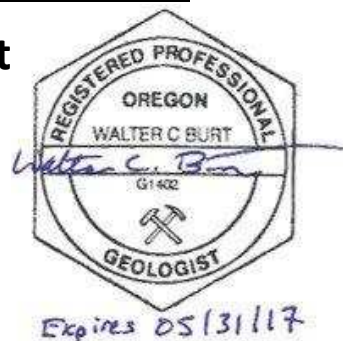
This section of the report presented alternatives for an expanded non-potable water distribution system within the City's service area. A preferred expansion option for the City's non-potable water distribution system was selected.

City of Newberg Supply Source Expansion Assessment

PREPARED FOR: Heidi Springer, PE – Murraysmith
Brian Ginter, PE – Murraysmith

PREPARED BY: Walt Burt, RG – GSI Water Solutions, Inc.
DeEtta Fosbury, RG – GSI Water Solutions, Inc.

DATE: January 9, 2017



Introduction

This technical memorandum (TM) summarizes GSI Water Solutions, Inc.'s (GSI) assessment of alternatives for future expansion of the City of Newberg's (City) supply source capacity. This assessment was prepared under subcontract to Murraysmith as an element of the City's 2016 water system master plan update.

The purpose of this assessment is to identify and initially evaluate potential future long-term source capacity expansion alternatives. The City's sole source of supply is its Marion County wellfield, which is located on the south side of the Willamette River, across from the City's water treatment plant (WTP) and service area. The City relies on two pipelines to convey water from the wellfield: one is suspended on an aging and now unused road bridge, and one crosses under the river. The City's highest priority objective for future source expansion is to improve its supply resiliency by developing 2 million gallons per day (mgd) of redundant capacity, ideally located on the north side (City-side) of the river. The City's preference is that at least some source capacity could be located in the northern portion of the City's service area.

This assessment focuses on the evaluation of groundwater source alternatives, although a summary of initial water rights considerations related to the feasibility of developing a surface water source of supply from the Willamette River also is included.

Background

The City has evaluated a variety of locations and technologies for supplying additional groundwater supply capacity, including evaluating the feasibility of (1) constructing a horizontal collector well (Ranney, 1993; CH2M Hill, 2000), (2) using ASR as a water management tool (CH2M Hill, 2000), and (3) expanding groundwater capacity within (Sweet, Edwards & Associates, Inc., 1983, CH2M Hill, 1992) and in the vicinity of the existing well field location (Ranney, 1980; CH2M Hill, 1997; 2000; GSI, 2006). Significant findings of these studies are summarized as follows:

- The general focus of these studies was the coarse-grained, recent alluvial sediments bordering the south and north sides of the Willamette River, although one study did evaluate the potential to develop a groundwater source within the Chehalem Valley (CH2M Hill, 1997). The study concluded that the potential for developing a groundwater source in the valley that met certain minimum capacity criteria was low.
- Locations identified as having a higher possibility for developing additional supply capacity on the basis of the potential presence of productive alluvial aquifer materials included:
 - the existing Marion County well field,
 - Ash Island,
 - areas north and east of Dundee on the north side of the river,
 - the floodplain areas adjacent to the north side of the Highway 219 bridge (Gearns Ferry),
 - Willamette Greenway State Park, located several miles east of the City.

While the alluvial aquifer is hydraulically connected to the river, the connection in the vicinity of the existing well field is limited, as evidenced by microscopic-particulate analysis (MPA) testing demonstrating that groundwater produced by the City's wells located near the river is not under the direct influence of surface water, and by high iron and manganese concentrations present in raw groundwater produced by the City's wells even after extended pumping durations. The implication of this finding is that a collector well is not a preferred alternative for capacity expansion within the City's well field.

2016 Source Expansion Evaluation

This evaluation expands on the findings of the prior studies to address the City's stated goal of 2 mgd of additional source capacity with preference for locating the capacity on the north side of the river. This evaluation considers to varying degrees three general alternatives for expanding the City's supply capacity:

1. Additional groundwater supply capacity
2. Surface water supply from the Willamette River
3. Storage using aquifer storage and recovery (ASR)

The primary factors that determine which potential groundwater source expansion and storage alternatives may be feasible include aquifer yield and water rights permitting. The feasibility of developing a surface water source involves several factors, the chief of which is the availability of water rights. This evaluation provides an initial assessment of considerations regarding water rights for a surface water source on the Willamette River, and evaluation of other factors related to a surface water source are beyond the scope of this evaluation.

While prior studies have focused primarily on the shallow alluvial aquifer, the City's source expansion priorities dictate expanding the focus of this evaluation to include consideration of other aquifers on the north side of the river. The assessment of developing additional groundwater source capacity involved two general steps: (1) identifying where the hydrogeology may be favorable for groundwater supply and/or ASR system development and where a water right can be obtained for a 2 mgd source of supply, and (2) developing potentially feasible alternatives, evaluating each relative to relevant criteria to identify benefits, risks and key uncertainties.

The remainder of this report includes the following elements:

- Description of the hydrogeology of the Newberg area to provide the basis for evaluation of the groundwater source alternatives
- Evaluation of feasibility of obtaining water rights for groundwater and Willamette River surface water sources
- Identification and evaluation of alternatives
- Summary of results

Hydrogeologic Setting

This section summarizes key aspects of the hydrogeology of the Newberg area, including the Chehalem Valley and bordering uplands (Chehalem Mountain and Parrett Mountain) to provide background and context for identifying favorable conditions for developing a 2 mgd supply and/or ASR system. The City of Newberg is bounded by the Red Hills of Dundee to the west and Parrett Mountain to the east. The Willamette River bounds the City to the south, and Chehalem Mountain is located just north of the City. The Newberg area is underlain by four major geologic units, which include (from oldest to youngest): Eocene to Miocene-age marine sediments, middle to late Miocene-age basalt flows of the Columbia River Basalt Group (CRBG), late Tertiary to early Quaternary semi-consolidated to unconsolidated (basin-fill) sediments, and Quaternary alluvial sediments near the river. The general characteristics of these units that are relevant to the potential to develop a groundwater supply source are summarized below. Figure 1 shows the general distribution of these units and mapped structures in the study area.

Marine Sediments

Marine sediments, consisting of tuffaceous and basaltic sandstone, siltstone, shale, and claystone, are exposed north and west of the City. Wells completed in this unit typically yield less than 10 gallons per minute (gpm), although locally some wells completed in fractured shale or sandstone may produce up to 200 gpm (Frank and Collins, 1978). The groundwater from this unit is generally of poor quality, containing elevated levels of total dissolved solids (TDS). This unit is not considered further as a target for source development because of poor quality water and low well yields.

CRBG

CRBG aquifers are an important source of municipal and agricultural groundwater supply in the Willamette Valley, and host several municipal ASR systems in the Tualatin Basin and City of Salem. Consequently, this evaluation took a close look at the potential feasibility of developing a groundwater source of supply or ASR system in the CRBG.

The CRBG consists of a series of laterally extensive tabular sheet basalt lava flows that originated from eruptive fissures in western Idaho and eastern Oregon and Washington, covering large areas of the Columbia River Plateau, Columbia Gorge and Willamette Valley. CRBG basalt flows typically exhibit a three-part intraflow structure: flow top, flow interior and flow bottom. The flow top and flow bottom are commonly vesicular and brecciated, which together may form relatively permeable zones that comprise the primary aquifers in the CRBG.

The CRBG in northwest Oregon consists of several individual lava flows; eleven separate flows were identified in the Parrett Mountain area by Miller et. al. (1994). The individual basalt flows range from a few feet to a few hundred feet thick, and are on average approximately 100 feet thick. The CRBG is estimated to be approximately 1,000 feet thick in the vicinity of Chehalem Mountains and Parrett Mountain. The Dundee Hills, located southwest of Newberg, also are comprised of CRBG flows, although

the section is significantly thinner than that of Chehalem and Parrett Mountains. The presence and nature of the CRBG underneath the City has not been documented.

The Chehalem Valley and south side of Chehalem Mountain define the Gales Creek/Mt Angel fault zone, a regional northwest-trending fault zone, which displaces older marine sediments against CRBG in the Chehalem Valley. Where larger faults offset water-bearing interflow zones in the CRBG, the aquifers are commonly bounded or compartmentalized. Compartmentalization limits the amount of water that can be stored in an aquifer and magnifies drawdowns in production wells. These effects limit the productivity and longer-term sustainable capacity of wells. The CRBG may be absent under portions of the City as a result of displacement by the fault. Surrounding basalt highlands are segmented by parallel northwest-trending and cross-cutting faults (Miller, et al, 1994; and Frank and Collins, 1978). As a consequence, CRBG aquifers are expected to be highly-compartmentalized, particularly under Parrett Mountain and the Dundee Hills. Declining water levels and boundary effects identified during aquifer testing in these areas are consistent with a compartmentalized aquifer system.

A review of water well logs for the general vicinity of the City indicates that well yields for the CRBG range between 5 and 450 gpm, but are generally less than 150 gpm for domestic or community supply wells. Further, the basalt aquifers in the highlands around Newberg have experienced declining water levels in response to pumping. A study completed by Miller et. al. (1994) found that groundwater levels in the CRBG in the Parrett Mountain area had declined on average 1 foot per year over the previous 14 years. The water level declines have prompted the Oregon Water Resources Department (OWRD) to designate the CRBG aquifers under Chehalem Mountain and Parrett Mountain as Groundwater Limited Areas (GWLAs; Figure 1). Limited well yields and groundwater level declines in these areas are consistent with compartmentalization of the CRBG aquifers, which has unfavorable implications both for developing a sustainable source and for implementing ASR in the CRBG.

The few basalt wells within the City limits are located mostly in the northern portion of the City, and generally yield less than 80 gpm. United States Geological Survey (USGS) regional-scale mapping suggests the possible presence of a relatively thick section of CRBG beneath the older basin-fill sediments near the Willamette River; however, the presence of basalt under the southern portion of the City is unverified, and older mapping interprets that the basalt section has been removed by faulting and erosion under a portion of the City. Additional investigation, including drilling exploratory borings near the periphery of the south and west edges of the City limits would be necessary to confirm the presence of the CRBG and to assess the viability of the CRBG aquifer(s) in this area.

In summary, well yields and the nature and distribution of the CRBG, where known to be present outside the GWLAs, suggest that the potential for drilling a supply well with a high capacity (>500 gpm) within the CRBG is low. The potential for developing a groundwater source in the CRBG in areas that have not been explored (and the CRBG potentially is absent) is highly uncertain.

Basin-Fill Sediments

This geologic unit consists of alluvial sediments deposited in the Chehalem Valley and south into the Willamette Valley, and includes the Willamette Silt and the Lower Sedimentary Unit (LSU) of Conlon, et al (2015). Within the Willamette and Chehalem valleys, this unit consists of fine-grained sediments and is typically described on well logs as blue clay with minor amounts of sand and gravel present (Conlon et al., 2015). In the vicinity of the City, the LSU is primarily silt and clay, with occasional beds of fine sand and some gravel. The thickness of this unit varies from a few feet up to approximately 480 feet (Frank and Collins, 1978). The LSU overlies the CRBG, and where the CRBG is not present, the LSU overlies the Marine Sediments. The Willamette Silt overlies the LSU, and is generally less than 50 feet thick. Wells

completed in the basin-fill sediments typically have production rates of less than 200 gpm. On the basis of low existing well yields, the potential for developing a high yield production well within the basin-fill sediments is low.

Younger Alluvium

This unit consists of younger alluvial sediments deposited within the floodplain of the Willamette River. In the general vicinity of the City, the lower portion of this unit commonly consists of channel-derived sand and gravel, which is interlayered with and overlain by backwater/overbank-derived silt and clay. The coarser section of the unit comprises the alluvial aquifer, the most productive aquifer in the Newberg area, and is the City's source of supply for its Marion County wellfield.

The Willamette River is entrenched into older sediments in the Newberg area. The implication of this environment is that the floodplain areas where younger alluvial sediments are present are limited in extent on the outside (north) of the bend in the river as it flows past Newberg. Areas where the alluvial aquifer is confirmed or more likely to be present include: (1) within the broad floodplain that defines the inside of the riverbend on the south side of the river, and (2) in two areas on the north side of the river: including between the City and Dundee, and the area adjacent to the Highway 219 bridge, southeast of the City (Figure 1).

In most areas, the coarser-grained sediments forming the alluvial aquifer are 10 to 30 feet thick, although several investigations focused on the area surrounding the City's production wells have identified a paleochannel with up to 95 feet of coarser-grained sediments (CH2M Hill, 2000). The City's wellfield is located within and around this paleochannel (Figure 2). A thicker sequence of coarse-grained sediments also has been observed in two irrigation wells located within the area east of Highway 219 on the north side of the river. Wells completed in the alluvial aquifer typically produce water with high concentrations of iron and manganese.

Summary

Wells completed in the Marine Sediments are likely to produce low quantities of poor-quality water. Likewise, the LSU is not a productive aquifer in this area. The CRBG aquifers outside and in the northern part of the City, where known to be present, are compartmentalized, have low to medium yields, and declining water level trends. The presence, thickness, and productivity of the CRBG in the southern portion of the City is unknown. Wells completed in younger alluvium present under the Willamette River floodplain and in hydraulic connection with the river are known to produce 1,000 to 3,000 gpm, depending on seasonal variations in water levels, well construction, and the thickness and nature of the alluvium in which the well is completed. Consequently, the highest-potential alternative for developing a 2 mgd groundwater source on the north side of the river is to target the coarse material found in the younger alluvium near the Willamette River.

Water Rights Considerations

Surface Water Rights

At the request of the City, we completed a preliminary evaluation of the feasibility of obtaining a water right to develop a Willamette River surface water supply source, including obtaining a new water right and acquiring an existing right. This evaluation did not include consideration of other feasibility factors for development of a surface water source.

Obtaining a New Surface Water Permit

The following discussion evaluates the City of Newberg's ability to obtain a new surface water right authorizing the use of up to 2 mgd of surface water from the Willamette River for municipal purposes. Prior to issuing a permit, OWRD will review a surface water application to determine whether:

- 1) Water is available for the proposed use;
- 2) The proposed use is allowed in the applicable basin program administrative rules;
- 3) The use would not cause injury to other water rights; and
- 4) The use is consistent with other rules of the Water Resources Commission.

If OWRD finds that each of the criteria is met, the agency can presume that the proposed use would be in the public interest and issue a water use permit. (It is worth noting that third parties can challenge this determination as part of the permit application process.)

Based on our review of each of these criteria, as described below, GSI anticipates that OWRD would find that the proposed use of water from the Willamette River would be in the public interest, and could issue a permit for that use. As discussed below, the permit would, however, be expected to have conditions that could limit the use of water during periods of low flow.

Water Availability: To determine water availability for new surface water permits, OWRD considers its water availability analysis at 80 percent exceedance, which indicates whether the requested water would be expected to be available 8 years out of 10. Water is available in the Willamette River above the Molalla River at 80 percent exceedance each month of the year. Therefore, OWRD would find water to be available for the proposed use.

Basin Program Administrative Rules: OWRD's Willamette River basin program administrative rules identify the "classified" (allowable) uses of the water in the basin's waterways. The classified uses of water from the mainstem Willamette River below the Calapooia River (near Albany) include the use of water for municipal purposes. As a result, OWRD would find the proposed use of surface to be consistent with the Basin Program.

Injury: A new permit issued for the proposed use would be "junior in priority" to all existing water rights. Under the prior appropriation system, if insufficient water was available to meet the needs of all water users, the most junior would be regulated off until the needs of the senior water right holders were met. Based on this system, OWRD would conclude that issuance of a new permit would not cause injury to existing water rights.

Other Rules of the Commission: As part of this final assessment, OWRD will consider whether the proposed use of water is consistent with its "Division 33 rules," which are used to determine whether the use will impair or be detrimental to the public interest with regard to fish species listed under the state or federal endangered species acts. As part of this process, OWRD will request input from the Oregon Department of Fish and Wildlife (ODFW) and the Oregon Department of Environmental Quality (DEQ) about impacts of the proposed water use on listed fish and fish habitat. Based on our experience with other Willamette River permit applications, we would anticipate ODFW (and potentially DEQ) to raise some concerns about the proposed use of water and to recommend approval of the application with conditions. The most significant condition we would expect the agencies to recommend would be a condition to protect certain levels of streamflow in the Willamette River. (These target flows were identified as part of the Willamette Basin Project Biological Opinion.) The condition would only allow the diversion of water if the stream gage at Salem showed that the following target flows were met:

Time Period	Streamflow in cubic feet per second
October	5,630
November through March	6,000
April 1 to April 15	15,000
April 16 to April 30	17,000
May	15,000
June 1 to June 15	12,600
June 16 to June 30	8,500
July through September	5,630

The streamflows in the Willamette River are controlled primarily by the U.S. Army Corps of Engineers (USACE) releases of water from the Willamette Basin Project federal reservoirs. The USACE typically operates the reservoirs in a manner that causes these target flows to be met. During deficit water years, however, these target flows may not be met. In such cases, the condition recommended by ODFW would preclude the diversion of water under a new permit. In 2015, the flow targets were not met for a total of 142 days.

GSI anticipates that OWRD would issue the City a permit for the proposed use of surface water from the Willamette River. The City may, however, be unable to obtain water under the permit during periods of low flow due to conditions that are expected to be included in the permit. These conditions are being applied to new permits in order to maintain adequate stream flows during summer months. Use can be curtailed during times when the Willamette River does not meet target stream flows (as determined by the Oregon Department of Fish and Wildlife and the Oregon Department of Environmental Quality). For example, target flows were not met during the summer of 2015 for a total of 142 days.

The City should also be aware that in the Willamette Basin Program administrative rules, there are “minimum perennial streamflows” (MPSFs) for the use of stored water. At some point in the future, the MPSFs may be changed into instream water rights that would protect water released from the federal reservoirs as it flows down the Willamette River, which could possibly affect holders of Willamette River water rights. The City may want to investigate this issue further if it is seriously considering obtaining a Willamette River water right.

Obtaining an Existing Surface Water Right

An alternative to obtaining a new surface water permit would be to purchase an existing surface water right, ideally one that does not have the same conditions to which a new permit would be attached. To be acquired, the water right would need to be perfected, as evidenced by a water right certificate, and “transferred” (changed) to allow the City to use the water for municipal purposes. OWRD would evaluate a transfer application to determine whether the requested change would cause “injury” to existing water rights (prevent them from receiving water to which they are entitled) or “enlargement” (increase the amount of water that could be used under the water right). Additionally, a transfer cannot change the source of water, so water flowing past the original point of diversion must also be able to flow past the new point of diversion. A detailed analysis of a transfer would require identification and review of a water right to be transferred. Typically transferring water downstream will not be determined to cause injury or enlargement. Also, on the Willamette River it may also be possible to transfer an existing water right to a new location upstream under certain circumstances.

Groundwater Rights

Obtaining a New Groundwater Right

No new groundwater permits will be issued for municipal supply in the CRBG in the Parrett Mountain or Chehalem Mountain GWLAs, and it is unlikely that OWRD would issue a permit for a new CRBG source in the Dundee Hills. Consequently, the areas where OWRD potentially would issue a water right for the CRBG are limited. Figure 1 shows locations outside the GWLAs where CRBG has been mapped. As mentioned earlier, the presence and nature of CRBG is unknown across a broad area within and west of the City.

For the remainder of this analysis, we have assumed that the well(s) would likely be completed in the alluvial aquifer and located within one-quarter mile of, and hydraulically connected to, the Willamette River. Prior to issuing a groundwater permit, OWRD would review a permit application according to the same four criteria described above for a new surface water permit application:

- 1) Water is available for the proposed use;
- 2) The proposed use is allowed in the applicable basin program administrative rules;
- 3) The use would not cause injury to other water rights; and
- 4) The use is consistent with other rules of the Water Resources Commission.

We have evaluated each of these review criteria to determine the expected outcome of OWRD's review of a permit application requesting the use of 2 mgd of groundwater for municipal use.

Water availability: First, OWRD will evaluate whether groundwater is available for the proposed use. In performing this evaluation, OWRD will consider the water bearing unit (or aquifer) from which groundwater will be withdrawn for the proposed use, the proposed rate of water use, and any existing information OWRD has regarding the aquifer's water level (e.g., whether the aquifer water level is stable, increasing, or declining). A declining aquifer level suggests that existing groundwater withdrawals are exceeding recharge to the aquifer, which may result in OWRD making an unfavorable finding regarding groundwater availability.

In addition, OWRD will determine if the proposed use would have the potential for substantial interference (PSI) with surface water. If OWRD found PSI with surface water, it would subject the groundwater use to regulatory limitations on the adjacent surface water source, such as surface water availability. In making this determination, OWRD will first determine whether a well is developing water from a confined or unconfined aquifer. Next, OWRD will determine whether the aquifer is hydraulically connected to surface water. In making this determination, OWRD will assume that a well less than one-quarter mile from a surface water source that produces water from an unconfined aquifer is hydraulically connected to the surface water. Finally, if the well is determined to produce water from an aquifer that is hydraulically connected to surface water, OWRD will determine whether it has the potential to cause substantial interference with surface water. OWRD will assume that a use of hydraulically-connected groundwater will have PSI if it meets any of the following criteria:

1. The well is less than one-quarter mile from the surface water;
2. The well is less than one mile from the surface water, and groundwater would be appropriated at a rate greater than five cubic feet per second (cfs) ;
3. The well is less than one mile from the surface water, and groundwater would be appropriated at a rate greater than one percent of the pertinent minimum perennial streamflow, senior instream water right, or the natural streamflow that is expected 80 percent of the time; or

4. The well is less than one mile from the surface water, and groundwater appropriation for a period of 30 days would cause stream depletion greater than 25 percent of the rate of appropriation.

For a permit application to use groundwater from the alluvial aquifer, we anticipate that OWRD would find that groundwater is available. Because the alluvial aquifer is expected to have hydraulic connection with surface water, OWRD will next determine if the proposed use of groundwater would have PSI with the surface waters. Since the new well is expected to be located within one-quarter mile from the Willamette River, it is expected to have PSI with the River. As a result, limitations on the use of surface water would be applied to the new groundwater right. As previously described, however, water is available in the Willamette River above the Molalla River at 80 percent exceedance each month of the year. So surface water availability does not impose any limitations on the use of groundwater.

Basin Program Administrative Rules: OWRD's Willamette River basin program administrative rules "classify" groundwater for municipal use. In addition, because the proposed well will likely be within one-quarter mile of the Willamette River, the basin program rule classifications for surface water would also apply. As described above, the classified uses of water from the mainstem Willamette River below the Calapooia River (near Albany) include the use of water for municipal purposes. As a result, OWRD should find the use of groundwater for the proposed use to be consistent with the Basin Program rules.

Injury: Except for two irrigation wells located at the east side of the area on the north side of the river next to the Highway 219 bridge, no other wells are located in the areas of interest for an alluvial aquifer source. While the likelihood that OWRD would find the new use would cause injury if a new well(s) was installed on the west side of the floodplain area is low, this issue should be evaluated in the event the City determines to further evaluate whether to install a well(s) in this area.

Other Rules of the Water Resources Commission: Finally, OWRD will evaluate whether the proposed use of water is consistent with other OWRD administrative rules. In this case, the rules that OWRD would consider would be those related to current well construction standards and Division 33 rules (related to listed fish species).

As part of its review OWRD will evaluate whether the construction of the well proposed for use in the permit application meets current water well construction standards (as provided in the agency's administrative rules in OAR 690-210). If OWRD identifies a construction issue, OWRD will require that the construction of the well be modified to meet standards before a water use permit is issued.

As described above, OWRD will also request input from ODFW and DEQ about impacts of the proposed water use on listed fish and fish habitat. However, ODFW and DEQ typically have not recommended any additional permit conditions for groundwater applications.

The process for acquiring a new groundwater permit (assuming the application meets all of the requirements) is expected to take approximately one year. The City should secure a water right, whether through a transfer or obtaining a new permit, prior to beginning construction of a supply source. There is a high likelihood of obtaining a water right, but the City should be aware of the intrinsic risk whenever a water right transaction occurs. OWRD may impose restrictions, curtailments, or other limitations on a new water right.

Transferring an Existing Groundwater Right

The City may potentially move one or more of its existing groundwater rights to appropriate water from a well(s) on the north side of the Willamette River. To change the authorized point of appropriation (well) for an existing water right certificate, a water right transfer application must be filed with OWRD.

The agency will evaluate a transfer application to determine whether the requested change would cause “injury” to existing water rights or “enlargement.” Additionally, since a transfer cannot change the source of water appropriated, the new well would need to appropriate water from the same aquifer from which the current well appropriates water. Although the new well(s) would be located across the river from the current wells operated under the permit, OWRD is likely to conclude that the well(s) would draw from the same aquifer because the flood plain alluvial sediments are both in connection with the river.

The proposed change would not be expected to cause enlargement because use at the new well would be limited to the amount that could be used at the original well. Finally, the change would not be expected to cause injury to existing water rights. However, the City should complete additional analysis in consultation with OWRD to verify this assumption given the presence of two irrigation wells and a surface water right on Spring Brook within the same floodplain area as the CPRD properties.

Subsurface Storage Alternative: Aquifer Storage and Recovery

ASR is the underground storage of treated drinking water in a suitable aquifer and the subsequent recovery of the water from the same well or wells, generally requiring no re-treatment other than disinfection. A suitable aquifer is capable of storing sufficient volumes and supports recovery rates that meet the City’s needs. Based on the City’s goal of developing 2 mgd (1,388 gpm) of redundant capacity, and assuming a recovery period of up to 90 days, 190 million gallons of storage is needed. (OWRD typically allows recovery of up to 95 percent of the annual storage volume.) The ideal geologic setting for ASR is a confined and relatively productive aquifer of sufficient extent to accommodate the target storage volume. In the Newberg area, the basin-fill sediments and alluvial sediments are ill-suited for ASR, whereas, the CRBG hosts several operational ASR systems in Oregon.

The two most important criteria for determining whether ASR is feasible are the availability of excess treated source water for storage and the presence of a suitable aquifer. Potential challenges with other feasibility factors, such as infrastructure needs, land ownership/use and geochemical compatibility between the storage aquifer, native groundwater and ASR source water, generally can be addressed with engineered and administrative solutions.

Based on our review of the regional hydrogeology and other factors, developing an ASR system capable of delivering 2 mgd to the City for an extended period would face significant challenges. While several successful ASR systems target the CRBG in the Tualatin Basin and northern Willamette Valley, the CRBG in the highland areas surrounding the City of Newberg appears to be a faulted and highly bounded system. Compartmentalization of the CRBG aquifers have significant potential to limit achievable recovery rates and storage volumes. The compartmentalized nature of the CRBG also presents a higher risk of excessive interference with existing water users. Recently-applied OWRD conditions that commonly limit new wells completed in the CRBG to one interflow zone also may limit recovery and injection rates, thus requiring additional wells to meet capacity goals.

An order-of-magnitude estimate of the number of ASR wells needed to achieve a cumulative recovery rate of 2 mgd in the Parrett Mountain and Chehalem Mountain areas is 6 to 10, based on an initial survey of the average pumping capacities of existing higher-yielding wells (150 – 250 gpm). However, the feasibility of any particular location is highly uncertain, potentially requiring testing of many more sites to identify suitable locations. We do not recommend further evaluation of this alternative at this time because of (1) the high number of locations that would need to be tested and developed, (2) the

high cost to develop each site, including the well, ASR pump station, piping and disinfection and (3) high uncertainty regarding the suitability of the CRBG aquifers in the area for ASR.

Groundwater Supply Alternatives

This evaluation of alternatives for developing additional groundwater source capacity focuses on groundwater withdrawal from the alluvial flood plain sediments (alluvial aquifer). Consistent with findings of previous studies, the alluvial aquifer provides the City with the best opportunity for developing an additional 2 mgd of source capacity, based on current knowledge. Developing source capacity from other aquifers, including the CRBG, basin-fill sediments and marine sediments were eliminated from further consideration for the following reasons:

- The presence and suitability of the CRBG as a long-term supply source within the City is unknown and would require a significant investment to explore, and the potential for the CRBG to provide a sufficient source of supply where known to be present outside the GWLAs is low.
- Neither the basin-fill sediments nor the marine sediments appear to be able to support wells of sufficient capacity to supply the rates and quantities needed by the City.

Two basic alternatives for developing source capacity in the alluvial aquifer are available to the City. One alternative is to develop additional capacity in or near the City's Marion County wellfield on the south side of the river. This is the alternative with the highest certainty and has some other advantages. However, it does not address the City's primary objective with regards to this next increment of source capacity: to develop redundancy on the north side of the river. The second alternative is to evaluate the feasibility of developing capacity in locations where the alluvial aquifer is present on the north side of the river. This alternative accomplishes the City's objective of developing source redundancy on the north side of the river but has higher associated uncertainty.

These general alternatives were evaluated relative to two key feasibility criteria: water rights permitting and favorable hydrogeology. The more favorable alternatives identified were further evaluated for advantages and disadvantages relative to other feasibility criteria listed below:

Property Ownership and Land Use: The availability of land and land use authorization for development of a well(s). Preference is for publicly-owned parcels zoned for land uses compatible with siting a municipal water source.

Water Quality: Potential water quality and types of treatment needed. The City currently treats its groundwater supply to remove iron. The City does not currently have capabilities to treat surface water or groundwater under the direct influence of surface water.

Infrastructure: The proximity of the site(s) to treatment and distribution piping capable of conveying 1 to 2 mgd of additional supply capacity.

Source vulnerability: Proximity of known contamination or land uses with a potential to adversely affect source water quality. The former Yamhill County landfill and known Department of Environmental Quality (DEQ) cleanup sites are examples (Figure 3).

The following sections summarize the feasibility of developing a groundwater source in the alluvial aquifer and the benefits, risks and an approach to further evaluating each alternative.

Marion County Wellfield Capacity Expansion Alternative

The City completed several studies since 1980 to evaluate the potential to develop groundwater supplies from the alluvial aquifer within the floodplain on the south side of the river. The outcome of these studies was continued expansion of the City's Marion County wellfield, centered on the thickest known section of saturated aquifer. The City has fully developed the pumping capacity of the majority of this channel feature, although the capacities of two wells (4 and 5) are diminished, potentially because of biofouling. While the aquifer becomes appreciably thinner northwest and south of the wellfield (Figure 2), the thickness and nature of the aquifer and potential presence of additional channel features have not been fully explored on the south end of the City's parcel, nor in the northerly portions of the adjacent parcel. The presence of undeveloped alluvial aquifer on the City's parcel and adjacent areas, and the diminished capacity of the City's older wells (particularly Well 4) present a couple of potential opportunities for developing additional capacity on the south side of the river, which could be implemented independently or collectively:

- 1) Evaluate whether the capacities of Well 4 and Well 5 can be restored and/or whether replacing Well 4 would be beneficial
- 2) Fully explore the City's parcel and nearby areas, and drill a new well(s) based on the results of this assessment

While additional source capacity within or near the City's Marion County wellfield does not address the City's primary objective of developing 2 mgd of redundancy on the north side of the river to improve system resiliency, the alternative has a few inherent advantages:

- The City owns the parcel occupied by the wellfield and has existing land use approvals to utilize the parcel, which is designated for exclusive farm use (EFU), for municipal drinking water source.
- Much of the access, power and conveyance infrastructure necessary to add capacity is already in place.
- The City holds undeveloped water right capacity for this aquifer, and changes to the City's water rights to add or move well locations should be relatively simple.

The primary disadvantage of this alternative is that this redundant capacity also would rely on the conveyance across the river and not provide the level of resiliency the City seeks by locating redundant capacity on the north side of the river. Another disadvantage is that the yield of individual wells may be lower than the City's existing wells, resulting in a higher cost per unit capacity. The approach and general steps for developing additional source capacity in or near the Marion County wellfield are summarized below:

Improve/Replace Existing Wells

This option would involve evaluating whether the performance of older existing wells 4 and 5 could be restored to improve overall source capacity, and if not, whether the City should consider replacing Well 4. The performance and capacities of wells 4 and 5 have been significantly diminished since originally installed. Recent advances in well assessment and rehabilitation methods may better inform the City whether to continue to operate these assets as-is or consider implementing a thorough and structured rehabilitation program to restore their capacity. One possible conclusion of the assessment would be that completing a comprehensive rehabilitation program would not be worthwhile. The evaluation could also include an assessment of whether replacing Well 4 would significantly improve overall source

capacity given that Well 4 is located at a sufficient distance from the remainder of the wells such that it would be less affected by interference from other wells.

Implementation of this option would include the following steps:

- 1) Complete a comprehensive assessment of Well 4 and potentially Well 5 to develop a full understanding of the causes of well fouling and diminished well performance. The assessment would initially involve review of information from prior assessment and rehabilitation efforts, including well videos, performance testing, water quality data and rehabilitation methodologies used. The information review would be followed by targeted water quality and bacteriological testing, and possibly a well video survey
- 2) Develop a structured rehabilitation program to target the mechanisms of fouling and evaluate potential effectiveness
- 3) Evaluate potential capacity gains to be achieved by replacing Well 4
- 4) Complete a cost/benefit analysis
- 5) Implement a structured rehabilitation program, depending on results of cost/benefit analysis

Drill New Wells on City or Adjacent Parcel

CH2M Hill (1992) estimated that the capacity of a new well drilled within the thinner (~20 feet) section of the alluvial aquifer would be between 450 and 700 gpm. However, the well capacity potential for certain portions of the City's parcel and the adjacent western parcel is not well understood because the depth, thickness and nature of the alluvial aquifer has not been fully explored. This option would involve filling in gaps in knowledge of the thickness of the alluvial aquifer on the City's parcel and developing the desired capacity increment by installing wells in the most advantageous locations on the basis of well capacity, property, permitting and infrastructure (power and conveyance) costs. The initial phase of this option would explore the extent and thickness of the aquifer on the adjacent parcel to fully understand the resource capacity of the parcels:

- 1) Negotiate an agreement with the owner of the parcel adjacent to the City's property.
- 2) Conduct a surface geophysical survey using time-domain electromagnetic (TDEM) methods, which has been proven effective at identifying and quantifying the thickness of the alluvial aquifer in environment of the Marion County wellfield.
- 3) Identify the most promising locations for installing a well(s) based on aquifer thickness and well interference.
- 4) Install a test boring to confirm the select location(s) is favorable for a production well
- 5) Develop a cost/benefit analysis based on projected well capacity and costs for permitting, installing a production well, installing the pumping system and controls, and connecting the well to the conveyance system.
- 6) Amend the City's groundwater permit to move or add the prospective well locations.
- 7) Install, test, and connect one or more production wells, as needed

North Side Capacity Expansion Alternative

This alternative involves developing source capacity in the alluvial aquifer on the north side of the river. Target areas for exploring the presence and nature of the alluvial aquifer include: (1) the floodplain on either side of Highway 219, termed the Gearns Ferry Area, and (2) the floodplain between Rogers Landing County Park (Rogers Landing) and the City of Dundee, referred to below as the Southwestern Area. The general locations of these areas are shown in figures 1 and 3.

Prior studies also identified Willamette Greenway State Park as an additional alternative for developing a source on the north side of the river. However, the park is located approximately 4 miles east of the City, and because of the high cost to install conveyance to the water treatment plant is not considered further in this evaluation.

Developing source capacity at one of these two locations addresses the City's primary objective of developing 2 mgd of redundancy on the north side of the river to improve system resiliency. Other advantages include the availability of publicly-owned property, and water rights currently held by the City could be utilized for wells completed in the alluvial aquifer. Also, wells completed in the vicinity of the Gearns Ferry Area indicate productive aquifer materials are present at least in some areas. However, potential well yields and water quality at the possible target are uncertain because neither location has been adequately explored. Past and present land uses at both locations require further evaluation to understand whether they pose a potential risk to source water quality. Both areas would require installing up to a mile of piping to convey raw water from the areas to the City's water treatment plant. A summary of the issues and general steps associated with evaluating and developing additional source capacity in the target areas on the north side of the river are summarized below.

Gearns Ferry Area

The Gearns Ferry Area was identified during previous groundwater supply studies as potentially having favorable conditions for developing a groundwater supply source from the alluvial aquifer (CH2M Hill, 1997). The Gearns Ferry Area includes two parcels owned by Chehalem Parks and Recreation District (CPRD) adjacent to the east and west sides of Highway 219 (Figure 4). The remainder of the Gearns Ferry Area is privately-owned. Nearly all of the floodplain is in cultivation, and the land is designated EFU.

The City completed a limited evaluation of the groundwater supply potential of the eastern portion of the CPRD property in 2006 (GSI, 2006), based on the identification of productive aquifer conditions in two irrigation wells located on the Willamette Farms property to the east of the CPRD parcel and an irrigation/domestic well located to the west (Figure 4). The investigation included drilling an exploratory borehole on the east edge of the CPRD property and water quality testing of the Willamette Farms wells. Although the test borehole did not intercept a thick sequence of productive material, the majority of the CPRD property remains unexplored and appears to have potential to host a thicker sequence of productive alluvial aquifer materials. The 2006 investigation did identify the presence of cyanide in a sample from one of the Willamette Farms wells, most likely a residue from agricultural chemical use. Consequently, additional investigation of groundwater quality and current agricultural practices at the Willamette Farms and CPRD parcels, as well as water quality testing on the CPRD site, would be necessary to assess the risks to source water quality prior to investing in a supply source at this location.

As indicated above, further investigation is necessary to evaluate the feasibility of developing a groundwater source at the CPRD property to address the two primary data gaps: (1) verify the presence and pumping capacity of the aquifer, and estimate well yields; and (2) evaluate groundwater quality and current and potential future agricultural practices to assess risks to source water quality. We recommend the following approach for the feasibility evaluation:

1. Meet with OWRD hydrogeologists and permit specialists to review any potential concerns or constraints to be addressed in applying for a transfer to add a new well(s) at this location to the City's existing water rights.
2. Complete a surface geophysical survey (TDEM) of the CPRD property to identify the distribution, depth and thickness of coarse-grained alluvial aquifer materials.
3. Sample the Willamette Farms and any other identified wells completed in alluvial aquifer, and analyze for a complete suite of inorganic and synthetic organic compounds, including pesticides, fungicides and herbicides.
4. Conduct outreach to the adjacent landowners to gage support for a wellfield project on EFU land
5. Interview owners/managers of adjacent properties and lessees of the CPRD property to review current and planned future farm practices.
6. Drill two to three test borings using roto sonic techniques to verify the results of the geophysical survey, collect water quality samples and identify a location(s) for advancing a test well. The test borings will target locations where geophysics indicates a substantial thickness of alluvial aquifer is present at least 200 feet from the river to avoid the presumption that groundwater is under the direct influence of surface water, and therefore requires treatment.
7. Complete a test well and complete a long-term aquifer test and water quality sampling.
8. Should the results of the investigations demonstrate that the desired capacity of acceptable quality can be developed, prepare a conceptual design and costs for a well(s), pump and controls, conveyance and treatment plant upgrades to bring the new source online.
9. Submit a transfer application to add a new well(s) to one of the City's existing alluvial aquifer water rights.

Southwest Area

The Southwest Area encompassing the floodplain between Rogers Landing and the City of Dundee is the other proximal area with potentially-favorable hydrogeologic conditions for development of a groundwater source of supply in the alluvial aquifer on the north side of the river (Figure 5). However, this particular area has several challenges and thus is less preferable than the Gears Ferry area. First, little information is available from which to assess the yield potential in this area. Also, the only publicly-owned property potentially suitable for development of a groundwater source is the Rogers Landing, located at the north end of the floodplain. A closed landfill is located between Rogers Landing and Dundee, approximately ¼-mile from the western edge of the park. The potential for contamination related to the landfill to affect a groundwater source installed in this area requires scrutiny. The land located between the landfill and the City of Dundee is privately-held agricultural land designated EFU, which may present some access and land use challenges.

Similar to the CPRD property, further investigation is necessary to evaluate the feasibility of developing a groundwater source in the Southwestern Area to address two primary data gaps: (1) verify the presence and pumping capacity of the aquifer, and estimate well yields; and (2) evaluate groundwater quality, potential landfill impacts, and current and potential future agricultural practices to assess risks to source water quality. We recommend the following approach to evaluate the feasibility of developing a groundwater source in the Southwest Area:

1. Complete a surface geophysical survey (TDEM) of the select location to identify the distribution, depth and thickness of coarse-grained alluvial aquifer materials.
2. Conduct outreach to the adjacent landowners to gage support for a wellfield project on EFU land.
3. Interview owners/managers of adjacent agricultural properties to review current and planned future farm practices.
4. Drill two to three test borings to verify the results of the geophysical survey, collect water quality samples and identify a location(s) for advancing a test well. The test borings will target locations where geophysics indicates a substantial thickness of alluvial aquifer is present at least 200 feet from the river to avoid the presumption that groundwater is under the direct influence of surface water, and therefore requires treatment.
5. Complete a test well and complete a long-term aquifer test and water quality sampling.
6. Should the results of the investigations demonstrate that the desired capacity of acceptable quality can be developed, prepare a conceptual design and costs for a well(s), pump and controls, conveyance and treatment plant upgrades to bring the new source online.
7. Submit an application to add a new well(s) to one of the City's existing alluvial aquifer water rights.

Summary

The City desires to develop 2 mgd of new source capacity to provide redundancy and service future growth. Ideally, the new source capacity would be located on the north side of the river to improve system resiliency by reducing dependence on the City's sole source of supply, the Marion County wellfield, which is located across the Willamette River. While this evaluation is focused primarily on groundwater source alternatives, three general alternatives for developing additional source capacity were assessed varying degrees. The general alternatives and scope of this evaluation for each are as follows

1. New Willamette River surface water supply: evaluation of water rights considerations only
2. Subsurface storage using ASR: initial desktop assessment of the potential to develop an ASR system with 2 mgd of recovery capacity based on hydrogeological conditions
3. Additional groundwater source capacity: identification and evaluation of alternatives for expanding the capacity for the City's existing Marion County wellfield and developing a new groundwater source on the north side of the river, including water rights considerations and roadmaps for implementation

Willamette River Surface Water Source

The assessment of the potential to develop a surface water source from the Willamette River was limited to a review of water rights considerations. At present GSI anticipates that OWRD would issue the City a new permit for the proposed use of surface water from the Willamette River. The City may, however, be unable to obtain water under the permit during periods of low flow due to conditions that are expected to be included in the permit. Use can be curtailed during times when the Willamette River does not meet target stream flows (as determined by the Oregon Department of Fish and Wildlife and

the Oregon Department of Environmental Quality). For example, target flows were not met during the summer of 2015 for a total of 142 days.

An alternative to obtaining a new surface water permit would be to purchase an existing surface water right, ideally one that does not have the same conditions to which a new permit would be attached. A detailed analysis of a transfer would require identification and review of a water right to be transferred. Typically transferring water downstream will not be determined to cause injury or enlargement. Also, on the Willamette River it may also be possible to transfer an existing water right to a new location upstream under certain circumstances. In the absence of viable subsurface storage options, the City's most reliable alternative for developing a surface supply would be to identify and transfer an existing, certificated water right.

Subsurface Storage using ASR

Based on our review of the regional hydrogeology and other factors, developing an ASR system capable of delivering 2 mgd to the City for an extended period would face significant challenges. An order-of-magnitude estimate of the number of ASR wells needed to achieve a cumulative recovery rate of 2 mgd in the Parrett Mountain and Chehalem Mountain areas is 6 to 10, based on an initial survey of the average pumping capacities of existing higher-yielding wells (150 – 250 gpm). However, the feasibility of any particular location is highly uncertain, potentially requiring testing of many more sites to identify suitable locations. Implementation of this alternative would entail acquiring a sufficient number of suitable sites, testing each site and developing suitable sites. Assuming feasible based on site availability and hydrogeological conditions, the cost of each increment of capacity would likely be prohibitive. , For these reasons, we do not recommend further evaluation of this alternative at this time.

Groundwater Supply Development

Of the four primary aquifer systems in the Newberg area, only the alluvial aquifer, present within the Willamette River floodplain, appears to have the potential to develop a 2 mgd supply. Two potential alternatives for development of the desired capacity from the Alluvial Aquifer are available to the City:

1. Enhance and expand the capacity of the existing Marion County wellfield by rehabilitating or replacing existing underperforming wells and/or developing new wells on undeveloped portions of the City's or adjacent properties.
2. Develop a new source of supply on the north side of the river at one of two locations where the Alluvial Aquifer appears to be present: the Southwestern and the Gearn's Ferry areas.

Enhance or Expand Capacity of Marion County Wellfield

This alternative includes several intrinsic advantages, including the presence of existing conveyance, property ownership and somewhat less uncertainty about the hydrogeological conditions. However, the City's resiliency objective is not addressed by developing additional capacity on the south side of the river. This general alternative includes two options, (1) rehabilitate and/or replace existing wells to increase capacity, or (2) drill new wells in undeveloped portions of the City's parcel or the adjacent parcel located to the west. Both options could be implemented with only minor modifications to the City's existing water rights.

Rehabilitate and/or replace existing wells: This option would involve evaluating whether the performance of older existing wells 4 and 5 could be restored to improve overall source capacity, and if not, whether the City should consider replacing Well 4. An advantage of this option is that it could maximize the utility of existing wells and distribution infrastructure.

Drill new wells on City or adjacent parcel: This option would involve filling in gaps in knowledge of the thickness and permeability of the alluvial aquifer for certain portions of the City's parcel and the adjacent western parcel, and developing the desired capacity increment by installing wells in the most advantageous locations on the basis of well capacity, property, permitting and infrastructure (power and conveyance) costs.

North Side Capacity Expansion Alternative

This alternative involves developing source capacity in the alluvial aquifer on the north side of the river in either the Gearns Ferry Area, or the Southwestern Area (figures 1 and 3). Developing source capacity at one of these two locations addresses the City's primary objective of developing 2 mgd of redundancy on the north side of the river to improve system resiliency. Other advantages include the availability of publicly-owned property, and water rights currently held by the City could be utilized for wells completed in the alluvial aquifer. Also, wells completed in the vicinity of the Gearns Ferry Area indicate productive aquifer materials are present at least in some areas. However, potential well yields and water quality at the possible target are uncertain because neither location has been adequately explored. Past and present land uses at both locations require further evaluation to understand whether they pose a potential risk to source water quality. Both areas would require installing up to a mile of piping to convey raw water from the areas to the City's water treatment plant.

References

- CH2M Hill, 1992. City of Newberg, well field evaluation study. Report dated October 1, 1992.
- CH2M Hill, 1993. City of Newberg Ranney collector feasibility study. Report dated December 22, 1993.
- CH2M Hill, 1997. City of Newberg preliminary groundwater availability study. Technical memorandum dated July 17, 1997.
- CH2M Hill, 2000. Newberg wellfield exploration, test well installation, pump test, and well interference analysis. Report dated March 9, 2000.
- Conlon, T.D., Wozniak, K.C., Woodcock, D., Herrera, N.B., Fisher, B.J., Morgan, D.S., Lee, K.L., and Hinkle, S.R. Ground-water hydrology of the Willamette Basin, Oregon. U.S. Geological Survey Scientific Investigations Report 2005-5168, 83 p.
- Frank, F.J. and C.A. Collins, 1978. Groundwater in the Newberg Area, Northern Willamette Valley, Oregon. U.S. Geological Survey and State of Oregon Water Resources Department, Groundwater Report No. 27.
- GSI, 2006. Gearns Ferry property investigation. Memorandum from Jeff Barry to Dan Danicic, City of Newberg.
- Miller, D.W., Gates, S.M., Brodersen, B.T., and Zwart, M.J., 1994. Groundwater conditions of basalt aquifers, Parrett Mountain, Northwestern Willamette Valley, Oregon: Oregon Water Resources Department, Groundwater Report 40, 144 p.
- Ranney Method Western Corporation, 1980. Tigard Water District hydrogeological survey – Ranney collector feasibility report. Consultant report to Tigard Water District.
- Sweet, Edwards & Associates, Inc., 1983. Newberg well field hydrogeologic study. Consultant report submitted to Kramer, Chin & Mayo, Inc.

Figures

This page intentionally left blank.

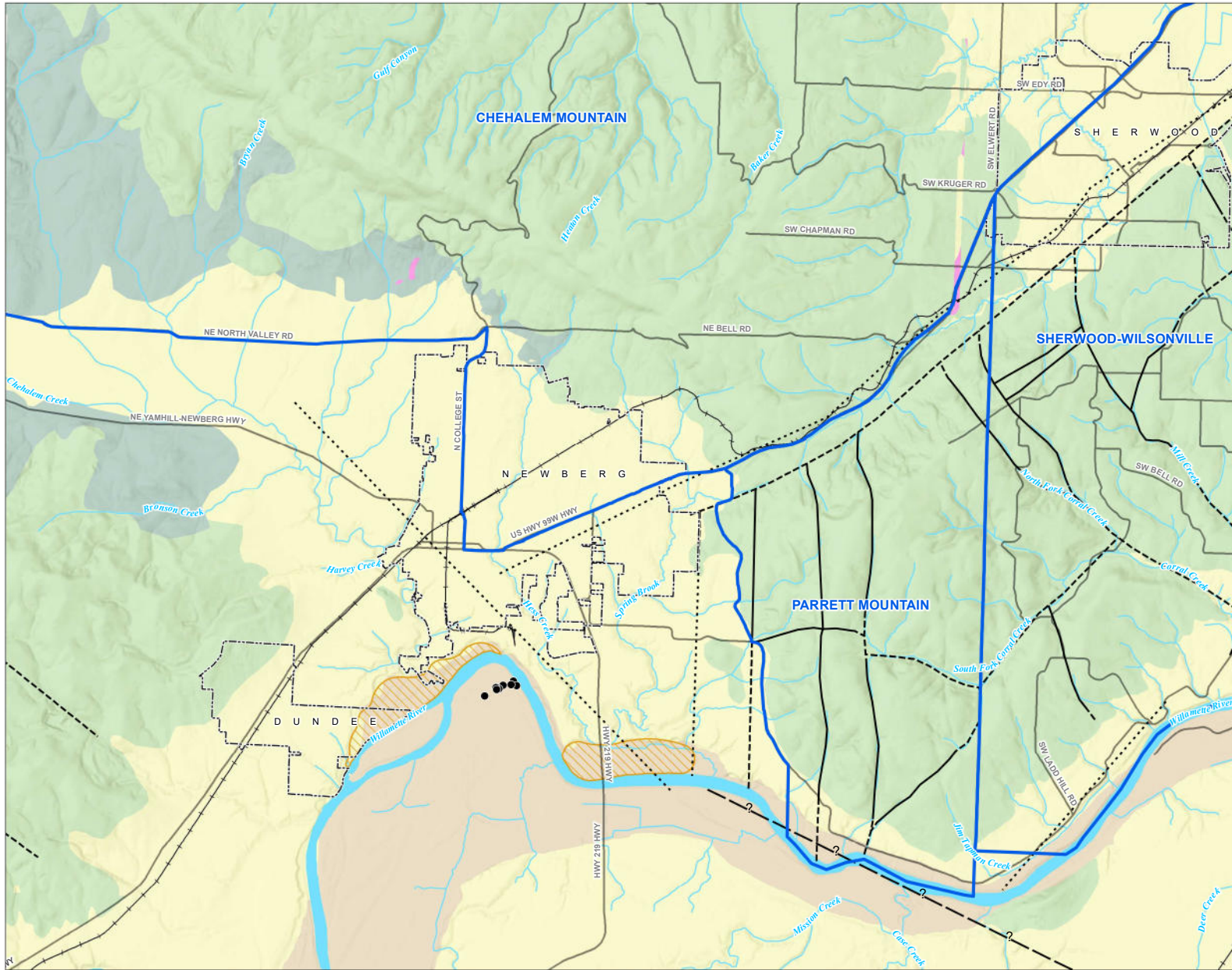


FIGURE 1
Geologic Setting
 Expansion Assessment
 Newberg, Oregon

LEGEND

Surficial Geology

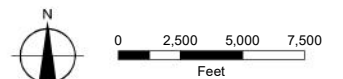
- Floodplain Deposits of the Willamette River and Major Tributaries (Younger Alluvium)
- Quaternary Alluvium (Basin-Fill)
- Tertiary Sedimentary Rocks (Basin-Fill Sediments)
- Columbia River Basalt Group (CRBG)
- Marine Sediments

- Normal Fault
- Approximate Fault
- Concealed Fault
- Uncertain Fault

All Other Features

- City Production Well
- Potential Alluvial Aquifer Source Location
- OWRD Groundwater Limited Area
- Cities
- Major Road
- Railroad
- Watercourse
- Waterbody

NOTE:
 Fault lines digitized from USGS PP-1424-A and OWRD Groundwater Report No. 40 (Miller, D.W., et. al., 1994, Groundwater Conditions of Basalt Aquifers, Parrett Mountain, Northern Willamette Valley, Oregon).



MAP NOTES:
 Date: May 27, 2016
 Data Sources: Newberg, OWRD, DOGAMI, METRO
 RLIS



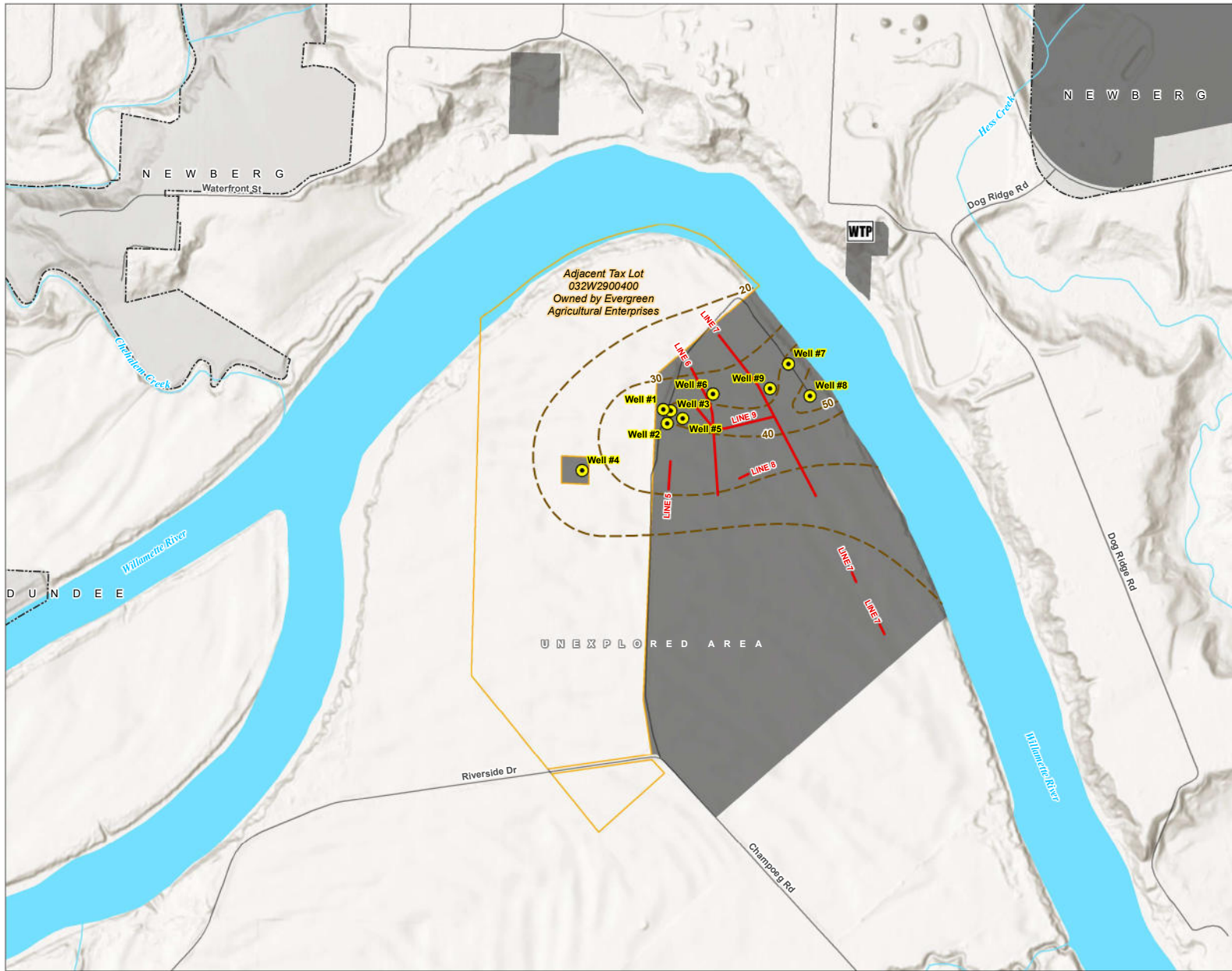
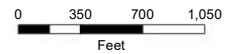


FIGURE 2
Geophysical Investigations
 Expansion Assessment
 Newberg, Oregon

LEGEND

- ⊙ Production Well
- Geophysical Investigation Location
- Estimated Thickness (feet) of Coarse-Grained Deposits (CH2M, 1992)
- WTP Newberg Water Treatment Plant
- CD Cities
- City-Owned Tax Lot
- Adjacent Tax Lot
- Major Road
- Watercourse
- Waterbody



MAP NOTES:

Date: May 27, 2016
 Data Sources: Newberg, Yamhill Co GIS, Marion Co GIS, METRO RLIS, CH2MHILL Well Field Study (1992)



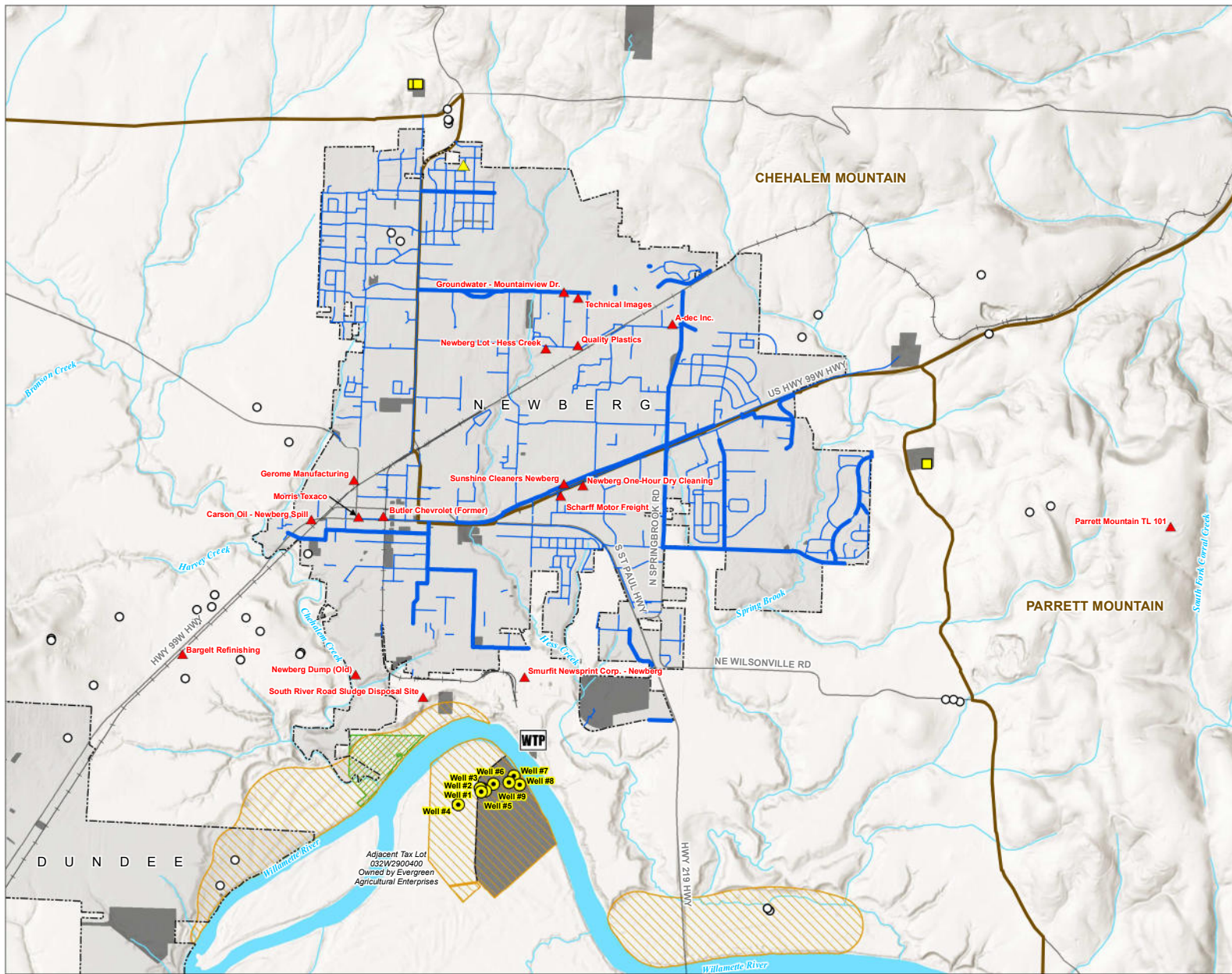


FIGURE 3
Potential Source Expansion Areas
 Expansion Assessment
 Newberg, Oregon

LEGEND

Distribution System

- Ⓜ Production Well
- ▲ Pump Station
- Enclosed Storage Facility
- WTP Newberg Water Treatment Plant
- 8, 9, and 10 inch diameter water main (capable of distributing 700 gpm [1 MGD])
- 10 inch diameter water main (capable of distributing more than 800 gpm)

All Other Features

- ▲ DEQ ECSI Site
- ▲ Potential Alluvial Aquifer Source Location
- Groundwater Right Point of Appropriation (POA)
- ▲ Approximate Former Yamhill County Landfill
- OWRD Groundwater Limited Areas
- Cities
- City-Owned Tax Lot
- Adjacent Tax Lot to Wellfield
- Major Road
- Railroad
- Watercourse
- Waterbody



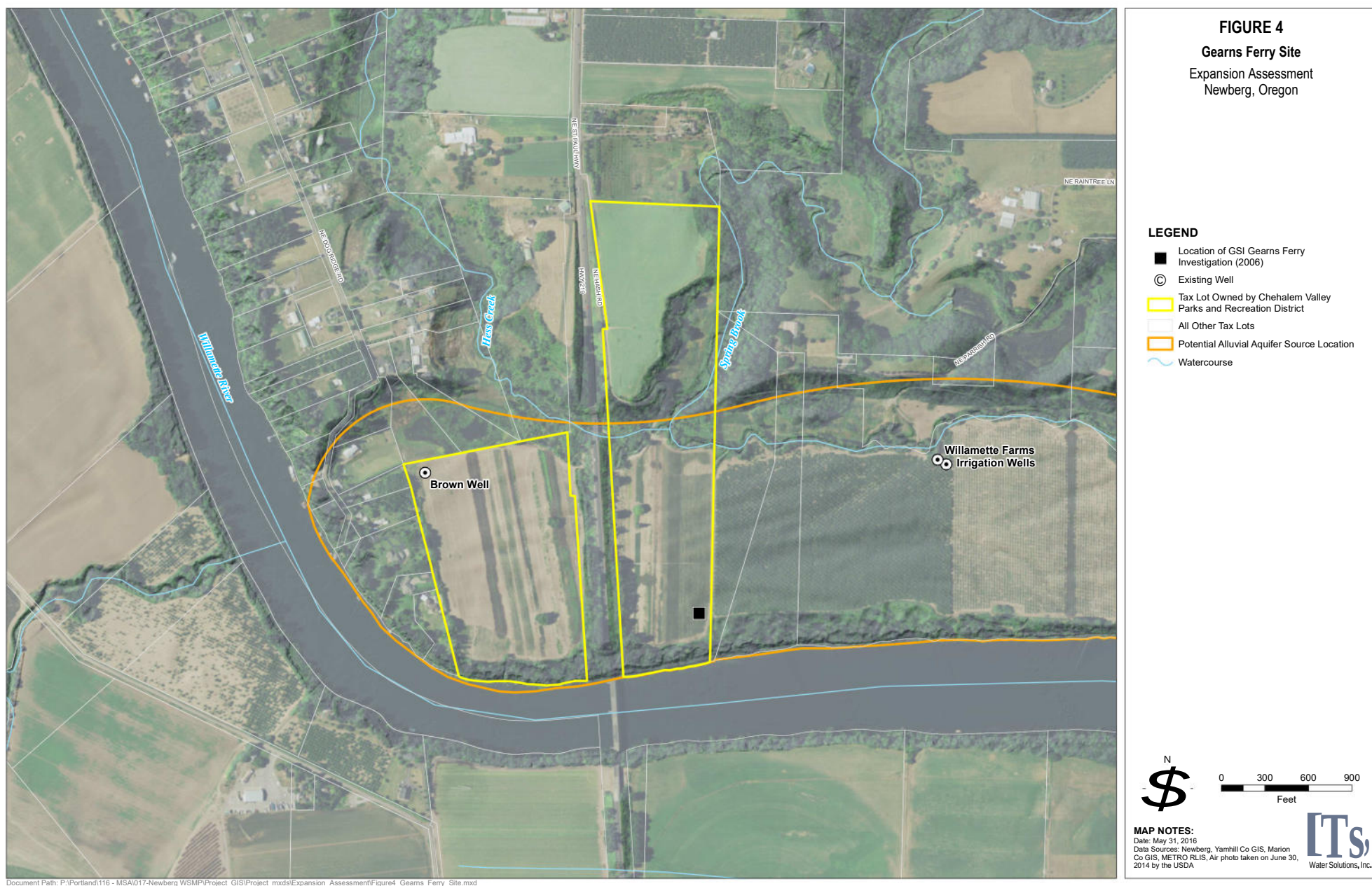
0 1,300 2,600 3,900
 Feet

MAP NOTES:

Date: May 31, 2016
 Data Sources: Newberg, OWRD, OR DEQ, Yamhill
 Co GIS, Marion Co GIS, METRO RLIS

ITS
 Water Solutions, Inc.

Document Path: P:\Portland\116 - MSA\017-Newberg WSP\Project_GIS\Project_mxd\Expansion_Assessment\Figure3_Source_Expansion_Area.mxd



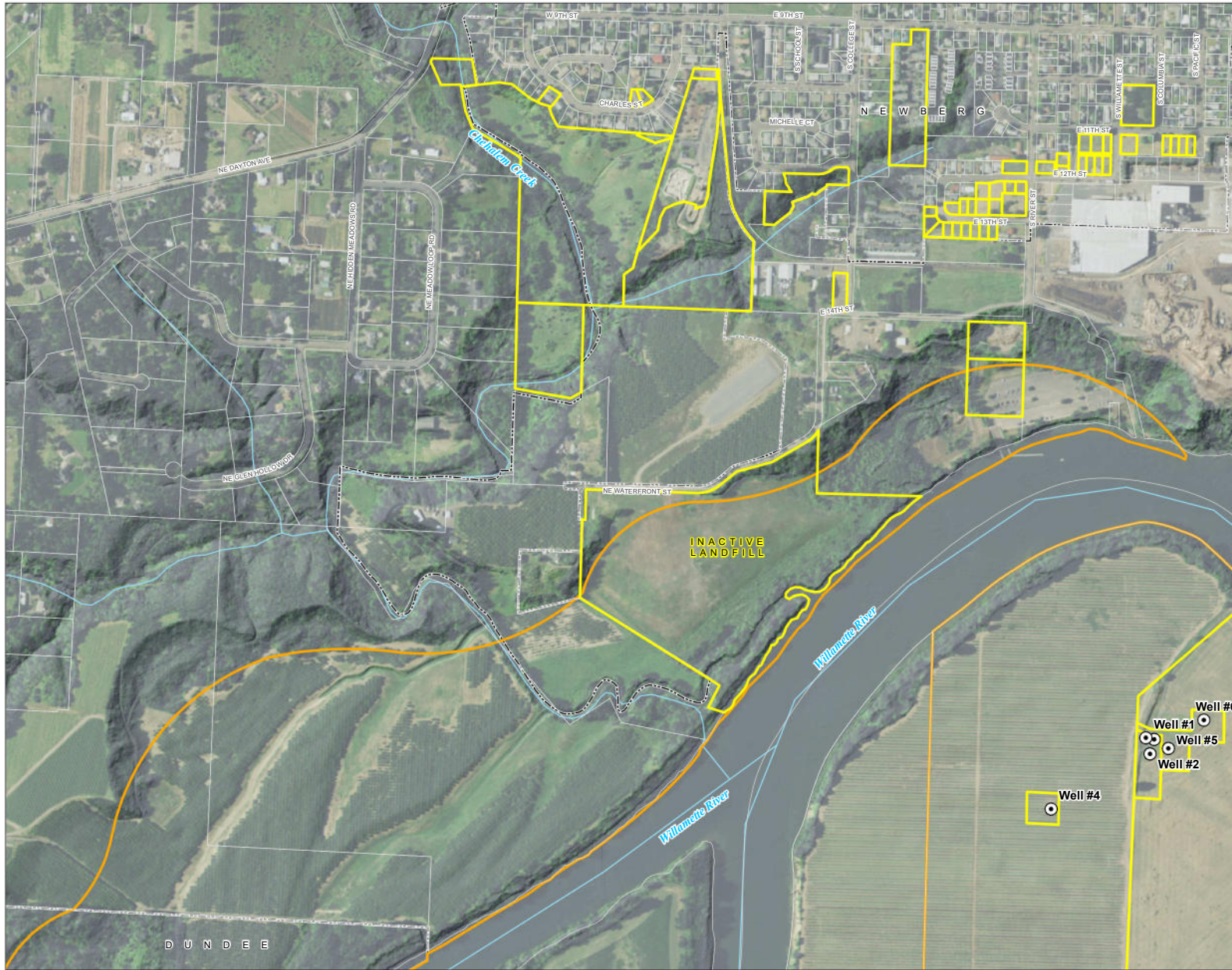
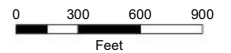


FIGURE 5
Southwest Area
 Expansion Assessment
 Newberg, Oregon

LEGEND

- Ⓡ Existing Well
- Yellow outline Tax Lot Publicly Owned
- White outline All Other Tax Lots
- Orange outline Potential Alluvial Aquifer Source Location
- ifj City Limit
- Blue line Watercourse



MAP NOTES:

Date: May 31, 2016
 Data Sources: Newberg, Yamhill Co GIS, Marion Co GIS, METRO RLIS, Air photo taken on June 30, 2014 by the USDA



Document Path: P:\Portland\116 - MSA\017-Newberg WSMP\Project_GIS\Project_mxd\Expansion_Assessment\Figure5_SW_Area.mxd

Water System Development Charges

Prepared For
City of Newberg

February 22, 2017



Introduction

Oregon legislation establishes guidelines for the calculation of system development charges (SDCs). Within these guidelines, local governments have latitude in selecting technical approaches and establishing policies related to the development and administration of SDCs. A discussion of this legislation follows, along with the methodology for calculating updated water SDCs for the City of Newberg (the City) based on the recently completed Water System Master Plan (Murraysmith).

SDC Legislation in Oregon

In the 1989 Oregon state legislative session, a bill was passed that created a uniform framework for the imposition of SDCs statewide. This legislation (Oregon Revised Statute [ORS] 223.297-223.314), which became effective on July 1, 1991, (with subsequent amendments), authorizes local governments to assess SDCs for the following types of capital improvements:

- Drainage and flood control
- Water supply, treatment, and distribution
- Wastewater collection, transmission, treatment, and disposal
- Transportation
- Parks and recreation

The legislation provides guidelines on the calculation and modification of SDCs, accounting requirements to track SDC revenues, and the adoption of administrative review procedures.

SDC Structure

SDCs can be developed around two concepts: (1) a reimbursement fee, and (2) an improvement fee, or a combination of the two. The **reimbursement fee** is based on the costs of capital improvements *already constructed or under construction*. The legislation requires the reimbursement fee to be established or modified by an ordinance or resolution setting forth the methodology used to calculate the charge. This methodology must consider the cost of existing facilities, prior contributions by existing users, gifts or grants from federal or state government or private persons, the value of unused capacity available for future system users, rate-making principles employed to finance the capital improvements, and other relevant factors. The objective of the methodology must be that future system users contribute no more than an equitable share of the capital costs of *existing* facilities. Reimbursement fee revenues are restricted only to capital expenditures for the specific system with which they are assessed, including debt service.

The methodology for establishing or modifying an **improvement fee** must be specified in an ordinance or resolution that demonstrates consideration of the *projected costs of capital improvements identified in an adopted plan and list*, that are needed to increase capacity in the system to meet the demands of new development. Revenues generated through improvement fees are dedicated to capacity-increasing capital improvements or the repayment of

debt on such improvements. An increase in capacity is established if an improvement increases the level of service provided by existing facilities or provides new facilities.

In many systems, growth needs will be met through a combination of existing available capacity and future capacity-enhancing improvements. Therefore, the law provides for a **combined fee** (reimbursement plus improvement component). However, when such a fee is developed, the methodology must demonstrate that the charge is not based on providing the same system capacity.

Credits

The legislation requires that a credit be provided against the improvement fee for the construction of “qualified public improvements.” Qualified public improvements are improvements that are required as a condition of development approval, identified in the system’s capital improvement program, and either (1) not located on or contiguous to the property being developed, or (2) located in whole or in part, on or contiguous to, property that is the subject of development approval and required to be built larger or with greater capacity than is necessary for the particular development project to which the improvement fee is related.

Update and Review

The methodology for establishing or modifying improvement or reimbursement fees shall be available for public inspection. The local government must maintain a list of persons who have made a written request for notification prior to the adoption or amendment of such fees. The legislation includes provisions regarding notification of hearings and filing for reviews. The notification requirements for changes to the fees that represent a modification to the methodology are 90-day written notice prior to first public hearing, with the SDC methodology available for review 60 days prior to public hearing.

Other Provisions

Other provisions of the legislation require:

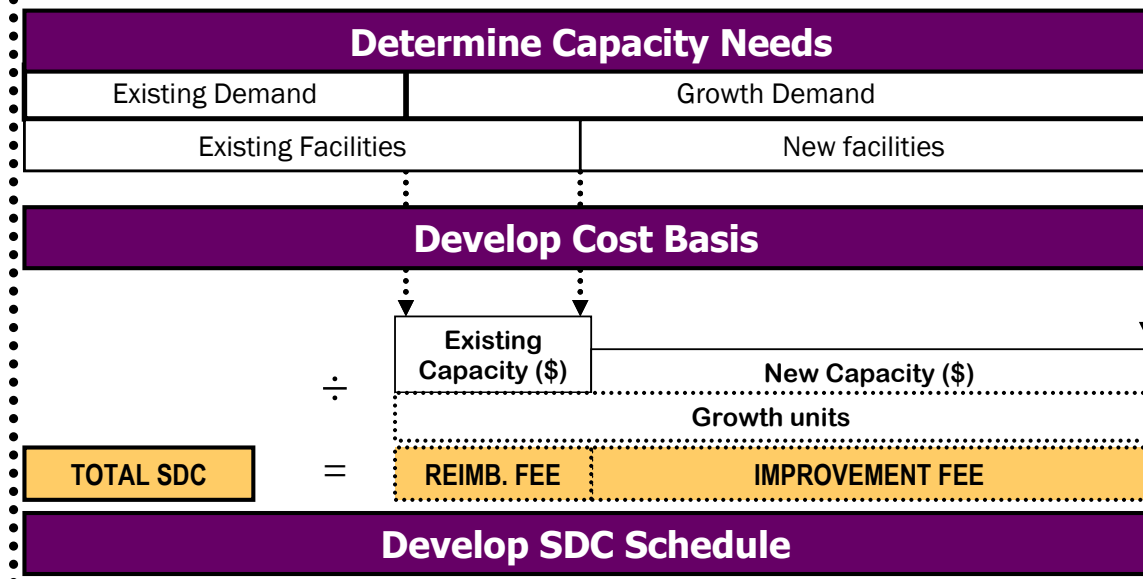
- Preparation of a capital improvement program (CIP) or comparable plan (prior to the establishment of a SDC), that includes a list of the improvements that the jurisdiction intends to fund with improvement fee revenues and the estimated timing, cost, and eligible portion of each improvement.
- Deposit of SDC revenues into dedicated accounts and annual accounting of revenues and expenditures, including a list of the amount spent on each project funded, in whole or in part, by SDC revenues.
- Creation of an administrative appeals procedure, in accordance with the legislation, whereby a citizen or other interested party may challenge an expenditure of SDC revenues.

The provisions of the legislation are invalidated if they are construed to impair the local government’s bond obligations or the ability of the local government to issue new bonds or other financing.

Methodology Overview

The general methodology used to calculate water SDCs in Newberg is illustrated in **Figure 1**. It begins with an analysis of system planning and design criteria to determine growth's capacity needs, and how they will be met through existing system available capacity and capacity expansion. Then, the capacity to serve growth is valued to determine the "cost basis" for the SDCs, which is then spread over the total growth capacity units to determine the system wide unit costs of capacity. The final step is to determine the SDC schedule, which identifies how different developments will be charged, based on their estimated capacity requirements.

Figure 1 – Overview of SDC Methodology



Water SDC Methodology

This section presents the updated water system development charge (SDC) analysis, based on the City's recently completed Water System Master Plan (Master Plan).

Determine Capacity Needs

Table 1 shows the planning assumptions for the water system as determined by the Master Plan. Capacity requirements are generally evaluated based on the following system design criteria:

- Maximum Day Demand (MDD) -- The highest daily recorded rate of water production in a year. Used for allocating source, pumping and delivery facilities.
- Storage Requirements -- Storage facilities provide three functions: operational (or equalization) storage, and storage for emergency and fire protection needs. Used for allocating storage facility costs.

Table 1
City of Newberg
Water System Development Charge Analysis
Planning Data

	MDD (mgd) ¹	Storage (mg)
Capacity Requirements		
Current		
System	4.90	
Zone 1	4.86	5.87
High Elevation Zones	0.04	0.20
Future Requirements		
System	8.77	
Zone 1	7.35	8.8
High Elevation Zones	1.42	1.7
Growth Allocations		
System Growth	3.87	
Share of Future Requirements	44%	
Zone 1 Growth	2.49	2.93
Share of Future Requirements	34%	33%
High Elevation Growth	1.38	1.5
Share of Future Requirements	97%	88%

¹ Includes potable and non-potable systems

As shown in Table 1, system MDD is currently about 4.9 million gallons per day (mgd), including both potable and non-potable use. Growth in MDD is projected to be about 3.9 mgd over the study period. For supply and delivery purposes, the potable and non-potable

systems are evaluated on a combined basis, as collectively the systems will be used to meet future MDD.

Storage requirements are about 5.6 million gallons (mg) currently, and are limited to the potable system. Future storage requirements are expected to be 8.8 mg in Zone 1, and 1.7 mg in Zone 2. Pumping and storage requirements are evaluated separately for each zone.

Develop Cost Basis

The capacity needed to serve new development will be met through a combination of existing available system capacity and additional capacity from planned system improvements. The reimbursement fee is intended to recover the costs associated with the growth-related capacity in the existing system; the improvement fee is based on the costs of capacity-increasing future improvements needed to meet the demands of growth. The value of capacity needed to serve growth in aggregate within the planning period, adjusted for grants and contributions used to fund facilities, is referred to as the “cost basis”.

Reimbursement Fee

Table 2 shows the reimbursement fee cost basis calculations. The reimbursement fee cost basis reflects the growth share of existing system assets of June 30, 2016. As shown in Table 2, the value of the existing water system (based on original purchase cost) is almost \$44 million. When developer contributions are deducted, the City’s historical investment in water system facilities totals about \$39 million (excluding vehicles and minor equipment costs).

The growth share for each asset type is based on the planning data provided in Table 1. The existing supply, storage, and delivery system facilities all have capacity that will be utilized by future growth, and therefore the allocations are based on growth’s share of future demands. As shown in Table 1, growth share of future MDD (used to allocate supply and delivery costs) is 44 percent, and storage (based on Zone 1 requirements) is 33 percent. Support facilities are allocated 20 percent to future growth, based on the City’s estimates. The reimbursement fee cost basis excludes any assets (like the sodium hypochlorite equipment) that will be replaced by planned capital improvements. As shown in Table 2, the reimbursement fee cost basis totals \$16.3 million.

Table 2

City of Newberg
 Water System Development Charge Analysis
Reimbursement Fee Cost Basis

Description	Original Cost	City Cost	Growth Share	
			%	\$
Supply				
Wells	\$3,762,294	\$3,762,294	44%	\$1,660,214
Treatment	\$9,970,901	\$9,970,901	44%	\$4,399,930
Sodium Hypochlorite Equipment	\$167,464	\$167,464	0%	\$0
Springs	\$52,059	\$52,059	44%	\$22,972
Effluent Re-use	\$2,319,652	\$2,319,652	44%	\$1,023,609
Subtotal	\$16,272,370	\$16,272,370		\$7,106,726
Storage				
Corral Creek	\$3,573,002	\$3,573,002	33%	\$1,189,647
North Valley Rd. Reservoir	\$1,939,871	\$1,939,871	33%	\$645,889
Reservoir 1 & 2	\$1,157,019	\$1,157,019	33%	\$385,235
Reservoir 3	\$12,487	\$12,487	33%	\$4,158
East Reservoir	\$320,070	\$320,070	33%	\$106,569
Other	\$43,818	\$43,818	33%	\$14,589
Subtotal	\$7,046,267	\$7,046,267		\$2,346,087
Water Delivery				
Developer	\$4,576,425	\$0	44%	\$0
City Water	\$10,389,944	\$10,389,944	44%	\$4,584,844
Parallel River Line	\$3,191,301	\$3,191,301	44%	\$1,408,248
Water Line N Arterial S Curve	\$1,027,555	\$1,027,555	44%	\$453,436
Effluent Reuse	\$818,636	\$818,636	44%	\$361,245
Subtotal	\$20,003,861	\$15,427,436		\$6,807,774
Support Facilities				
3rd St. Building/Land	\$226,272	\$226,272	20%	\$45,254
2nd St. Parking	\$74,535	\$74,535	20%	\$14,907
Subtotal	\$300,807	\$300,807		\$60,161
Total	\$43,623,305	\$39,046,880		\$16,320,748

Source: City Fixed Asset Records as of June 30, 2016

Improvement Fee

Table 3 shows the improvement fee cost basis calculations. As with the existing facility costs, the costs of most planned improvements (from the Master Plan and the City's capital improvement plan) are allocated in proportion to future demands using the percentages shown in Table 1. Pumping and other high elevation water infrastructure improvements are allocated in proportion to the upper zone needs, and existing distribution main upsizing (which is specific to Zone 1) are allocated in proportion to Zone 1 MDD. System extension at Chehalem Drive and Columbia Drive, and in the nonpotable system is needed only for future growth. Support facilities are allocated 20 percent to growth based on the City's analysis.

As shown in Table 3, the total improvement fee cost basis is about \$15 million.

Table 3
City of Newberg
Water System Development Charge Analysis
Improvement Fee Cost Basis (Project List)

ID#	PROJECT	Time Period	Cost Estimate	SDC-Eligible Portion %	\$
	Supply				
	2 mgd redundant supply development	2019-2023	\$3,619,000	44%	\$1,596,982
	Hypochlorite Generator	2018	\$500,000	44%	\$220,639
	Water Rights Review and Reconfiguration	2018	\$25,000	44%	\$11,032
	Subtotal		\$4,144,000		\$1,828,652
	Pumping				
P-1	Bell East Pump Station - Zone 3	2022-2023	\$1,450,000	97%	\$1,409,155
P-2	Bell West Pump Station - Zone 2	2019-2020	\$1,450,000	97%	\$1,409,155
	Subtotal		\$2,900,000		\$2,818,310
	Distribution				
M-1-M-8, M-18	Upsize existing mains; construct new distribution loops to improve fire flow capacity	2018-2022	\$2,202,000	34%	\$745,984
M-9	NE Zimri Dr Zone 3 distribution backbone within UGB	2023	\$346,000	97%	\$336,254
M-19	Chehalem Dr water system extension west and north to Columbia Dr	2018-2019	\$600,000	100%	\$600,000
M-14 & M-15	N College St - N Terrace Street - Bell West P.S. (P-2) - Veritas School	2019-2020	\$433,000	97%	\$420,803
	College Street WL to Mountain View	2018	\$470,000	10%	\$47,000
	Fixed Base Radio Read	2020	\$1,000,000	44%	\$441,277
	Subtotal		\$5,051,000		\$2,591,317
	Future High Elevation Water Infrastructure				
R-1	1.7 MG Bell Road Reservoir - Zone 3	20 Year +	\$2,400,000	88%	\$2,117,647
M-16	Zimri Dr. E transmission main to Bell Rd Reservoir	20 Year +	\$1,847,000	97%	\$1,794,972
M-17	Bell Rd W transmission main - N College Street to Zimri Dr.	20 Year +	\$1,726,000	97%	\$1,677,380
	Subtotal	\$0	\$5,973,000		\$5,589,999
	Planning				
	Seismic Resilience Study	2018	\$150,000	44%	\$66,192
	Water Management & Conservation Plan	2027	\$100,000	44%	\$44,128
	Water System Master Plan update	2027	\$250,000	44%	\$110,319
	SDC Study	2017	\$5,000	100%	\$5,000
	WTP & Bridge Transmission Main Slope Stability Study	2018	\$150,000	44%	\$66,192
	Subtotal		\$655,000		\$291,830
	Other				
	North non-potable water line and Otis Springs pumping improvements	2024-2027	\$1,750,000	100%	\$1,750,000
	Public Works Maintenance Facility Master Plan	2018-2022	\$737,500	20%	\$147,500
	Subtotal		\$2,487,500		\$1,897,500
	Total		\$21,210,500		\$15,017,608

Develop Unit Costs

The unit costs of capacity are determined by dividing the respective cost bases by the system-wide growth-related capacity requirements defined in Table 1. The system-wide unit costs are then multiplied by the capacity requirements per equivalent dwelling unit (EDU) to yield the fees per EDU. Table 3 shows these calculations.

Table 4
City of Newberg
Water System Development Charge
Unit Cost Calculations

	System Component						
	Supply	Storage/ Pumping	Distribution	Upper Elevation	Planning	Support	Total
Reimbursement Cost Basis	\$7,106,726	\$2,346,087	\$6,807,774	\$0	\$0	\$60,161	\$16,320,748
Growth Capacity Req (mgd)	3.9	3.9	3.9			3.9	
Unit Cost	\$1,836,363	\$606,224	\$1,759,115			\$15,546	
Capacity per EDU (mgd)	0.000605	0.000605	0.000605			0.000605	
Reimbursement \$/EDU	\$1,110	\$367	\$1,064	\$0	\$0	\$9	\$2,550
Improvement Cost Basis	\$1,828,652	\$2,818,310	\$4,341,317	\$5,589,999	\$291,830	\$147,500	\$15,017,608
Growth Capacity Req (mgd)	3.9	3.9	3.9	3.9	3.9	3.9	
Unit Cost	\$472,520	\$728,245	\$1,121,787	\$1,444,444	\$75,408	\$38,114	
Capacity per EDU (mgd)	0.000605	0.000605	0.000605	0.000605	0.000605	0.000605	
Improvement \$/EDU	\$286	\$440	\$678	\$873	\$46	\$23	\$2,346

EDU capacity requirements are estimated based on current MDD and the total number of meter equivalents in the system. The base service unit for the water system is a 3/4-inch meter, the standard size for a single family dwelling. The meter equivalents for larger meter sizes represent the equivalent hydraulic capacity relative to a 3/4-inch meter. **Table 5** shows the meter equivalency factors for each meter size.

Based on the existing MDD and meter equivalents, the estimated capacity requirement per EDU is 605 gallons per day (0.000605 mgd). Applying the capacity requirement per EDU by the unit costs of capacity yields reimbursement and improvement costs per EDU of \$2,550 and \$2,346, respectively as shown in Table 4.

SDC Schedule

Table 5 shows the SDC schedule for each meter size for potable and non-potable customers. The potable SDCs include the full cost per EDU shown in Table 4, while the non-potable SDCs exclude the costs of storage and upper elevation pumping and other improvements. The total SDC per EDU for potable and non-potable are \$4,896 and \$3,216, respectively. The SDCs for larger meter sizes are scaled up based on the hydraulic capacity factors.

Table 5
City of Newberg
Water System Development Charge Analysis
SDC Schedule

Meter Size	SDCr	SDCi	Potable SDC	Factor 3/4"
Potable				
3/4"	\$2,550	\$2,346	\$4,896	1.0
1"	\$4,335	\$3,989	\$8,323	1.7
1 1/4"	\$6,375	\$5,866	\$12,240	2.5
1 1/2"	\$8,415	\$7,743	\$16,157	3.3
2"	\$13,514	\$12,435	\$25,949	5.3
3"	\$25,499	\$23,463	\$48,961	10.0
4"	\$42,583	\$39,183	\$81,765	16.7
6"	\$84,145	\$77,427	\$161,572	33.0
8"	\$135,142	\$124,352	\$259,494	53.0
10"	\$195,489	\$179,880	\$375,368	76.7
NonPotable				
3/4"	\$2,183	\$1,033	\$3,216	1.0
1"	\$3,712	\$1,755	\$5,467	1.7
1 1/4"	\$5,458	\$2,581	\$8,040	2.5
1 1/2"	\$7,205	\$3,408	\$10,613	3.3
2"	\$11,572	\$5,473	\$17,044	5.3
3"	\$21,833	\$10,326	\$32,159	10.0
4"	\$36,461	\$17,244	\$53,706	16.7
6"	\$72,049	\$34,076	\$106,125	33.0
8"	\$115,716	\$54,728	\$170,443	53.0
10"	\$167,387	\$79,166	\$246,553	76.7

Exhibit “B”: Findings

CPTA-17-001 – 2017 Water Master Plan – Ordinance No. 2017-2816

Applicable Newberg Comprehensive Plan (NCP) Goals and Policies & Applicable Oregon Statewide Planning Goals (SPG)

SPG 1/NCP A. Citizen Involvement. Goal: To maintain a Citizen Involvement Program that offers citizens the opportunity for involvement in all phases of the planning process.

Finding: The city meets this requirement by having various citizen committees with opportunities for the public to testify on general or specific matters. For this specific application, a Citizens Advisory Committee was formed consisting of 8 members who advised City staff and the consultants on the preparation of the 2017 Water Master Plan. Drafts of the Water System Master Plan were also posted onto the City of Newberg website for public review. Additionally, the proposal will go to both the Planning Commission and the City Council, providing multiple opportunities for citizen participation. Finally, notice was published in the Newberg Graphic newspaper. The SPG 1 and NCP A goals are met.

SPG 2. Land Use Planning. Goal: To establish a land use planning process and policy framework as a basis for all decision and actions related to use of land and to assure an adequate factual base for such decisions and actions.

Finding: This Goal requires that actions related to land use be consistent with acknowledged comprehensive plans of cities and counties.

The City of Newberg last updated its Water System and Water Treatment Facility Master Plans in 2005 and 2002 respectively (which is adopted as part of the acknowledged Newberg Comprehensive Plan). The 2017 Water System Master Plan updates and incorporates the two previous plans into to one comprehensive document and will be incorporated by reference into the Newberg Comprehensive Plan an noted in Exhibit “C”. The SPG 2 goal is met.

SPG 6/NCP E. Air, Water, and Land Resource Quality. Goal: To maintain and, where feasible, enhance the air, water, and land resource qualities within the community.

Finding: Goal 6 addresses the quality of air, water, and land resources. In the context of a comprehensive plan amendment, a local government complies with Goal 6 by explaining why it is reasonable to expect that the proposed uses authorized by the plan amendment will be able to satisfy applicable federal and state environmental standards, including air and water quality standards. The 2017 Water Master Plan address the land use pattern and density consistent with the acknowledged Newberg Comprehensive Plan to ensure that air, water and land resource quality through efficient use of the land supply through the provision of water facilities. The SPG 6 and NCP E goals are met.

SPG 9. Economic Development/NCP H. The Economy. Goal: To develop a diverse and stable economic base.

Finding: The 2017 Water System Master Plan provides for adequate water service provision for all residential, commercial, industrial and institutional uses that are anticipated in the acknowledged Newberg Comprehensive Plan for source, treatment and distribution through the identification of necessary water system improvements based on projected population growth which will ensure a diverse and stable economic base of the community over the 20-year planning horizon. SPG 9 and NCP H goals are met.

SPG 13/NCP M. Energy. Goal: To conserve energy through efficient land use patterns and energy-related policies and ordinances.

Finding: The 2017 Water Master Plan has taken into consideration the acknowledged Newberg Comprehensive Plan and the Population Forecasts for Yamhill County, and its Cities and Unincorporated Areas 2011-2035 for population projections to provide an energy efficient source, treatment and distribution system within the Newberg Urban Growth Boundary. SPG 13 and NCP M goals are met.

SPG 11/NCP L. Public Facilities and Services. Goal: To plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban development.

Finding: The 2017 Water Master Plan outlines the provision of the City of Newberg's water system from source, treatment, distribution, storage and pumping as identified in Exhibit "A". The plan lays out the necessary improvements for the system and extension of the water system to service all lands within the Newberg Urban Growth Boundary in a timely, orderly and efficient arrangement for urban development and meets SPG 11 and NCP L.

Applicable Oregon Revised Statute

197.712 Commission duties; comprehensive plan provisions; public facility plans; state agency coordination plans; compliance deadline; rules.

(2) By the adoption of new goals or rules, or the application, interpretation or amendment of existing goals or rules, the Land Conservation and Development Commission shall implement all of the following:

(e) A city or county shall develop and adopt a public facility plan for areas within an urban growth boundary containing a population greater than 2,500 persons. The public facility plan shall include rough cost estimates for public projects needed to provide sewer, water and transportation for the land uses contemplated in the comprehensive plan and land use regulations. Project timing and financing provisions of public facility plans shall not be considered land use decisions.

Finding:

The 2017 Water System Master Plan is an element of the City of Newberg public facility plan covering the urban growth boundary of the City and updates the 2005 Water Distribution System Master Plan and 2002 Water Treatment Facilities Plan. The City of Newberg population is 23,465. The 2017 Water System Master Plan includes cost estimates for the land uses contemplated in the comprehensive plan and land use regulations and meets the requirement.

Applicable Oregon Administrative Rules (OARs)

OAR Chapter 333, Division 61 Public Water Systems

OAR 333-061-0005

Purpose

The purpose of these rules is to provide a basis for implementing the Oregon Drinking Water Quality Act of 1981, enacted to assure safe drinking water at all water systems which serve the public, and to promote coordination between the programs for supervising water systems which are conducted by the Authority and the U.S. Environmental Protection Agency.

Finding: The 2017 Water System Master Plan, Exhibit “A”, was prepared in accordance with OAR 333-061 to meet safe drinking water requirements as noted within the 2017 Water System Master Plan and meets the requirement.

OAR Chapter 660, Division 11 Public Facilities Planning

OAR 660-011-0000

Purpose

The purpose of this division is to aid in achieving the requirements of Goal 11, Public Facilities and Services, OAR 660-015-0000(11), interpret Goal 11 requirements regarding public facilities and services on rural lands, and implement ORS 197.712(2)(e), which requires that a city or county shall develop and adopt a public facility plan for areas within an urban growth boundary containing a population greater than 2,500 persons. The purpose of the plan is to help assure that urban development in such urban growth boundaries is guided and supported by types and levels of urban facilities and services appropriate for the needs and requirements of the urban areas to be serviced, and that those facilities and services are provided in a timely, orderly and efficient arrangement, as required by Goal 11. The division contains definitions relating to a public facility plan, procedures and standards for developing, adopting, and amending such a plan, the date for submittal of the plan to the Commission and standards for Department review of the plan.

Finding: The City of Newberg is a community of 23,465 individuals with an acknowledged Comprehensive Plan and Urban Growth Boundary. Because the population is greater than 2,500 Newberg is required to have an adopted public facility plan (Water Master Plan). The City of Newberg currently has a 2002 Water Treatment Facilities Plan and a 2005 Water Distribution System Master Plan which are proposed to be updated by the 2017 Water System Master Plan to assure that urban development in Urban Growth Boundary is guided and supported by types and levels of urban facilities and services appropriate for the needs and requirements of the urban area to be serviced, and that water facilities are provided in a timely, orderly and efficient arrangement. The proposed 2017 Water System Master Plan is consistent with the Purpose of OAR 660-011-0000.

OAR 660-011-0005

Definitions

(1) "Public Facilities Plan": A public facility plan is a support document or documents to a comprehensive plan. The facility plan describes the water, sewer and transportation facilities which are to support the land uses designated in the appropriate acknowledged comprehensive plans within an urban growth boundary containing a population greater than 2,500. Certain elements of the public facility plan also shall be adopted as part of the comprehensive plan, as specified in OAR 660-11-045.

Finding: The City of Newberg population estimate as of July 2016, as determined by Portland State University Population Research Center, is 23,465. The 2017 Water System Master Plan is being adopted as a support document and as part of the Newberg Comprehensive Plan. The 2017 Water Master Plan supports the land use designations in the acknowledged Newberg Comprehensive Plan which covers the Newberg Urban Growth Boundary. The 2017 Water System Plan as part of the overall Public Facilities Plan meets the definition of OAR 660-011-0005(1).

(2) "Rough Cost Estimates": Rough cost estimates are approximate costs expressed in current-year (year closest to the period of public facility plan development) dollars. It is not intended that project cost estimates be as exact as is required for budgeting purposes.

Finding: the 2017 Water System Master Plan, Exhibit A, contains cost estimates as noted under OAR 660-011-0010 and meets the definition.

(3) "Short Term": The short term is the period from year one through year five of the facility plan.

Finding: The 2017 Water System Master Plan, Exhibit "A", contains a short term horizon of five years consistent with the definition of OAR 660-011-0005(3).

(4) "Long Term": The long term is the period from year six through the remainder of the planning period.

Finding: The 2017 Water System Master Plan, Exhibit "A", contains a long term horizon of six years to the end of the planning horizon of 20-years consistent with the definition of OAR 660-011-0005(3).

(5) "Public Facility": A public facility includes water, sewer, and transportation facilities, but does not include buildings, structures or equipment incidental to the direct operation of those facilities.

Finding: The 2017 Water System Master Plan, Exhibit "A", is a public facility per the definition of OAR 660-011-0005(5).

(6) "Public Facility Project": A public facility project is the construction or reconstruction of a water, sewer, or transportation facility within a public facility system that is funded or utilized by members of the general public.

Finding: The 2017 Water System Master Plan, Exhibit "A", contains identified projects per the definition of OAR 660-011-0005(6).

(7) "Public Facility Systems": Public facility systems are those facilities of a particular type that combine to provide water, sewer or transportation services.

For purposes of this division, public facility systems are limited to the following:

(a) Water:

(A) Sources of water;

(B) Treatment system;

(C) Storage system;

(D) Pumping system;

(E) Primary distribution system.

Finding: The 2017 Water System Master Plan, Exhibit "A", is a part of the Public Facility Systems and includes the required elements of OAR 660-011-0005(7)(a).

(b) Sanitary sewer:

(A) Treatment facilities system;

(B) Primary collection system.

Finding: The 2017 Water System Master Plan is not a Sanitary Sewer Plan.

(9) "Urban Growth Management Agreement": In accordance with OAR 660-003-0010(2)(c), and urban growth management agreement is a written statement, agreement or set of agreements setting forth the means by which a plan for management of the unincorporated area within the urban growth boundary will be completed and by which the urban growth boundary may be modified (unless the same information is incorporated in other acknowledged documents).

Finding: The City of Newberg has a Newberg Urban Area Growth Management Agreement with Yamhill County that was initially adopted in 1979 (as amended) that is an agreement on the management of the unincorporated area within the Newberg Urban Growth Boundary and contains requirements on how the Urban Growth Boundary may be modified consistent with the definition in 660-011-0005(9). This Agreement is included as Attachment 2.

OAR 660-011-0010

The Public Facility Plan

(1) The public facility plan shall contain the following items:

(a) An inventory and general assessment of the condition of all the significant public facility systems which support the land uses designated in the acknowledged comprehensive plan;

Finding: The 2017 Water System Master Plan, Exhibit “A”, includes an assessment of the condition of the overall water system that supports the designated uses in the acknowledged Newberg Comprehensive Plan and s the requirement.

(b) A list of the significant public facility projects which are to support the land uses designated in the acknowledged comprehensive plan. Public facility project descriptions or specifications of these projects as necessary;

Finding: The 2017 Water System Master Plan, Exhibit “A”, Section 7 identifies the significant projects with descriptions to support the estimated population and land uses identified in the acknowledged Newberg Comprehensive Plan and meets the requirement.

(c) Rough cost estimates of each public facility project;

Finding: The 2017 Water System Master Plan, Exhibit “A”, Section 7 provides costs estimates for projects as noted in Table 7-5 and meets the requirement.

(d) A map or written description of each public facility project's general location or service area;

Finding: The 2017 Water System Master Plan, Exhibit “A”, contains descriptions and maps of the public facility projects as noted in Tables 7-2, 7-3, 7-4, 7-5 and Figure 7-1 and meets the requirement.

(e) Policy statement(s) or urban growth management agreement identifying the provider of each public facility system. If there is more than one provider with the authority to provide the system within the area covered by the public facility plan, then the provider of each project shall be designated;

Finding: The 2017 Water System Master Plan, Exhibit “A”, identifies that the City of Newberg is the water service provider within the city limits and as annexations occur to lands within the Urban Growth Boundary. This is consistent with the Newberg Urban Area Growth Management Agreement included as Attachment 1 and meets the requirement.

(f) An estimate of when each facility project will be needed; and

Finding: The 2017 Water System Master Plan, Exhibit “A”, Table 7-5 includes an estimate of the time horizons of when water system capital improvements are estimated to occur. This is broken out in the horizons of 1-5 years, 6-10 years, 10-20 years and 20 years and beyond which meets the requirement.

(g) A discussion of the provider's existing funding mechanisms and the ability of these and possible new mechanisms to fund the development of each public facility project or system.

Finding: The 2017 Water System Master Plan, Exhibit “A”, Section 7 and Table 7-5 identifies the proposed capital improvement projects and what percentage of the projects are eligible for System Development Charge funding and meets the requirement.

(2) Those public facilities to be addressed in the plan shall include, but need not be limited to those specified in OAR 660-011-0005(5). Facilities included in the public facility plan other than those included in OAR 660-011-0005(5) will not be reviewed for compliance with this rule.

Finding: OAR 660-011-0005(5) identifies water and its subsets of sources of water, treatment system, storage system, pumping system, and primary distribution system. The 2017 Water System Master plan addresses all of these components as noted in Exhibit “A” and meets the requirement.

(3) It is not the purpose of this division to cause duplication of or to supplant existing applicable facility plans and programs. Where all or part of an acknowledged comprehensive plan, facility master plan either of the local jurisdiction or appropriate special district, capital improvement program, regional functional plan, similar plan or any combination of such plans meets all or some of the requirements of this division, those plans, or programs may be incorporated by reference into the public facility plan required by this division. Only those referenced portions of such documents shall be considered to be a part of the public facility plan and shall be subject to the administrative procedures of this division and ORS Chapter 197.

Finding: The City of Newberg is proposing to update and adopt the 2017 Water Master Plan. Other than the proposed Water Capital Improvement Plan included as Attachment 3 no other special district or regional functional plan is being referenced.

OAR 660-011-0015

Responsibility for Public Facility Plan Preparation

(1) Responsibility for the preparation, adoption and amendment of the public facility plan shall be specified within the urban growth management agreement. If the urban growth management agreement does not make provision for this responsibility, the agreement shall be amended to do so prior to the preparation of the public facility plan. In the case where an unincorporated area exists within the Portland Metropolitan Urban Growth Boundary which is not contained within the boundary of an approved urban planning area agreement with the County, the County shall be the responsible agency for preparation of the facility plan for that unincorporated area. The urban growth management agreement shall be submitted with the public facility plan as specified in OAR 660-011-0040.

Finding: The Newberg Urban Area Growth Management Agreement, Attachment 2, Section V. Urban Services identifies the City of Newberg as the ultimate provider of urban services within the Urban Growth Boundary and specifically notes that service expansion plans are the responsibility of the City of Newberg, which meets the requirement of OAR 660-011-0015.

(2) The jurisdiction responsible for the preparation of the public facility plan shall provide for the coordination of such preparation with the city, county, special districts and, as necessary, state and federal agencies and private providers of public facilities. The Metropolitan Service District is responsible for public facility plans coordination within the District consistent with ORS 197.190 and 268.390.

Finding: The 2017 Water System Master Plan, Exhibit “A”, has been coordinated with Yamhill County. No other service providers are responsible for water service provision within the Newberg Urban Growth Boundary, which meets the requirement of OAR 660-011-0015(2). Coordination with the Oregon Health Authority will occur as part of the Post Acknowledgement Plan Amendment process through the Oregon Department of Land Conservation and Development for compliance with OAR Chapter 333, Division 61.

(3) Special districts, including port districts, shall assist in the development of the public facility plan for those facilities they provide. Special districts may object to that portion of the facilities plan adopted as part of the comprehensive plan during review by the Commission only if they have completed a special district agreement as specified under ORS 197.185 and 197.254(3) and (4) and participated in the development of such portion of the public facility plan.

Finding: There are no special districts within the water service provision area of the Newberg Urban Growth Boundary.

(4) Those state agencies providing funding for or making expenditures on public facility systems shall participate in the development of the public facility plan in accordance with their state agency coordination agreement under ORS 197.180 and 197.712(2)(f).

Finding: No State agencies funding sources have been identified at this time for capital expenditures to implement the 2017 Water System Master Plan. Future opportunities may be identified.

OAR 660-011-0020

Public Facility Inventory and Determination of Future Facility Projects

(1) The public facility plan shall include an inventory of significant public facility systems. Where the acknowledged comprehensive plan, background document or one or more of the plans or programs listed in OAR 660-011-0010(3) contains such an inventory, that inventory may be incorporated by reference. The inventory shall include:

(a) Mapped location of the facility or service area;

(b) Facility capacity or size; and

(c) General assessment of condition of the facility (e.g., very good, good, fair, poor, very poor).

Finding: The 2017 Water System Master Plan, Exhibit “A”, contains an inventory of all significant water facility systems and includes a mapped location, facility capacity and size, and an assessment of the condition of the water system facility in compliance with OAR 660-011-0020(1)(a-c) and meets the requirement.

(2) The public facility plan shall identify significant public facility projects which are to support the land uses designated in the acknowledged comprehensive plan. The public facility plan shall list the title of the project and describe each public facility project in terms of the type of facility, service area, and facility capacity.

Finding: The 2017 Water System Master Plan, Exhibit “A”, identifies water system facility projects that support the projected population and land uses designated in the acknowledged Newberg Comprehensive Plan and lists by project title and description each project within the plan in compliance with OAR 660-011-0020(2) and meets the requirement.

(3) Project descriptions within the facility plan may require modifications based on subsequent environmental impact studies, design studies, facility master plans, capital improvement programs, or site availability. The public facility plan should anticipate these changes as specified in OAR 660-011-0045.

Finding: The 2017 Water System Master Plan, Exhibit “A”, identifies capital improvement projects over the next 20 years. As these projects are further developed through the City’s 5-Year Water Capital Improvement Program, Attachment 3, and as project designs start the environmental impacts, facility master plans and capital improvement program adjustment may be necessary and will be addressed at that and any necessary project description modifications in the 2017 Water System Master Plan will be addressed, which meets the requirement.

OAR 660-011-0025

Timing of Required Public Facilities

(1) The public facilities plan shall include a general estimate of the timing for the planned public facility projects. This timing component of the public facilities plan can be met in several ways depending on whether the project is anticipated in the short term or long term. The timing of projects may be related directly to population growth, e.g., the expansion or new construction of water treatment facilities. Other facility projects can be related to a measure of the facility's service level being met or exceeded, e.g., a major arterial or intersection reaching a maximum vehicle-per-day standard. Development of other projects may be more long term and tied neither to specific population levels nor measures of service levels, e.g., sewer projects to correct infiltration and inflow problems. These projects can take place over a long period of time and may be tied to the availability of long-term funding. The timing of projects may also be tied to specific years.

Finding: The 2017 Water System Master Plan, Exhibit “A”, includes a general estimate of the of the timing of the planned public improvements based on population and urban development activities within the Newberg Urban Growth Boundary. The timing is broken down into time horizons of 1-5 years, 6-10 years, 10-20 years and 20 years and beyond which meets the requirement of OAR 660-011-0025(1).

(2) Given the different methods used to estimate the timing of public facilities, the public facility plan shall identify projects as occurring in either the short term or long term, based on those factors which are related to project development. For those projects designated for development in the short term, the public facility plan shall identify an approximate year for development. For those projects designated for development over the long term, the public facility plan shall provide a general estimate as to when the need for project development would exist, e.g., population level, service level standards, etc. Timing provisions for public facility projects shall be

consistent with the acknowledged comprehensive plan's projected growth estimates. The public facility plan shall consider the relationships between facilities in providing for development.

Finding: The 2017 Water System Master Plan, Exhibit "A", identifies short-term and longer term projects identified as horizons of 1-5 years, 6-10 years, 10-20 years and 20 years and beyond projects. The Plan does not identify the estimated year within the 1-5 year horizon. Instead the City is utilizing our 5-Year Capital Improvement Program to identify the timing of the short term projects. A draft of the 5-Year Capital Improvement Program is included as Attachment 3. Mid-term and long term projects are based on population growth estimates provided by Portland State University as part of the Population Forecasts for Yamhill County, its Cities and Unincorporated Area 2011-2035 which can be used for planning purposes. The requirement to comply with OAR 660-011-0025(2) has been met.

(3) Anticipated timing provisions for public facilities are not considered land use decisions as specified in ORS 197.712(2)(e), and, therefore, cannot be the basis of appeal under ORS 197.610(1) and (2) or 197.835(4).

Finding: The 2017 Water System Master Plan, Exhibit "A", identifies short term and long term projects.

OAR 660-011-0030

Location of Public Facility Projects

(1) The public facility plan shall identify the general location of the public facility project in specificity appropriate for the facility. Locations of projects anticipated to be carried out in the short term can be specified more precisely than the locations of projects anticipated for development in the long term.

Finding: The 2017 Water System Master Plan, Exhibit "A", Section 7 identifies the general location of short term and long term projects in compliance with OAR 660-011-0030(1) and meets the requirement.

(2) Anticipated locations for public facilities may require modifications based on subsequent environmental impact studies, design studies, facility master plans, capital improvement programs, or land availability. The public facility plan should anticipate those changes as specified in OAR 660-011-0045.

Finding: The 2017 Water System Master Plan, Exhibit "A", identifies capital improvement projects over the next 20 years. As these projects are further developed through the City's 5-Year Capital Improvement Plan and project designs start environmental impacts, facility master plans and capital improvement program adjustment may be necessary and will be addressed at that and any necessary project description modifications in the 2017 Water System Master Plan will be addressed, which meets the requirement.

OAR 660-011-0035

Determination of Rough Cost Estimates for Public Facility Projects and Local Review of Funding Mechanisms for Public Facility Systems

(1) The public facility plan shall include rough cost estimates for those sewer, water, and transportation public facility projects identified in the facility plan. The intent of these rough cost estimates is to:

(a) Provide an estimate of the fiscal requirements to support the land use designations in the acknowledged comprehensive plan; and

(b) For use by the facility provider in reviewing the provider's existing funding mechanisms (e.g., general funds, general obligation and revenue bonds, local improvement district, system development charges, etc.) and possible alternative funding mechanisms. In addition to including rough cost estimates for each project, the facility plan shall include a discussion of the provider's existing funding mechanisms and the ability of these and possible new mechanisms to fund the development of each public facility project or system. These funding mechanisms may also be described in terms of general guidelines or local policies.

Finding: the 2017 Water System Master Plan, Exhibit "A", contains cost estimates for the water system. The Newberg City Council at the time of review of the 2017 Water System Master Plan will also be reviewing the System Development Charge schedule for the apportionment of cost for infrastructure improvements. This overall process meets the requirement of OAR 660-011-0035(1)(a).

The 2017 Water System Master Plan, Exhibit "A", identifies funding methodology for water system improvements in compliance with OAR 660-011-0035(1)(b).

(2) Anticipated financing provisions are not considered land use decisions as specified in ORS 197.712(2)(e) and, therefore, cannot be the basis of appeal under ORS 197.610(1) and (2) or 197.835(4).

Finding: The 2017 Water System Master Plan, Exhibit "A", has financing provisions included in Section 7 and Appendix D.

OAR 660-011-0040

Date of Submittal of Public Facility Plans

The public facility plan shall be completed, adopted, and submitted by the time of the responsible jurisdiction's periodic review. The public facility plan shall be reviewed under OAR Chapter 660, Division 25, "Periodic Review" with the jurisdiction's comprehensive plan and land use regulations. Portions of public facility plans adopted as part of comprehensive plans prior to the responsible jurisdiction's periodic review will be reviewed pursuant to OAR Chapter 660, Division 18, "Post Acknowledgment Procedures".

Finding: the 2017 Water System Master Plan will be reviewed under OAR Chapter 660, Division 18, "Post Acknowledgment Procedures" as the City of Newberg is not currently in a Periodic Review process under OAR Chapter 660, Division 25.

OAR 660-011-0045

Adoption and Amendment Procedures for Public Facility Plans

(1) The governing body of the city or county responsible for development of the public facility plan shall adopt the plan as a supporting document to the jurisdiction's comprehensive plan and shall also adopt as part of the comprehensive plan:

(a) The list of public facility project titles, excluding (if the jurisdiction so chooses) the descriptions or specifications of those projects;

(b) A map or written description of the public facility projects' locations or service areas as specified in sections (2) and (3) of this rule; and

(c) The policy(ies) or urban growth management agreement designating the provider of each public facility system. If there is more than one provider with the authority to provide the system within the area covered by the public facility plan, then the provider of each project shall be designated.

Finding: The 2017 Water System Master Plan, Exhibit "A", is being adopted as a supporting document to the acknowledged Newberg Comprehensive Plan and is being adopted as part of the Newberg Comprehensive Plan as noted in Exhibit "C" and complies with OAR 660-011-0045(1). The 2017 Water Master Plan includes a listing of projects as identified in Exhibit "A" and meets the requirement of OAR 660-011-0045(1)(a). A map of the location of water system improvements is included in Exhibit "A" and meets the requirement of OAR 660-011-0045(1)(b). The Newberg Urban Area Growth Management Agreement (Attachment 2) identifies that City of Newberg is the service provider of the water system within the Urban Growth Boundary and the Newberg city limits and meets the requirement of OAR 660-011-0045(1)(c).

(2) Certain public facility project descriptions, location or service area designations will necessarily change as a result of subsequent design studies, capital improvement programs, environmental impact studies, and changes in potential sources of funding. It is not the intent of this division to:

(a) Either prohibit projects not included in the public facility plans for which unanticipated funding has been obtained;

(b) Preclude project specification and location decisions made according to the National Environmental Policy Act; or

(c) Subject administrative and technical changes to the facility plan to ORS 197.610(1) and (2) or 197.835(4).

Finding: The 2017 Water Master Plan, Exhibit “A”, has a list of capital projects to be implemented over the ensuing 20 year period. As new funding options may be identified in the future or environmental reviews require modifications to a proposed project, the plan may have to be revisited on an as needed basis in conformance with OAR 660-011-0045(2).

(3) The public facility plan may allow for the following modifications to projects without amendment to the public facility plan:

(a) Administrative changes are those modifications to a public facility project which are minor in nature and do not significantly impact the project's general description, location, sizing, capacity, or other general characteristic of the project;

(b) Technical and environmental changes are those modifications to a public facility project which are made pursuant to "final engineering" on a project or those that result from the findings of an Environmental Assessment or Environmental Impact Statement conducted under regulations implementing the procedural provisions of the National Environmental Policy Act of 1969 (40 CFR Parts 1500-1508) or any federal or State of Oregon agency project development regulations consistent with that Act and its regulations.

(c) Public facility project changes made pursuant to subsection (3)(b) of this rule are subject to the administrative procedures and review and appeal provisions of the regulations controlling the study (40 CFR Parts 1500-1508 or similar regulations) and are not subject to the administrative procedures or review or appeal provisions of ORS Chapter 197, or OAR Chapter 660 Division 18.

Finding: No administrative or technical changes are anticipated at this time for the 2017 Water System Master Plan. If these situations arise the City of Newberg will comply with the provisions of OAR 660-011-0045(3).

(4) Land use amendments are those modifications or amendments to the list, location or provider of, public facility projects, which significantly impact a public facility project identified in the comprehensive plan and which do not qualify under subsection (3)(a) or (b) of this rule. Amendments made pursuant to this subsection are subject to the administrative procedures and review and appeal provisions accorded "land use decisions" in ORS Chapter 197 and those set forth in OAR Chapter 660 Division 18.

Finding: No land use amendments are anticipated at this time that would trigger OAR 660-011-0045(4). If such amendments occur in the future the City of Newberg will comply with OAR 660-011-0045(4).

Exhibit “C” Comprehensive Plan Text Amendment

Comprehensive Plan Amendments – Track Changes Version CPTA-17-001 – 2017 Water System Master Plan Ordinance No. 2017-2816

[Excerpted from the Newberg Comprehensive Plan Index]

IV.	POPULATION GROWTH	65
A.	HISTORIC POPULATION	65
B.	POPULATION PROJECTIONS	66
V.	LAND NEED AND SUPPLY	67
A.	BUILDABLE LAND INVENTORY	67
B.	HOUSING AND RESIDENTIAL LAND NEEDS	68
C.	COMMERCIAL LAND NEED AND SUPPLY	70
D.	INDUSTRIAL LAND NEED AND SUPPLY	72
E.	INSTITUTIONAL LAND NEED AND SUPPLY	75
F.	SUMMARY OF LAND NEEDS	77
VI.	SUMMARY	78
VII.	TRANSPORTATION SYSTEM PLAN	UNDER SEPARATE COVER
VIII.	<u>2017 Water System Master Plan</u>	<u>UNDER SEPARATE COVER</u>

L. PUBLIC FACILITIES AND SERVICES

GOAL: To plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban development.

POLICIES:

1. All Facilities & Services Policies

- a. The provision of public facilities and services shall be used as tools to implement the land use plan and encourage an orderly and efficient development pattern.
- b. The extension of publicly-owned facilities and services into currently undeveloped areas shall occur only in accordance with the Water Master Plan, Wastewater Master Plan, Storm Drainage Master Plan and the Newberg Design and Construction Standards~~Public Facilities and Service Plan.~~
- c. New public facilities and services shall be designed at levels consistent with planned densities and designated land uses for the area.
- d. Services shall be planned to meet anticipated community needs.

- e. Owners of properties which are located on unimproved streets should be encouraged to develop their streets to City standards.
- f. Maximum efficiency for existing urban facilities and services will be encouraged through infill of vacant land within the Urban Growth Boundary~~City land~~.
- g. Public facilities and services necessary to meet the special needs of industrial activities should be planned for those areas designated industrial on the comprehensive plan map and should be provided at a level sufficient to support proposed activities, if public funds are available.
- h. New residential areas shall have: paved streets, curbs, pedestrian ways, water, sewer, storm drainage, street lights and underground utilities.

2. Sewers and Water Policies

- a. All existing development within the City limits ~~shall~~will connect to public sewer and water systems as soon as they become available.
- b. Water systems within the planning area will be designed to provide an adequate peak flow for fire protection.
- c. Developments with urban densities should be encouraged to locate within the area which can be serviced by Newberg's present sanitary sewer system.
- d. Sewer and water service shall not be provided outside the City limits except for cases of health hazards, where no other alternative exists, and where property owners agree to annex upon request of the City.
- e. Individual water service may be provided to properties within the Urban Reserve Area on a case-by-case basis, with review and approval by both the City Council and the City Engineer~~Engineering Manager~~. New connections will only be allowed where service to existing users will not be diminished.
- f. Additional sewer and water connections should be discouraged in the floodplain. Any new sewer and water connections in the flood plain will be required to be flood proofed in order to prevent inundation. (Ordinance 2002-2564, April 15, 2002.)

3. Street Lighting Policies

- a. Adequate street lighting shall be provided with priority given to arterial and collector streets, intersections, pedestrian paths, and bikeways.
- b. New street lights shall use high pressure sodium or other energy efficient lamps.

4. Fire Protection Policies

- a. Fire protection should be provided in accordance with the suggested guidelines of the National Board of Fire Underwriters and the Insurance Services Office.
- b. Fire stations shall have good access to arterial streets.
- c. Adequate warning signals should be installed where emergency vehicles gain access to the street.

5. Schools Policies

- a. Elementary schools should be centrally located with reference to their service areas.
- b. In accordance with the land use plan, the school district should anticipate development and acquire the best sites in advance of urbanization.
- c. Elementary schools should not be located on arterial streets.
- d. Schools should be built with parks wherever possible. To this end, the City together with the School and Park Districts should coordinate development plans.
- e. The location of schools should be used as a major tool for directing future residential growth.
- f. Schools shall be encouraged to serve as centers for neighborhood and community activities.
- g. New schools shall be located in such a manner as to provide adequate and safe pedestrian, bicycle, and automobile access. Streets shall be fully improved and major intersections shall provide signalization where necessary.
- h. Access to existing schools should be upgraded to levels required for new school facilities.
- i. The City shall encourage and support George Fox College as a community asset.
- j. Recognizing that schools are part of a developing community, plans for future growth shall provide adequate land to meet the needs of the area's schools. (Ordinance 2006-2634, Jan. 3, 2006.)

6. Civic Center Policies

- a. The City shall actively pursue acquisition of lands and the development of a civic center.
- b. The Civic Center shall be located to serve the entire planning area.

7. Park Facilities Policies

- a. In conjunction with Chehalem Park and Recreation District, park facilities shall be provided consistent with recreational needs.
- b. New residential development shall contribute to the Public Lands Fund or shall donate land for public parks or facilities when appropriate and acceptable to the City.

VII. TRANSPORTATION SYSTEM PLAN

Under separate cover.

VIII. 2017 WATER MASTER PLAN

Under separate cover.

Exhibit “C” Comprehensive Plan Text Amendment

Comprehensive Plan Amendments – Clean Changes Version CPTA-17-001 – 2017 Water System Master Plan Ordinance 2017-2816

[Excerpted from the Newberg Comprehensive Plan Index]

IV.	POPULATION GROWTH	65
A.	HISTORIC POPULATION	65
B.	POPULATION PROJECTIONS	66
V.	LAND NEED AND SUPPLY	67
A.	BUILDABLE LAND INVENTORY	67
B.	HOUSING AND RESIDENTIAL LAND NEEDS	68
C.	COMMERCIAL LAND NEED AND SUPPLY	70
D.	INDUSTRIAL LAND NEED AND SUPPLY	72
E.	INSTITUTIONAL LAND NEED AND SUPPLY	75
F.	SUMMARY OF LAND NEEDS	77
VI.	SUMMARY	78
VII.	TRANSPORTATION SYSTEM PLAN	UNDER SEPARATE COVER
VIII.	2017 Water System Master Plan	UNDER SEPARATE COVER

L. PUBLIC FACILITIES AND SERVICES

GOAL: To plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban development.

POLICIES:

1. All Facilities & Services Policies

- a. The provision of public facilities and services shall be used as tools to implement the land use plan and encourage an orderly and efficient development pattern.
- b. The extension of publicly-owned facilities and services into currently undeveloped areas shall occur only in accordance with the Water Master Plan, Wastewater Master Plan, Storm Drainage Master Plan and the Newberg Design and Construction Standards.
- c. New public facilities and services shall be designed at levels consistent with planned densities and designated land uses for the area.
- d. Services shall be planned to meet anticipated community needs.

- e. Owners of properties which are located on unimproved streets should be encouraged to develop their streets to City standards.
- f. Maximum efficiency for existing urban facilities and services will be encouraged through infill of vacant land within the Urban Growth Boundary.
- g. Public facilities and services necessary to meet the special needs of industrial activities should be planned for those areas designated industrial on the comprehensive plan map and should be provided at a level sufficient to support proposed activities, if public funds are available.
- h. New residential areas shall have: paved streets, curbs, pedestrian ways, water, sewer, storm drainage, street lights and underground utilities.

2. Sewers and Water Policies

- a. All existing development within the City limits shall connect to public sewer and water systems as soon as they become available.
- b. Water systems within the planning area will be designed to provide an adequate peak flow for fire protection.
- c. Developments with urban densities should be encouraged to locate within the area which can be serviced by Newberg's present sanitary sewer system.
- d. Sewer and water service shall not be provided outside the City limits except for cases of health hazards, where no other alternative exists, and where property owners agree to annex upon request of the City.
- e. Individual water service may be provided to properties within the Urban Reserve Area on a case-by-case basis, with review and approval by both the City Council and the City Engineer. New connections will only be allowed where service to existing users will not be diminished.
- f. Additional sewer and water connections should be discouraged in the floodplain. Any new sewer and water connections in the flood plain will be required to be flood proofed in order to prevent inundation. (Ordinance 2002-2564, April 15, 2002.)

3. Street Lighting Policies

- a. Adequate street lighting shall be provided with priority given to arterial and collector streets, intersections, pedestrian paths, and bikeways.
- b. New street lights shall use high pressure sodium or other energy efficient lamps.

4. Fire Protection Policies

- a. Fire protection should be provided in accordance with the suggested guidelines of the National Board of Fire Underwriters and the Insurance Services Office.
- b. Fire stations shall have good access to arterial streets.
- c. Adequate warning signals should be installed where emergency vehicles gain access to the street.

5. Schools Policies

- a. Elementary schools should be centrally located with reference to their service areas.
- b. In accordance with the land use plan, the school district should anticipate development and acquire the best sites in advance of urbanization.
- c. Elementary schools should not be located on arterial streets.
- d. Schools should be built with parks wherever possible. To this end, the City together with the School and Park Districts should coordinate development plans.
- e. The location of schools should be used as a major tool for directing future residential growth.
- f. Schools shall be encouraged to serve as centers for neighborhood and community activities.
- g. New schools shall be located in such a manner as to provide adequate and safe pedestrian, bicycle, and automobile access. Streets shall be fully improved and major intersections shall provide signalization where necessary.
- h. Access to existing schools should be upgraded to levels required for new school facilities.
- i. The City shall encourage and support George Fox College as a community asset.
- j. Recognizing that schools are part of a developing community, plans for future growth shall provide adequate land to meet the needs of the area's schools. (Ordinance 2006-2634, Jan. 3, 2006.)

6. Civic Center Policies

- a. The City shall actively pursue acquisition of lands and the development of a civic center.
- b. The Civic Center shall be located to serve the entire planning area.

7. Park Facilities Policies

- a. In conjunction with Chehalem Park and Recreation District, park facilities shall be provided consistent with recreational needs.
- b. New residential development shall contribute to the Public Lands Fund or shall donate land for public parks or facilities when appropriate and acceptable to the City.

VII. TRANSPORTATION SYSTEM PLAN

Under separate cover.

VIII. 2017 WATER MASTER PLAN

Under separate cover.



PLANNING COMMISSION RESOLUTION 2017-325

A RESOLUTION INITIATING A COMPREHENSIVE PLAN TEXT AMENDMENT FOR THE WATER MASTER PLAN UPDATE

RECITALS

1. Oregon Administrative Rule Division 11 Public Facilities Planning states that "The purpose of this division is to aid in achieving the requirements of Goal 11, Public Facilities and Services, OAR 660-015-0000(11), interpret Goal 11 requirements regarding public facilities and services on rural lands, and implement ORS 197.712(2)(e), which requires that a city or county shall develop and adopt a public facility plan for areas within an urban growth boundary containing a population greater than 2,500 persons. The purpose of the plan is to help assure that urban development in such urban growth boundaries is guided and supported by types and levels of urban facilities and services appropriate for the needs and requirements of the urban areas to be serviced, and that those facilities and services are provided in a timely, orderly and efficient arrangement, as required by Goal 11. The division contains definitions relating to a public facility plan, procedures and standards for developing, adopting, and amending such a plan, the date for submittal of the plan to the Commission and standards for Department review of the plan."
2. The City of Newberg Engineering Services Department had in their FY 2015-2016 and 2016-2017 work program to update the Water Master Plan as the prior Water Distribution System and Water Treatment Facilities Plan were last updated in 2004 and 2002, respectively.
3. The City of Newberg Engineering Service Department contracted with Murray Smith & Associates, Inc. to update the Water Master Plan and a draft plan is now ready to be reviewed and adopted consistent with Oregon Administrative Rule Chapter 660, Division 11 Public Facilities Planning.
4. After proper notice, the Newberg Planning Commission considered the proposal at their March 9, 2017 meeting.

The Newberg Planning Commission resolves as follows:

1. The Commission initiates a Comprehensive Plan Text Amendment to update the Water Master Plan.

Adopted by the Newberg Planning Commission this 9th day of March, 2017.



Planning Commission Chair

ATTEST:



Planning Commission Secretary

Newberg Urban Area Growth Management Agreement

Adopted by Newberg City Council on July 2, 1979 and Yamhill County Board of Commissioners on June 20, 1979; As Amended by Newberg City Council on November 2, 1998 and Yamhill County Board of Commissioners on December 3, 1998; As Further Amended by Newberg City Council on June 5, 2000 and Yamhill County Board of Commissioners on December 14, 2000.

Preface

Seen from above, the modern city edges imperceptibly out of its setting. There are no clear boundaries. Just now the white trace of the super highway passed through cultivated fields; now it is an asphalt image of streets and buildings. As one drives in from the airport or looks out from the train window, clumps of suburban houses, industrial complexes, and occasional green space flash by; it is hard to tell where city begins or county ends." (Oscar Handlin, "The Modern City as a Field of Historical Study" in The Historian and the City (Cambridge, Mass. 1963, p.1).

I. Introduction

The City of Newberg and Yamhill County recognize the need for coordination and cooperation in the management of growth in and around the Newberg Urban Area. This agreement is formulated in accordance with this principle.

This agreement establishes a process for maintaining ongoing planning efforts, designed to keep pace with growth and change. It is essential that intergovernmental coordination be maintained to assure the citizens of the City of Newberg and Yamhill County that growth occurs in an orderly and efficient manner.

To that end, this agreement sets forth the means by which a plan for management of the unincorporated area within the Urban Growth Boundary will be implemented and by which the Urban Growth Boundary may be modified.

II. Definitions

Area of Influence - An area of land designated by the City of Newberg and Yamhill County that extends one mile outside Newberg's Urban Growth Boundary wherein the County will give the City an opportunity to participate in land use actions to be taken by the County.

Urban Growth Boundary - A line jointly adopted by the City of Newberg and Yamhill County that encircles the City and separates rural and urbanizable land. Newberg's Urban Growth Boundary is shown on the attached map.

III. General

1. Plan Map Conflicts. The 1979 Comprehensive plan Land Use Map adopted by the City of Newberg on July 2, 1979 shall be the plan map for the area within the Urban Growth Boundary, and shall replace conflicting portions of the Yamhill County Comprehensive Plan Map (1974) pertinent to this area. Where said maps conflict, Yamhill County shall initiate the process necessary for consideration of a map amendment.
2. Urban Growth Boundary. In accordance with the comprehensive Plan of the City of Newberg, the jointly adopted Urban Growth Boundary shall define the geographical limits of urbanization. The City of Newberg shall prepare for the orderly extension of public facilities and services within the boundary. Lands outside the boundary shall be maintained in accordance with the Yamhill County Comprehensive
3. Urbanization. The City of Newberg and Yamhill County shall encourage urbanization within the boundary to occur in an orderly and efficient manner, resulting in a compact, balanced urban center meeting long-term economic and social needs of the residents of the area regardless of political boundaries.
4. Implementation and Coordination. The very nature of planning requires continual refinement of various elements of the Comprehensive Plan. This includes the preparation of implementing ordinances, refinement plans and functional plans. As the Newberg Comprehensive Plan is implemented, the City and County will work together in a coordinated effort to achieve the goals of the Yamhill County and Newberg Comprehensive Plans.
5. Concurrence and Recommendation. The legitimate interests of the City and County overlap within the City's Urban Growth Boundary and Area of Influence. This agreement attempts to resolve these overlapping interests by providing for concurrence of City and County governing bodies for certain decisions and by providing for recommendations of one governing body to the other for other decisions.
 - a. Concurrence. Where concurrence is required, the City and County shall agree upon a decision. If agreement cannot be reached, procedures outlined in ORS 197.300 may be invoked.
 - b. Recommendation. Where a recommendation is required, the City and County need not agree upon a decision. The procedures are these: The right to object to any item referred to a jurisdiction for a recommendation shall be deemed to have been waived unless the referring jurisdiction is notified otherwise within thirty days; the time limit for consideration of items referred for recommendation shall begin to run from the time the item is received by the jurisdiction whose recommendation is being solicited; each jurisdiction shall have standing to appeal the decision of the other governing body.

IV. Term of this Agreement; Amendment

1. The term of this agreement runs from July 2, 1979, to July 2, 1980, and may be extended thereafter by increments of one year. During the term of the agreement or extension, the agreement may be changed by mutual consent of the parties hereto. This agreement is automatically renewed at the end of such term or extension unless either party hereto requests revision of the agreement by so notifying the other party at least ninety days before the end of the current term or extension.

V. Urban Services

1. The City of Newberg is recognized as the ultimate provider of urban services within the Urban Growth Boundary. To this end:
 - a. Special Districts. Before Yamhill County shall create any special district for the provision of utilities, transportation, or other public facilities or services, the matter shall be referred to the City of Newberg for a recommendation. The County shall not act contrary to such recommendation.
 - b. Service Capacity. Development within the Urban Growth Boundary shall not exceed the capacity of existing services.
 - c. Annexation. Annexation shall occur in accordance with the Newberg Comprehensive Plan. Before final action by the City Council on an annexation proposal, the proposal shall be forwarded to the Board of County Commissioners for its recommendation. In order to provide the board with advance notice of reasoning for a proposed annexation, the findings adopted by the City Planning Commission shall be referred to the board following the Commission action.
 - d. Service Expansion Plans. As the ultimate provider of urban services, the City shall prepare and from time to time update utility expansion plans. These plans shall provide a basis for the extension of services within the Urban Growth Boundary and as such shall be referred to Yamhill County for information and comment.
 - e. Roads. The County and City shall cooperatively develop an implementation policy regarding streets and roads within the Urban Growth Boundary which is consistent with the City Comprehensive Plan. Such policy shall include, but not be limited to, the following:
 - (1) The circumstances under which the City will assume ownership of and maintenance responsibility for County roads within the corporate limits.
 - (2) The conditions under which new public streets and roads will be developed within the urban Growth Boundary.

- (3) The conditions under which existing roads designated as future arterial in the City Comprehensive Plan will be improved.
 - (4) The conditions under which County and other roads should meet City standards within the Urban Growth Boundary. Roads should be compatible with City street alignments and extensions. Upon annexation of property, roads adjacent to (and which serve) such property should also be annexed.
- f. The County and the City through its departments shall coordinate their planning efforts and actions that affect land use with those of special districts.

VI. Establishment of the Newberg Urban Area Management Commission

The City of Newberg and Yamhill County do hereby establish the Newberg Urban Area Management Commission (NUAMC) as a hearings officer in accordance with ORS 215.406. The NUAMC shall be composed of the following members:

- Commissioner of the Yamhill County Board of Commissioners designated by the board.
- Mayor or council person of the City of Newberg designated by the Council.
- Member of Newberg Planning Commission designated by the City Council.
- Member of the Yamhill County Planning Commission Designated by the Board of County Commissioners.
- Member of the Newberg-Dundee P.A.C. designated by the Board of County Commissioners.
- Member of the Newberg Citizen Involvement Advisory Committee designated by the City Council.
- Member-at-large chosen by the above NUAMC members and ratified by the City Council and County Board.

Duties and Responsibilities. The NUAMC shall function in accordance with by-laws to be adopted by the Newberg City Council and the Yamhill County Board of Commissioners.

It shall be the responsibility of the Newberg Urban Area Management Commission to hold hearings, make findings, and present its decision to City and County governing bodies as outlined in this agreement and the by-laws.

VII. Establishment of Land Use Review Procedures

1. Urban Growth Boundary Amendment

Amendment of the Urban Growth Boundary may be initiated by the Yamhill County Board of Commissioners, the Newberg City Council, or by an individual owner(s) of property who request(s) inclusion in or exclusion from the Urban Growth Boundary.

Amendment of the Urban Growth Boundary shall be treated as a map amendment to both the City and County Comprehensive Plan maps.

The joint fee for individual amendment shall be the sum of fees established from time to time by each governing body.

Each application shall include a map and sufficient information to make a decision based on the following factors:

- a. Demonstrated need to accommodate long-range urban population growth requirements consistent with LCDC goals;
- b. Need for housing, employment opportunities, and livability;
- c. Orderly and economic provision for public facilities and services;
- d. Maximum efficiency of land uses within and on the fringe of the existing urban area;
- e. Environmental, energy, economic and social consequences;
- f. Retention of agricultural land as defined, with Class I being the highest priority for retention and Class VI the lowest priority; and,
- g. Compatibility of the proposed urban uses with nearby agricultural activities.

Applications shall be filed with the Newberg Planning Department which shall collect the joint fee and forward the Yamhill County fee along with notice to the Yamhill County Department of Planning and Development. Applications must be complete prior to consideration by the Newberg Urban Area Management Commission.

Applications shall be accumulated and referred quarterly to the Newberg Urban Area Management Commission for a Public Hearing for which at least ten days advance public notice shall be given by publication in a newspaper of general circulation in the County (or published in the territory so concerned--ORS 215.060).

Following the Public Hearing, the NUAMC shall make and forward its findings and decision directly to the governing body of each jurisdiction which shall then make a determination based

upon the facts and record presented at the NUAMC hearing and shall not be required to hold a public hearing thereon.

Nothing included in this process requires or prohibits the City or County from referring the application to its respective Planning Commissions for information.

If the governing bodies do not concur in their final decision within sixty days of referral of the matter to them by the NUAMC, a joint meeting shall be held to resolve differences. If agreement cannot be reached, procedures for resolutions of conflict provided within ORS 197.300 may be invoked.

2. Comprehensive Plan Amendment

- a. Inside U.G.B., but outside city limits. This amendment shall be filed with Yamhill County, and shall otherwise be treated as an amendment to the Urban Growth Boundary.
- b. Inside city limits. The application shall be processed by the City of Newberg and shall be referred to Yamhill County for a recommendation.
- c. Outside the Urban Growth Boundary, but within the "Area of Influence". This amendment shall be processed by Yamhill County and shall be referred to the City of Newberg for a recommendation.

3. Zone Changes

The City of Newberg and Yamhill County recognize that each jurisdiction has authority to zone within its legal boundaries. However, the Urban Growth Boundary recognizes the eventual assumption of authority by the City of Newberg. Therefore, the following procedures are established:

- a. Zone change outside city limits but within the Urban Growth Boundary. Prior to filing an application with Yamhill County, the applicant shall apply for and receive a recommendation from the City of Newberg concerning the requested land use action. Requests shall be processed following the procedures outlined in the Addendum to this agreement, Section 2, item 5 (b). No fee shall be charged for processing a recommendation from the City of Newberg. Applications submitted without this recommendation will be deemed incomplete. The application then shall be processed in accordance with Yamhill County ordinances, except that the application will be referred to the NUAMC for a hearing in lieu of the Yamhill County Planning Commission. Appeals of the NUAMC decision shall be heard by the Yamhill County Board of Commissioners.
- b. Inside city limits. The application shall be processed by the City of Newberg and shall be referred to Yamhill County for information and/or comment.

- c. Outside the Urban Growth Boundary but within the "Area of Influence". The application shall be processed by Yamhill County and shall be referred to the City of Newberg for information and/or comment.

4. Other Items Affecting Land Use

- a. Items having a substantial impact upon land use under the jurisdiction of Yamhill County within Newberg's Area of Influence shall be referred to the City of Newberg for information and comment. Items having a substantial impact upon land use under the jurisdiction of Yamhill County within Newberg's U.G.B. shall be reviewed by the City of Newberg. Prior to filing an application with Yamhill County, the applicant shall apply for and receive a recommendation from the City of Newberg concerning the requested land use action. Requests shall be processed following the procedures outlined in the Addendum to this agreement, Section 2, item 5 (b). No fee shall be charged for processing a recommendation from the City of Newberg. Applications submitted without this recommendation will be deemed incomplete. Items not having a substantial impact may be so referred. Items having a substantial impact upon land use shall include but are not limited to:
 - (1) Conditional Use Permits, (Excluding Temporary Hardship Dwellings)
 - (2) Planned Unit Developments
 - (3) Subdivisions and Partitions
 - (4) Public Improvement Projects
 - (5) Health Hazards
 - (6) Special Exceptions
 - (7) Capital Improvement Programs
 - (8) Major Transportation Improvements
- b. Within the U.G.B., when Yamhill County ordinances require a Planning Commission public hearing on any of the above items, either as a recommendation or as a final action, the application shall be referred to NUAMC who shall hear the matter in lieu of the Yamhill County Planning Commission. Appeals of the NUAMC decision shall be heard by the Yamhill County Board of Commissioners.
- c. Items having substantial impact upon land use under the jurisdiction of the City of Newberg shall be referred to Yamhill County for information and/or comment. Items not having a substantial impact may be so referred. Items having a substantial impact upon land use shall include but are not limited to:

- (1) Conditional Use Permits
 - (2) Planned Unit Developments
 - (3) Subdivisions and Partitions
 - (4) Public Improvement Projects
 - (5) Extension of the Public Sewer, Water or Storm Drainage systems
 - (6) Capital Improvement Programs
 - (7) Major Transportation Improvements
5. Any of the above applications which may affect an agency identified in the City of Newberg or Yamhill County agency coordination list shall be referred to said agency for information and/or comment.

ADDENDUM TO NEWBERG URBAN AREA GROWTH MANAGEMENT AGREEMENT

This Addendum to Newberg Urban Area Growth Management Agreement pursuant to Newberg City Ordinance #1967 dated July 2, 1979 (hereinafter “Addendum”) is made by agreement between Yamhill County (“County”) and the City of Newberg (“City”).

RECITALS

- A. The City and the County have previously entered into an intergovernmental agreement known as the Newberg Urban Area Growth Management Agreement (“NUAGMA”) pursuant to Newberg City Ordinance #1967 dated July 2, 1979 and Yamhill County Ordinance 214 dated June 20, 1979, setting forth their respective rights and responsibilities with respect to the Urban Growth Boundary (UGB) and Area of Influence.
- B. The County and the City have previously adopted an Urban Reserve Area for the City of Newberg as required by OAR Chapter 660, Division 21, as shown on their comprehensive plan and zoning maps, plan policies and land use regulations, to guide the management of these areas in accordance with the requirements of OAR Chapter 660 Division 21. Newberg City Ordinance 95-2397, Yamhill County Ordinance 596 (copies attached).
- C. The Urban Reserve Area is intended over time to be incorporated into an urban growth boundary. Because full urban services are not yet available in the area, urban level development is not permitted. Very limited rural development of property can occur in the area, but only when such usage is consistent with and does not impede the future urbanization of property.
- D. The purpose of this Addendum is to clarify planning and zoning intents and add provisions to the existing intergovernmental agreement for the purpose of satisfying the requirements of OAR Chapter 660, Division 21 relating to Urban Reserve Areas.

AGREEMENT

NOW, THEREFORE, the City and County agree as follows:

Section 1 Definitions:

- (1) “Urban Reserve Area” has the same meaning as set forth in OAR 660-021-0010 (1), and means lands outside of an urban growth boundary identified as highest priority for inclusion in the urban growth boundary when additional urbanizable land is needed in accordance with the requirements of Goal 14.

Section 2. Compliance with OAR Chapter 660, Division 21. In accordance with the applicable requirements of Chapter 660, Division 21, City and County agree as follows:

- (1) As required by OAR 660-021-0040(3):

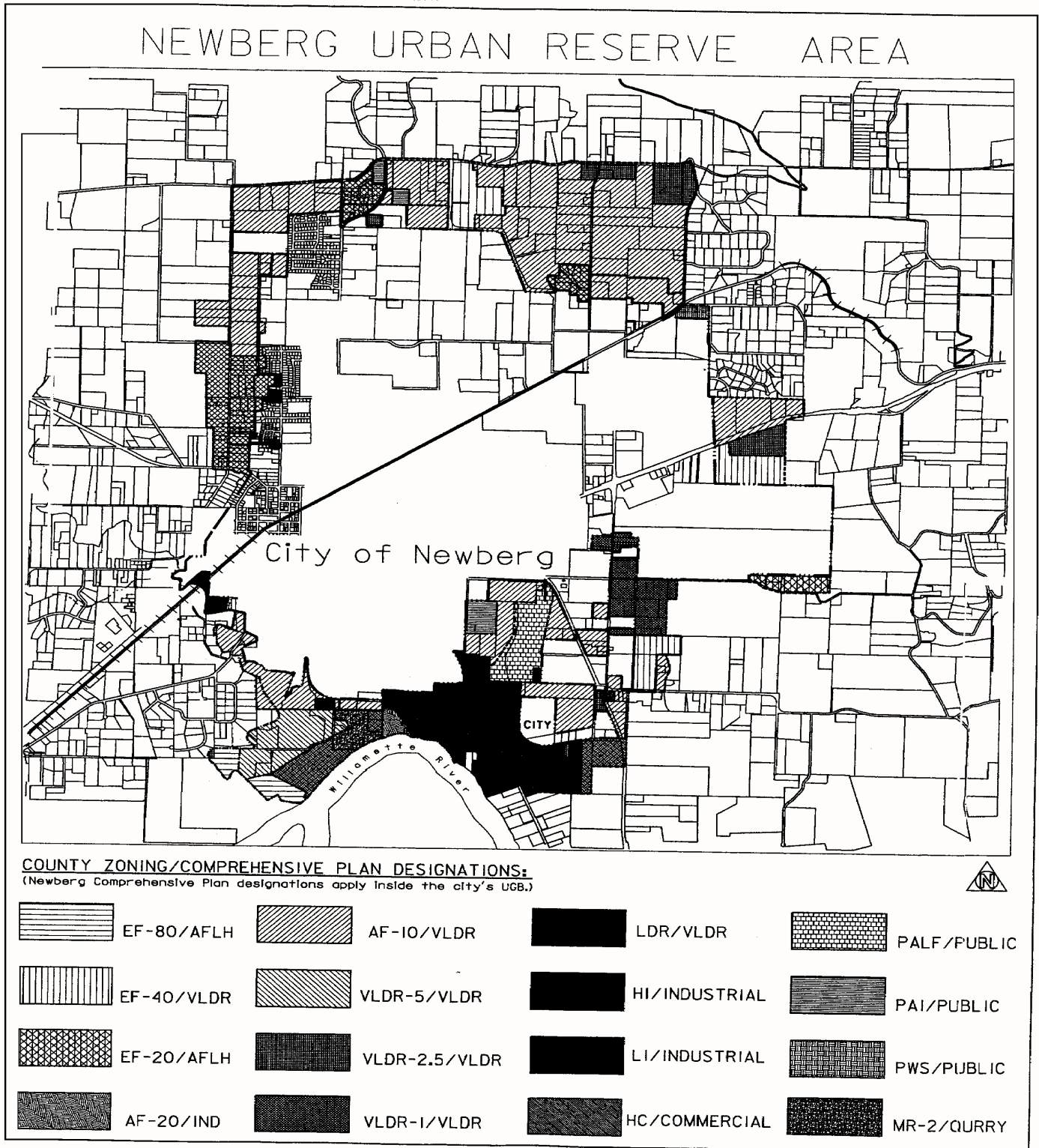
- (a) The County shall prohibit zone amendments allowing more intensive uses, including higher residential density, than permitted at the date of this agreement.
- (2) As required by OAR 660-021-0050(1), unless otherwise agreed to, designation of the local government responsible for building code administration and land use regulation in the URA shall be:
 - (a) Prior to inclusion within the UGB: County
 - (b) After inclusion within the UGB : County
 - (c) After annexation into the city: City
- (3) Designation of service responsibility, as required by OAR 660-021-0050(2):
 - (a) The local government or special district responsible for services (including sewer, water, fire protection, parks, transportation, storm water) for areas within the URA are designated and shown on map(s) attached hereto and incorporated herein as Exhibit "1A."
 - (b) The areas projected for future urban service responsibility after inclusion in the urban growth boundary are shown on map(s) attached hereto and incorporated herein as Exhibit "1A."
- (4) As required by OAR 660-021-0050(3), the terms and conditions under which service responsibility will be transferred or expanded, for areas where the provider of service is expected to change over time, is described in Exhibit "1B," attached hereto and incorporated herein.
- (5) As required by OAR 660-021-0050(4), procedures for notification and review of land use actions to ensure involvement by all affected local governments and special districts:
 - (a) Within the Urban Reserve Area, Comprehensive Plan Amendments, zone changes, and other applications affecting land use, including conditional use, PUDs, subdivisions and partitions, public improvement projects, health hazards, capital improvement programs and major transportation improvements, shall be processed by Yamhill County. Prior to filing an application with Yamhill County, the applicant shall apply for and receive a recommendation from the City of Newberg concerning the requested land use decision. Applications submitted without this recommendation will be deemed incomplete.
 - (b) Upon request or application for a recommendation on a requested land use decision in the URA, the City shall use the following procedures in developing a recommendation (see Exhibit 1C for criteria to be used by the City in the recommendation process):

- (1) Applicant shall file with the City a substantially complete Yamhill County application and include a future development plan as provided in this agreement.
- (2) The City staff or City Council may refer the application to the City Planning Commission for a recommendation to the City Council.
- (3) The recommendation to Yamhill County shall be from the City Council.
- (4) Notice of any hearings shall be to the general public and any hearings shall be legislative in nature. Additional notice may be provided as the City deems necessary. This shall not be a quasi-judicial hearing since the City of Newberg is making a recommendation.
- (5) The City of Newberg shall furnish to the applicant its recommendation to Yamhill County within 60 days of the date that the request for recommendation is filed with the City of Newberg. City staff may request additional information from the applicant concerning the application prior to making a recommendation. Unless otherwise agreed between City and applicant, failure to furnish the recommendation within 60 days will waive the requirement to have a recommendation accompany the application.
- (6) The City reserves the right to make additional recommendations and comments concerning the application to Yamhill County during the Yamhill County process.
- (7) Nothing in this agreement limits the rights of either party in participating in the land use process before either jurisdiction.
- (8) Nothing in this agreement shall be construed as mandatory county approval criteria.

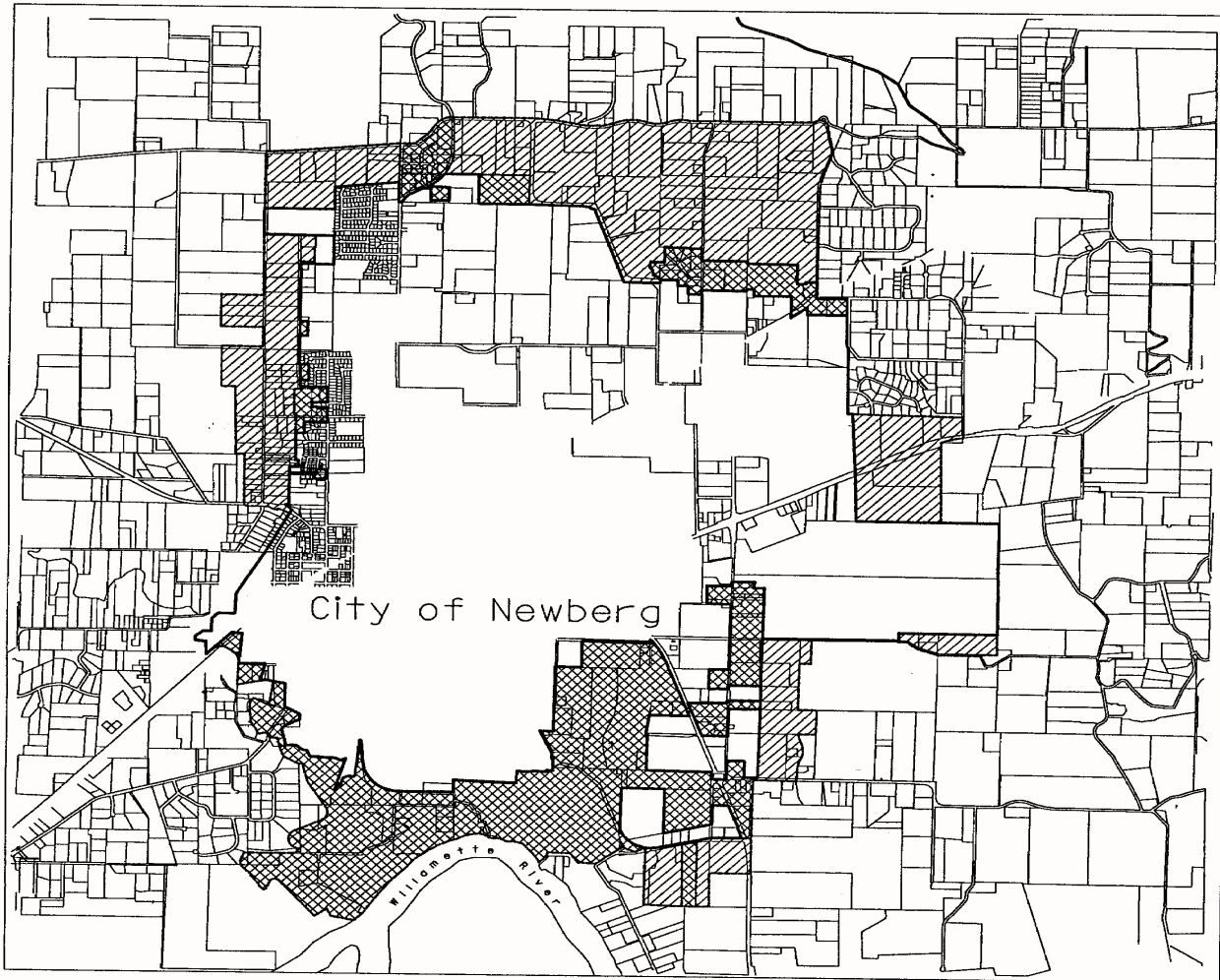
Section 3. In all other respects, the Newberg Urban Area Growth Management Agreement shall remain in full force and effect.

Section 4. Effective Date. This Addendum becomes effective on November 2, 1998.

EXHIBIT 1A URBAN RESERVE AREA MAPS



NEWBERG URBAN RESERVE AREA



LEGEND:



Urban Reserve Area



Urban Growth Boundary

————— City Boundary Line

————— Urban Reserve Area

————— Urban Growth Boundary



Special Districts: Yamhill County Extension Service
 Yamhill County Soil and Water Conservation Service
 School District 29J, Newberg
 Yamhill Educational Service District
 Newberg Fire Protection District
 Chehalem Park and Recreation District
 Portland Community College

EXHIBIT 1B

URBAN SERVICE TRANSITION POLICIES

Service Responsibility in General The following “Existing Service Provider” shall be responsible for providing public services within the Urban Reserve Areas. The “Future Urban Service Provider” is the provider projected to have responsibility after inclusion in the UGB or in the City depending on the terms and conditions identified below. The timing for changing the responsible service provider will be flexible, depending on citizen needs and location of properties.

<u>Service</u>	<u>Existing Service Provider</u>	<u>Future Urban Service Provider</u>
Sanitary Disposal	No Public Provider	City of Newberg
Water	Service Districts	City of Newberg
Fire Protection	Newberg Rural Fire District	City of Newberg
Parks & Recreation	Chehalem Park and Recreation District/Yamhill County	Chehalem Park and Recreation District/Yamhill County
Transportation	Yamhill County/ODOT	City of Newberg/ODOT
Storm Water	Yamhill County	City of Newberg

Terms and Conditions under which Service Responsibility will be transferred or expanded.

- D. Special Districts. The City shall agree to the formation of any special district within the Urban Reserve Area prior to the approval of the formation of the district by Yamhill County. This provision shall not apply to County-wide service districts formed under ORS Chapter 451.
- B. Annexation. Annexation of property from the URA may be permitted if contiguous to City limits and shall occur in accordance with the Newberg Comprehensive Plan. Before final action by the City Council on an annexation proposal, the proposal shall be forwarded to the Board of County Commissioners for a recommendation. In order to provide the Board with advance notice of a proposed annexation, the findings adopted by the City Planning Commission shall be referred to the Board following the Planning Commission action.
- C. Service Expansion Plans. Service expansion plans shall be consistent with the Newberg Urban Area Growth Management Agreement. As the future provider of sanitary disposal, storm water and water services, the City shall prepare and from time to time update utility expansion plans. These plans shall provide a basis for the extension of services within the Urban Growth Boundary, and as such shall be referred to Yamhill County for information and comment.
- D. Transition Policies Relating to Service Responsibility

- 1. Sanitary Sewer Service There will be no public provider of these services until City services are available, except in the case of a state mandate due to a health hazard. At the time of annexation, the City will require hook-up to City sanitary sewer services. Nothing in this provision shall limit the ability of individuals to provide services on their own private property within the Urban Reserve Area.

2. Potable Water Service The City of Newberg shall be the sole and only public provider of water in this area, except for existing water districts, unless new districts are expanded or created through mutual agreement by the City and the County. Nothing in this provision shall limit the ability of individuals to provide services on their own private property within the Urban Reserve Area.
3. Fire Protection The Newberg Rural Fire District provides fire protection services to property within the Urban Reserve Area and the Urban Growth Boundary. The City will provide fire protection services to property within the city limits.
4. Parks and Recreation Chehalem Park and Recreation District and Yamhill County provide park and recreation services within the Urban Reserve Area and the Urban Growth Boundary. Chehalem Park and Recreation District and Yamhill County will remain providers of these services within the city limits unless agreed otherwise.
5. Transportation and Street Improvements Yamhill County provides Transportation services on county roads within the Urban Reserve Area. Yamhill County policies for transfer of jurisdiction are outlined in the Yamhill County Transportation System Plan Section 5.1, Policy 1.5, and Section 5.2.2, Goals and Policies 4, 5, 6 (See attachment Exhibit 1. B.). In summary, the policy is to transfer jurisdiction and maintenance responsibilities to the city upon annexation and improvement to City standards.

Roads in the Urban Reserve Area ultimately are to be developed to City standards. Development in the Urban Reserve Area shall provide adequate transportation facilities to serve the development as provided in Yamhill County ordinances.

The Oregon Department of Transportation provides transportation services on state highways within the Urban Reserve area. The department retains jurisdiction and maintenance responsibilities on all state highways after incorporation into the UGB and annexation except in special cases where jurisdiction is transferred to the City or County by a specific agreement.

6. Storm Water Management Yamhill County provides public storm water management services to property where required within the Urban Reserve Area. The City will provide storm water management services to property within the city limits. Transition of public storm water management services will follow transition of road maintenance responsibilities.

ATTACHMENT TO EXHIBIT 1B

County Transportation Plan (Page 73): The Transportation System Plan (TSP) of Yamhill County provides in Section 5.1, Policy 1.5, Section 5.2.2, Goals and Policies 4, 5, and 6 as follows:

Yamhill County TSP Policy 1.5. *The lead agency for transportation project review shall be:*

- a: Yamhill County for facilities outside the UGBs*
- b. The affected city for facilities within the UGBs*
- c. The State of Oregon. Yamhill County and affected cities on projects involving state-owned facilities.*

Yamhill County TSP Policy 4. *It is the policy of Yamhill County to coordinate the County Transportation System Plan with the transportation plans of the ten incorporated cities within Yamhill County. The County will emphasize continuity in the classification of roads and appropriate design standards for roadways which link urban areas with rural areas outside Urban Growth Boundaries. At the time of UGB amendment Yamhill County and the City involved shall agree on classification and design standards of all County Roads within the proposed UGB area prior to finalization of the amendment.*

Yamhill County TSP Policy 5 *County policy will encourage the expeditious transfer of jurisdiction of roadways to incorporated cities in conjunction with annexation. It is the policy of Yamhill County that developers of property who propose annexation and who have frontage on a road that does not meet City road standards shall have the primary responsibility for upgrading the road to City standards. Roads shall be upgraded at the time of annexation, or the developer shall sign an agreement with the City to upgrade the road, at the time of development. Transfer of jurisdiction shall require the approval of both the County and the City, in accordance with provisions in Oregon Revised Statutes 373.270.*

Yamhill County TSP Policy 6. *It is the policy of Yamhill County to require the transfer, or an agreement to transfer with specific time lines and milestones as part of the agreement, jurisdiction of County roadways within urban growth boundaries to their respective cities at the time of annexation.*

EXHIBIT 1C
CRITERIA AND SUBMITTALS FOR CITY RECOMMENDATION
REGARDING DEVELOPMENT IN THE URA

- A. Criteria: Generally, the following criteria will be used by the City of Newberg in developing City recommendations regarding land use development in the Urban Reserve Area. It is the City's intent to recommend that the County only allow development in the Urban Reserve Area that is limited in scope and that is consistent with the future urban development of the property.
1. Future Development Plan: The City Council shall recommend approval, recommend approval with conditions, or recommend against the future development plan in accordance with the following criteria:
 - (a) The current development shall not cause more than 10 percent of the property to be used for site improvements including buildings, parking areas, improved recreation areas, and storage areas, unless the City agrees the development intensity will not prohibit future urban development.
 - (b) The future development plan shall allow for the efficient future urban development of the remainder of the property. It shall allow for construction of future urban streets and utilities, and shall allow for required setbacks to current and future property lines.
 - (c) The plan is consistent with adopted plans and policies for the area, such as street or utility plans and policies in this agreement.
 2. The City may recommend that the application be approved with conditions, which may include, but are not limited to: an agreement to annex, a deferred improvement agreement for future public facilities; construction of necessary street improvements, storm drains, or other public facilities; dedication of right-of-way, easements for utilities; special setbacks from planned right-of-ways.
- B. Submittal Requirements
1. A future development plan shall be required for any development in the Urban Reserve Area requiring a Yamhill County Type B or Type C review, excluding any development that involves a change in use to existing buildings only. The future development plan shall be used solely to evaluate the current proposal's compatibility with potential future urban development. It does not bind or commit the applicants, property owners, review bodies, or governing bodies to approve or carry out the proposed future development.
 2. The future development plan shall show how the property could be fully developed when incorporated into the city. The plan shall be drawn to scale and shall include the following:
 - (a) The location of potential future streets within and surrounding the site.

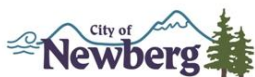
- (b) The location of potential future sewer, water, and storm drainage facilities within and surrounding the site.
- (c) The location and approximate dimensions of potential future lot lines.
- (d) Setback lines for proposed structures from current and proposed property lines.

CAPITAL IMPROVEMENT PROGRAM



March 6, 2017

Fiscal Years 2017 - 2022



The Capital Improvement Program (CIP) is the implementation plan for identified software, City facilities, transportation, storm drainage, water, and wastewater

projects. The CIP may change based on the community's needs, available budget, etc....

Capital Improvement Program

FISCAL YEARS 2017 - 2022

INTRODUCTION

The capital infrastructure needs within the five year CIP are identified through a variety of sources, including Master Plans, City Council goals, operational needs, and regulatory obligations.

In keeping with the Council goals, Staff over the last 2 years has begun a program to reduce the amount of inflow and infiltration (I&I) that enters the wastewater system. I&I is the term used to describe surface and subsurface water that enters the wastewater piping system, caused primarily by aging infrastructure that needs to be repaired or replaced. The water enters into the wastewater pipes through cracks, holes, joint failures, faulty connections, and through holes in manhole covers. During large storm events I&I can create an overflow situation as the system is not built to handle the additional water. Although I&I is essentially 'clean water', the additional water flows to the wastewater treatment plant and must be treated with the normal wastewater flows. Normal dry weather processing at the wastewater treatment plant is approximately 3 million gallons per day, whereas, during heavy rainfall events the peak flows at the wastewater treatment plant are in excess of 20 million gallons per day. This additional flow due to excessive I&I create added operational and maintenance costs to the wastewater system.

Projects based on the adopted plan will be proposed for the next 5 fiscal years to aggressively repair and/or replace inadequate portions of the system. Although the costs to repair the aging wastewater collection system will be significant, it can no longer be postponed. Two projects were completed last fiscal year and there has been a noticeable reduction in I&I in those basins already.

Public Works is also committed to providing well maintained streets to our citizens. Although, this work started in 2012, there is a substantial amount of road repair yet to be completed. The road maintenance program budget continues to be under-funded, as identified in the 2014 City wide Pavement Management System Implementation Report. Staff has embarked on a process to determine and implement new funding sources. Phase 1 of this project is expected to be complete in Fiscal year 16/17.

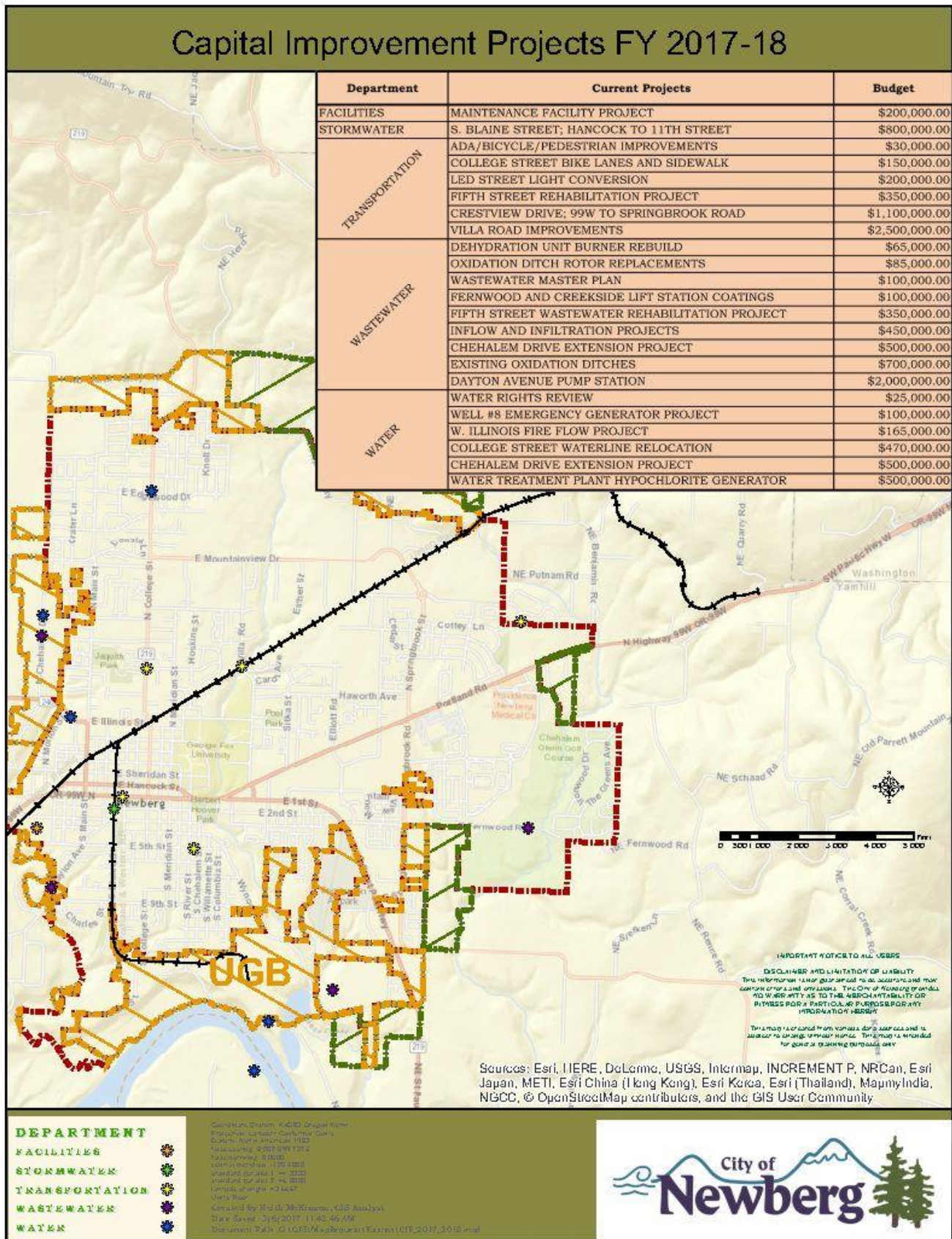
Oregon Department of Transportation (ODOT) remains committed to constructing the Newberg/Dundee Bypass. Since this state highway system runs through Newberg, the City is required to pay a share of the cost of the bypass. ODOT has agreed to loan the money to the City with interest only payments begun in 2014. Full payments begin in 2018. These payments will be made using the Federal Funds Exchange.

Since 2007, there has been a major effort to upgrade the City's Wastewater Treatment Plant. The City will continue the upgrade with the addition of roofing repairs, rotor replacements and structural repairs to the existing oxidation ditches. Future upgrades will be determined based on the update to the Master Plan to be completed in 2017.

The City continues to focus its efforts towards establishing a high quality and adequate potable water supply, storage, and distribution system. With the completion of the Water Master Plan, additional projects have been added to address system deficiencies over the next several years. A project has also been added to extend water and wastewater lines up Chehalem Drive to facilitate development in this area.

Engineering Services works closely with Public Works Operations and Maintenance divisions to complete the identified projects on an annual basis. The fiscal year 2017-2018 Capital Improvement Program implements the planning, design, and construction of the capital infrastructure needs of the City by prioritizing projects based on an analysis of the master plans and other studies in combination with the availability of funding. The scheduled projects in the years beyond FY 2017-2018 are not intended to be a spending commitment, but are included to show a proposed plan for the projects that are considered to be a priority at this particular snapshot in time.

A map of the Capital Improvement Projects for FY 2017-2018 is shown on the following page.



Water Projects

The Water Program provides planning, design and construction of improvements for the City's public water utility system. This program area includes the well field, storage reservoirs, water treatment plant, pump station, and water distribution system.

The following project list was developed from the 2015 Water Master Plan and other associated studies while considering the available funds from the water utility rates and system development charges.

Water Program

Project Summary Sheet

WELL #8 EMERGENCY GENERATOR PROJECT

Fiscal Year	Costs	Criteria Met:	
2017/2018	100,000	☒	Safety/Liability
		☒	Council Goals
2018/2019	N/A	☐	Maintenance
		☐	Required per Regulation
Future Years	N/A	☐	Coordinates with Larger Project
		☒	Existing Capacity
Project Total	100,000	☐	Cost Reduction
		☐	Future Capacity

PROJECT DESCRIPTION:

This project is to purchase and place an emergency generator at the well field to be able to operate Well 8 in the event of an emergency power outage. At this time there is not any existing back up power in the well field that could be operated in the event of an extended power outage do to either flood or other natural disaster. The intent is to purchase a generator on a trailer that will be placed out at the well field but would have the potential to be moved to other locations if the need arose. This project meets the emergency preparedness goal of council and reduces the liability of a water shortage during an emergency.

PROPOSED FUNDING SOURCES:

This will be funded by water rate revenues.



FIGURE 1 EMERGENCY GENERATOR FOR THE WELL FIELD

Water Program

Project Summary Sheet

WATER TREATMENT PLANT HYPOCHLORITE GENERATOR

Fiscal Year	Costs	Criteria Met:	
2017/2018	\$500,000	☒	Safety/Liability
		☐	Council Goals
2018/2019	N/A	☒	Maintenance
		☐	Required per Regulation
Future Years	N/A	☐	Coordinates with Larger Project
		☐	Existing Capacity
Project Total	\$500,000	☒	Cost Reduction
		☒	Future Capacity

PROJECT DESCRIPTION:

This project is an upgrade of the existing system that is reaching end of operational life. The options are to rebuild the existing system or to replace the system with a safer more energy efficient device that is less expensive to operate. The system upgrade also requires less maintenance and is safer to work on. The new system also consolidates the types of systems operating at the Water Treatment Plant (WTP) and the Wastewater Treatment Plant (WWTP) to the same system. In the event of an emergency the systems at the WTP and the WWTP will have interchangeable parts.

FUNDING SOURCES:

This will be paid for by water rate revenue.



FIGURE 2 PROPOSED WATER TREATMENT PLANT SODIUM HYPOCHLORITE GENERATOR

Water Program

Project Summary Sheet

CHEHALEM DRIVE EXTENSION PROJECT

Fiscal Year	Costs	Criteria Met:	
2017/2018	\$500,000	☐	Safety/Liability
		☐	Council Goals
2018/2019	\$500,000	☐	Maintenance
		☐	Required per Regulation
Future Years	N/A	☒	Coordinates with Larger Project
		☐	Existing Capacity
Project Total	\$1,000,000	☐	Cost Reduction
		☒	Future Capacity

PROJECT DESCRIPTION:

This project would extend the public water line from the existing terminus on the east side of Chehalem Creek in Hwy 240 to NE Chehalem Drive and then north in Chehalem Drive to just south of the intersection with Mountainview Drive. There have been several development inquiries in this area and the water line extension would allow for orderly future development. This project would be constructed in conjunction with a wastewater extension.

PROPOSED FUNDING SOURCES:

This will be paid for out of system development charges.



FIGURE 4 CHEHALEM DRIVE PUBLIC WATER SERVICE LINE EXTENSION

Water Program

Project Summary Sheet

COLLEGE STREET WATERLINE RELOCATION

Fiscal Year	Costs	Criteria Met:	
2017/2018	\$470,000	☐	Safety/Liability
		☐	Council Goals
2019/2020	N/A	☐	Maintenance
		☐	Required per Regulation
Future Years	N/A	☒	Coordinates with Larger Project
		☐	Existing Capacity
Project Total	\$470,000	☐	Cost Reduction
		☐	Future Capacity

PROJECT DESCRIPTION:

The Oregon Department of Transportation will be extending sidewalks and bike lanes further north on the west side of College Street. As a part of this project the City's existing water line will need to be lowered as it is too shallow. This work is scheduled to begin in 2017/2018 and will be coordinated with the waterline valve project.

PROPOSED FUNDING SOURCES:

This will be paid for out of water rates.



FIGURE WATERLINE RELOCATION FROM CRESTVIEW TO FOOTHILLS ON THE WEST SIDE OF COLLEGE STREET

Water Program

Project Summary Sheet

VALVES ON COLLEGE STREET

Fiscal Year	Costs	Criteria Met:	
2018/2019	\$200,000	☒	Safety/Liability
		☐	Council Goals
2019/2020	N/A	☒	Maintenance
		☐	Required per Regulation
Future Years	N/A	☒	Coordinates with Larger Project
		☒	Existing Capacity
Project Total	\$200,000	☒	Cost Reduction
		☐	Future Capacity

PROJECT DESCRIPTION:

One of the reasons for the massive amount of flooding in 2014 when the waterline in College Street broke was the lack of valves on the existing line to shut the flow of water off. This project would add valves in strategic locations to minimize future problems. It will be coordinated with the College Street waterline relocation project.

PROPOSED FUNDING SOURCES:

This will be paid for out of water rates.



FIGURE 5 2014 WATELINE BREAK ON COLLEGE STREET CAUSING MASSIVE FLOOD

Water Program

Project Summary Sheet

DECOMMISSION WELLS #1 AND #2

Fiscal Year	Costs	Criteria Met:	
2018/2019	\$200,000	☒	Safety/Liability
		☐	Council Goals
2019/2020	N/A	☐	Maintenance
		☒	Required per Regulation
Future Years	N/A	☐	Coordinates with Larger Project
		☐	Existing Capacity
Project Total	\$200,000	☐	Cost Reduction
		☐	Future Capacity

PROJECT DESCRIPTION:

Wells #1 & #2 have reached the end of life and are not being utilized. This project would properly decommission the wells per state standards.

PROPOSED FUNDING SOURCES:

This will be paid for out of water rates and system development charges.

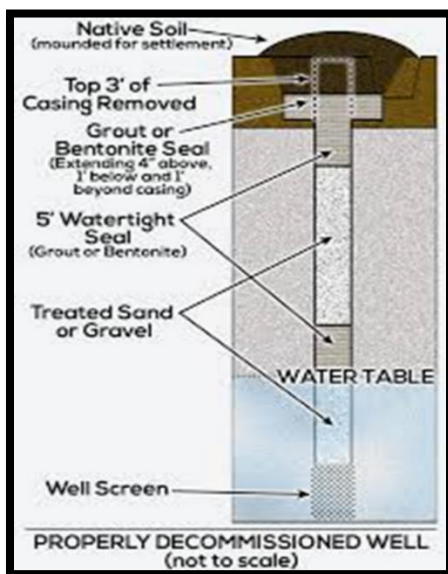


FIGURE 6 DECOMMISSION WELLS 1 & 2

Water Program

Project Summary Sheet

DOWNTOWN FIRE FLOW PROJECT

Fiscal Year	Costs	Criteria Met:	
2020/2021	\$552,000	☒	Safety/Liability
		☐	Council Goals
2021/2022	N/A	☐	Maintenance
		☐	Required per Regulation
Future Years	N/A	☒	Coordinates with Larger Project
		☒	Existing Capacity
Project Total	\$552,000	☐	Cost Reduction
		☒	Future Capacity

PROJECT DESCRIPTION:

This project is to replace several non-looped sections of 1 and 2 inch diameter water mains along Hancock Street through downtown Newberg. Fire flow deficiencies occur in this area in addition to inadequate fire hydrant spacing and coverage. This project will coordinate with the newly adopted Downtown Plan.

PROPOSED FUNDING SOURCES:

This will be paid for out of water rate revenue and system development charges.

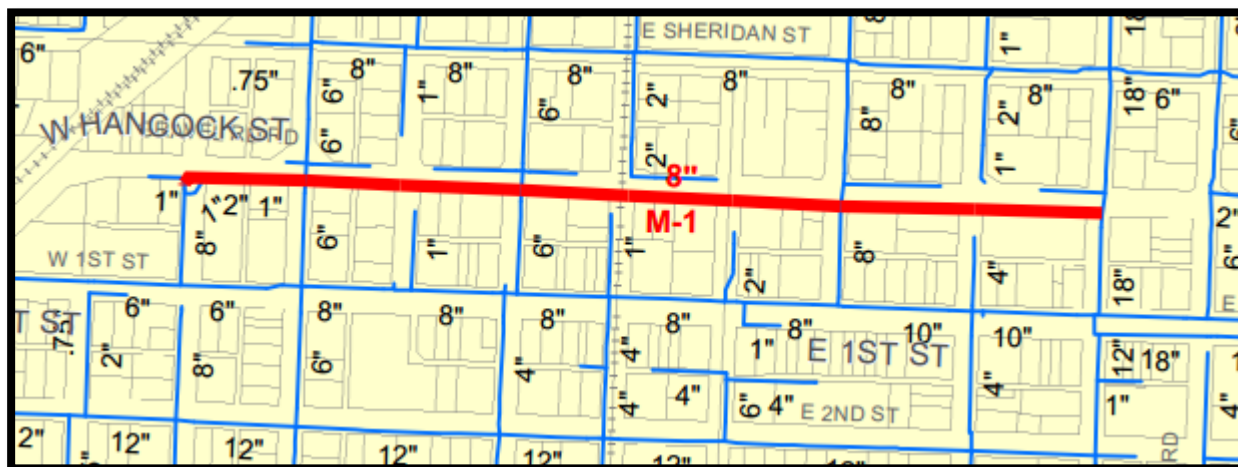


FIGURE 7 REPLACING DEFICIENT PIPE AND INADEQUATE FIRE HYDRANTS ON HANCOCK STREET

Water Program

Project Summary Sheet

FIXED BASED RADIO READ

Fiscal Year	Costs	Criteria Met:	
2019/2020	\$1,000,000	☐	Safety/Liability
		☐	Council Goals
2020/2021	\$25,000	☒	Maintenance
		☐	Required per Regulation
Future Years	N/A	☐	Coordinates with Larger Project
		☐	Existing Capacity
Project Total	\$1,025,000	☒	Cost Reduction
		☐	Future Capacity

PROJECT DESCRIPTION:

The existing meter reading system requires that someone drive through the entire city to read the meters. The fixed based system will allow for the meters to be read from the maintenance yard in real time. This will cut down on labor costs and could detect catch a leak sooner. Rate payers will also have the ability to gain access to hourly real-time and historical water use information. Hourly use data will allow the operations and treatment plant run time.

PROPOSED FUNDING SOURCES:

This will be paid for out of water rates and system development charges.

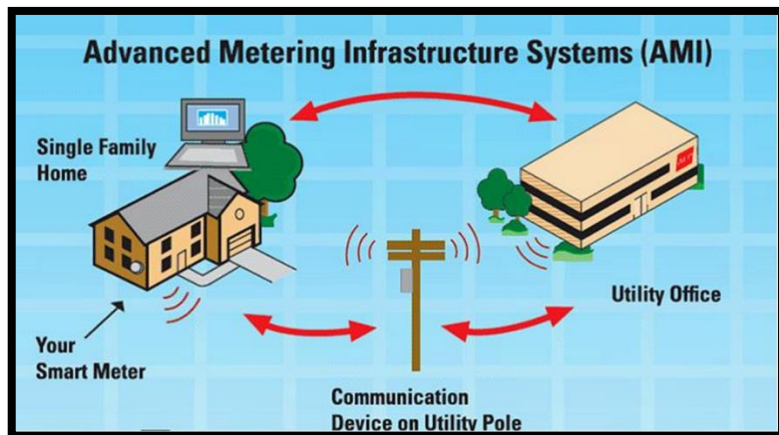
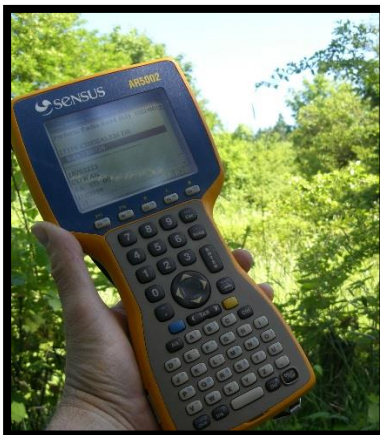


FIGURE 8 READING METERS CURRENTLY (LEFT) VS ADVANCED WATER METERING READING INFRASTRUCTURE SYSTEM (RIGHT)

Water Program

Project Summary Sheet

GEORGE FOX FIRE FLOW PROJECT

Fiscal Year	Costs	Criteria Met:	
2018/2019	\$346,000	☒	Safety/Liability
		☐	Council Goals
2019/2020	N/A	☐	Maintenance
		☐	Required per Regulation
Future Years	N/A	☒	Coordinates with Larger Project
		☒	Existing Capacity
Project Total	\$346,000	☐	Cost Reduction
		☒	Future Capacity

PROJECT DESCRIPTION:

The water modeling revealed that this area has a fire flow and pressure deficiency under existing conditions and future growth. The installation of 1410 lineal feet of 8" waterlines will address this deficiency.

PROPOSED FUNDING SOURCES:

This will be paid for out of water rate revenue by George Fox University and system development charges.

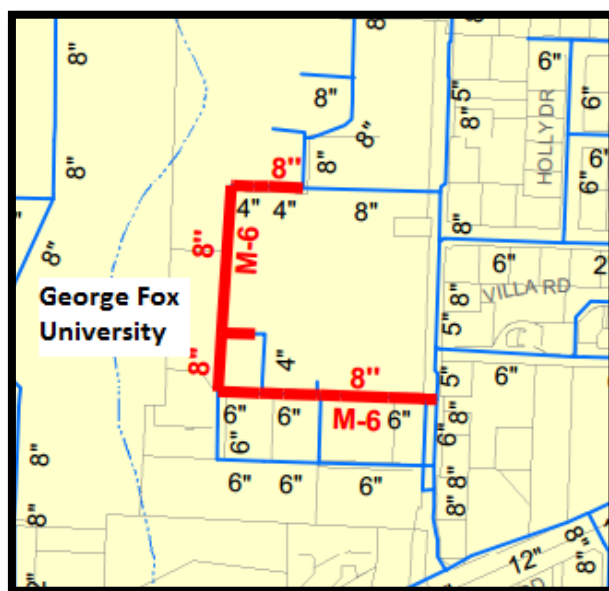


FIGURE 9 FIRE HYDRANT WATER FLOW

Water Program

Project Summary Sheet

N. COLLEGE STREET WATERLINE PROJECT

Fiscal Year	Costs	Criteria Met:	
2019/2020	\$241,000	☐	Safety/Liability
		☐	Council Goals
2020/2021	\$192,000	☐	Maintenance
		☐	Required per Regulation
Future Years	N/A	☒	Coordinates with Larger Project
		☐	Existing Capacity
Project Total	\$433,000	☐	Cost Reduction
		☒	Future Capacity

PROJECT DESCRIPTION:

This project extend waterlines from N. Terrace Drive to the Bell West Pump Station and then to the east down Bell Road. This will help supply water for future Zone 2 development. This project should be constructed in conjunction with the proposed Bell Road West Pump Station.

PROPOSED FUNDING SOURCES:

This will be paid for out of water rate revenue and system development charges.

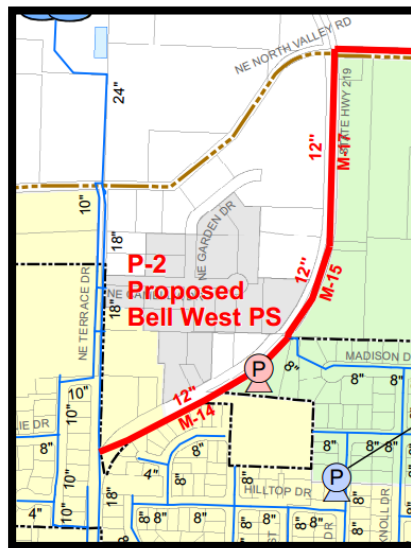


FIGURE 10 EXPAND WATERLINES FOR FUTURE DEVELOPMENT

Water Program

Project Summary Sheet

REDUNDANT SUPPLY PROJECT

Fiscal Year	Costs	Criteria Met:	
2018/2019	\$163,000	☒	Safety/Liability
		☒	Council Goals
2019/2020	\$365,000	☐	Maintenance
		☐	Required per Regulation
Future Years	\$3,091,000	☐	Coordinates with Larger Project
		☒	Existing Capacity
Project Total	\$3,619,000	☐	Cost Reduction
		☒	Future Capacity

PROJECT DESCRIPTION:

The City's current water supply is the well field on the south side of the Willamette River. To address supply vulnerability and long-term water resiliency, per the water system master plan the City should pursue another source north of the River. The redundant supply should have an approximate capacity of 2 million gallons per day. This project would include water rights, exploration, property acquisition and potentially the construction of a secondary treatment plant.

PROPOSED FUNDING SOURCES:

This will be paid for out of water rate revenue and system development charges.

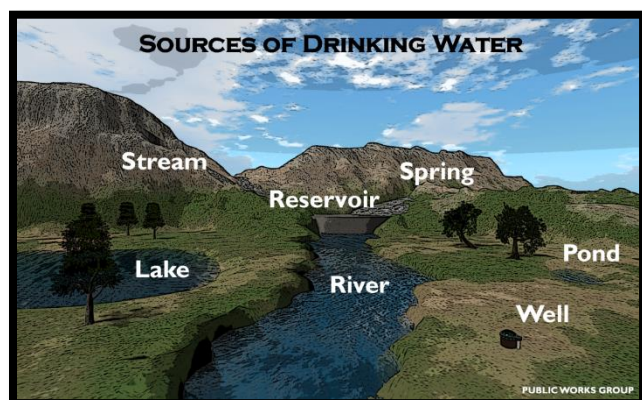


FIGURE 11 EXPLORING FUTURE WATER SUPPLY

Water Program

Project Summary Sheet

SEISMIC RESILIENCY PROJECT

Fiscal Year	Costs	Criteria Met:	
2017/2018	\$200,000	☒	Safety/Liability
		☒	Council Goals
2018/2019	N/A	☒	Maintenance
		☒	Required per Regulation
Future Years	N/A	☐	Coordinates with Larger Project
		☒	Existing Capacity
Project Total	\$200,000	☒	Cost Reduction
		☒	Future Capacity

PROJECT DESCRIPTION:

This project will evaluate the seismic resiliency of the entire water system, evaluate the seismic hazards of the existing water treatment plant, and provide both projects and best management practices. This will help the city's water system become more resilient in the case of major seismic event.

PROPOSED FUNDING SOURCES:

This will be paid for out of both water rates and system development charges.

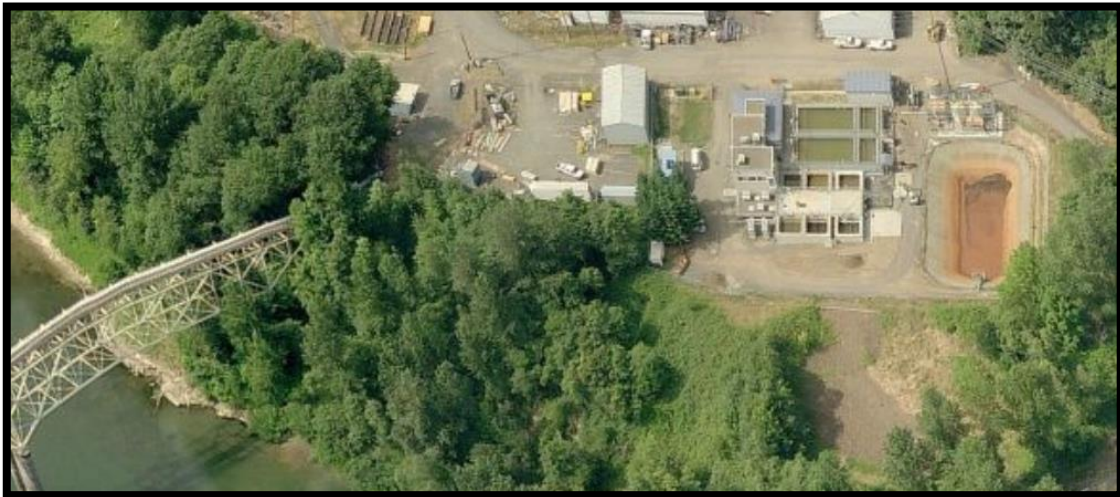


FIGURE 12 WATER TREATMENT FACILITY SEISMIC RESILIENCY

Water Program

Project Summary Sheet

VITTORIA SQUARE FIRE FLOW PROJECT

Fiscal Year	Costs	Criteria Met:	
2019/2020	\$147,000	☒	Safety/Liability
		☐	Council Goals
2020/2021	N/A	☐	Maintenance
		☐	Required per Regulation
Future Years	N/A	☒	Coordinates with Larger Project
		☒	Existing Capacity
Project Total	\$147,000	☐	Cost Reduction
		☒	Future Capacity

PROJECT DESCRIPTION:

The water modeling revealed that this area has a fire flow and pressure deficiency under existing conditions and future growth. The installation of 600 lineal feet of 8" waterlines will address this deficiency.

PROPOSED FUNDING SOURCES:

This will be paid for out of water rate revenue and system development charges.



FIGURE 13 EXPANDING WATERLINE TO ELIMINATE DEFICIENT WATER FLOW AND FOR FUTURE GROWTH

Water Program

Project Summary Sheet

W. ILLIONIS FIRE FLOW PROJECT

Fiscal Year	Costs	Criteria Met:	
2017/2018	\$165,000	☒	Safety/Liability
		☐	Council Goals
2019/2020	N/A	☐	Maintenance
		☐	Required per Regulation
Future Years	N/A	☒	Coordinates with Larger Project
		☒	Existing Capacity
Project Total	\$165,000	☐	Cost Reduction
		☒	Future Capacity

PROJECT DESCRIPTION:

The water modeling revealed that this area has a fire flow and pressure deficiency under existing conditions and future growth. The installation of an 8" waterline will address this deficiency.

PROPOSED FUNDING SOURCES:

This will be paid for out of water rate revenue and system development charges.

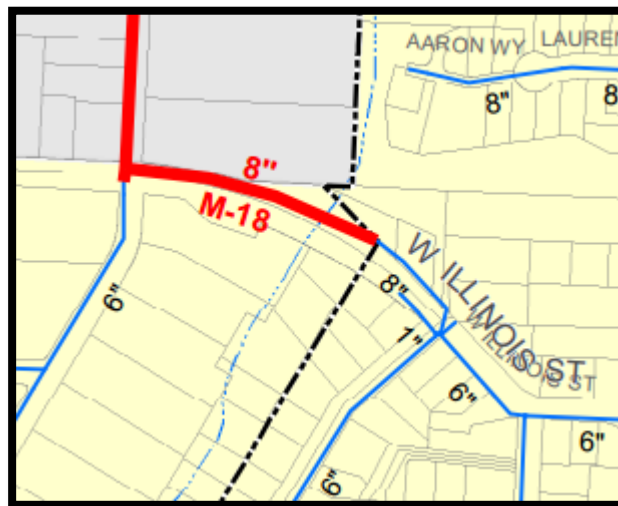


FIGURE 14 EXPANDING WATERLINE TO ELIMINATE WATER DEFICIENCY AND FOR FUTURE GROWTH

Water Program

Project Summary Sheet

WATER RIGHTS REVIEW, RECONFIGURATION AND WATER CONSERVATION PLAN

Fiscal Year	Costs	Criteria Met:	
2017/2018	25,000	☐	Safety/Liability
		☐	Council Goals
2018/2019	\$100,000	☐	Maintenance
		☒	Required per Regulation
Future Years	N/A	☐	Coordinates with Larger Project
		☐	Existing Capacity
Project Total	\$125,000	☐	Cost Reduction
		☒	Future Capacity

PROJECT DESCRIPTION:

This project is intended to take a comprehensive view of our existing water rights, make sure they are correctly a proportioned and reconfigure if necessary. The water right work will be used in our update of our required Water Conservation Plan the following year.

PROPOSED FUNDING SOURCES:

This will be paid for out of water rates and system development charges.

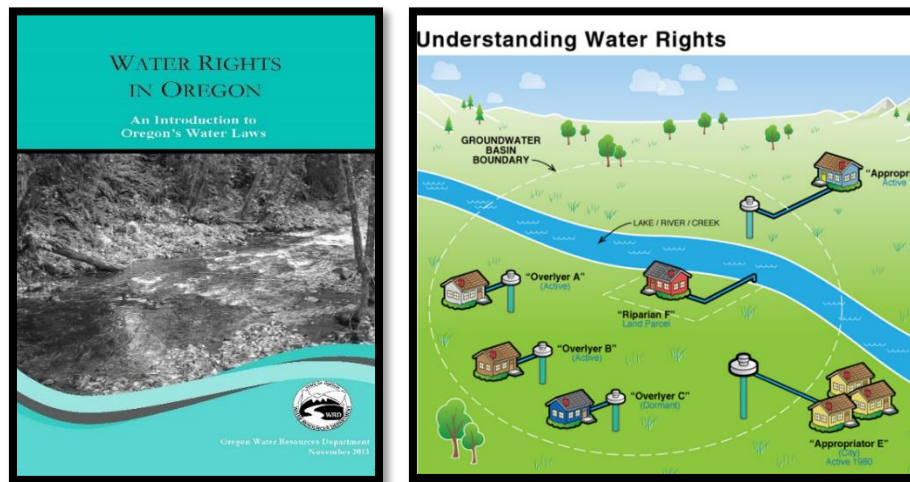


FIGURE 15 COMPREHENSIVE STUDY OF THE CITY'S EXISTING WATER RIGHTS



PLANNING COMMISSION RESOLUTION 2017-326

A RESOLUTION RECOMMENDING CITY COUNCIL APPROVE THE 2017 WATER SYSTEM MASTER PLAN

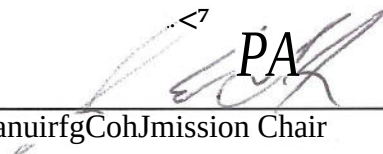
RECITALS:

- L** The City of Newberg last updated its Water System Master plan in 2005.
2. The City of Newberg last updated its Water Treatment Plant Master Plan in 2002.
3. The City of Newberg contracted with Murray Smith & Associates Inc. in 2015 to update the water system and water treatment master plans.
4. The 2017 Water System Master Plan was prepared in accordance with Oregon Statewide Planning Goal 11 - Public Facilities and Services, ORS 197.712(2)(e), Oregon Administrative Rules Chapter 333 Division 61 Public Water Systems and Chapter 660 Division 11 Public Facilities Planning.
5. Citizen Involvement in development of the 2017 Water Master Plan was provided by a Citizens Advisory Committee of eight (8) members which met three times.
6. After proper notice, the Newberg Planning Commission opened the hearing on April 13, 2017 to consider the proposal and continued the hearing to April 27, 2017.
7. The Newberg Planning Commission continued the hearing in April 27, 2017 to consider the proposal, considered public testimony and deliberated.

NOW THEREFORE, BE IT RESOLVED by the Planning Commission of the City of Newberg that it recommends the City Council approve the 2017 Water System Master Plan. This recommendation is based on the staff report, the findings in Exhibit "B", the Comprehensive Plan Text Amendment in Exhibit "C", and testimony.

Adopted by the Newberg Planning Commission this 27th day of April, 2017.

ATTEST:

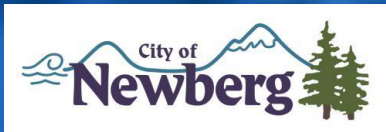

 Planning Commission Chair


 Planning Commission Sgftetary

Attached:
 Exhibit "A": 2017 Water System Master Plan
 Exhibit "B": Findings
 Exhibit "C": Comprehensive Plan Text Amendment

Newberg Water Master Plan City Council

June 5, 2017



Presented by:
Heidi Springer, PE
Brian Ginter, PE
Murraysmith

Why Master Plan?

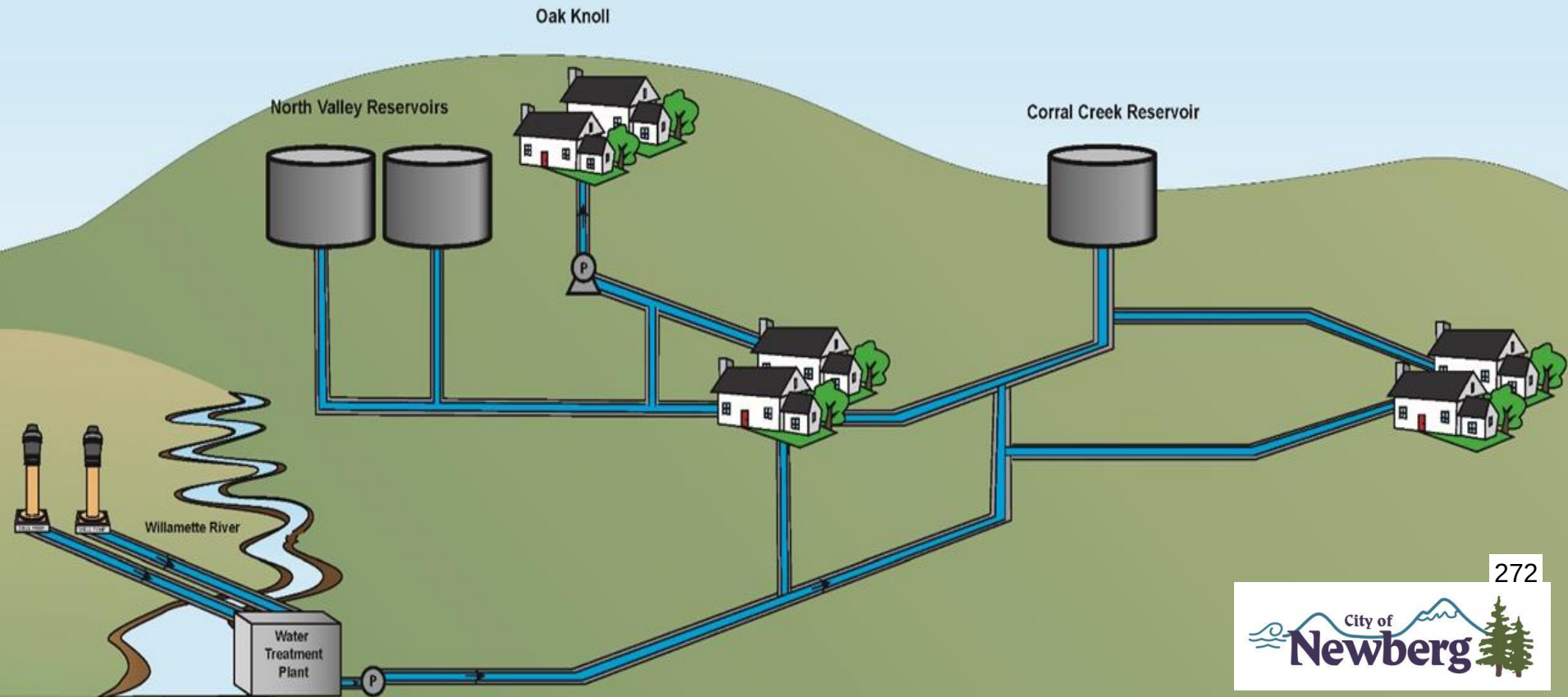
- Required by the State of Oregon
- Identify short- and long-term needs
 - Capital improvements
 - Staffing levels
 - Policy updates
 - Financial strategy
- Improve level of service to customers
 - Economic development support
 - Redundancy
 - Developer standards identification
- Develop short- and long-term roadmap for system improvements

Plan Elements

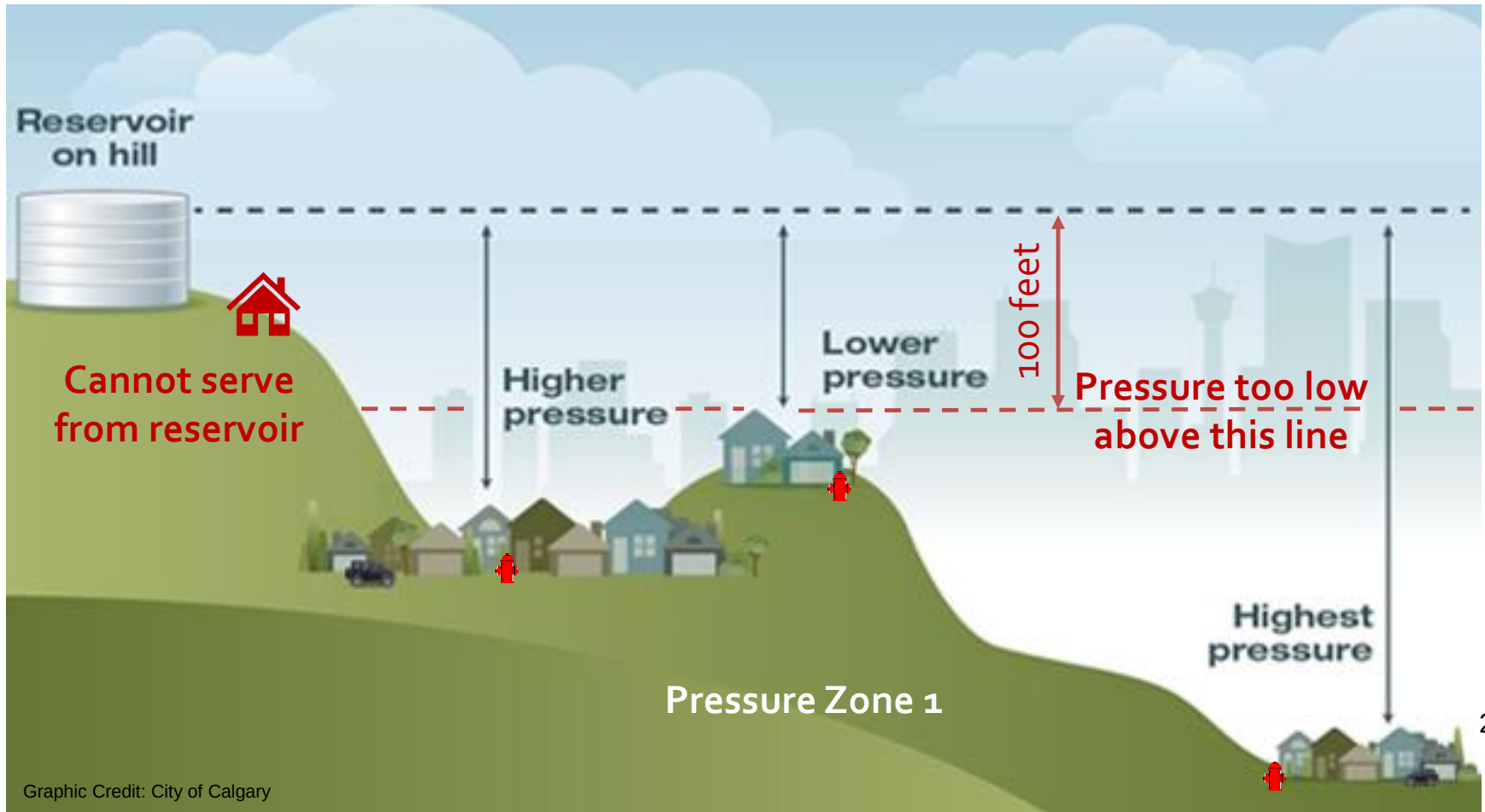
- Describe existing facilities
- Establish water need (demand)
 - Existing
 - 20-year growth horizon
- Establish water service goals (performance criteria)
- Identify deficiencies and develop solutions
- Describe financing options

Water System Overview

Supply and distribution system

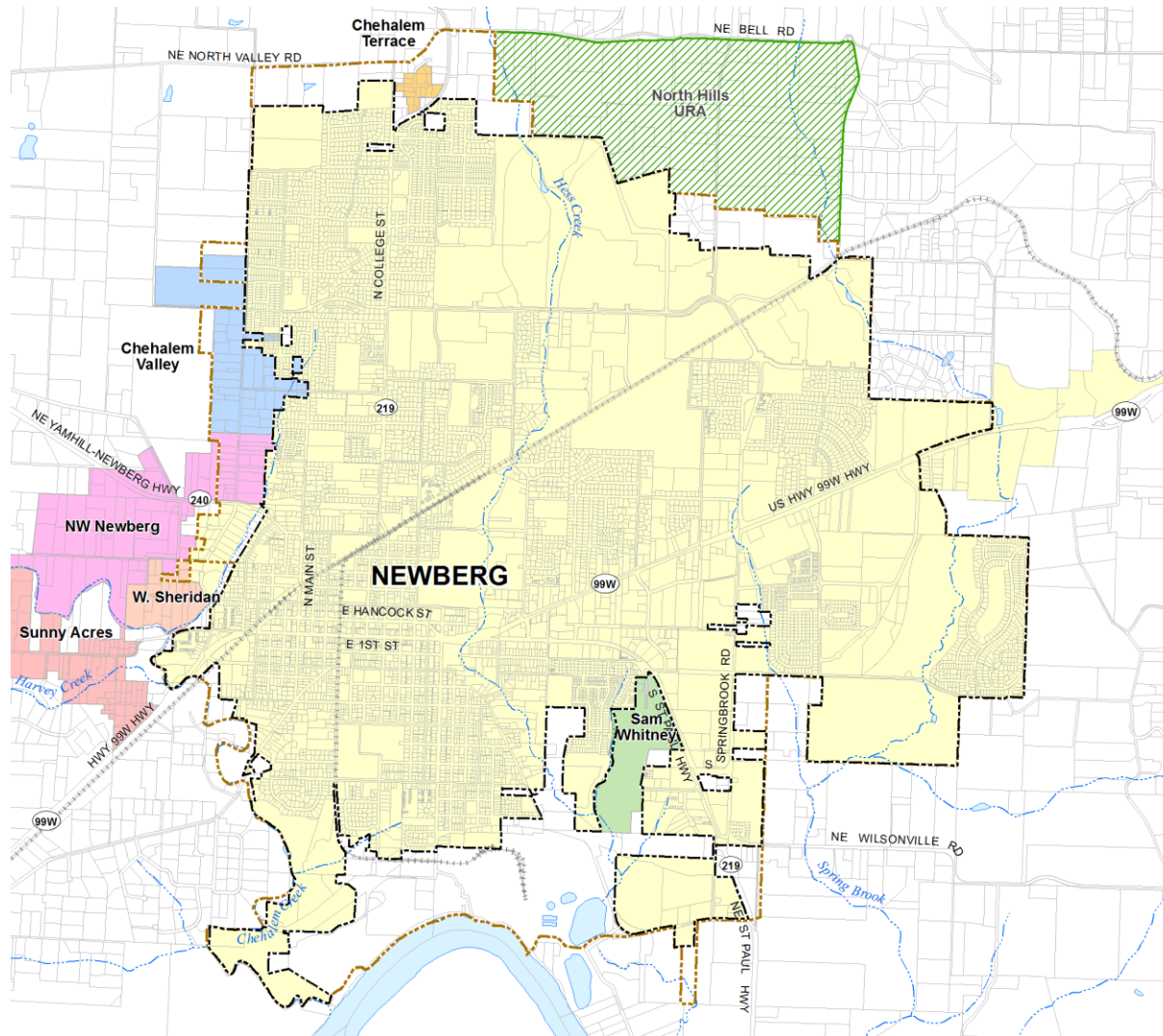


Service Pressure Zone



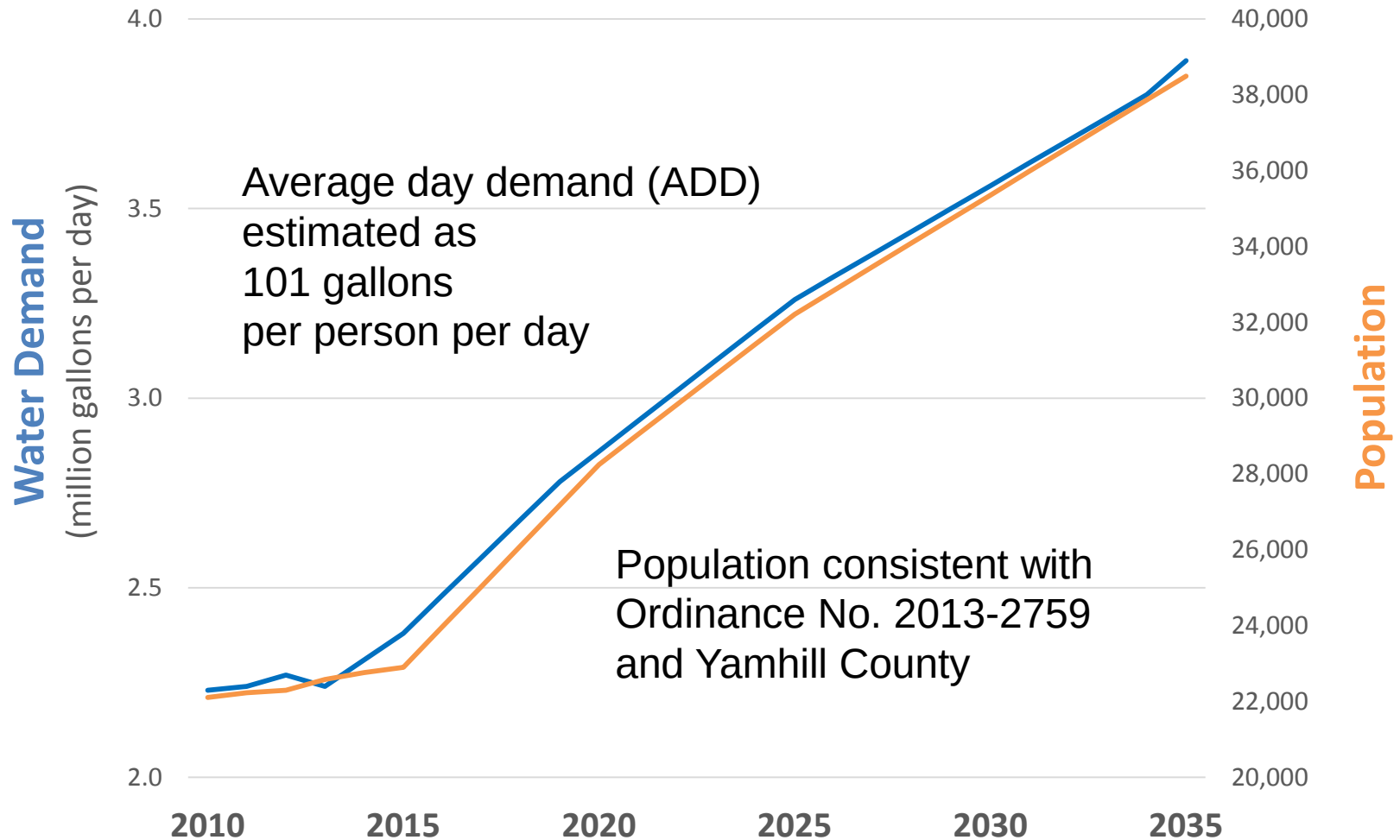
Graphic Credit: City of Calgary

Service Area



- Existing
- 20-year
 - UGB
 - Water Districts
- North Hills URA

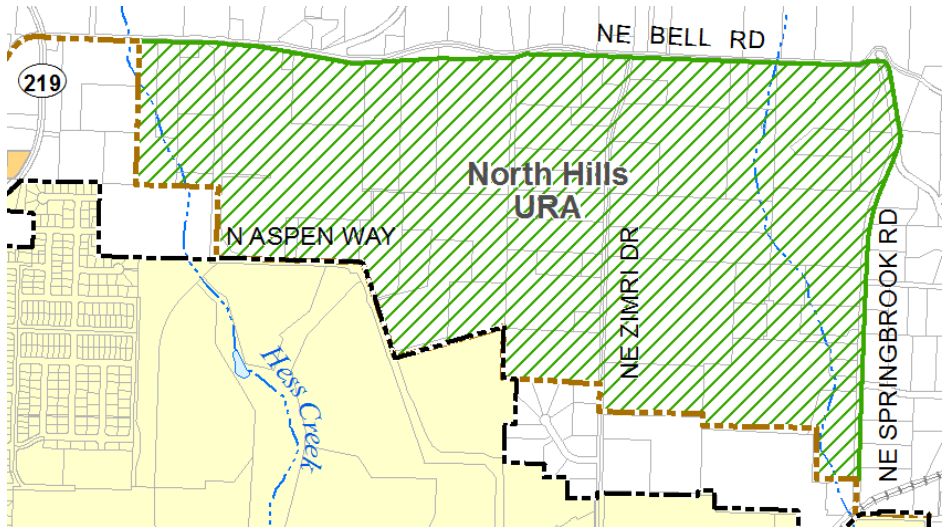
Water Demand Growth



Water Demand Summary

Year	Population	Water Demand (million gallons per day)	
		Average Day (ADD)	Max Day (MDD)
Existing (2015)	22,900	2.38	4.75
2020	28,250	2.86	5.72
2025	32,213	3.26	6.52
2035	38,490	3.89	7.78

North Hills URA



- Beyond 20-year planning window
- Higher elevation to be served from new reservoir
- Ultimate water demand impacts future reservoir size

Service Zone	Projected growth beyond 20-Years		
	Population (11 persons/acre)	Water Demand (mgd)	
		ADD	MDD
Zone 1 (existing reservoirs)	303	0.03	0.06
Zone 3 and 4 (future reservoir)	4,102	0.41	0.82

Water Supply System

- Three components:
 - Source
 - Existing groundwater wellfield across the Willamette River
 - Transmission
 - Two Willamette River crossings – old bridge and beneath river
 - Treatment
 - Conventional WTP located within the West Rock Mill property

Water Supply Analysis

Evaluate Capacity

- Firm wellfield capacity
- Transmission mains
- Treatment plant

Assess Condition and Vulnerabilities

- Identify risks
- Likelihood of failure

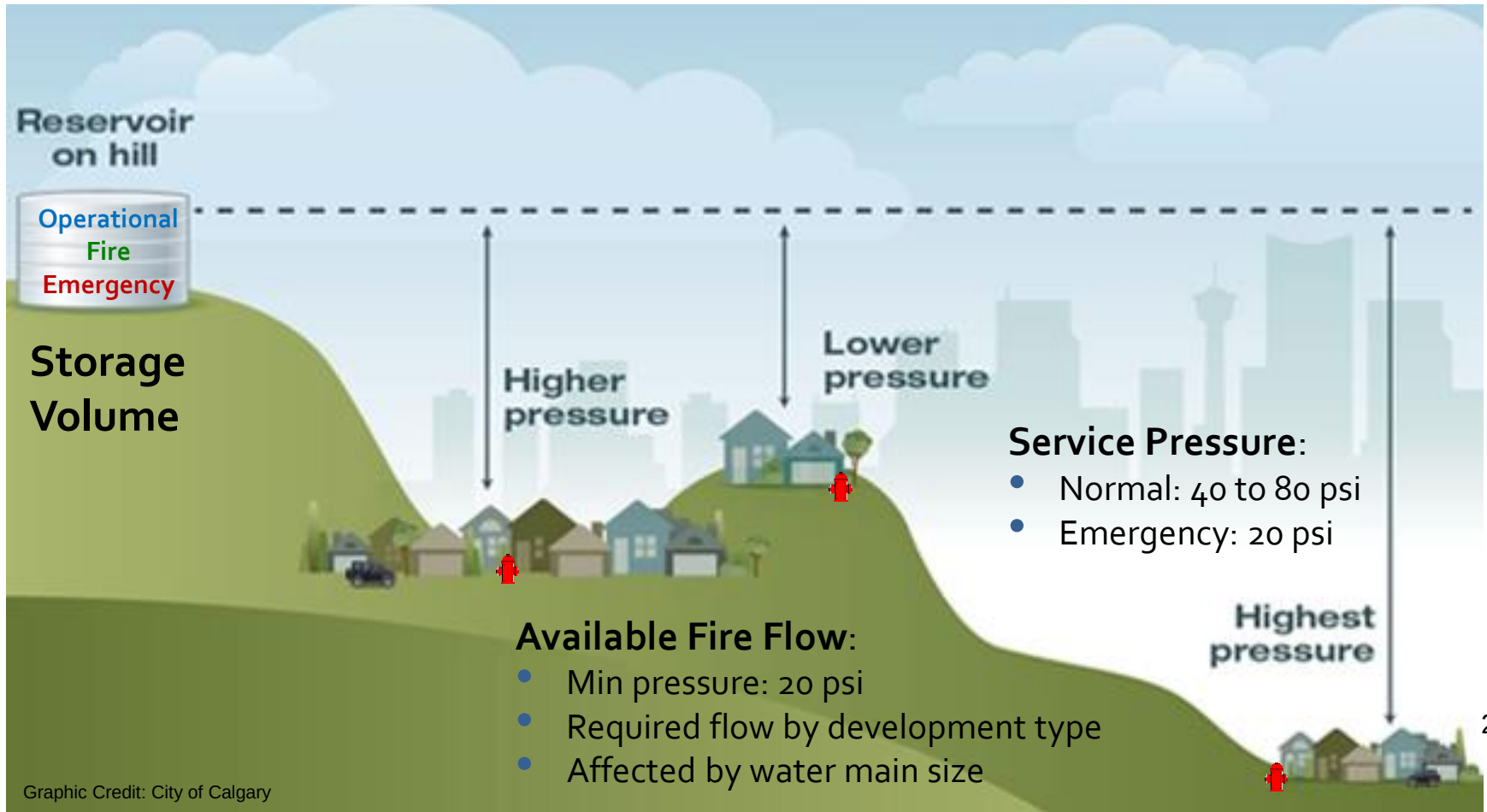
Identify Improvements to Provide Desired Level of Service

- Expansion of capacity
- Mitigation of risks
- New redundant facilities

Water Supply Findings

- Adequate capacity to meet 20-year demand forecast
- Condition and vulnerability
 - **Source:** Good condition, access challenges (flooding)
 - **Transmission:** Bridge suspended main is vulnerable (adequate capacity in under river crossing)
 - **Treatment:** Some minor condition/capacity bottlenecks
- Redundant supply to meet reliability goals
 - winter season average demand (~ 2 mgd)

Distribution System Criteria



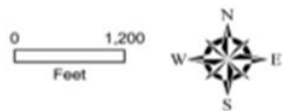
Distribution Findings

- Storage volume
 - Adequate for the 20-year horizon
 - Future higher zone storage beyond 20 years if growth occurs in North Hills URA
- Pumping capacity
 - Higher zone pump station(s) for future growth
- Water mains
 - Fire flow improvements
 - Main extensions for future growth
 - Routine pipe replacement program

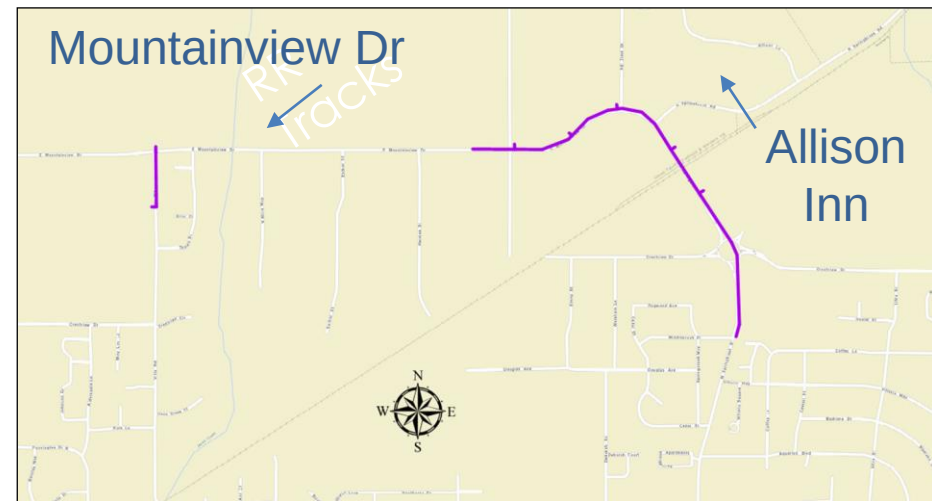
Non-potable Water System

- Two supply sources:
 - Otis Springs
 - 0.5 mgd
 - Recycled Water System (WWTP tertiary treatment)
 - 1.0 mgd, expandable to 2.0 mgd
- Non-potable distribution mains
- One customer – Chehalem Glenn Golf Course
 - Peak demand = 0.6 mgd

Existing Non-Potable System



**City of Newberg
Non-Potable Water System Map
WWTP Reuse System & Otis Spring**
1/14/2016



This pipe is not currently connected to a source.

Key Non-potable Analysis Questions

- Are there potential customers if the non-potable system is expanded?
- Is it necessary to expand existing recycled water production capacity?
- How should the non-potable “purple pipe” distribution network be routed?
 - Consider potential customers and capital piping costs

Potential Non-Potable Customers

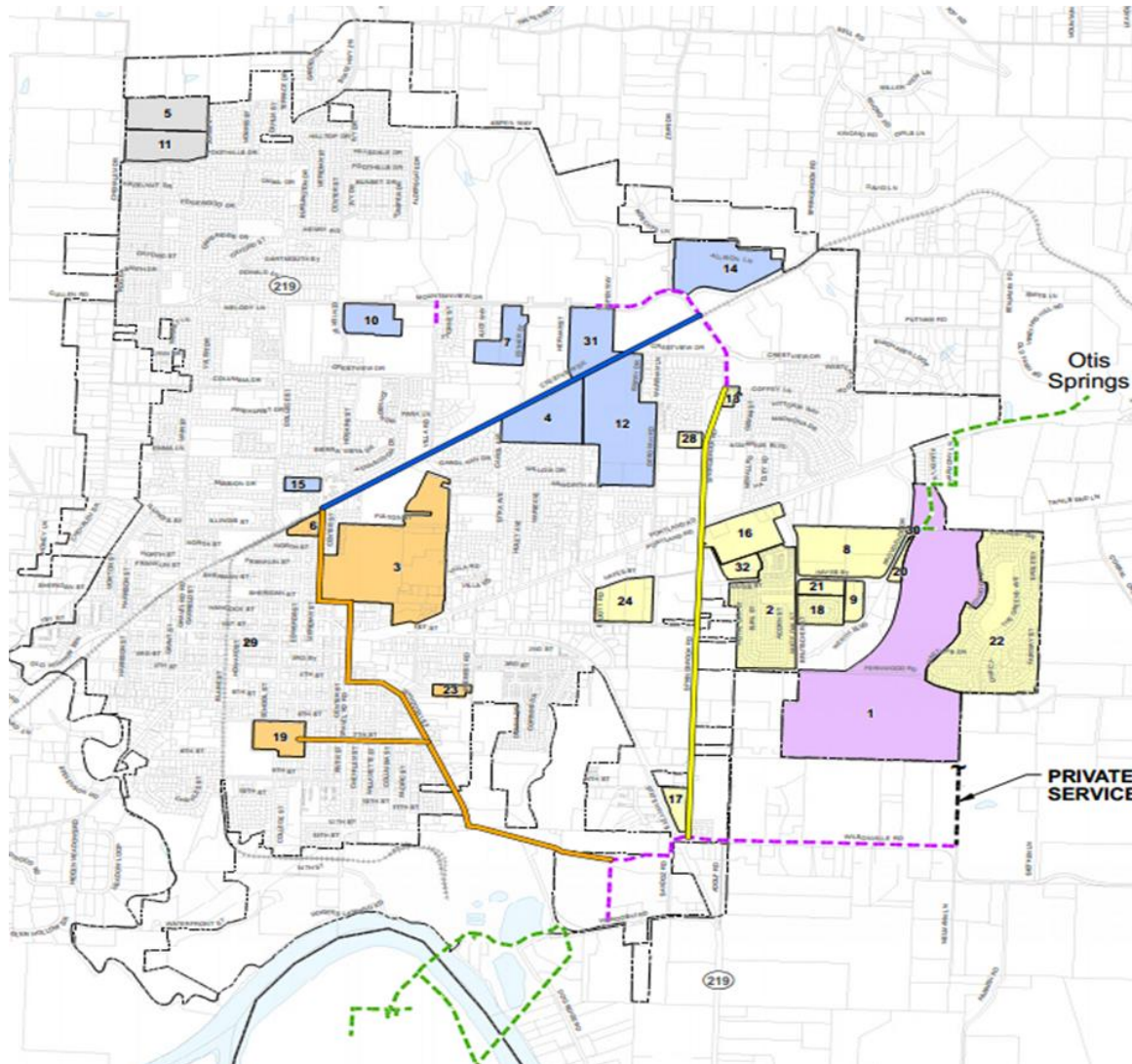
- Examine irrigation billing records for customers with > 450,000 gallons of seasonal use
- Potential customers
 - Future Springbrook development
 - George Fox University
 - Newberg School District
 - Chehalem Park & Recreation District
- Approx. 0.6 mgd additional non-potable demand if all potential customers connect

Non-Potable Capacity

Non-potable Water	Million gallons per day (mgd)
Water Available	1.5
Existing Demand	0.3 - 0.6
Future Demand	0.6
Total Demand	1.2

Existing non-potable water available exceeds potential demand. No need to expand recycled water system capacity.

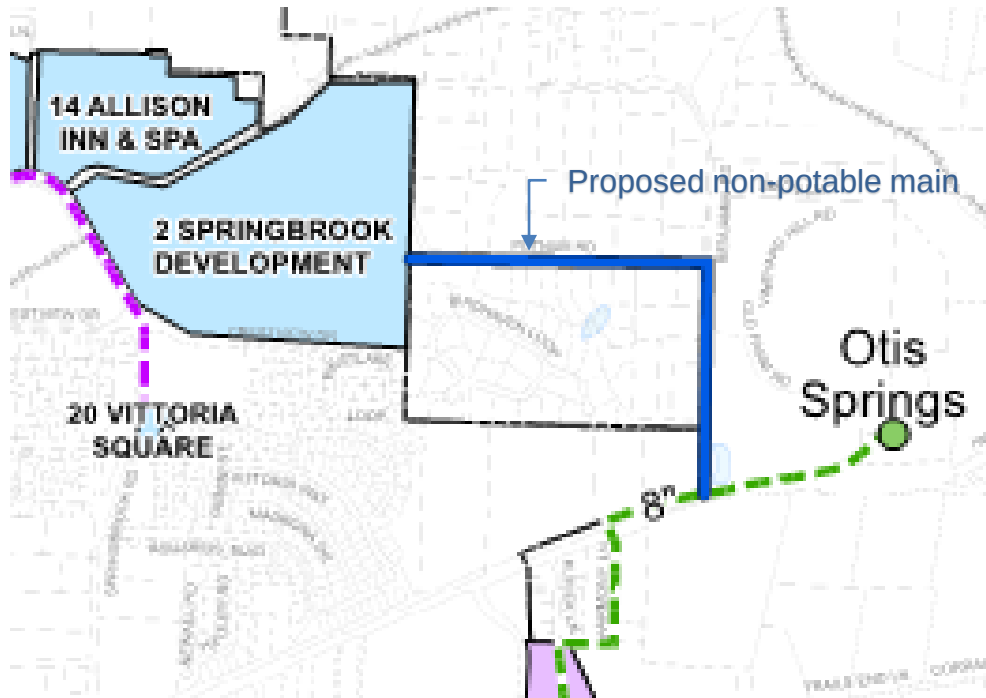
Non-potable Distribution



- City-wide looped system
- High capital cost
 - \$8.9 million for pipe
- Consider single segment of pipe instead

Non-potable Recommendation

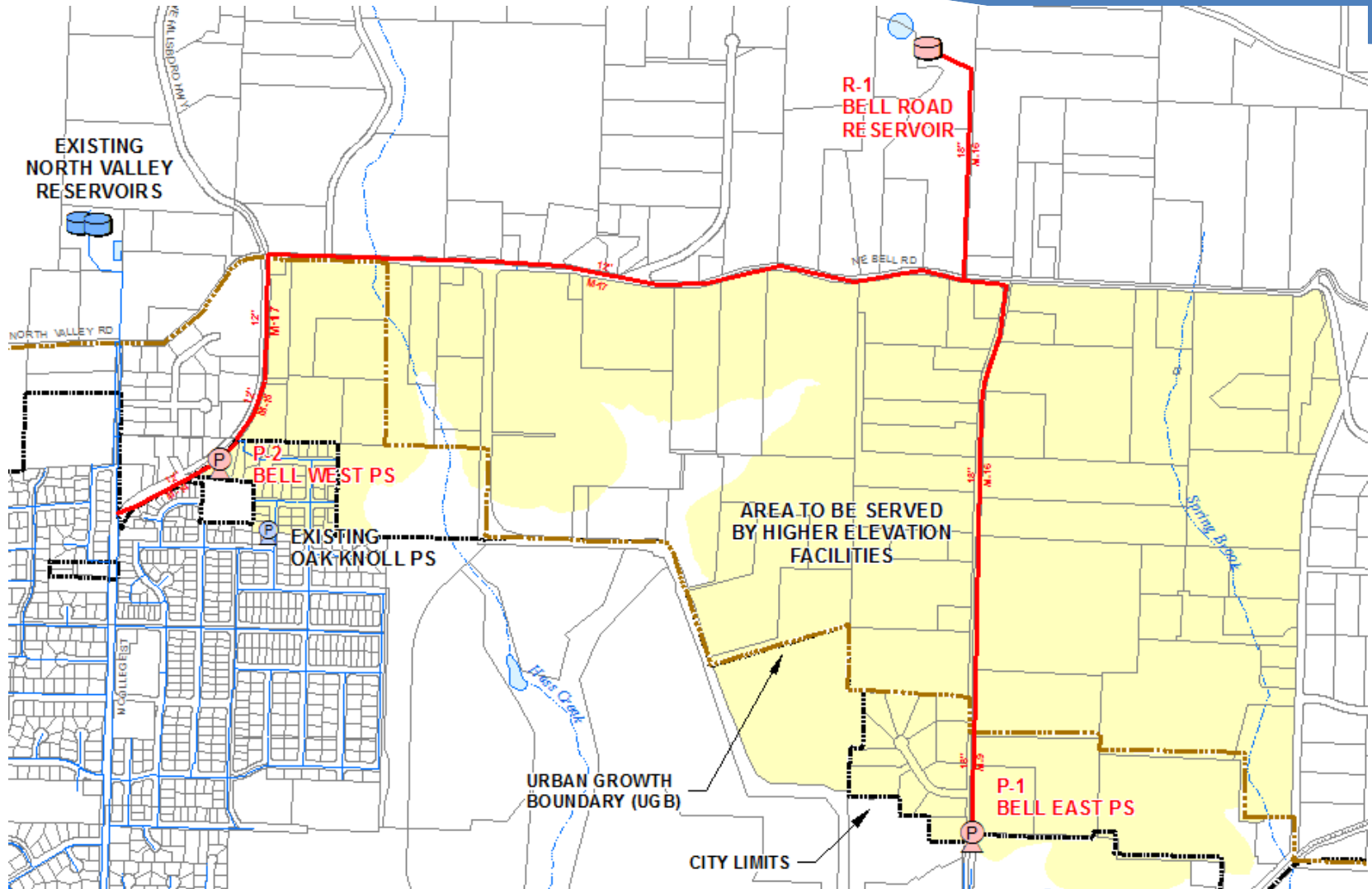
- Expand Otis Springs to serve new Springbrook development on north end of city



- Provides expansion with lowest capital cost
- Use Recycled System for Riverfront MP area and Golf Course

- Water System Analysis Key Findings:
 - Redundant supply source recommended
 - Zone 1 piping needed for fire flow
 - Higher zone pump stations needed for short- and long-term growth
 - Higher zone piping needed for future growth and system expansion
 - Future higher zone storage needed beyond 20 years if growth occurs in North Hills
 - Expand non-potable system to serve Springbrook

Higher Elevation Service



Planning Studies

- Treatment plant and bridge transmission main slope stability study
 - Previous history of minor slides in the area
 - Critical facilities for maintaining drinking water supply
- Seismic resilience study
 - Identify risks to water system during an earthquake
 - Recommend system improvements to mitigate risks
 - Guided by Oregon Resilience Plan goals

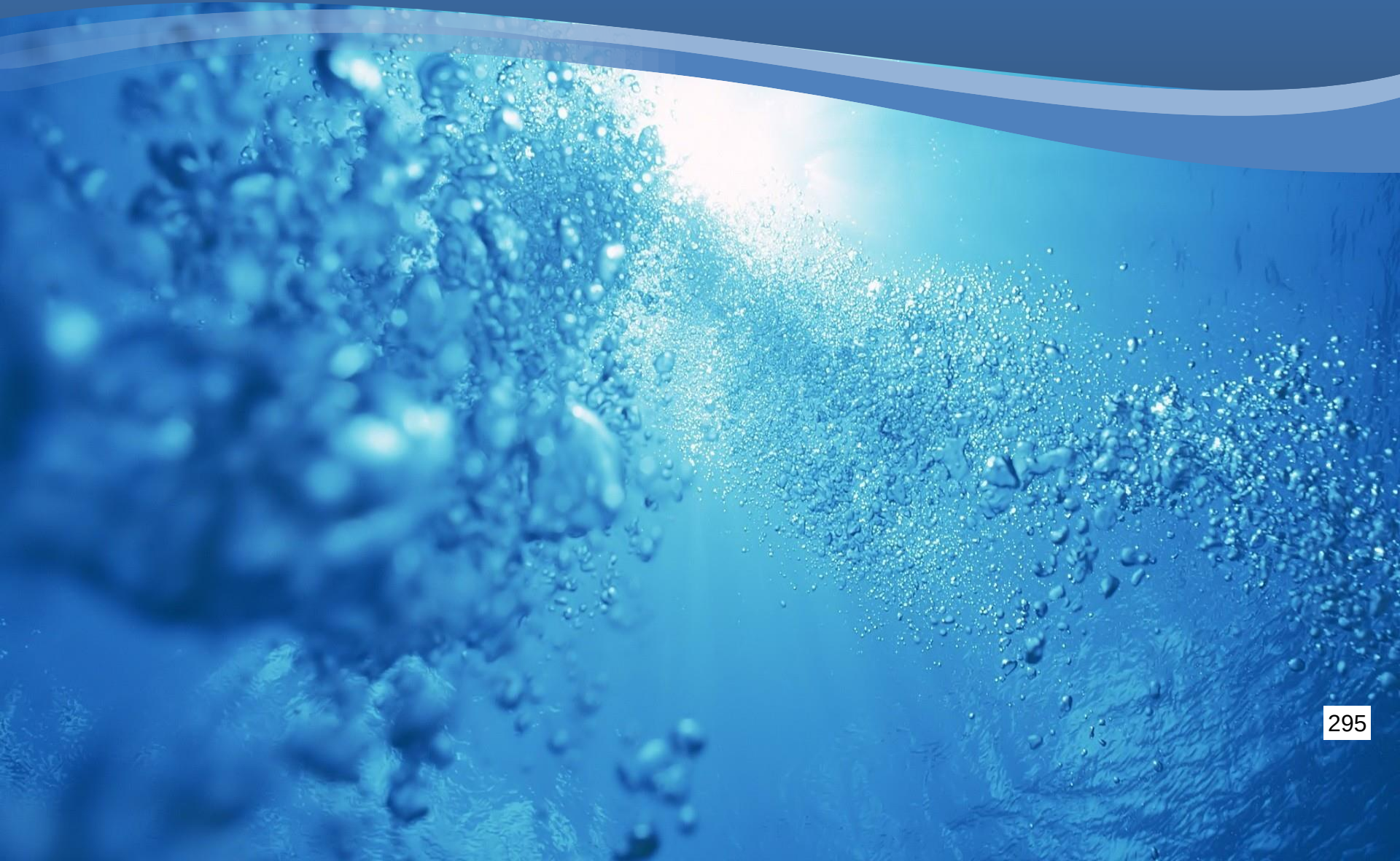
Proposed CIP Summary

Improvement Category	CIP Schedule and Project Cost Summary			
	5-year	10-year	20-year	Estimated Project Cost
	2017-2022	2022-2027	2027-2037	
Supply	\$ 3,037,150	\$ 1,081,850	\$ -	\$ 4,119,000
Pump Stations	\$ 2,175,000	\$ 725,000	\$ -	\$ 2,900,000
Distribution Mains	\$ 4,937,000	\$ 1,846,000	\$ 3,000,000	\$ 9,783,000
Higher Elevation Facilities	\$ -	\$ -	\$ 1,915,000	\$ 1,915,000
Planning	\$ 300,000	\$ 350,000	\$ -	\$ 650,000
Other - Includes non-potable	\$ 737,500	\$ 1,750,000	\$ -	\$ 2,487,500
CIP Total	\$11,186,650	\$ 5,752,850	\$ 4,915,000	\$ 21,854,500
Annual Average CIP Cost				
	\$2,237,330	\$1,693,950	\$1,092,725	
	5-year	10-year	20-year	

- System Development Charges (SDCs)
 - Methodology updated

- Water Rate Evaluation
 - City staff and Citizens Water Rate Review Committee

Questions



Improvement Category	CIP No.	Project Description	CIP Schedule and Project Cost Summary					Preliminary Cost % to Growth
			5-year	10-year	20-year	Beyond 20 years	Estimated Project Cost	
			2017-2022	2022-2027	2027-2037			
Supply		2 mgd redundant supply development	\$ 2,537,150	\$ 1,081,850			\$ 3,619,000	44%
		Hypochlorite generator	\$ 500,000				\$ 500,000	44%
		Subtotal	\$ 3,037,150	\$ 1,081,850	\$ -	\$ -	\$ 4,119,000	\$ 1,812,360
Pump Stations	P-1	Bell East Pump Station - Zone 3 constant pressure	\$ 725,000	\$ 725,000			\$ 1,450,000	97%
	P-2	Bell West Pump Station - Zone 2 constant pressure	\$ 1,450,000				\$ 1,450,000	97%
		Subtotal	\$ 2,175,000	\$ 725,000	\$ -	\$ -	\$ 2,900,000	\$ 2,813,000
Distribution Mains	M-1 thru M-8, M-18	Upsize existing mains and construct new distribution loops to improve fire flow capacity	\$ 2,202,000				\$ 2,202,000	34%
	M-9	NF Zimri Drive Zone 3 distribution backbone within UGB		\$ 346,000			\$ 346,000	97%
	M-14 and M-15	N College Street - N Terrace Street - proposed Bell West P.S. (P-2) - Veritas School	\$ 433,000				\$ 433,000	97%
	M-19	Chehalem Drive water system extension north to Columbia Drive	\$ 600,000				\$ 600,000	100%
		Routine Main Replacement Program	\$ 1,702,000	\$ 1,500,000	\$ 3,000,000	\$ 133,798,000	\$ 140,000,000	0%
		Subtotal	\$ 4,937,000	\$ 1,846,000	\$ 3,000,000	\$ 133,798,000	\$ 143,581,000	\$ 2,104,310
Future High Elevation Water Infrastructure	R-1	1.7 MG Bell Road Reservoir - Zone 3			\$ 339,000	\$ 2,061,000	\$ 2,400,000	88%
	M-16	Zimri Drive East transmission main to Bell Road Reservoir			\$ 815,000	\$ 1,032,000	\$ 1,847,000	97%
	M-17	Bell Road west transmission main - N College Street to Zimri Drive			\$ 761,000	\$ 965,000	\$ 1,726,000	97%
		Subtotal	\$ -	\$ -	\$ 1,915,000	\$ 4,058,000	\$ 5,973,000	\$ 5,577,810
Planning		WTP and Bridge Transmission Main Slope Stability Study	\$ 150,000				\$ 150,000	44%
		Seismic Resilience Study	\$ 150,000				\$ 150,000	44%
		Water Management & Conservation Plan update		\$ 100,000			\$ 100,000	44%
		Water Master Plan update		\$ 250,000			\$ 250,000	44%
		Subtotal	\$ 300,000	\$ 350,000	\$ -	\$ -	\$ 650,000	\$ 286,000
Other		North non-potable water line and Otis Springs pumping improvements		\$ 1,750,000			\$ 1,750,000	100%
		Public Works Maintenance Facility Master Plan	\$ 737,500				\$ 737,500	44%
		Subtotal	\$ 737,500	\$ 1,750,000	\$ -	\$ -	\$ 2,487,500	\$ 2,074,500
Capital Improvement Program (CIP) Total			\$ 11,186,650	\$ 5,752,850	\$ 4,915,000	\$ 137,856,000	\$ 159,710,500	\$ 14,667,980
			Annual Average CIP Cost					
			\$2,237,330 5-year	\$1,693,950 10-year	\$1,092,725 20-year			

REQUEST FOR COUNCIL ACTION

DATE ACTION REQUESTED: June 5, 2017

Order ____ No.	Ordinance ____ No.	Resolution <u>XX</u> No. 2017-3376	Motion ____	Information ____
-------------------	-----------------------	---------------------------------------	-------------	------------------

SUBJECT: A Resolution to approve the Water System Development Charge Methodology and decrease the charge

Contact Person (Preparer) for this
Motion: Kaaren Hofmann, PE, City Engineer
Dept.: Public Works - Engineering
File No.:

HEARING TYPE: ADMINISTRATIVE

RECOMMENDATION:

Adopt Resolution No. 2017-3376.

EXECUTIVE SUMMARY:

System Development Charges (SDCs) are fees assessed or collected at the time of increased usage of a capital improvement, at the time of issuance of a development permit or building permit, or at the time of connection to the capital improvement. The purpose of SDCs are to impose a portion of the cost of capital improvements upon those developments that create the need for or increase the demands on capital improvements in the City.

Per Newberg Municipal Code 13.05.080, the City Council shall adopt a plan that lists the capital improvements that may be funded by SDCs, and that lists the estimated cost and timing of each improvement. The City Council is conducting a hearing tonight to adopt the Water Master Plan dated May 2017. This plan serves as the basis for the updated SDC capital project list. that is included in Attachment A (Water SDC Methodology Report) as Table 3.

As a part of the Water Master Plan Update, the SDC methodology and fees were also evaluated and updated. The proposed Water SDC methodology report is included as Attachment A. Development of the SDC charges was completed by Deb Galardi of Galardi Consulting, LLC.

NMC 13.05.040 and 13.05.050 note that changes to the fee and methodology shall be adopted by the City Council in a resolution. Oregon Revised Statutes dictate that the methodology for establishing or modifying improvement or reimbursement fees shall be available for public inspection. The local government must maintain a list of persons who have made a written request for notification prior to the adoption or amendment of such fees. The notification requirements for changes to the fees that represent a modification to the methodology are 90-day written notice prior to first public hearing, with the SDC methodology available for review 60 days prior to public hearing. On February 1, 2017, a notification (Attachment B) was sent to the parties noted in Attachment C and was posted on the City website. The methodology report was made available on the City's webpage on March 2, 2017.

Oregon Revised Statutes (ORS) 223.309 provides that a local government may update the SDC project list at any time (separate from the methodology). If the SDC will be increased by a proposed modification to the list, then notice to interested parties shall be provided 30 days prior to adoption of the revised list. A public hearing on the change is required only if the City receives a request in writing within 7 days of the scheduled adoption.

Staff did meet with the Home Builder's Association and there were no concerns raised on this proposal.

FISCAL IMPACT:

The proposed SDCs for potable water will be decreasing by approximately \$1352 for a residential ¾" meter installation. This is mainly due to the removal of the need for a new water treatment plant and large storage reservoirs. The pipe sizing necessary based on the revised hydraulic modeling has also decreased. A non-potable water SDC is being implemented also to address the necessary capital improvements to advance that system as directed by the Council.

The proposed SDC Schedule is below:

<i>SDC Schedule</i>				
Meter Size	SDCr	SDCi	Potable SDC	Factor ¾"
Potable				
¾"	\$2,550	\$2,346	\$4,896	1.0
1"	\$4,335	\$3,989	\$8,323	1.7
1 ¼"	\$6,375	\$5,866	\$12,240	2.5
1 ½"	\$8,415	\$7,743	\$16,157	3.3
2"	\$13,514	\$12,435	\$25,949	5.3
3"	\$25,499	\$23,463	\$48,961	10.0
4"	\$42,583	\$39,183	\$81,765	16.7
6"	\$84,145	\$77,427	\$161,572	33.0
8"	\$135,142	\$124,352	\$259,494	53.0
10"	\$195,489	\$179,880	\$375,368	76.7
NonPotable				
¾"	\$2,183	\$1,033	\$3,216	1.0
1"	\$3,712	\$1,755	\$5,467	1.7
1 ¼"	\$5,458	\$2,581	\$8,040	2.5
1 ½"	\$7,205	\$3,408	\$10,613	3.3
2"	\$11,572	\$5,473	\$17,044	5.3
3"	\$21,833	\$10,326	\$32,159	10.0
4"	\$36,461	\$17,244	\$53,706	16.7
6"	\$72,049	\$34,076	\$106,125	33.0
8"	\$115,716	\$54,728	\$170,443	53.0
10"	\$167,387	\$79,166	\$246,553	76.7

A RESOLUTION TO APPROVE THE WATER SYSTEM DEVELOPMENT CHARGE METHODOLOGY AND DECREASE THE CHARGE

RECITALS:

1. System Development Charges (SDCs) are fees assessed or collected at the time of increased usage of a capital improvement, at the time of issuance of a development permit or building permit, or at the time of connection to the capital improvement. The purpose of the SDC is to impose a portion of the cost of capital improvements upon those developments that create the need for or increase the demands on capital improvements.
2. The City Council is conducting a hearing tonight to adopt the Water Master Plan dated May 2017. This served as the basis for the updated SDC project list. This project list has been incorporated into the methodology included as Attachment A (Table 3).
3. As a part of the Water Master Plan Update, the SDC methodology and fees were also evaluated and updated. The Water SDC methodology report and proposed fee schedule is included in Attachment A.
4. On February 1, 2017, notification was sent to interested parties and was posted on the website.
5. The methodology report was made available on the City's webpage on March 2, 2017.

THE CITY OF NEWBERG RESOLVES AS FOLLOWS:

1. The City Council approves the water SDC schedule as follows:

Water SDC Schedule

Meter Size	SDCr	SDCi	Potable SDC	Factor 3/4"
Potable				
3/4"	\$2,550	\$2,346	\$4,896	1.0
1"	\$4,335	\$3,989	\$8,323	1.7
1 1/4	\$6,375	\$5,866	\$12,240	2.5
1 1/2"	\$8,415	\$7,743	\$16,157	3.3
2"	\$13,514	\$12,435	\$25,949	5.3
3"	\$25,499	\$23,463	\$48,961	10.0
4"	\$42,583	\$39,183	\$81,765	16.7
6"	\$84,145	\$77,427	\$161,572	33.0
8"	\$135,142	\$124,352	\$259,494	53.0
10"	\$195,489	\$179,880	\$375,368	76.7
NonPotable				
3/4"	\$2,183	\$1,033	\$3,216	1.0
1"	\$3,712	\$1,755	\$5,467	1.7
1 1/4	\$5,458	\$2,581	\$8,040	2.5

1 1/2"	\$7,205	\$3,408	\$10,613	3.3
2"	\$11,572	\$5,473	\$17,044	5.3
3"	\$21,833	\$10,326	\$32,159	10.0
4"	\$36,461	\$17,244	\$53,706	16.7
6"	\$72,049	\$34,076	\$106,125	33.0
8"	\$115,716	\$54,728	\$170,443	53.0
10"	\$167,387	\$79,166	\$246,553	76.7

2. The system development charges will be effective on any permit application not yet issued.

➤ **EFFECTIVE DATE** of this resolution is the day after the adoption date, which is: June 6, 2017.

ADOPTED by the City Council of the City of Newberg, Oregon, this 5th day of June, 2017.

Sue Ryan, City Recorder

ATTEST by the Mayor this 8th day of June, 2017.

Bob Andrews, Mayor

Methodology Report

Water System Development Charges

Prepared For
City of Newberg

February 22, 2017



Introduction

Oregon legislation establishes guidelines for the calculation of system development charges (SDCs). Within these guidelines, local governments have latitude in selecting technical approaches and establishing policies related to the development and administration of SDCs. A discussion of this legislation follows, along with the methodology for calculating updated water SDCs for the City of Newberg (the City) based on the recently completed Water System Master Plan (Murray Smith & Associates).

SDC Legislation in Oregon

In the 1989 Oregon state legislative session, a bill was passed that created a uniform framework for the imposition of SDCs statewide. This legislation (Oregon Revised Statute [ORS] 223.297-223.314), which became effective on July 1, 1991, (with subsequent amendments), authorizes local governments to assess SDCs for the following types of capital improvements:

- Drainage and flood control
- Water supply, treatment, and distribution
- Wastewater collection, transmission, treatment, and disposal
- Transportation
- Parks and recreation

The legislation provides guidelines on the calculation and modification of SDCs, accounting requirements to track SDC revenues, and the adoption of administrative review procedures.

SDC Structure

SDCs can be developed around two concepts: (1) a reimbursement fee, and (2) an improvement fee, or a combination of the two. The **reimbursement fee** is based on the costs of capital improvements *already constructed or under construction*. The legislation requires the reimbursement fee to be established or modified by an ordinance or resolution setting forth the methodology used to calculate the charge. This methodology must consider the cost of existing facilities, prior contributions by existing users, gifts or grants from federal or state government or private persons, the value of unused capacity available for future system users, rate-making principles employed to finance the capital improvements, and other relevant factors. The objective of the methodology must be that future system users contribute no more than an equitable share of the capital costs of *existing* facilities. Reimbursement fee revenues are restricted only to capital expenditures for the specific system with which they are assessed, including debt service.

The methodology for establishing or modifying an **improvement fee** must be specified in an ordinance or resolution that demonstrates consideration of the *projected costs of capital improvements identified in an adopted plan and list*, that are needed to increase capacity in the system to meet the demands of new development. Revenues generated through improvement fees are dedicated to capacity-increasing capital improvements or the repayment of

debt on such improvements. An increase in capacity is established if an improvement increases the level of service provided by existing facilities or provides new facilities.

In many systems, growth needs will be met through a combination of existing available capacity and future capacity-enhancing improvements. Therefore, the law provides for a **combined fee** (reimbursement plus improvement component). However, when such a fee is developed, the methodology must demonstrate that the charge is not based on providing the same system capacity.

Credits

The legislation requires that a credit be provided against the improvement fee for the construction of “qualified public improvements.” Qualified public improvements are improvements that are required as a condition of development approval, identified in the system’s capital improvement program, and either (1) not located on or contiguous to the property being developed, or (2) located in whole or in part, on or contiguous to, property that is the subject of development approval and required to be built larger or with greater capacity than is necessary for the particular development project to which the improvement fee is related.

Update and Review

The methodology for establishing or modifying improvement or reimbursement fees shall be available for public inspection. The local government must maintain a list of persons who have made a written request for notification prior to the adoption or amendment of such fees. The legislation includes provisions regarding notification of hearings and filing for reviews. The notification requirements for changes to the fees that represent a modification to the methodology are 90-day written notice prior to first public hearing, with the SDC methodology available for review 60 days prior to public hearing.

Other Provisions

Other provisions of the legislation require:

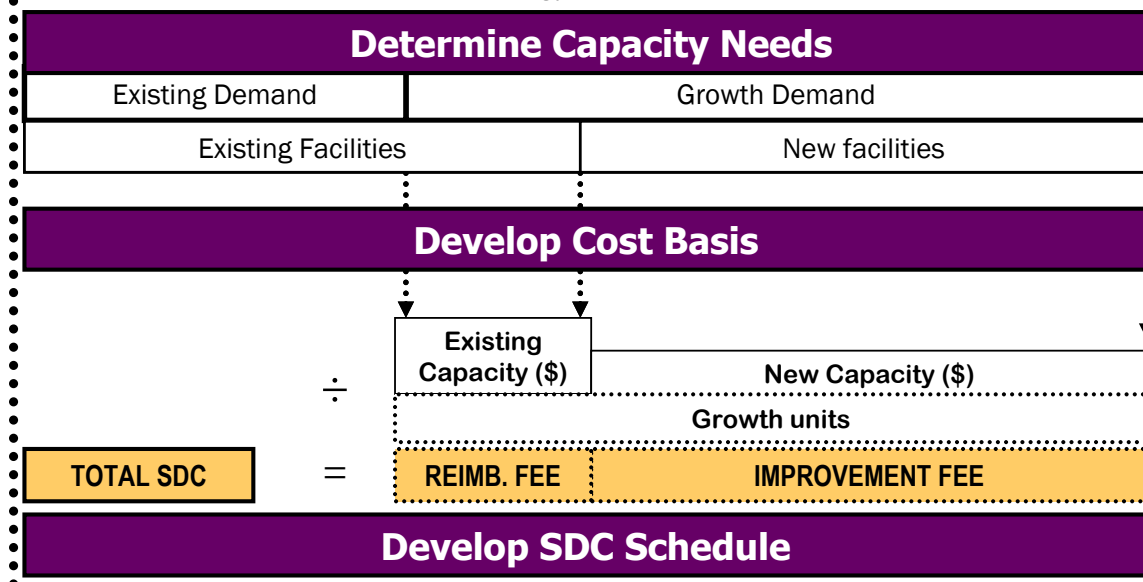
- Preparation of a capital improvement program (CIP) or comparable plan (prior to the establishment of a SDC), that includes a list of the improvements that the jurisdiction intends to fund with improvement fee revenues and the estimated timing, cost, and eligible portion of each improvement.
- Deposit of SDC revenues into dedicated accounts and annual accounting of revenues and expenditures, including a list of the amount spent on each project funded, in whole or in part, by SDC revenues.
- Creation of an administrative appeals procedure, in accordance with the legislation, whereby a citizen or other interested party may challenge an expenditure of SDC revenues.

The provisions of the legislation are invalidated if they are construed to impair the local government’s bond obligations or the ability of the local government to issue new bonds or other financing.

Methodology Overview

The general methodology used to calculate water SDCs in Newberg is illustrated in **Figure 1**. It begins with an analysis of system planning and design criteria to determine growth's capacity needs, and how they will be met through existing system available capacity and capacity expansion. Then, the capacity to serve growth is valued to determine the "cost basis" for the SDCs, which is then spread over the total growth capacity units to determine the system wide unit costs of capacity. The final step is to determine the SDC schedule, which identifies how different developments will be charged, based on their estimated capacity requirements.

Figure 1 – Overview of SDC Methodology



Water SDC Methodology

This section presents the updated water system development charge (SDC) analysis, based on the City's recently completed Water System Master Plan (Master Plan).

Determine Capacity Needs

Table 1 shows the planning assumptions for the water system as determined by the Master Plan. Capacity requirements are generally evaluated based on the following system design criteria:

- Maximum Day Demand (MDD) -- The highest daily recorded rate of water production in a year. Used for allocating source, pumping and delivery facilities.
- Storage Requirements -- Storage facilities provide three functions: operational (or equalization) storage, and storage for emergency and fire protection needs. Used for allocating storage facility costs.

Table 1
City of Newberg
Water System Development Charge Analysis
Planning Data

	MDD (mgd) ¹	Storage (mg)
Capacity Requirements		
Current		
System	4.90	
Zone 1	4.86	5.87
High Elevation Zones	0.04	0.20
Future Requirements		
System	8.77	
Zone 1	7.35	8.8
High Elevation Zones	1.42	1.7
Growth Allocations		
System Growth	3.87	
Share of Future Requirements	44%	
Zone 1 Growth	2.49	2.93
Share of Future Requirements	34%	33%
High Elevation Growth	1.38	1.5
Share of Future Requirements	97%	88%

¹ Includes potable and non-potable systems

As shown in Table 1, system MDD is currently about 4.9 million gallons per day (mgd), including both potable and non-potable use. Growth in MDD is projected to be about 3.9 mgd over the study period. For supply and delivery purposes, the potable and non-potable

systems are evaluated on a combined basis, as collectively the systems will be used to meet future MDD.

Storage requirements are about 5.6 million gallons (mg) currently, and are limited to the potable system. Future storage requirements are expected to be 8.8 mg in Zone 1, and 1.7 mg in Zone 2. Pumping and storage requirements are evaluated separately for each zone.

Develop Cost Basis

The capacity needed to serve new development will be met through a combination of existing available system capacity and additional capacity from planned system improvements. The reimbursement fee is intended to recover the costs associated with the growth-related capacity in the existing system; the improvement fee is based on the costs of capacity-increasing future improvements needed to meet the demands of growth. The value of capacity needed to serve growth in aggregate within the planning period, adjusted for grants and contributions used to fund facilities, is referred to as the “cost basis”.

Reimbursement Fee

Table 2 shows the reimbursement fee cost basis calculations. The reimbursement fee cost basis reflects the growth share of existing system assets of June 30, 2016. As shown in Table 2, the value of the existing water system (based on original purchase cost) is almost \$44 million. When developer contributions are deducted, the City’s historical investment in water system facilities totals about \$39 million (excluding vehicles and minor equipment costs).

The growth share for each asset type is based on the planning data provided in Table 1. The existing supply, storage, and delivery system facilities all have capacity that will be utilized by future growth, and therefore the allocations are based on growth’s share of future demands. As shown in Table 1, growth share of future MDD (used to allocate supply and delivery costs) is 44 percent, and storage (based on Zone 1 requirements) is 33 percent. Support facilities are allocated 20 percent to future growth, based on the City’s estimates. The reimbursement fee cost basis excludes any assets (like the sodium hypochlorite equipment) that will be replaced by planned capital improvements. As shown in Table 2, the reimbursement fee cost basis totals \$16.3 million.

Table 2

City of Newberg
 Water System Development Charge Analysis
Reimbursement Fee Cost Basis

Description	Original	City	Growth Share	
	Cost	Cost	%	\$
Supply				
Wells	\$3,762,294	\$3,762,294	44%	\$1,660,214
Treatment	\$9,970,901	\$9,970,901	44%	\$4,399,930
Sodium Hypochlorite Equipment	\$167,464	\$167,464	0%	\$0
Springs	\$52,059	\$52,059	44%	\$22,972
Effluent Re-use	\$2,319,652	\$2,319,652	44%	\$1,023,609
Subtotal	\$16,272,370	\$16,272,370		\$7,106,726
Storage				
Corral Creek	\$3,573,002	\$3,573,002	33%	\$1,189,647
North Valley Rd. Reservoir	\$1,939,871	\$1,939,871	33%	\$645,889
Reservoir 1 & 2	\$1,157,019	\$1,157,019	33%	\$385,235
Reservoir 3	\$12,487	\$12,487	33%	\$4,158
East Reservoir	\$320,070	\$320,070	33%	\$106,569
Other	\$43,818	\$43,818	33%	\$14,589
Subtotal	\$7,046,267	\$7,046,267		\$2,346,087
Water Delivery				
Developer	\$4,576,425	\$0	44%	\$0
City Water	\$10,389,944	\$10,389,944	44%	\$4,584,844
Parallel River Line	\$3,191,301	\$3,191,301	44%	\$1,408,248
Water Line N Arterial S Curve	\$1,027,555	\$1,027,555	44%	\$453,436
Effluent Reuse	\$818,636	\$818,636	44%	\$361,245
Subtotal	\$20,003,861	\$15,427,436		\$6,807,774
Support Facilities				
3rd St. Building/Land	\$226,272	\$226,272	20%	\$45,254
2nd St. Parking	\$74,535	\$74,535	20%	\$14,907
Subtotal	\$300,807	\$300,807		\$60,161
Total	\$43,623,305	\$39,046,880		\$16,320,748

Source: City Fixed Asset Records as of June 30, 2016

Improvement Fee

Table 3 shows the improvement fee cost basis calculations. As with the existing facility costs, the costs of most planned improvements (from the Master Plan and the City's capital improvement plan) are allocated in proportion to future demands using the percentages shown in Table 1. Pumping and other high elevation water infrastructure improvements are allocated in proportion to the upper zone needs, and existing distribution main upsizing (which is specific to Zone 1) are allocated in proportion to Zone 1 MDD. System extension at Chehalem Drive and Columbia Drive, and in the nonpotable system is needed only for future growth. Support facilities are allocated 20 percent to growth based on the City's analysis.

As shown in Table 3, the total improvement fee cost basis is about \$15 million.

Table 3
City of Newberg
Water System Development Charge Analysis
Improvement Fee Cost Basis (Project List)

ID#	PROJECT	Time Period	Cost Estimate	SDC-Eligible Portion %	\$
	Supply				
	2 mgd redundant supply development	2019-2023	\$3,619,000	44%	\$1,596,982
	Hypochlorite Generator	2018	\$500,000	44%	\$220,639
	Water Rights Review and Reconfiguration	2018	\$25,000	44%	\$11,032
	Subtotal		\$4,144,000		\$1,828,652
	Pumping				
P-1	Bell East Pump Station - Zone 3	2022-2023	\$1,450,000	97%	\$1,409,155
P-2	Bell West Pump Station - Zone 2	2019-2020	\$1,450,000	97%	\$1,409,155
	Subtotal		\$2,900,000		\$2,818,310
	Distribution				
M-1-M-8, M-18	Upsize existing mains; construct new distribution loops to improve fire flow capacity	2018-2022	\$2,202,000	34%	\$745,984
M-9	NE Zimri Dr Zone 3 distribution backbone within UGB	2023	\$346,000	97%	\$336,254
M-19	Chehalem Dr water system extension west and north to Columbia Dr	2018-2019	\$600,000	100%	\$600,000
M-14 & M-15	N College St - N Terrace Street - Bell West P.S. (P-2) - Veritas School	2019-2020	\$433,000	97%	\$420,803
	College Street WL to Mountain View	2018	\$470,000	10%	\$47,000
	Fixed Base Radio Read	2020	\$1,000,000	44%	\$441,277
	Subtotal		\$5,051,000		\$2,591,317
	Future High Elevation Water Infrastructure				
R-1	1.7 MG Bell Road Reservoir - Zone 3	20 Year +	\$2,400,000	88%	\$2,117,647
M-16	Zimri Dr. E transmission main to Bell Rd Reservoir	20 Year +	\$1,847,000	97%	\$1,794,972
M-17	Bell Rd W transmission main - N College Street to Zimri Dr.	20 Year +	\$1,726,000	97%	\$1,677,380
	Subtotal	\$0	\$5,973,000		\$5,589,999
	Planning				
	Seismic Resilience Study	2018	\$150,000	44%	\$66,192
	Water Management & Conservation Plan	2027	\$100,000	44%	\$44,128
	Water System Master Plan update	2027	\$250,000	44%	\$110,319
	SDC Study	2017	\$5,000	100%	\$5,000
	WTP & Bridge Transmission Main Slope Stability Study	2018	\$150,000	44%	\$66,192
	Subtotal		\$655,000		\$291,830
	Other				
	North non-potable water line and Otis Springs pumping improvements	2024-2027	\$1,750,000	100%	\$1,750,000
	Public Works Maintenance Facility Master Plan	2018-2022	\$737,500	20%	\$147,500
	Subtotal		\$2,487,500		\$1,897,500
	Total		\$21,210,500		\$15,017,608

Develop Unit Costs

The unit costs of capacity are determined by dividing the respective cost bases by the system-wide growth-related capacity requirements defined in Table 1. The system-wide unit costs are then multiplied by the capacity requirements per equivalent dwelling unit (EDU) to yield the fees per EDU. Table 3 shows these calculations.

Table 4
City of Newberg
Water System Development Charge
Unit Cost Calculations

	System Component						
	Supply	Storage/ Pumping	Distribution	Upper Elevation	Planning	Support	Total
Reimbursement Cost Basis	\$7,106,726	\$2,346,087	\$6,807,774	\$0	\$0	\$60,161	\$16,320,748
Growth Capacity Req (mgd)	3.9	3.9	3.9			3.9	
Unit Cost	\$1,836,363	\$606,224	\$1,759,115			\$15,546	
Capacity per EDU (mgd)	0.000605	0.000605	0.000605			0.000605	
Reimbursement \$/EDU	\$1,110	\$367	\$1,064	\$0	\$0	\$9	\$2,550
Improvement Cost Basis	\$1,828,652	\$2,818,310	\$4,341,317	\$5,589,999	\$291,830	\$147,500	\$15,017,608
Growth Capacity Req (mgd)	3.9	3.9	3.9	3.9	3.9	3.9	
Unit Cost	\$472,520	\$728,245	\$1,121,787	\$1,444,444	\$75,408	\$38,114	
Capacity per EDU (mgd)	0.000605	0.000605	0.000605	0.000605	0.000605	0.000605	
Improvement \$/EDU	\$286	\$440	\$678	\$873	\$46	\$23	\$2,346

EDU capacity requirements are estimated based on current MDD and the total number of meter equivalents in the system. The base service unit for the water system is a 3/4-inch meter, the standard size for a single family dwelling. The meter equivalents for larger meter sizes represent the equivalent hydraulic capacity relative to a 3/4-inch meter. **Table 5** shows the meter equivalency factors for each meter size.

Based on the existing MDD and meter equivalents, the estimated capacity requirement per EDU is 605 gallons per day (0.000605 mgd). Applying the capacity requirement per EDU by the unit costs of capacity yields reimbursement and improvement costs per EDU of \$2,550 and \$2,346, respectively as shown in Table 4.

SDC Schedule

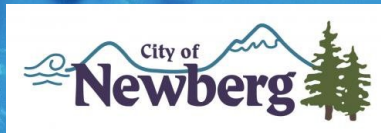
Table 5 shows the SDC schedule for each meter size for potable and non-potable customers. The potable SDCs include the full cost per EDU shown in Table 4, while the non-potable SDCs exclude the costs of storage and upper elevation pumping and other improvements. The total SDC per EDU for potable and non-potable are \$4,896 and \$3,216, respectively. The SDCs for larger meter sizes are scaled up based on the hydraulic capacity factors.

Table 5
City of Newberg
Water System Development Charge Analysis
SDC Schedule

Meter Size	SDCr	SDCi	Potable SDC	Factor 3/4"
Potable				
3/4"	\$2,550	\$2,346	\$4,896	1.0
1"	\$4,335	\$3,989	\$8,323	1.7
1 1/4"	\$6,375	\$5,866	\$12,240	2.5
1 1/2"	\$8,415	\$7,743	\$16,157	3.3
2"	\$13,514	\$12,435	\$25,949	5.3
3"	\$25,499	\$23,463	\$48,961	10.0
4"	\$42,583	\$39,183	\$81,765	16.7
6"	\$84,145	\$77,427	\$161,572	33.0
8"	\$135,142	\$124,352	\$259,494	53.0
10"	\$195,489	\$179,880	\$375,368	76.7
NonPotable				
3/4"	\$2,183	\$1,033	\$3,216	1.0
1"	\$3,712	\$1,755	\$5,467	1.7
1 1/4"	\$5,458	\$2,581	\$8,040	2.5
1 1/2"	\$7,205	\$3,408	\$10,613	3.3
2"	\$11,572	\$5,473	\$17,044	5.3
3"	\$21,833	\$10,326	\$32,159	10.0
4"	\$36,461	\$17,244	\$53,706	16.7
6"	\$72,049	\$34,076	\$106,125	33.0
8"	\$115,716	\$54,728	\$170,443	53.0
10"	\$167,387	\$79,166	\$246,553	76.7

Water SDC Methodology Public Hearing

June 5, 2017



Presented by:
Deb Galardi

Presentation Overview

- SDC Component/Costs
- SDC Schedule
- Summary of Findings

SDC Components/Costs

Reimbursement Fee

- Costs of **existing or in-process** facilities
- Related to **available capacity**
- Exclusive of grants & contributions

Improvement Fee

- Projects included on an **adopted list**
- Related to **capacity for growth**

Compliance Costs

- SDC methodology development
- Master planning

SDCs Per Equivalent Dwelling Unit

Description	Combined Cost	Unit Cost ¹	SDC per EDU ²	
			Potable	Nonpotable
Supply	\$8,935,378	\$2,308,883	\$1,396	\$1,396
Pump & Storage	\$5,164,396	\$1,334,469	\$807 ^r	\$0
Delivery	\$11,149,091	\$2,880,902	\$1,742	\$1,742
Upper Elevation Infrastructure	\$5,589,999	\$1,444,444	\$873	\$0
Planning	\$291,830	\$75,408	\$46	\$46
Other	\$207,661	\$53,659	\$32	\$32
Total	\$31,338,356	\$8,097,766	\$4,896	\$3,216

¹ Cost divided by 3.9 mgd

² Unit cost X 0.000605 mgd

EDU = Equivalent Dwelling Unit

SDC Schedule

Meter Size	Potable SDC	Nonpotable SDC	Factor 3/4"
3/4"	\$4,896	\$3,216	1.0
1"	\$8,323	\$5,467	1.7
1 1/4"	\$12,240	\$8,040	2.5
1 1/2"	\$16,157	\$10,613	3.3
2"	\$25,949	\$17,044	5.3
3"	\$48,961	\$32,159	10.0
4"	\$81,765	\$53,706	16.7
6"	\$161,572	\$106,125	33.0
8"	\$259,494	\$170,443	53.0

Summary of Findings

- Revised fee of \$4,896 for a ¾" meter is \$1,352 less than the current SDC (for potable)
 - Revised project list excludes new water treatment plant and large storage reservoirs
- A new SDC of \$3,216 per EDU proposed for non-potable system
 - Excludes pumping, storage and upper elevation costs

Questions



REQUEST FOR COUNCIL ACTION

DATE ACTION REQUESTED: June 5, 2017

Order ____ No.	Ordinance ____ No.	Resolution ____ No.	Motion ____	Information <u>XX</u>
-------------------	-----------------------	------------------------	-------------	-----------------------

SUBJECT: Newberg 2030 Project Update – Tasks 2 and 3

Contact Person (Preparer) for this
Item: Doug Rux, Director
Dept.: Community Development
File No.: GR-15-001

RECOMMENDATION:

Information only.

EXECUTIVE SUMMARY:

The Community Development Department, Planning Division, received a Technical Assistance Grant from the Department of Land Conservation and Development in the amount of \$30,000.00 to work on a future planning project. The project has been named “Newberg 2030”, because the future planning analysis largely revolves around the new Simplified Urban Growth Boundary (UGB) Method rules which create a 14-year UGB versus a 20-year UGB from the “old Traditional” rules. The project consists of four primary tasks:

1. Amending and establishing goals and policies to guide future planning efforts;
2. An updated dynamic buildable lands inventory the city can rely upon for future planning;
3. An evaluation of potential UGB study areas, based on the new Division 38 requirements (Simplified UGB Method); and
4. Creation of an action plan and implementation policies to refresh and reinforce the city’s economic development objectives and opportunities, achieve the identified residential density mix to satisfy the UGB streamlining rules, identify strategies to achieve identified community goals and objectives, and identify actions necessary to move forward with the analysis produced in Tasks 3 and 4 of this project.

On October 3, 2016 the City Council was provided an update on public input received on 10 questions aimed at getting feedback around community values. The approach was to ask one question per week, both in physical form on posters around town where citizens can write directly on the posters, and electronically on social media. The posters were placed in five locations: City Hall, Cultural Center, Library, Social Goods Market, and Friendsview Retirement Community.

On February 6, 2017 the City Council was provided an update on all of the Task 1 community outreach activities and responses along with potential Newberg Comprehensive Plan modifications.

Tasks 2 and 3 evaluated the buildable lands and established a study area boundary. The Technical Advisory Committee met on December 19, 2016 and March 21, 2017 to review and provide feedback on the Buildable Lands Inventory (BLI) and Study Area Boundary. The Citizens Planning Committee met on December 19, 2016 and March 21, 2017 on the same topic.

Highlights of the BLI include:

Residential – 2,192 acres, 1,061 improved acres, 179 constrained acres, 952 vacant acres.

318

Commercial Land – 381 acres, 225 developed acres, 10 constrained acres and 146 vacant acres.

Industrial Land – 479 acres, 326 developed acres, 64 constrained acres and 89 vacant acres.

Lands Outside the UGB – Lands within 1 mile to 1.5 miles, 527 acres in Urban Reserves, 10,109 acres outside of Urban Reserves. Of the 10,109 acres 4,337 acres are exception areas and 5,772 acres are resource lands.

Identified Issues with Division 38 Simplified UGB Method:

1. Standardization of Data Sources
2. Split Plan Designations
3. Deduction of Constraints
4. Public Land with Residential Plan Designations
5. Developed Employment Land
6. Partially Vacant Employment Land
7. Determination of Slopes Using Contour Data
8. Errors/Anomalies/Inconsistencies in County Assessment Data
9. Partially Vacant Multi-family Residential Land
10. Condo Common Areas
11. Classification of Lands In the UGB Study Area

A comparison of the Simplified UGB Method vs Traditional BLI Method. This analysis was done to compare the two methods for a Buildable Lands Inventory. Based on data the Simplified UGB Method identified 386 acres of additional buildable land verses the Traditional Method. This is broken out as:

1. Simplified Method - 952 acres buildable residential
2. Traditional Method – 625 acres buildable residential
3. Simplified Method – 146 acres buildable commercial
4. Traditional Method – 126 acres buildable commercial
5. Simplified Method – 89 acres buildable industrial
6. Traditional Method – 50 acres buildable industrial

The Buildable Lands Inventory and Study Area Boundary were submitted to the Department of Land Conservation and Development on March 29, 2017 meeting our contract deadline for these tasks.

FISCAL IMPACT:

Not applicable.

STRATEGIC ASSESSMENT (RELATE TO COUNCIL PRIORITIES FROM MARCH 2016):

Not applicable.

Attachments: 1. Newberg Buildable Lands Inventory and Study Area Boundary Final Report
2. Memorandum Comparison of Division 38 and Traditional BLI Methods
3. Buildable Lands Inventory and Study Area Boundary Power Point
4. DLCD Memorandum 5-18-17

Newberg Buildable Lands Inventory

March 2017

Prepared for:
City of Newberg

FINAL REPORT

ECONorthwest
ECONOMICS • FINANCE • PLANNING

KOIN Center
222 SW Columbia Street
Suite 1600
Portland, OR 97201
503.222.6060

ECONorthwest prepared this report for the City of Newberg. Newberg provided key geographic information system (GIS) data sets necessary for the inventory. All analysis conducted by ECONorthwest.

City of Newberg

Douglas Rux, Community Development Director

Consulting Staff

Bob Parker, AICP, Project Director, ECONorthwest

Beth Goodman, Project Manager, ECONorthwest

For over 40 years ECONorthwest has helped its clients make sound decisions based on rigorous economic, planning, and financial analysis. For more information about ECONorthwest: www.econw.com. For more information about this report, please contact:

Douglas Rux
Community Development Director
City of Newberg
414 E. First Street
Newberg, OR, 97132
Phone: 503-537-1212
Doug.Rux@newbergoregon.gov

Robert Parker
ECONorthwest
222 SW Columbia, Suite 1600
Portland, OR 97201
503-222-6060
parker@econw.com

Table of Contents

1. INTRODUCTION	1
2. METHODS	3
2.1 LAND INSIDE THE UGB	3
3. NEWBERG BUILDABLE LAND INVENTORY	9
3.1 OVERVIEW	9
3.2 LANDS IN THE NEWBERG UGB	13
3.3 UGB STUDY AREA (OUTSIDE EXISTING UGB)	25
4. CONCLUSIONS AND IMPLICATIONS	37
4.1 ISSUES WITH THE DIVISION 38 METHODS	37
4.2 SUMMARY	42
APPENDIX A: DATA SOURCES AND STUDY AREA DETERMINATION	43
APPENDIX B: DIVISION 38 GUIDELINES FOR BUILDABLE LAND INVENTORIES	50

This page intentionally blank

1. Introduction

The City of Newberg (City) is preparing to evaluate the sufficiency of lands within its Urban Growth Boundary (UGB). That process has two steps: (1) documentation of land needed for housing, employment and public facilities; and (2) documentation of land supply. Because the City is preparing for a UGB amendment, lands outside the UGB must also be inventoried. Newberg may pursue the boundary amendment in the second half of 2017 or first half of 2018 using the Division 38 (OAR 660-038) simplified urban growth boundary method. As an initial step in the process, the City contracted ECONorthwest to prepare a buildable lands inventory (BLI) that complies with applicable state statutes and administrative rules through a Technical Assistance Grant from the Oregon Department of Land Conservation and Development (DLCD) as part of a pre-UGB evaluation process as part of Division 38 (OAR 660-038) requirements.

The requirements for establishment of a UGB are defined in Statewide Planning Goal 14. The Goal 14 Oregon Administrative Rule (OAR 660-024) provides specific guidance with respect to the adoption and amendment of UGBs. In 2015, however, the Land Conservation and Development Commission (LCDC) developed a new administrative rule that created a simplified pathway for boundary reviews, which is codified as OAR 660-038 (Simplified Urban Growth Boundary Method). At this time through the DLCD grant, Newberg is evaluating the Division 38 simplified method subject to the analysis of the BLI of and direction provided by the Newberg City Council. That method provides detailed guidance on how buildable land inventories must be completed.

Thus, the legal requirements that govern the BLI for the City of Newberg are defined in OAR 660-038. Relevant sections include:

- **660-038-0060 - Buildable Lands Inventory (BLI) for Residential Land within the UGB.** A city must determine the supply and development capacity of lands within its UGB by conducting a buildable lands inventory (BLI) as provided in this rule.
- **660-038-0070 - Adjust Residential Lands Inventory to Account for Constrained Lands.** A city must adjust the inventory of residential lands prepared under OAR 660-038-0060 to account for constrained lands using this rule.
- **660-038-0120 - Inventory of Buildable Employment Land within the UGB.** A city must determine the supply and development capacity of employment lands within its UGB at the time of initiation by conducting a buildable lands inventory (BLI) for employment land as provided in this rule and OAR 660-038-00130.
- **660-038-0130 - Adjust Employment Buildable Land Inventory to Account for Constrained Lands.** A city must adjust the employment buildable lands inventory determined under OAR 660-038-0120 to account for constrained lands using this rule.
- **660-038-0160. Establishment of Study Area to Evaluate Land for Inclusion in the UGB.** Cities shall comply with this rule and OAR 660-038-0170 when determining which lands

to include within the UGB in response to a deficit of land to meet long-term needs determined under OAR 660-038-0080, 660-038-0150, or both.

- **660-038-0170 - Evaluation of Land in the Study Area for Inclusion in the UGB; Priorities.** A city considering a UGB amendment must decide which land to add to the UGB by evaluating all land in the study area determined under OAR 660-038-0160.

In short, the Division 38 rule creates several categories of land that is broadly divided between land within the current UGB and land in the required UGB study area. The rules provide specific guidance on how to address residential and employment lands within the UGB (but not public lands). The rules also provide guidance for evaluation of lands in the UGB study areas. In simple terms, the BLI for both residential and commercial and industrial lands consists of several common steps:

1. Determining the UGB study area
2. Classifying land into mutually exclusive categories by development status
3. Deducting land with development constraints
4. Developing tabular summaries of lands by classification and plan designation
5. Estimating land holding capacity in terms of dwellings and employees

The process included verification of land classifications (step 2 above; these can be thought of as development status) by City staff through review of draft maps provided by ECO.

This report summarizes the methods ECO proposes to use to conduct the Newberg BLI, including definitions and procedures we used for the classifications. It also includes a list of development constraints and how they are addressed in the buildable land inventory.

2. Methods

The methods for a Division 38 buildable lands inventory are largely defined in the rule. Consistent with Statewide Planning Goal 14, the rule addresses lands inside and outside UGBs in different ways. For land inside the UGB, OAR 660-038-0060 and 0070 describe the methods for residential lands, and OAR 660-038-0110 and 0120 describe the methods for employment lands. The simplified method does not require public land inside the UGB to be inventoried. OAR 660-038-0160 provides guidance for establishing a UGB study area, and OAR 660-038-0170 describes methods for evaluating lands outside the UGB. The relevant sections of the Administrative Rule are included in Appendix A.

The inventory is based on Yamhill County Assessment data that was current as of October 2016. The City provided additional data on plan designation, zoning, building footprints, and some natural hazards. Other data was obtained from the Oregon Geospatial Explorer. A full list of data sets used in the inventory is included in Appendix A.

The remainder of this chapter describes the general steps ECO used to implement the inventory. It is organized around lands inside and outside the UGB.

2.1 Land inside the UGB

The initial steps in the inventory include basic data processing. ECO used the UGB layer provided by the City (which was confirmed consistent with the 2015 boundary on the URA layer from the Oregon Geospatial Data Library) to “clip” tax lots within the UGB. ECO then merged in plan designation data.

Some tax lots clearly had split plan designations. While the rule does not address split plan designations, ECO and the City agreed they were too significant to ignore. For the Newberg BLI, ECO and the Community Development Director reviewed maps and agreed on specific tax lots with split plan designations to split. Any lot with a split over two acres was evaluated; any lot with at least 0.5 acre in a split was split. This included several lots with three plan designations.

Residential Land

Division 38 has specific language for how residential land is inventoried. The general steps are as follows:

1. Assign a density class to each plan designation (OAR 600-038-0060(1). Division 38 requires each parcel be identified as low-, medium-, or high-density residential based on a set of prescribed densities. ECO reviewed the Newberg Comprehensive Plan and discussed it with City staff. Residential lands were coded into Division 38 categories as shown in Exhibit 1.

Table 1. Newberg Plan Designations and Division 38 Density Categories

Plan Designation	Density Class
LDR	LDR
LDR/1A	LDR
LDR/SP	LDR
LDR-6.6	LDR
SD/LDR	LDR
MDR	MDR
MDR/RD	MDR
MDR/SP	MDR
MIX/SP	MDR
SD/MRR	MDR
HDR	HDR
HDR/SP	HDR

2. Assign improvement (development status). Division 38 has thresholds for determination of improvement status—Vacant, Partially Vacant, Developed. The city must identify all vacant lots and parcels with a residential comprehensive plan designation as described in OAR 660-038-0060((2).
 - i. *A city shall assume that a lot or parcel is vacant if it is at least 3,000 square feet with a real market improvement value of less than \$10,000.*
 - ii. *(3) The city must identify all partially vacant lots and parcels with a residential comprehensive plan designation, as follows: (a) For lots and parcels at least one-half acre in size that contain a single-family residence, the city must subtract one-quarter acre for the residence, and count the remainder of the lot or parcel as vacant land*
 - iii. *(b) For lots and parcels at least one-half acre in size that contain more than one single-family residence, multiple-family residences, non-residential uses, or ancillary uses such as parking areas and recreational facilities, the city must identify vacant areas using an orthophoto or other map of comparable geometric accuracy. For the purposes of this identification, all publicly owned park land shall be considered developed. If the vacant area is at least one-quarter acre, the city shall consider that portion of the lot or parcel to be vacant land.*
 - iv. *All other residential is classified as “Developed.”*
3. Deduct constraints. OAR 660-0380-0070 describes the methods:
 - (a) Floodways and water bodies.
 - (b) Other lands within the Special Flood Hazard Area as identified on the applicable Flood Insurance Rate Map;
 - (c) Lands within the tsunami inundation zone established pursuant to ORS 455.446;
 - (d) Contiguous lands of at least one acre with slopes greater than 25 percent.

- (e) Lands subject to development restrictions as a result of acknowledged comprehensive plan or land use regulations to implement Statewide Planning Goals 5, 6, or 7, and
- (f) Lands subject to development prohibitions, natural resource protections, or both in acknowledged comprehensive plan or land use regulations to implement Statewide Planning Goals 15, 16, 17, or 18.

The rule provides guidance for how much land can be deducted for each constraint.

Constraint	Deduction
(a) Floodways and water bodies.	100%
(b) Other lands within the Special Flood Hazard Area as identified on the applicable Flood Insurance Rate Map;	100%
(c) Lands within the tsunami inundation zone established pursuant to ORS 455.446;	no reduction unless the acknowledged comprehensive plan or land use regulations prohibits or reduces residential development
(d) Contiguous lands of at least one acre with slopes greater than 25 percent.	For lands with slopes that are greater than 25 percent: a 100 percent reduction. However, if the lot or parcel includes land with slopes less than 25 percent, the reduction applies only to the land with slopes greater than 25 percent.
(e) Lands subject to development restrictions as a result of acknowledged comprehensive plan or land use regulations to implement Statewide Planning Goals 5, 6, or 7, and	a reduction to the maximum level of development authorized by the acknowledged comprehensive plan or land use regulations.
(f) Lands subject to development prohibitions, natural resource protections, or both in acknowledged comprehensive plan or land use regulations to implement Statewide Planning Goals 15, 16, 17, or 18.	a reduction to the maximum level of development authorized by the acknowledged comprehensive plan or land use regulations.

4. Summarize results. This is a standard BLI step—develop maps and tables that summarize the results of the BLI and show the geographic location of lands.

Employment Land

Division 38 has specific language for how residential land is inventoried. The general steps are as follows:

1. Classify land as commercial or industrial. Division 38 requires classification of zoning and plan map districts as “commercial” or “industrial” based on the applicable definitions in OAR 660-038-0010. This step also identifies all employment lands that will be included in the inventory.

2. Assign improvement (development status). The city must identify which lots or parcels are vacant, partially vacant, or developed and calculate the total area of such land using the provisions of OAR 660-038-0120(2):

(a) A city may assume that a lot or parcel is vacant if the real market improvement value is less than \$5,000 or if the real market improvement value is less than or equal to 5 percent of the real market land value.

(b) A city may assume that a lot or parcel is partially vacant if either:

(A) The real market improvement value of the lot or parcel is greater than five percent and less than 40 percent of the real market land value, in which case, the city must assume that 50 percent of the lot or parcel is developed and 50 percent is vacant, or

(B) Based on an orthomap, the lot or parcel is greater than one acre in size and at least one-half acre is not improved.

(c) A city may assume that a lot or parcel is developed if the real market improvement value is greater than or equal to 40 percent of the real market land value.

3. Deduct constraints. OAR 660-0380-0070 describes the methods:

(a) Floodways and water bodies. For the purpose of this subsection, "water bodies" includes:

(A) Rivers; and

(B) Lakes, ponds, sloughs, and coastal waters at least one-half acre in size;

(b) Other lands within the Special Flood Hazard Area as identified on the applicable Flood Insurance Rate Map;

(c) Lands within the tsunami inundation zone established pursuant to ORS 455.446;

(d) Contiguous lands planned and zoned for commercial use of at least one acre with slopes that are greater than 25 percent. For purposes of this rule, slope shall be measured as the increase in elevation divided by the horizontal distance at maximum 10-foot contour intervals;

(e) Contiguous lands planned and zoned for industrial use of at least one acre with slopes that are greater than 10 percent. For purposes of this rule, slope shall be measured as the increase in elevation divided by the horizontal distance at maximum 10-foot contour intervals;

(f) Lands subject to development restrictions as a result of acknowledged comprehensive plan or land use regulations to implement Statewide Planning Goals 5, 6, or 7, and

(f) Lands subject to development prohibitions, natural resource protections, or both, in an acknowledged comprehensive plan or land use regulations that implement Statewide Planning Goals 15, 16, 17, or 18.

The rule provides guidance for how much land can be deducted for each constraint.

Constraint	Deduction
(a) Floodways and water bodies.	a 100 percent reduction.
(b) Other lands within the Special Flood Hazard Area as identified on the applicable Flood Insurance Rate Map;	For other lands within the Special Flood Hazard Area (SFHA) as identified on the applicable Flood Insurance Rate Map (FIRM), either (at the city's option): (A) A 50 percent reduction, or (B) A reduction to the levels required by the acknowledged comprehensive plan or land use regulations.
(c) Lands within the tsunami inundation zone established pursuant to ORS 455.446;	no reduction unless the acknowledged comprehensive plan or land use regulations prohibits or reduces residential development
(d) Contiguous lands planned and zoned for commercial use of at least one acre with slopes that are greater than 25 percent. For purposes of this rule, slope shall be measured as the increase in elevation divided by the horizontal distance at maximum 10-foot contour intervals;	Contiguous lands of at least one acre with slope greater than 25 percent: a 100 percent reduction
(e) Contiguous lands planned and zoned for industrial use of at least one acre with slopes that are greater than 10 percent. For purposes of this rule, slope shall be measured as the increase in elevation divided by the horizontal distance at maximum 10-foot contour intervals;	For lands designated for industrial use, contiguous lands of at least one acre with slope greater than 10 percent: a 100 percent reduction, provided that a lot or parcel with slopes greater than 10 percent that has at least five contiguous acres with slopes less than 10 percent, this authorized reduction does not apply to those areas.
(f) Lands subject to development restrictions as a result of acknowledged comprehensive plan or land use regulations to implement Statewide Planning Goals 5, 6, or 7, and	a reduction to the maximum level of development authorized by the acknowledged comprehensive plan or land use regulations.
(f) Lands subject to development prohibitions, natural resource protections, or both, in an acknowledged comprehensive plan or land use regulations that implement Statewide Planning Goals 15, 16, 17, or 18.	a reduction to the maximum level of development authorized by the acknowledged comprehensive plan or land use regulations.

4. Summarize results. This is a standard BLI step—develop maps and tables that summarize the results of the BLI and show the geographic location of lands.

Defining the UGB Study Area

Division 38 has specific language for how residential land is inventoried. The general steps are as follows—a more detailed description is presented in Appendix B. Division 38 has specific language for how residential land is inventoried. The general steps are as follows:

1. Identify any urban reserves. The ORS 197A.320 and Division 38 priority scheme makes exception lands and urban reserves the same priority.
2. Establish “preliminary” study area. This step involves UGB buffers dependent on population. For Newberg, these were 1 and 1.5 mile buffers. Lands within other UGBs are excluded. We note that we did not exclude constrained lands at this step. Lands across the Willamette River and in the Dundee UGB were excluded.
3. Adjust study area to include 2x need. We could not do this step because the PSU PRC data will not be available until the end of June 2017 because of ORS requirements. This effectively delays Region 3 from using Division 38 fully. For the purpose of this study we assume that the approximately 10,000 acres within the study area will be more than double land need.
4. Exclude land that is impractical to serve. Because we did not know the specific need, we did not make such deductions. The size of the URA and UGB study area suggest that the City should be able to meet a 14-year land need within the study area after making deductions for constraints. Moreover, the serviceability requirements outlined in Division 38 are unclear and untested and cannot be calculated at this initial level of evaluation.

Appendix A describes the methods used to create the study area in detail.

3. Newberg Buildable Land Inventory

This chapter presents the results of the Newberg BLI using the Division 38 methodology. The results are organized into three sections:

1. Overview. This section summarizes basic data about the three areas of interest for this BLI—the UGB, the Urban Reserve Areas, and the UGB study area.
2. Land in the Newberg UGB. This section presents the results of the Division 38 BLI for lands inside the Newberg UGB.
3. Land in the Newberg UGB Study Areas. This section presents results for the UGB Study Area. It includes a summary of land within Newberg’s Urban Reserve Areas (URAs) as well as lands within the UGB study area as determined by the Division 38 rule.

The results are intended to support a potential future boundary amendment process by the City of Newberg.

3.1 Overview

ECO traditionally summarizes basic attributes of study areas in our BLIs. We do this to provide context—how big is the UGB? How many acres are in tax lots? How much land is in roads and water? These statistics deepen our understanding of land use in a UGB.

Table 2 shows that Newberg has 4,476 acres within its UGB. Seventy percent of that land (3,072 acres) is in private tax lots. About 687 acres (15% is in federal, state or local public ownership), and about 717 acres (16%) are in roads or other right-of-ways.

Table 2. Summary of Study Areas

Location/Attribute	Acres
UGB	4,476
Area in Private Tax Lots	3,072
Public Land in Tax Lots	687
Roads/Right-of-Way	717
URA	551
Area in Private Tax Lots	527
Area in Roads	24
Buffer (outside UGB and URA)	
1-mile	4,700
1.5-mile	10,069

Source: Newberg and Yamhill County GIS data;
analysis by ECONorthwest

Table 3 shows area by generalized plan designation in the Newberg UGB. This analysis is from the City Comprehensive Plan map GIS layer and includes areas not in tax lots. Slightly more than half (51%) of land in the City is in a residential plan designation. The actual amount of land in residential designations is higher, as some of the mixed-use land can be used for housing, and a lot of the Springbrook master planned area is designated for residential uses.¹ Lands in the Springbrook master planned area are inventoried consistent with Division 38 standards and are not called out separately in subsequent tables.

Table 3. Area by Generalized Plan Designation, Newberg UGB

Generalized Plan Designation	Percent of	
	Acres	Acres
Commercial	281	6%
Industrial	533	12%
Low Density Residential	1,232	28%
Medium Density Residential	888	20%
High Density Residential	152	3%
Mixed-Use	196	4%
Public	707	16%
Springbrook Master Plan	487	11%
Total	4,475	100%

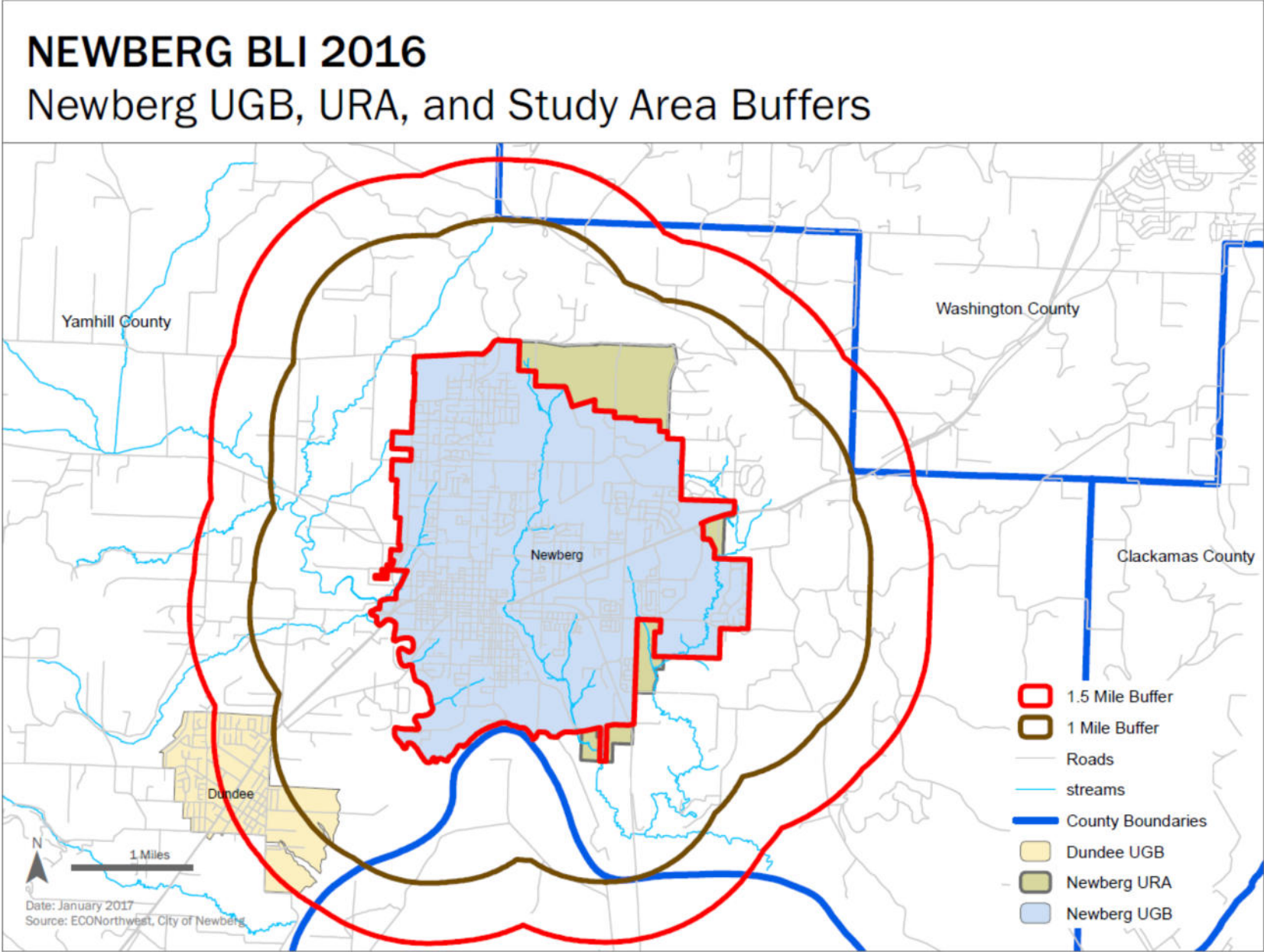
Source: Newberg Comprehensive Plan Designation;
analysis by ECONorthwest

Note: Table 3 includes land in right-of-way, water, and other areas not in tax lots.

Acres are for all land in plan designations, including land in water and right of way; subsequent tables (starting with Table 4) show only land in tax lots.

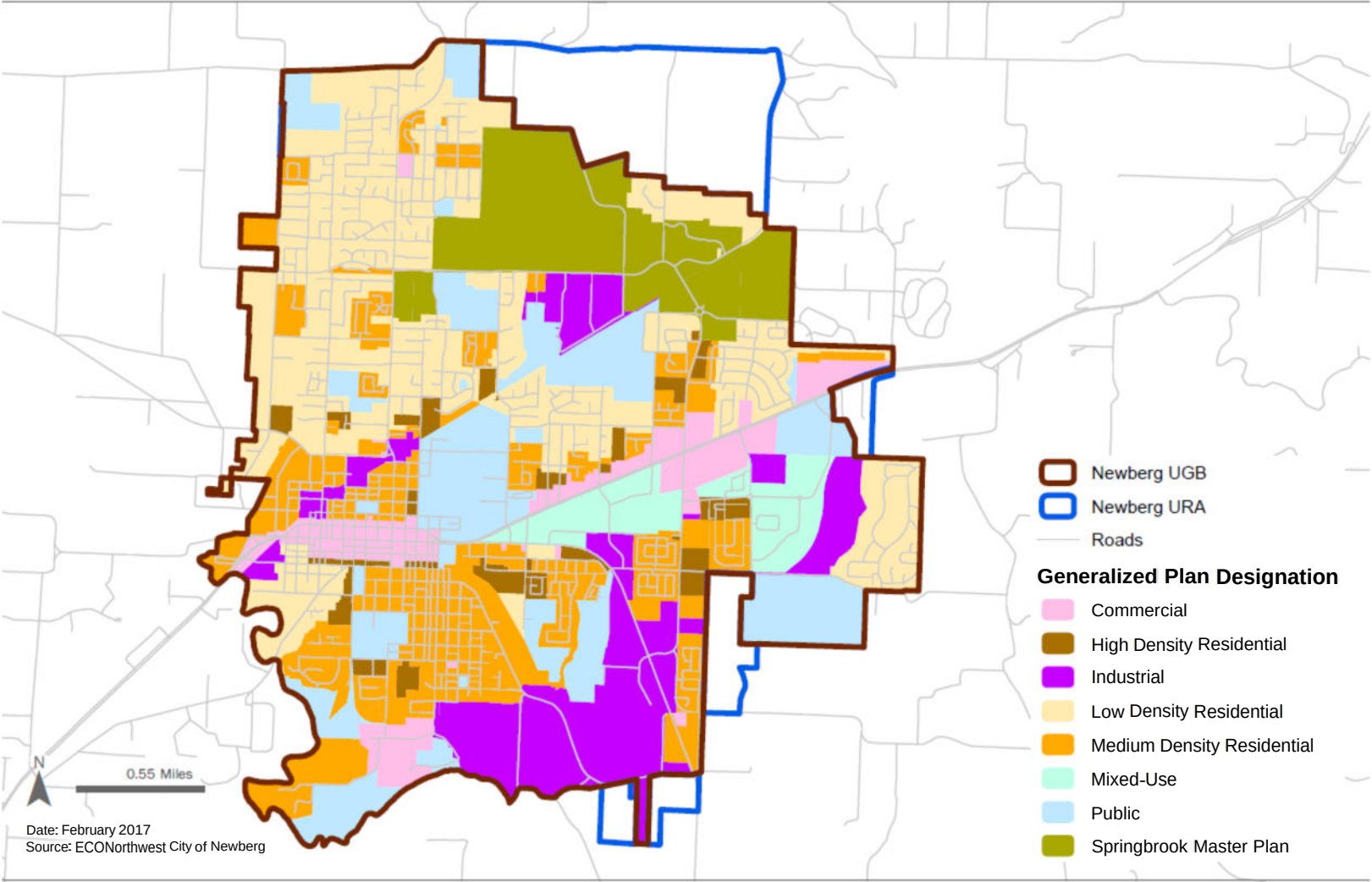
¹ The Springbrook Master Plan area includes land designated for housing, employment, and parks/open space. In the Master Plan, approximately 361 acres are designated for residential uses., 32 acres for employment, 13 acres for commercial uses, and 39 acres for a hospitality district. The remaining land is designated for park or open space.

Map 1. Newberg BLI Study Area Buffers



Map 2. Generalized Plan Designation, Newberg UGB

NEWBERG BLI 2016
Newberg UGB Generalized Plan Designation



3.2 Lands in the Newberg UGB

Every UGB review starts with an inventory of lands within the current boundary. This provides the foundational data to assess capacity for new housing and employment. Because Division 38 uses different methods for residential and employment lands, we divide the results into two sections.

Residential Land

Table 4 and Map 3 show residential land by development status and density. The results show that Newberg has about 2,192 acres in tax lots with residential plan designations. About 60% of all residential land in Newberg is in the low-density (LDR) category, 35% is in the MDR, and 6% in the HDR. Applying the Division 38 rules, about 948 acres were classified as “developed”, 790 as “partially vacant,” and 454 as “vacant.”

Table 4. Residential Land by Division 38 Development Status and Density, Newberg UGB, 2016

Status	Density Category			Total
	LDR	MDR	HDR	
Developed	564	350	33	948
Partially Vacant	448	261	81	790
Vacant	279	162	12	454
Total	1,292	773	127	2,192

Source: Newberg and Yamhill County GIS data; analysis by ECONorthwest

Table 5 shows all residential land by density class and constraint status. The result show 1,061 acres with improvements on developed or partially vacant tax lots. About 952 acres are vacant after deducting constraints consistent with Division 38 rules.

Table 5. Residential Land by Division 38 Density Class and Constraint Status, Newberg UGB, 2016

Div 38 Density Class	Tax Lots	Total Acres	Improved Acres	Constrained Acres	Vacant Acres
LDR	3,339	1,292	634	93	565
MDR	2,800	773	385	77	311
HDR	407	127	42	9	76
Total	6,546	2,192	1,061	179	952

Source: Newberg and Yamhill County GIS data; analysis by ECONorthwest

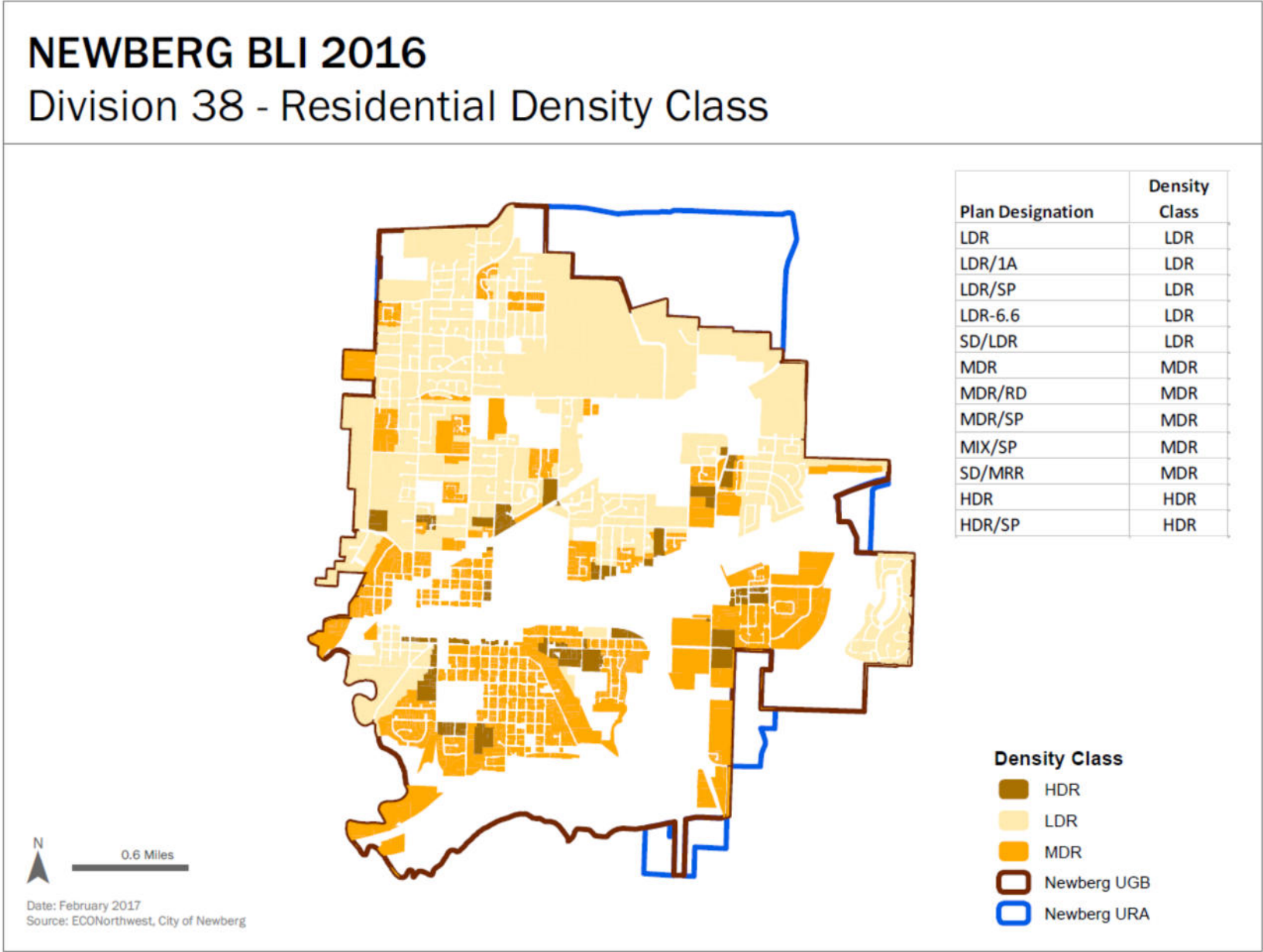
Table 6 shows the vacant area of vacant and partially vacant tax lots. The results show that about 52% of vacant and partially vacant residential tax lots are LDR, 40% MDR, and 8% HDR. With respect to area, 59% of vacant acres are in LDR, 33% in MDR, and 8% in HDR.

Table 6. Vacant and Partially Vacant, Residential Land by Division 38 Density Class-, Newberg UGB, 2016

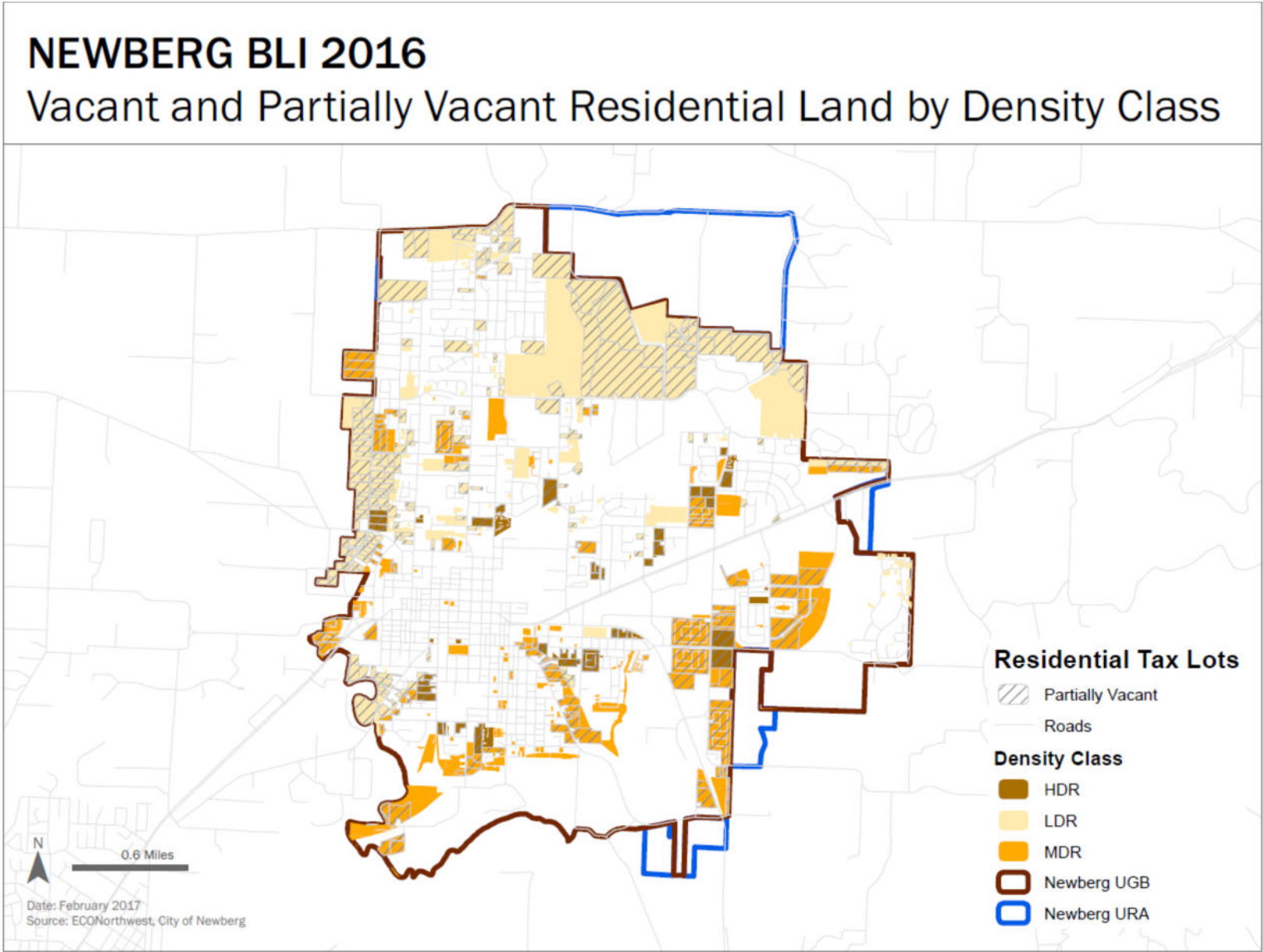
Div 38 Density Class	Tax Lots	Percent of Tax Lots	Vacant Acres	Percent of Vacant Acres
LDR	349	52%	565	59%
MDR	264	40%	311	33%
HDR	52	8%	76	8%
Total	665	100%	952	100%

Map 4 shows vacant and partially vacant residential land by density class. Map 5 adds constraints to the map.

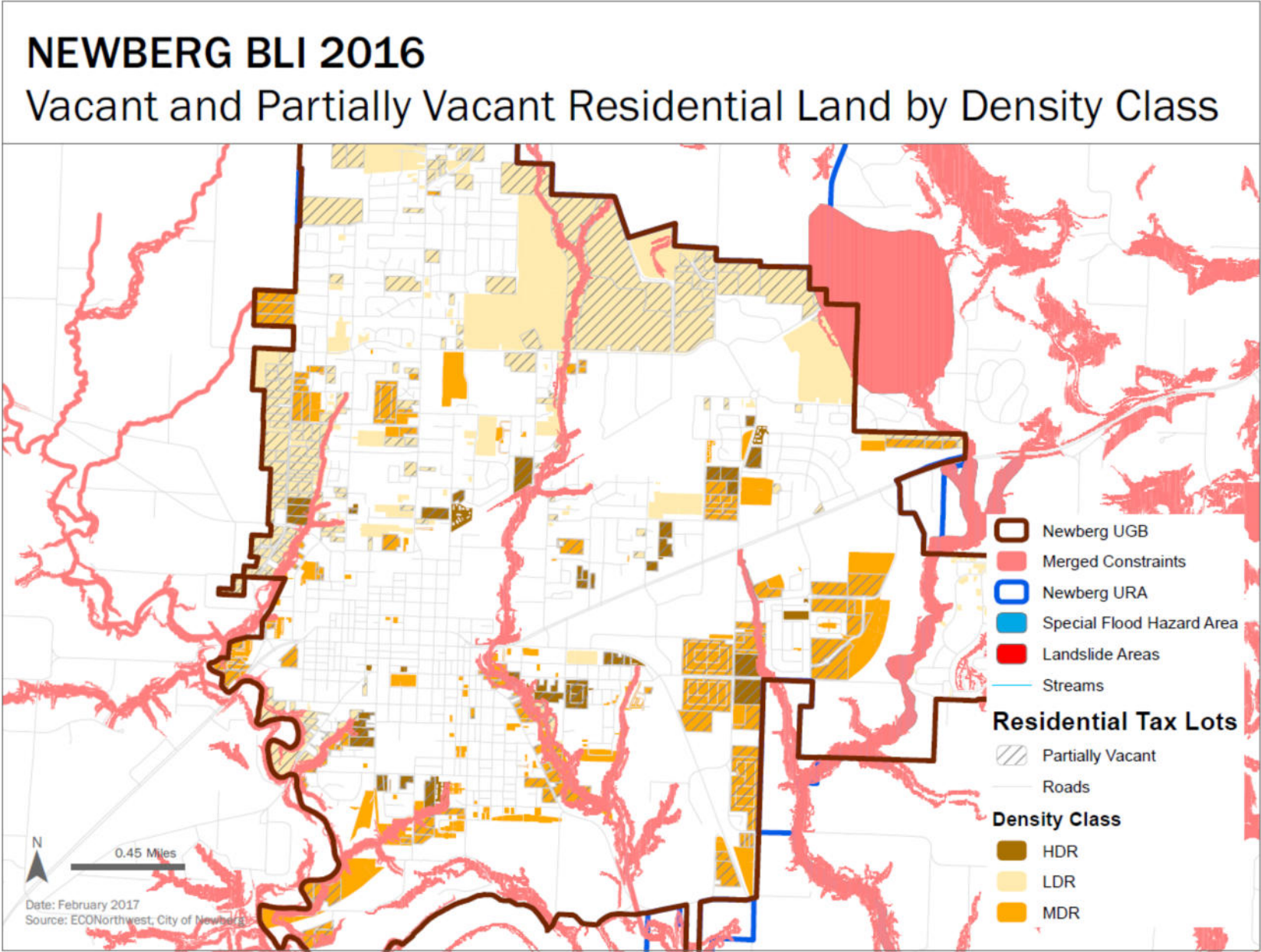
Map 3. All Residential Land by Division 38 Density Class



Map 4. Vacant and Partially Vacant Residential Land by Division 38 Density Class



Map 5. Vacant and Partially Vacant Residential Land by Division 38 Density Class and Constraint Status



Employment Land

The Division 38 rule requires commercial and industrial lands to be analyzed separately. The key difference is in how the rules treat constraints on commercial and industrial lands.

Table 7 shows all commercial land by development and constraint status. The results show that Newberg has about 381 acres of commercial land. About 146 acres are vacant without constraints.

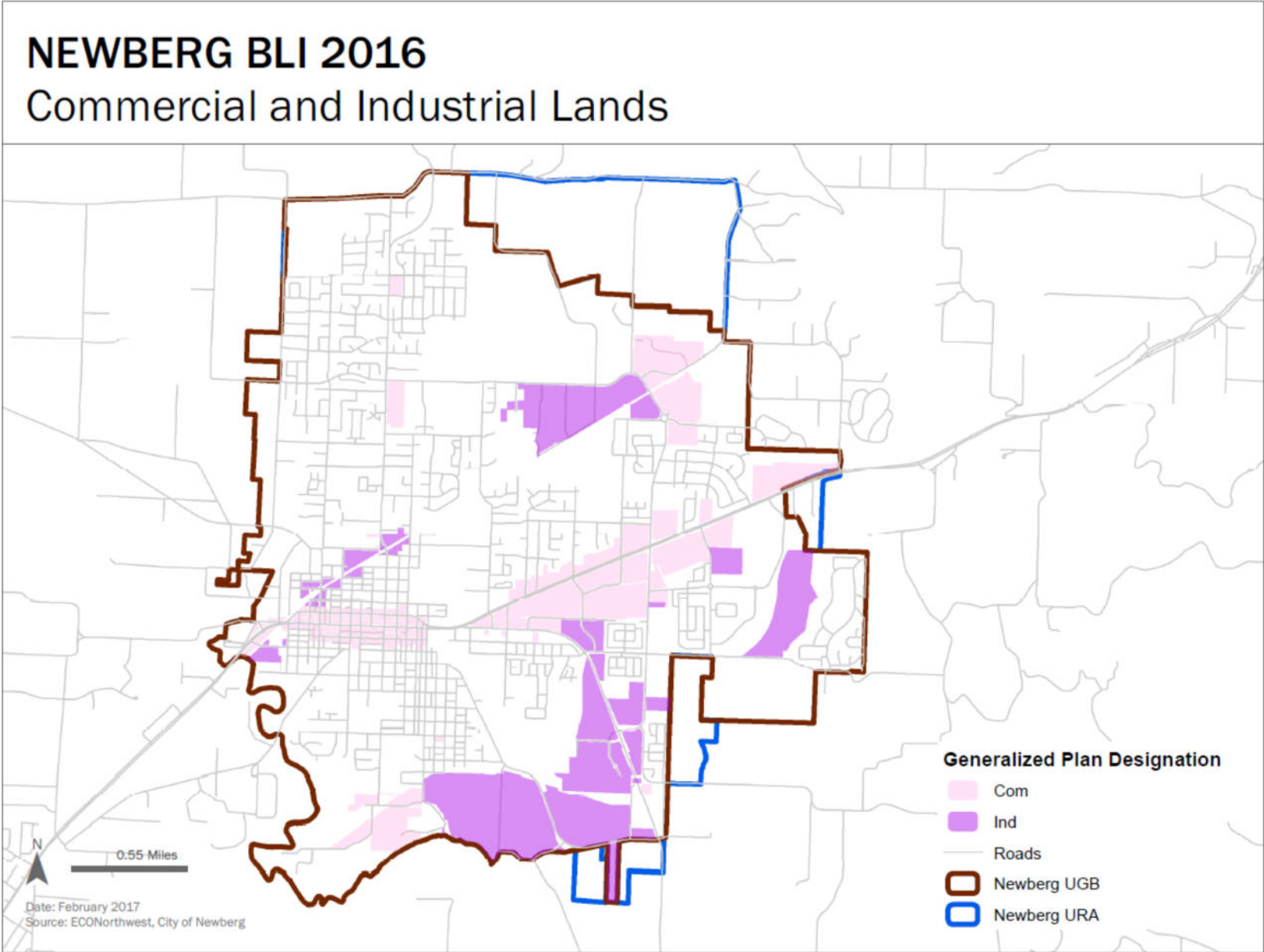
Table 7. All Commercial Land by Development and Constraint Status, Newberg UGB, 2016

Development Status	Tax Lots	Total Acres	Developed Acres	Constrained Acres	Vacant Acres
Developed	275	218	212	6	0
Partially Vacant	64	46	13	1	32
Vacant	91	118	0	4	114
Total	430	381	225	10	146

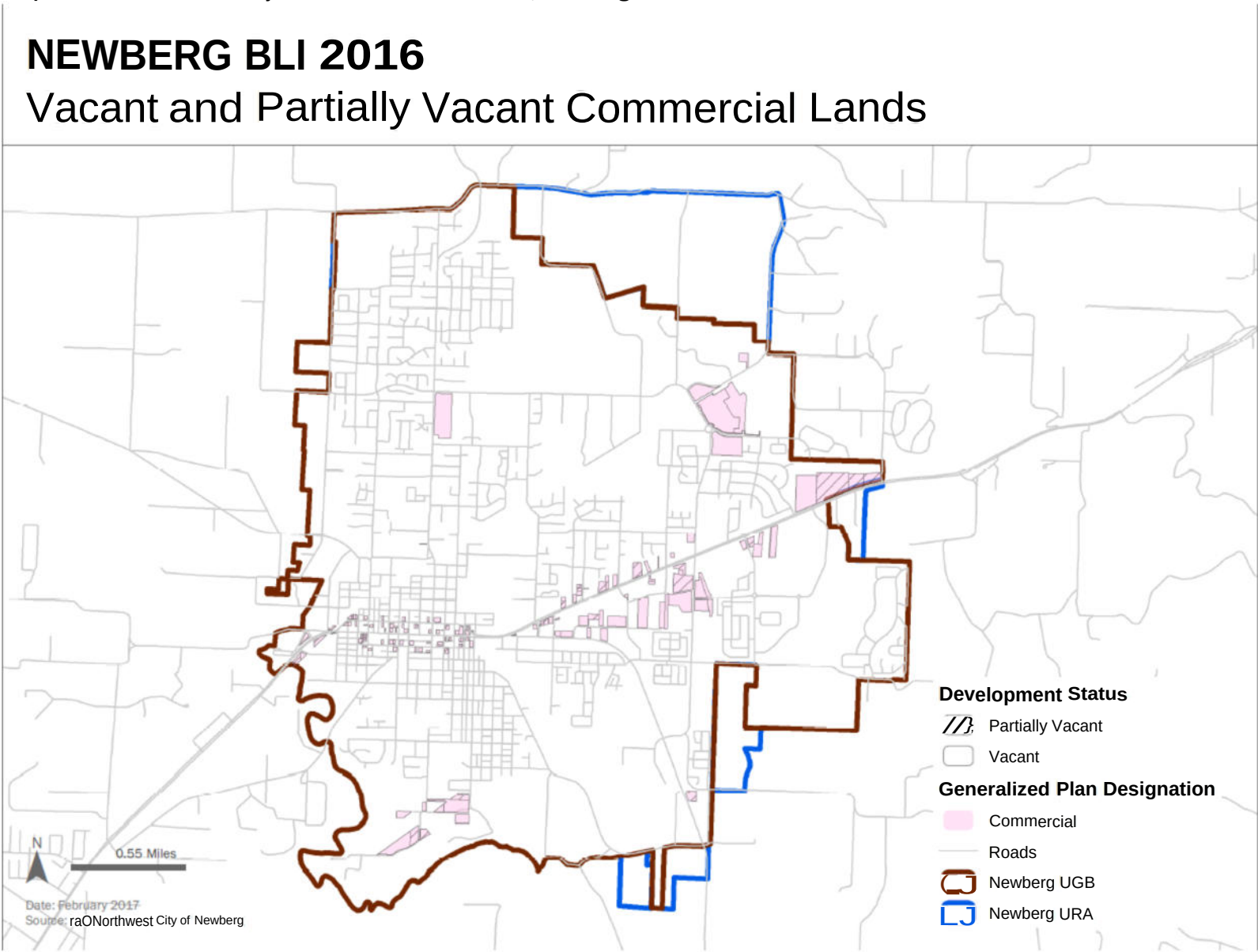
Source: Newberg and Yamhill County GIS data; analysis by ECONorthwest

Map 6 shows employment lands in the Newberg UGB. Map 7 shows vacant and partially vacant commercial land in the Newberg UGB. Map 8 adds constraints.

Map 6. Employment Lands in the Newberg UGB



Map 7. Vacant and Partially Vacant Commercial Land, Newberg UGB



Map 8. Vacant and Partially Vacant Commercial Land and Constraints, Newberg UGB

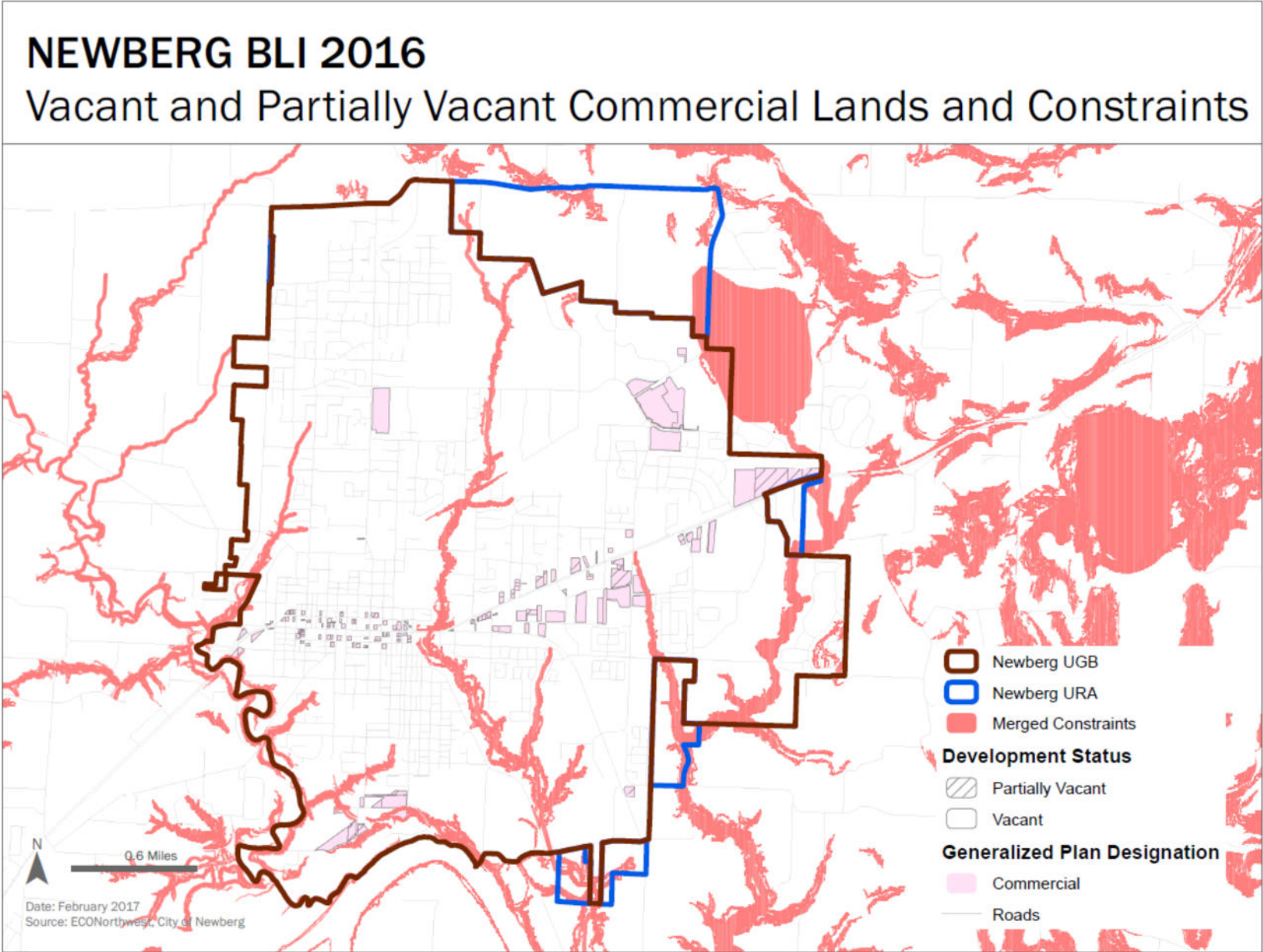


Table 8 shows industrial land in the Newberg UGB by development and constraint status. The results show that Newberg has 479 acres of industrial land. Of that land, 326 are developed, 64 constrained, and 89 vacant.

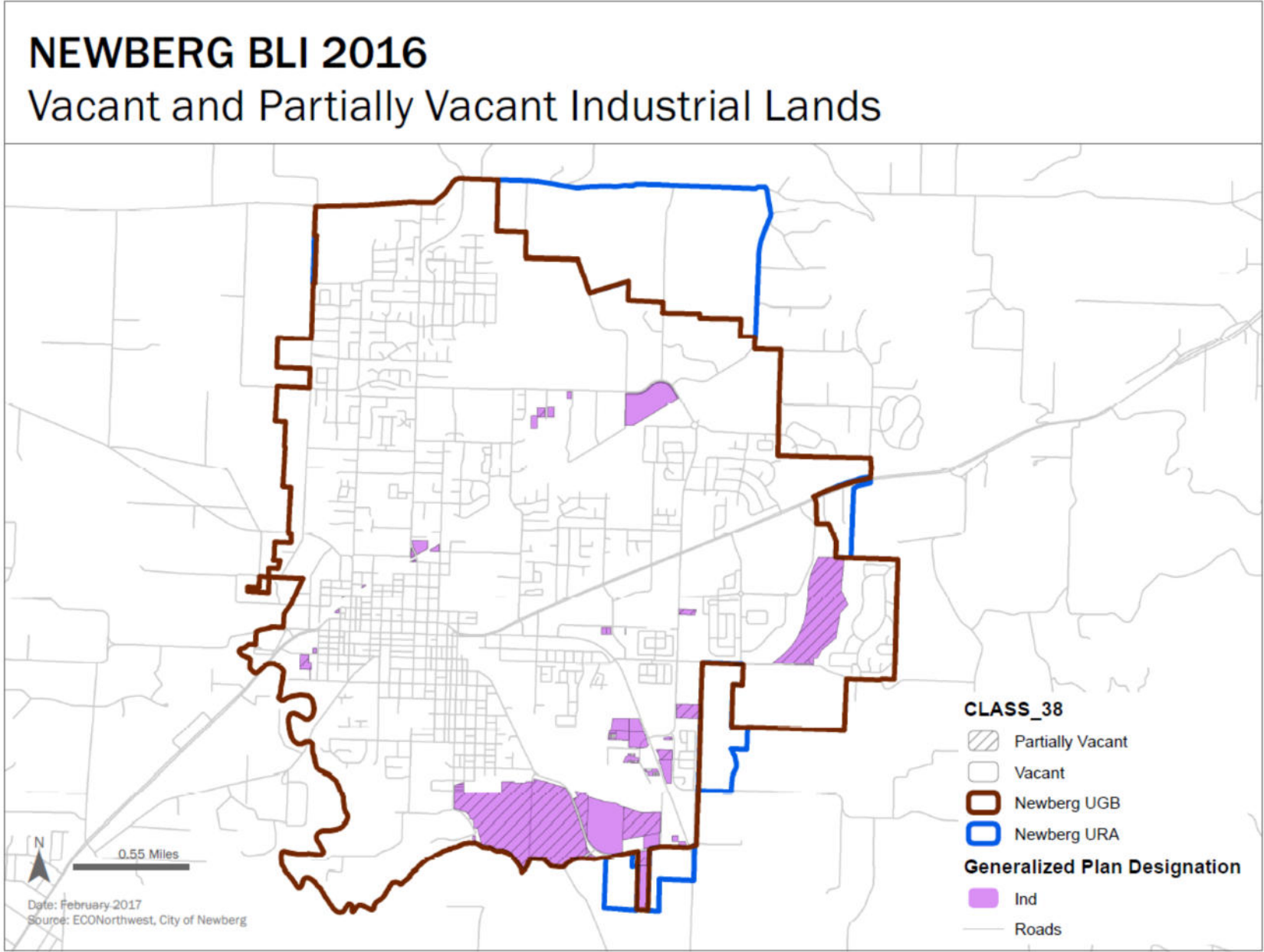
Table 8. All Industrial Land by Development and Constraint Status, Newberg UGB, 2016

Development Status	Tax Lots	Total Acres	Developed Acres	Constrained Acres	Vacant Acres
Developed	121	197	182	15	0
Partially Vacant	11	200	144	36	19
Vacant	44	82	0	13	70
Total	176	479	326	64	89

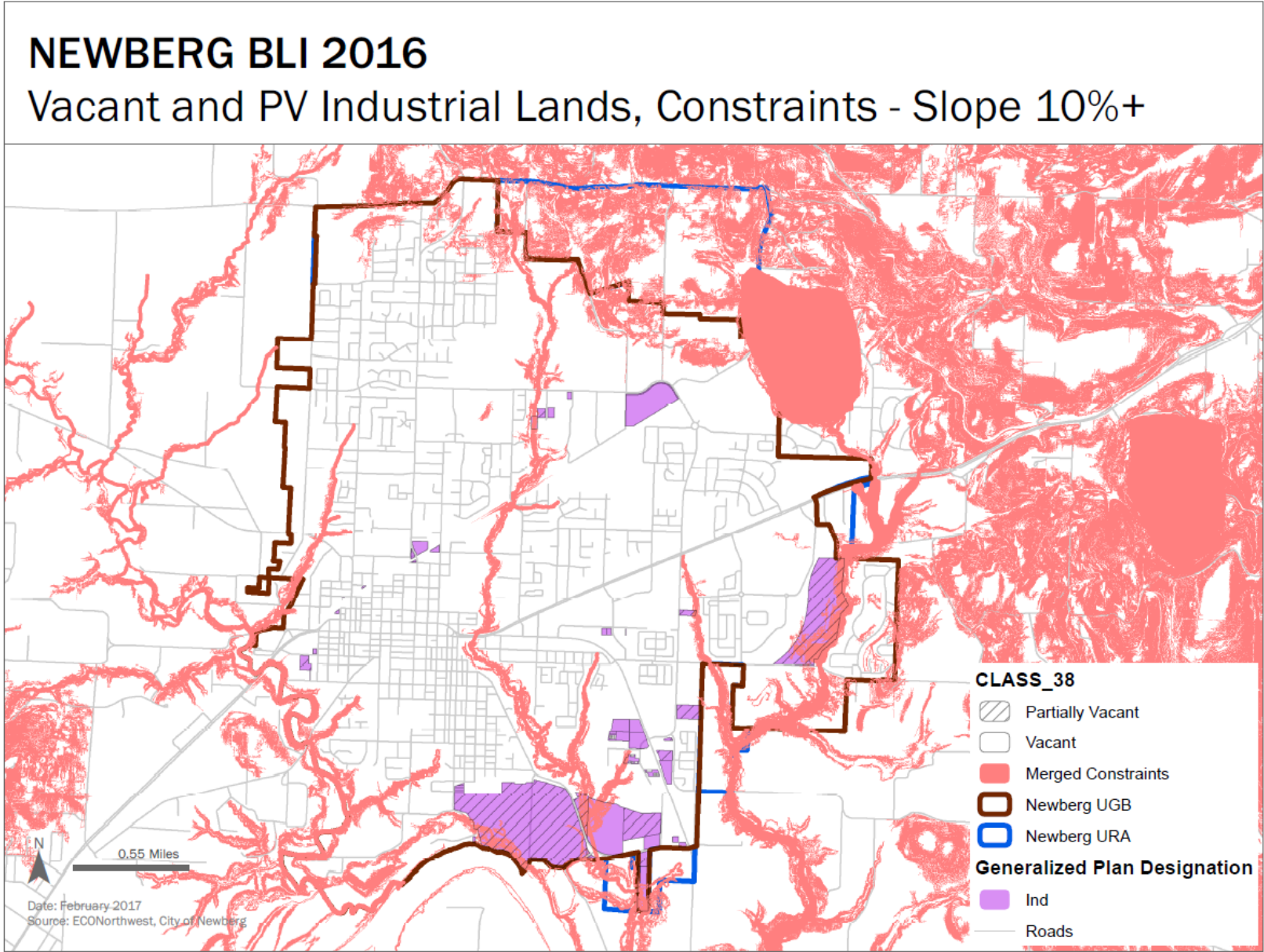
Source: Newberg and Yamhill County GIS data; analysis by ECONorthwest

Map 9 shows vacant and partially vacant industrial land in the Newberg UGB. Map 10 adds constraints.

Map 9. Vacant and Partially Vacant Industrial Land, Newberg UGB



Map 10. Vacant and Partially Vacant Industrial Land and Constraints, Newberg UGB



3.3 UGB Study Area (Outside Existing UGB)

OAR 660-038-0160 provides detailed guidance on establishing the study area to evaluate land for inclusion in the UGB. The full text of the requirements is included in Appendix B. For this discussion, we focus on the applicable standards. The rule divides the study area determination into two phases: (1) the preliminary study area; and (2) the final study area. Appendix A describes the steps used to define the study area.

The City of Newberg has Urban Reserve Areas adopted under OAR 660-021. Under the ORS 197A.320 priority scheme, urban reserves and exceptions lands within the UGB study area are first priority for inclusion in the UGB.

Table 9 summarizes lands in Newberg's URAs and the Division 38 study area. Newberg has a total of 527 acres in 122 tax lots. The average tax lot size in the URAs is 4.3 acres. Excluding the URAs, the Division 38 determined study area includes 10,109 acres in 1,697 tax lots. The average tax lot size in the UGB study area is 6.0 acres.

To define the study area, we included the entire area of any tax lot that was within or intersected the required 1.0 and 1.5 mile buffers. Analyzed by zoning, the study area includes 4,337 acres in 1,293 tax lots considered exceptions areas. The average tax lot size for exceptions lands within the UGB study area is 3.4 acres. The study area also includes 5,772 acres in 404 tax lots with resource zoning (e.g., exclusive farm or forest zones). Not surprisingly, the average size of tax lots with resource zoning was, at 14.3 acres, much larger than exceptions lands.

Table 9. Summary of Lands in Newberg Urban Reserve Areas and Division 38 UGB Study Area

Area	Tax Lots	Acres	Average Lot Size (ac)
Urban Reserve			
All land in taxlots	122	527	4.3
UGB Study Area (outside URA)			
All land in taxlots	1,697	10,109	6.0
Exceptions Areas	1293	4,337	3.4
Resource land	404	5,772	14.3

Map 11 shows the study area with a 25% slope and other constraints; Map 12 shows the study area with a 10% slope. The 10% slope is significant as Division 38 allows cities to assume that lands with contiguous areas over 10% slope in tax lots smaller than 5 acres are unsuitable for industrial development.

We struggled with classifying lands outside the UGB. The rules for determining "suitability" of land in the UGB study area are confusing. The provisions are found in OAR 660-038-0170(5):

With respect to section (1), a city must assume that vacant or partially vacant land in a particular priority category is "suitable" to satisfy a need deficiency identified in OAR 660-038-0080 or 660-038-0150, whichever is applicable, unless it demonstrates that the land cannot

satisfy the need based on one or more of the conditions described in subsections (a) through (f) of this section:

Comment: Our interpretation is that subsection 5 applies to all lands within the study area.

(a) Existing parcelization, lot sizes or development patterns of rural residential land make that land unsuitable for an identified employment need, as follows:

(A) Parcelization: the land consists primarily of parcels 2-acres or less in size, or

(B) Existing development patterns: the land cannot be reasonably redeveloped or infilled within the planning period due to the location of existing structures and infrastructure.

Comment: OAR 660-038-0170(5)(a) clearly references employment land need; as such, parcelization and lot size can only be used as a screen for employment lands.

(b) The land would qualify for exclusion from the preliminary study area under the factors in OAR 660-038-0160(2) but the city declined to exclude it pending more detailed analysis.

Comment: Our interpretation is that subsection 5(b) applies to all lands within the study area.

(c) The land is, or will be upon inclusion in the UGB, subject to natural resources protection under Statewide Planning Goals 5 such that that no development capacity should be forecast on that land to meet the land need deficiency.

Comment: Our interpretation is that subsection 5(c) applies to all lands within the study area that is subject to Goal 5 protection. This evaluation requires the same level of analysis that a traditional BLI would require.

(d) With respect to needed industrial uses only, the land is over 10 percent slope, as measured in the manner described in OAR 660-038-0160(5); is an existing lot or parcel that is smaller than 5 acres in size; or both.

Comment: It is clear that this applies only to industrial land. To decipher this provision, we must refer to OAR 660-038-0160(5). That section has four subsections. While not entirely clear, we assume that this refers to (5)(a), which states: "Contiguous areas of at least five acres where 75 percent or more of the land has a slope of 25 percent or greater; provided that contiguous areas 20 acres or more that are less than 25 percent slope may not be excluded under this subsection. Slope shall be measured as the increase in elevation divided by the horizontal distance at maximum ten-foot contour intervals;"

A strict application of this suggests that only lots of five acres or smaller, with a "Contiguous areas of at least five acres where 75 percent or more of the land has a slope." Our interpretation is that would mean that for a five-acre lot, the slope over 10%

would need to cover 75% of the lot area or 3.75 acres. The rule does not address larger lots with slopes over 10%.

(e) The land is subject to a conservation easement described in ORS 271.715 that prohibits urban development.

Comment: Our interpretation is that subsection 5(e) applies to all lands within the study area that have conservation easements that prohibit urban development.

(f) The land is committed to a use described in this subsection and the use is unlikely to be discontinued during the planning period:

(A) Public park, church, school, or cemetery, or

(B) Land within the boundary of an airport designated for airport uses, but not including land designated or zoned for residential, commercial or industrial uses in an acknowledged comprehensive plan or land use regulations.

Comment: Our interpretation is that subsection 5(f) applies to all lands within the study area that have any of the listed uses.

(6) For vacant or partially vacant lands added to the UGB to provide for residential uses:

(a) Existing lots or parcels one acre or less may be assumed to have a development capacity of one dwelling unit per lot or parcel. Existing lots or parcels greater than one acre but less than two acres shall be assumed to have an aggregate development capacity of two dwelling units per acre.

Comment: Our interpretation is that subsection 6(a) applies to all lands within the study area that would be added for residential uses. It is not clear whether the capacity is for the total number of units on the lot, or for additional units. Because the City has not calculated land need or determined which lands are suitable for residential uses, this study does not include a capacity analysis.

In short, the language focuses on suitability, but does not provide guidance for when a tax lot might be deemed developed or committed—with the potential exception that lands that would be added for residential uses under two acres have specific capacity assumptions tied to them. In that sense, all land potentially has capacity. The rule allows consideration of parcelization as a suitability criteria. The direction is vague: *the land cannot be reasonably redeveloped or infilled within the planning period due to the location of existing structures and infrastructure*. To put some structure on this part of the analysis, we classified tax lots as follows:

- Developed: tax lots less than 0.5 acre with existing single-family dwellings
- Partially Vacant - <2 Ac: tax lots between 0.5 and 1.99 acres with more than \$10,000 in improvement value.

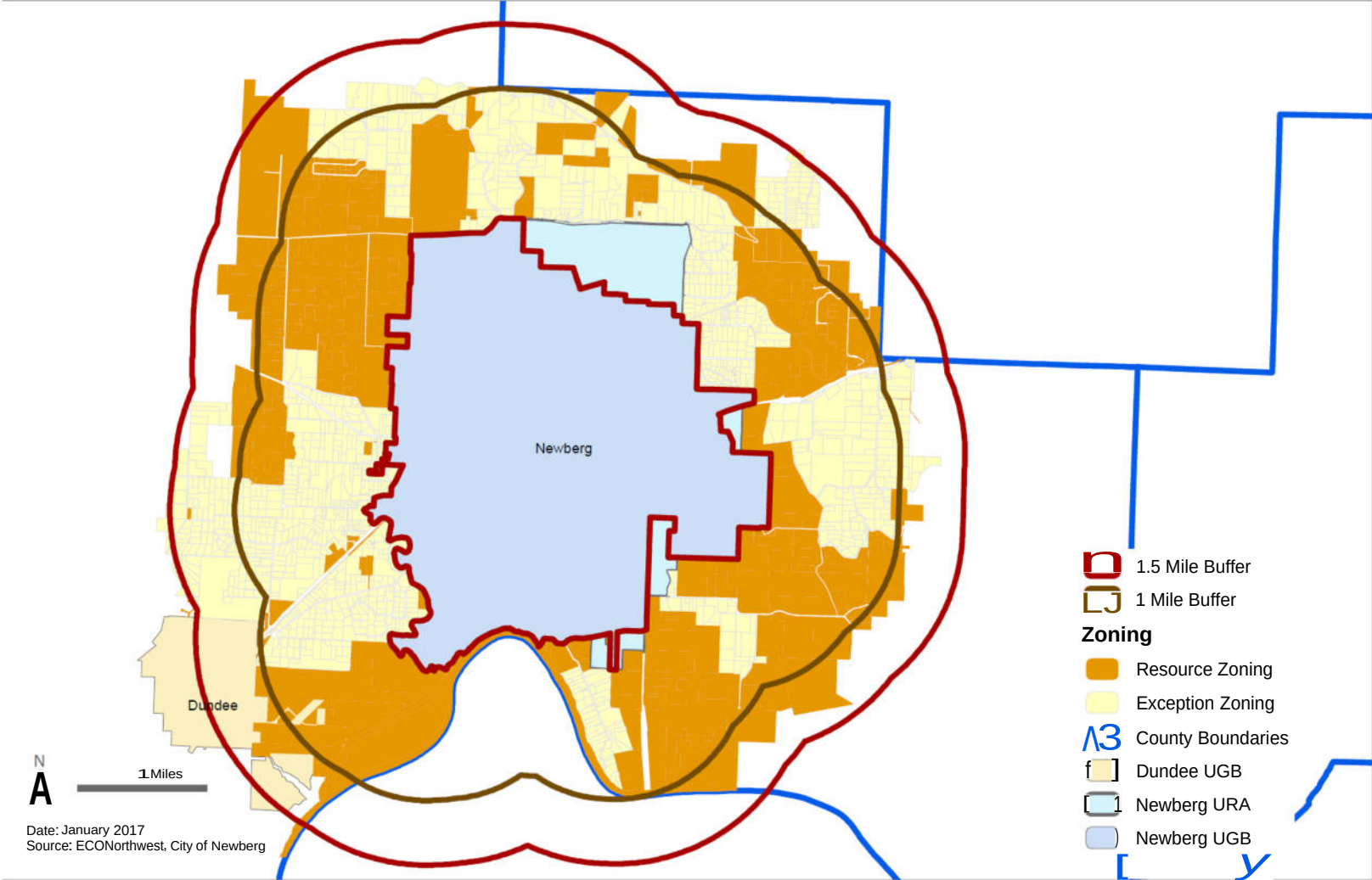
- Partially Vacant - ≥ 2 Ac: tax lots 2.0 acres and larger with more than \$10,000 in improvement value. We used aerial photo review to determine the vacant area of these tax lots.
- Vacant: tax lots of any size with $< \$10,000$ of improvement value.

These interpreted aspects of the rules were applied to both the URAs as well as the UGB study areas. We note that if Newberg pursues a boundary amendment using the Division 38 rules, more analysis will be required that is specific to lands that would be added for residential or employment uses. The framework ECO developed is intended to provide structure to allow presentation of the results in a more meaningful manner.

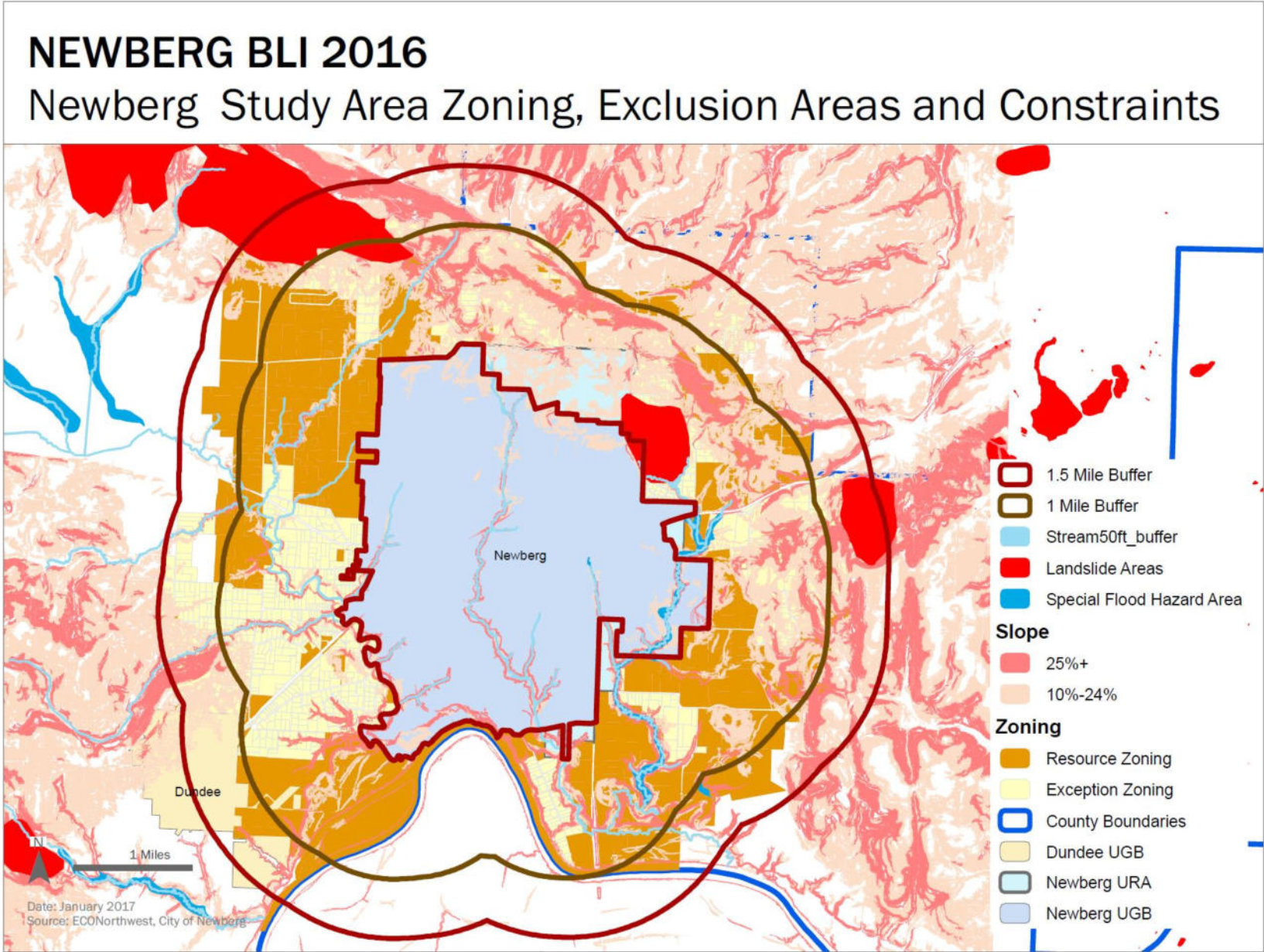
Map 11. Newberg Study Area, Buffers, Zoning, and Exclusion Areas (including 25% Slope Constraint)

NEWBERG BLI 2016

Newberg Study Area Zoning, Exclusion Areas and Constraints



Map 12. Newberg Study Area, Buffers, Zoning, and Exclusion Areas (including 10% Slope Constraint)



Urban Reserve Areas

Newberg established urban reserve areas as allowed by OAR 660-021. Prior to the 2016 revisions to ORS 197 and the establishment of the Division 38 rule, urban reserves were first priority lands for inclusion in a UGB. ORS 197A.320 changed the priority scheme to add exception lands as first priority.

Newberg has four urban reserve areas. The URAs include 527 acres in 111 tax lots. Table 10 shows tax lots in the URA by classification. The results show 452 buildable (suitable) acres within the URA (slopes <25%) and 265 acres with slopes <10%. Map 13 shows the location of URAs and constraints.

Table 10. Land by Classification in Newberg Urban Reserve Areas

Classification	Tax Lots	Total Acres	Developed Acres	Constrained Acres	Suitable Acres	
					>25% slope	>10% slope
Developed	24	12	9	3	0	0
Partially Vacant - <2 Ac	49	386	25	39	347	200
Partially Vacant - >=2 Ac	6	8	4	2	6	5
Vacant	32	121	0	22	99	60
Total	111	527	38	66	452	265

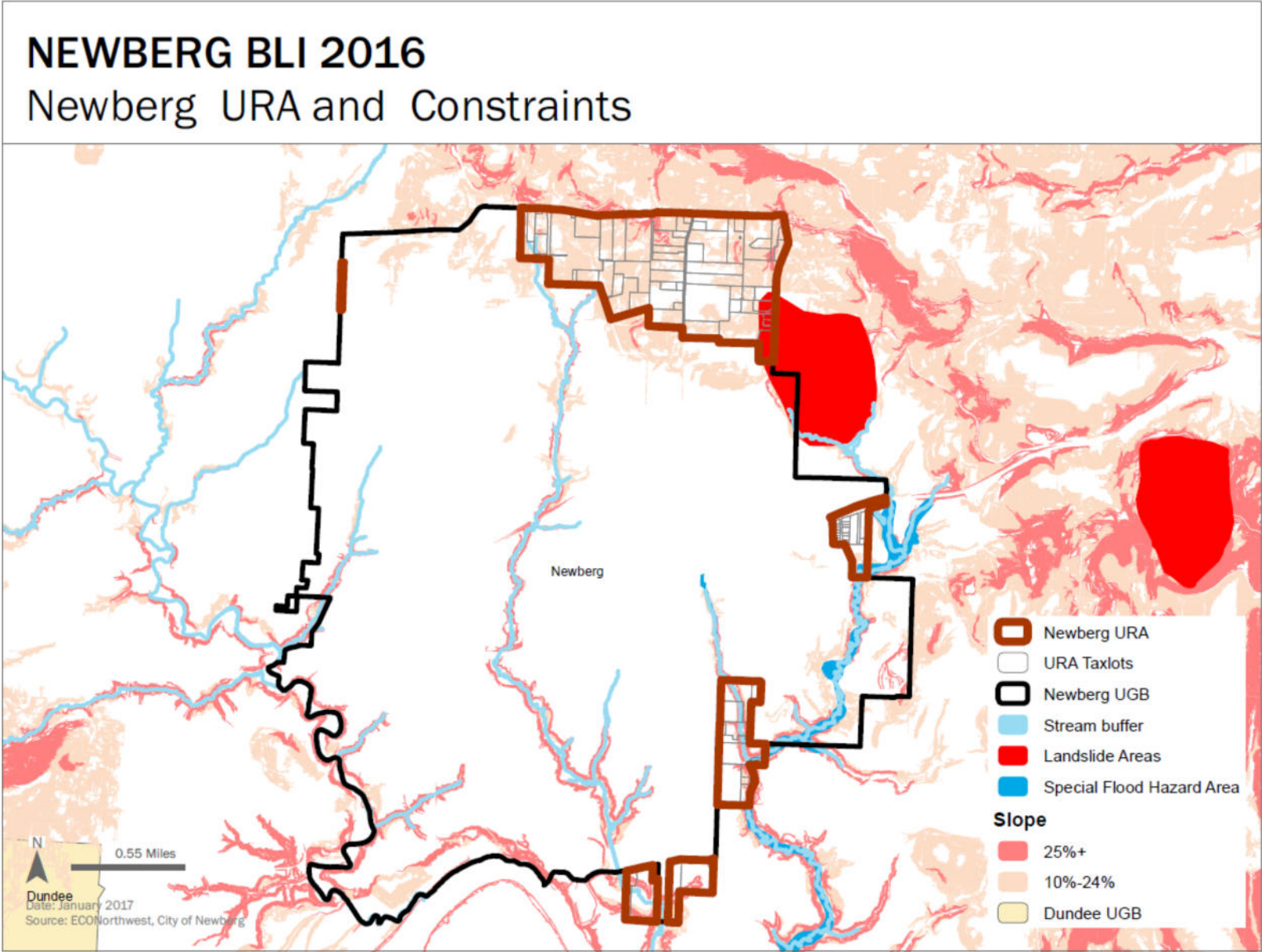
Table 11 shows tax lots by size and constraint status for the Newberg URAs. The results show that about 40% of the 452 buildable acres in URAs are in lots of 10 acres or larger.

Table 11. Vacant and Partially Vacant Tax lots by Size, Newberg URA (25% slope)

Lot Size (Ac)	Tax Lots	Total Acres	Buildable Acres	Existing DU
<=1	42	17	5	42
>1 and <2	6	8	6	6
>=2 and <5	27	89	76	27
>=5 and <10	20	153	133	20
>=10 and <20	14	195	167	14
>=20 and <50	2	64	64	2
Total	111	527	452	111

Note: Estimated capacity is for new dwelling units and assumes 1 new dwelling unit per lot for lots <=1 acre; 2 new dwelling units per lot for lots between 1 and 2 acres, and 6 dwelling units per lot for lots over 2 acres.

Map 13. Newberg Urban Reserve Areas and Development Constraints



UGB Study Area (Outside Urban Reserves)

The UGB Study Area includes 9,821 acres in 1,665 tax lots (excluding right-of-way). Table 12 shows tax lots by size and constraint status for the Newberg UGB Study Area. The results show that over 40% of the 9,821 acres outside of URAs are in lots of 20 acres or larger. The majority of land in larger lots is in resource zones; 6% of land in exceptions zones is in lots of 20 acres or larger.

Table 12. Vacant and Partially Vacant Tax lots by Size and Constraint Status, Newberg UGB Study Area (25% slope)

Lot Size (Ac)	Resource			Exceptions			Total		
	Tax Lots	Acres	% of Acres	Tax Lots	Acres	% of Acres	Tax Lots	Acres	% of Acres
<=1	69	41	1%	216	122	3%	285	163	2%
> 1 and <2	45	67	1%	250	368	9%	295	435	4%
>=2 and <5	61	206	4%	612	1,797	42%	673	2,003	20%
>=5 and <10	69	509	9%	138	968	22%	207	1,477	15%
>=10 and <20	63	955	17%	60	784	18%	123	1,738	18%
>=20 and <50	56	1,694	31%	6	178	4%	62	1,873	19%
>=50	19	2,024	37%	1	107	2%	20	2,131	22%
Total	382	5,497	100%	1,283	4,325	100%	1,665	9,821	100%

Table 13 shows tax lots in the UGB Study Area by classification. The results show 7,413 buildable (suitable) acres within the UGB Study Area (slopes <25%), and 5,417 suitable acres (slopes >10%). Nearly 2,800 acres are in priority 1 exceptions areas, with about 2,215 of those in partially vacant (e.g., rural residential lots with a dwelling) lots greater than 2 acres.

Table 13. Land by Classification in Newberg UGB Study Area

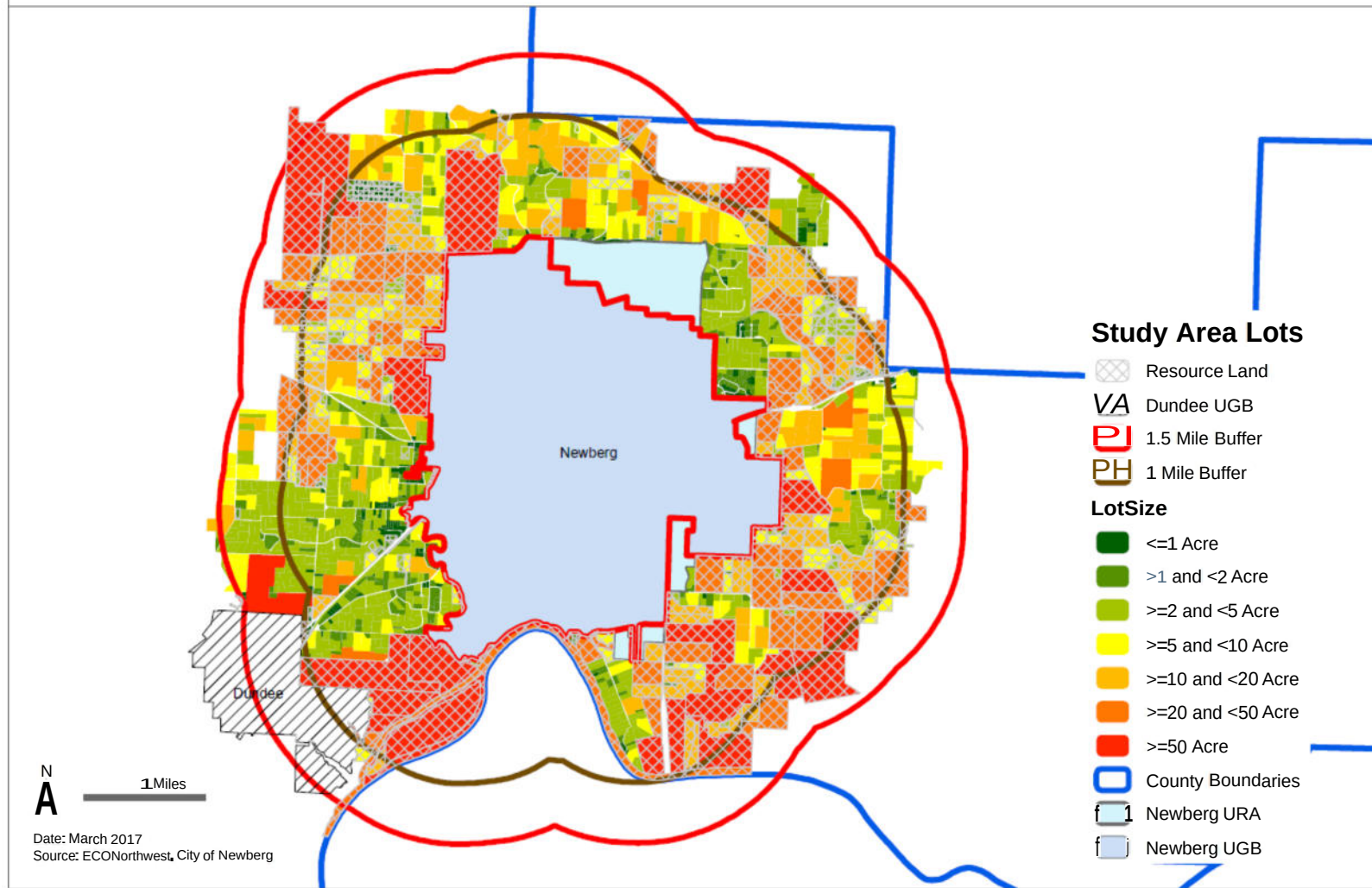
Development Status	Tax Lots	Total Acres	Developed Acres	Slope 25% or over		Slope 10% or Over	
				Constrained Acres	Suitable Acres	Constrained Acres	Suitable Acres
Resource Lands							
Developed	21	9	7	2	0	2	0
Partially Vacant - <2 ac	16	27	8	2	17	5	14
Partially Vacant - >=2 ac	184	3,724	92	480	3,152	1,127	2,505
Vacant	161	1,737	0	277	1,461	537	1,200
Subtotal	382	5,497	107	761	4,629	1,671	3,719
Exceptions Areas							
Developed	145	93	82	11	0	20	-9
Partially Vacant - <2 ac	219	320	104	69	147	113	103
Partially Vacant - >=2 ac	727	3,342	338	788	2,215	1,669	1,335
Vacant	192	570	0	148	421	300	270
Subtotal	1283	4,325	525	1,016	2,783	2,101	1,698
TOTAL	1,665	9,821	632	1,777	7,413	3,772	5,417

Note: Suitable acres for slopes 10% or over shows a negative figure in the Developed row for Exceptions areas. This is because some of the developed area is in slopes over 10%.

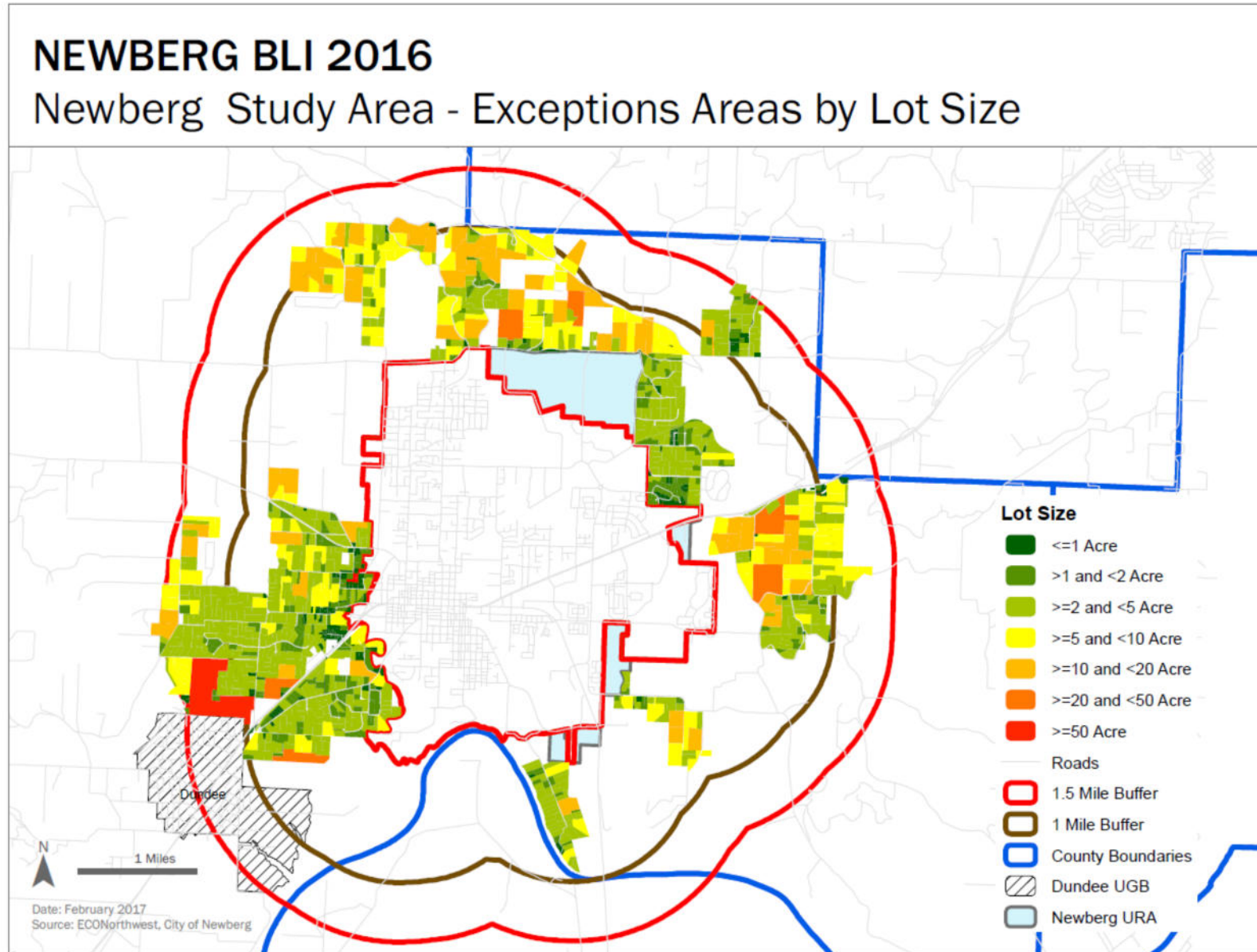
Map 14. Tax lots by Size, Newberg UGB Study Area

NEWBERG BLI 2016

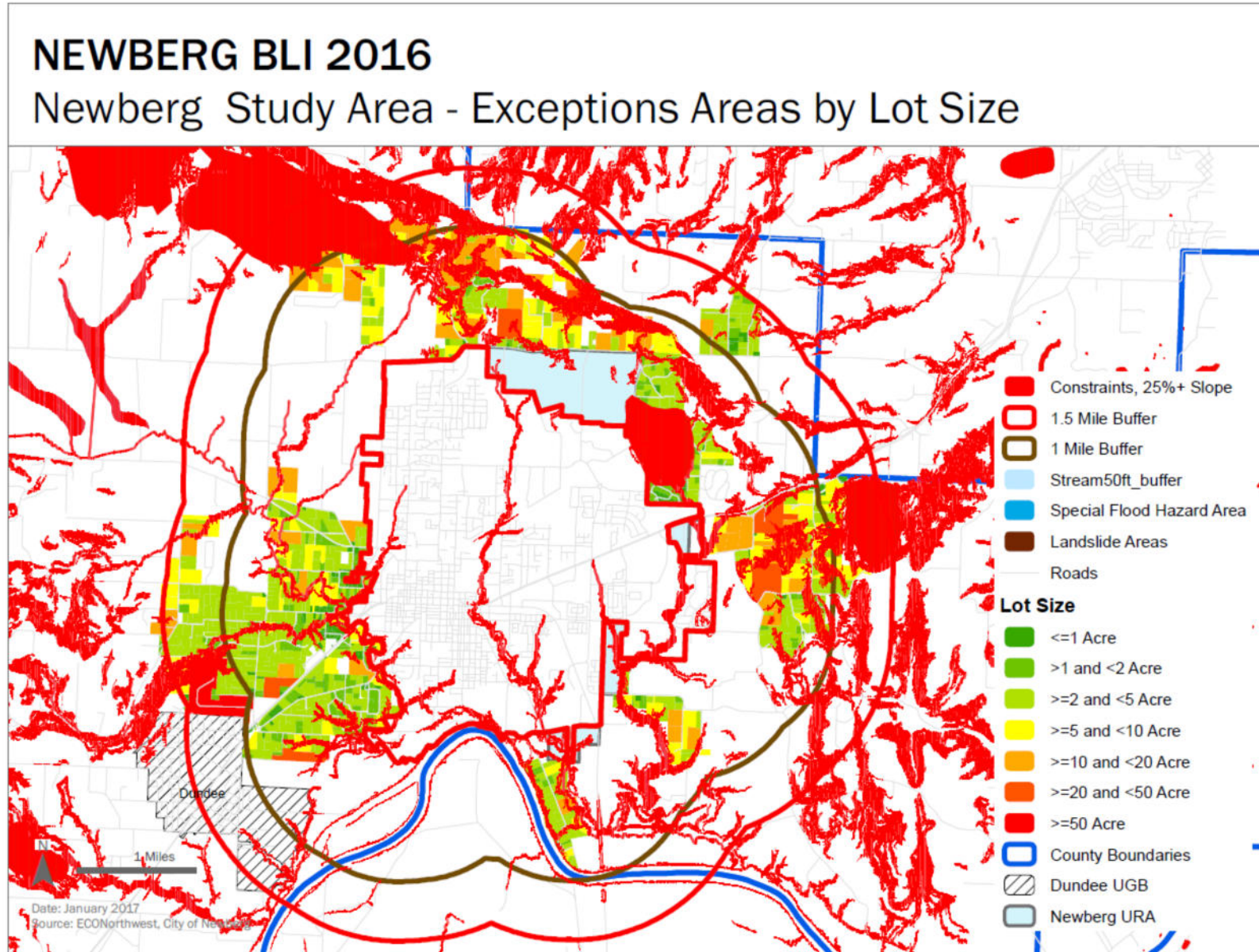
Newberg Study Area - Lot Size



Map 15. Exceptions Area Tax lots by Size, Newberg UGB Study Area



Map 16. Exceptions Area Tax lots by Size and Constraint Status (25%+ Slope), Newberg UGB Study Area



4. Conclusions and Implications

Newberg faces a key decision in the coming months: whether to pursue a boundary amendment using the Division 38 method, or use the traditional method. The issues with the traditional method are well known. Newberg’s last attempt at an expansion using the traditional method was appealed and ultimately withdrawn.

ECO does not make a recommendation about which method is most appropriate for the City of Newberg. That is a decision that the City Council will need to make with staff input. What we want to do is to inform that dialog. This chapter includes two sections: (1) issues with the Division 38 method; and (2) comparison of the Division 38 method with the standard method.

4.1 Issues with the Division 38 Methods

ECO identified a number of issues with the Division 38 method. To help the City—and DLCD—better understand those issues, and how they impact the BLI results, we summarize them here. This task was not in our work program, but we feel compelled to discuss the issues given their nature and extent. This discussion is not intended to be comprehensive—there may be other issues with the Division 38 method that we did not encounter since we only implemented the BLI portions of the rule. We also note that some of these issues may be unique to Newberg—we are working from a sample of one city; other cities may have a different experience with the rules. Thus, our comments focus on the following sections (note, we number them for reference; the order is not intended to imply precedence or priority):

1. **Standardization of Data Sources.** This is less a critique, than an observation and suggestion. For many data sources, several hosts and versions might be available (e.g., UGB data from the City or Oregon Explorer). It’s not always clear which is preferable or if the data are the most accurate data available. It took a fair amount of time to assemble the required databases, some of which may require expensive subscriptions or fees (part of the Newberg UGB study is in Washington County; Metro manages the data in the region and we used ECO’s subscription to RLIS for the Washington County data). As a suggestion, DLCD could generate and post approved data sets for many of the attributes required—particularly natural hazards.
2. **Split Plan Designations.** The rule does not address the issue of split plan designations. These are very common in cities and many are too big to be ignored. The topology of polygons in plan designation layers frequently does not conform to tax lot boundaries creating so-called “slivers.” These slivers are not true split designations; rather they are remnant from how the data were originally input. ECO sometimes uses complicated algorithms to evaluate split plan designations. For the purpose of the Newberg BLI, ECO and the Community Development Director reviewed maps and agreed on specific tax lots with split plan designations to split. Any lot with a split over two acres was evaluated; any lot with at least 0.5 acre in a split was split.

3. **Deduction of constraints.** In a typical BLI, we would merge all constraints together to create a single constraint layer. Those constraints would then be deducted from vacant and partially vacant areas. In this sense, all constraints are treated the same. This has been found compliant with statewide planning goals, as many BLIs using these methods have been adopted and acknowledged.

Division 38 treats different constraints differently. Some constraints are allowed a 100% deduction; some a 50% deduction, and some, the extent of local policy. Moreover, industrial lands get a different threshold for slope (which is not inconsistent with methods used by ECO in the past) This makes sense in theory; in practice it greatly complicates the process of deducting constraints.

For example, constraints often share the same geography. It's not uncommon for a stream to have a floodway and floodplain that are accompanied by steep slopes and Goal 5 resources. Under the Division 38 rule, each of these interactions must be analyzed and accounted for individually. These are not simple operations to perform in GIS.

Finally, we find the ½ acre threshold on water bodies in OAR 660-038-0070 and 130 (1)(a)(B) odd. This also requires additional work, since the default assumption on a typical BLI is that waterbodies of all sizes, are not developable. This rule implies that waterbodies under ½ acre do not pose a constraint (e.g., that they can be filled and developed) without the understanding of requirement of other regulatory agencies to fill these water bodies.

4. **Public lands with residential plan designations.** Generally, Division 38 does not require inventory of public lands. We note that some cities we've worked with do not have a public land designation. In those instances, Division 38 would require most lands to be inventoried as residential or commercial.

The rule makes provisions for publicly owned-park land that might meet the threshold of partially vacant (e.g., lots of ½ acre or larger), but not for other public uses. Newberg has schools and other public uses that total more than 70 acres (including Chehalem Valley Middle School) that clearly are not, and will not be available for development in the 14-year planning horizon.

5. **Developed employment land.** The rule does establish a clear threshold for employment lands to be considered developed or committed. The rule identifies thresholds for partially vacant that either require 50% of the land be classified as vacant (lots less than 1 acre) or that aerial photo review occur. Aerial photo interpretation is not particularly complicated, but it is time consuming.
6. **Partially vacant employment land.** OAR 660-038-0120(2)(b)(A) reads "*The real market improvement value of the lot or parcel is greater than five percent and less than 40 percent of the real market land value, in which case, the city must assume that 50 percent of the lot or parcel is developed and 50 percent is vacant.*" The example below shows two developments that meet this threshold. Both would be considered fully developed in a traditional BLI. One

is a bank (on the right) and the other a Jiffy Lube (on the left). While this does not equate to a lot of land in Newberg, it forces an unreasonable assumption on the BLI.



7. **Determination of slopes using contour data.** GIS experts typically build slope thresholds from DEMs (digital elevation models) and not contours. The development of slope thresholds is an advanced GIS operation that we would not characterize as simple. This is an area where the state could provide a standardized data set for cities to use.
8. **Errors/anomalies/inconsistencies in County Assessment data.** Consistent with previous experience with County Assessment data, we found many errors or anomalies (these “errors” do not affect the assessment of property, but also do not reflect the value of use). Key among them was developed tax lots with \$0 real market improvement values. Not surprisingly, this happens frequently on lands that are exempt from taxation.

Churches provide a good example. Newberg has 55 taxlots that have “church” in the owner field. Twenty-seven of those taxlots show an improvement value of \$0; three have an improvement value of less than \$10,000, and 25 have an improvement value of \$10,000 or more. Per the Division 38 rule, all residential land with improvement value less than \$10,000 and greater than 3,000 SF is to be considered vacant. These lands totaled 61 acres. The image below highlights three churches that would typically be considered developed or partially vacant based on aerial photo or field inspection.



9. **Partially Vacant multi-family residential land.** Per the Division 38 rule, all residential land with improvement value less than \$10,000 and great than 3,000 SF is to be considered vacant. The image below shows several developments—assisted living facilities—that are fully developed, but get classified as partially vacant. The rule does not provide a clear and objective pathway to identifying when multi-family land is considered developed. Based on the rule criteria, all multifamily land with improvements must be subject to aerial orthophoto review. This process is no more efficient than a standard BLI.



10. **Condo common areas.** The Yamhill County Assessor systematically assesses condo common areas as having \$0 improvement value. These areas are clearly not available for future development, nor do they have any residential capacity. The Division 38 rule requires they be considered vacant. A cursory search identified 28 taxlots with about 10 acres—enough to be a consideration in our view. The image below provides one example.



11. **Classification of lands in the UGB study area.** We found this portion of the rule convoluted and difficult to interpret. The rule uses vague criteria for determining whether land in the UGB study area is vacant, partially vacant, or developed—in fact there are limited criteria for determining development status, only criteria for exclusions that address various reasons for exclusion.

For land that would be for future residential use, the rule incorporates thresholds from the UO research of 1 and 2 acres. The language around capacity is a bit unclear with respect to whether the units are total units or new units. A plain interpretation would be total units.

Because the rule lacked clear guidance on how to evaluate both residential and employment lands in the UGB study area, we developed a classification system based on development status and lot size to summarize the results. It is not clear, however, whether that system would pass legal muster given that the rule does not provide any guidance. It is useful in the context of thinking about lot size and development capacity.

To summarize, **the simplified BLI method is not simple**. In our initial comments about the Division 38 rule, we indicated that there is no way to make a GIS-based inventory simple. We understand the rationale for a GIS based method. However, as described above, parts of the Division 38 method are more complicated than a typical standard method. Moreover, in most instances, the rule requires assumptions that increase the amount of land assumed available for development.

4.2 Summary

Clear differences exist between the Division 38 and standard methods. Given some of the issues with land classification, it is difficult for ECO to recommend the City use this methodology moving forward. We identified far too much residential land that would normally be considered developed that the Division 38 rules require the City to consider as vacant. Moreover, we do not see any flexibility in interpreting the Division 38 rules. While we are not attorneys, a common-sense reading of the rule suggests a literal interpretation of its provisions. In short, the rule does not accommodate exceptions.

Appendix A: Data Sources and Study Area Determination

ECO conducted a buildable land inventory (BLI) consistent with the requirements of OAR 660-038. The first step in the inventory was to obtain the necessary GIS data (Exhibit A-1). The data came from several sources—the City of Newberg; the Metro RLIS database; Yamhill County; and the Oregon Geospatial Data Center.

Exhibit A-1. Data Sources for Newberg BLI

Data	Source	Description
Tax lots – Yamhill	Yamhill County Assessor, provided by City of Newberg	Tax lot fabric for entire county. Fabric includes roads.
Tax lots – Washington	Metro RLIS – ECO subscription	Tax lots
Tax lots - Marion	Marion County GIS	Tax lots
City Boundaries	City	Includes city limit, UGB and urban reserve areas
UGB	Oregon Spatial Explorer	2015 UGBs
Counties	Oregon Spatial Explorer	2015 County boundaries
Streets	City of Newberg	City / county roads
Streams	City of Newberg	Perennial streams
Zoning	Yamhill County; Metro RLIS (Washington); Marion County GIS	Zoning outside incorporated city boundaries
Landslide areas	DOGAMI SLIDO 3.2 database	DOGAMI mapped landslide areas
Special Flood Area	Oregon Spatial Explorer – statewide FEMA FIRM database	Areas of special flood hazard
Building Footprint	City of Newberg	Building footprints for land inside the Newberg UGB

Study Area Determination

The first step in the inventory process is to determine the study area. The study area for Newberg includes all land within the Newberg urban growth boundary (UGB) as well as lands outside the UGB.

Land within the Newberg UGB

As required by OAR 660-038, the inventory will include all land within the current Newberg UGB. From a practical perspective, this means that all lands within tax lots identified by the Yamhill County Assessor that fall within the UGB (as shown by the GIS data) will be inventoried. The tax lot database ECO received from the City is current as of August 2016. The inventory then builds from the tax lot-level database to estimates of buildable land by plan designation.

UGB Study Area

OAR 660-038-0160 provides detailed guidance on establishing the study area to evaluate land for inclusion in the UGB. The full text of the requirements is included in Appendix A. For this discussion, we focus on the applicable standards. The rule divides the study area determination into two phases: (1) the preliminary study area; and (2) the final study area. OAR 660-038-0160(1) defines the requirements for the preliminary study area. Items underlined apply to Newberg.

(1) The city shall determine which land to add to the UGB by evaluating alternative locations within a “study area” established pursuant to this rule. To establish the study area, the city must first identify a “preliminary study area” which shall not include land within a different UGB or the corporate limits of a city within a different UGB. The preliminary study area shall include:

(a) All lands in the city’s acknowledged urban reserve, if any;

(b) All lands that are within the following distance from the acknowledged UGB, except as provided in subsection (d):

(A) For cities with a UGB population less than 10,000: one-half mile;

(B) For cities with a UGB population equal to or greater than 10,000: one mile;

(c) All exception areas contiguous to an exception area that includes land within the distance specified in subsection (b) and that are within the following distance from the acknowledged UGB:

(A) For cities with a UGB population less than 10,000: one mile;

(B) For cities with a UGB population equal to or greater than 10,000: one and one-half miles;

(d) At the discretion of the city, the preliminary study area may include land that is beyond the distance specified in subsections (b) and (c).

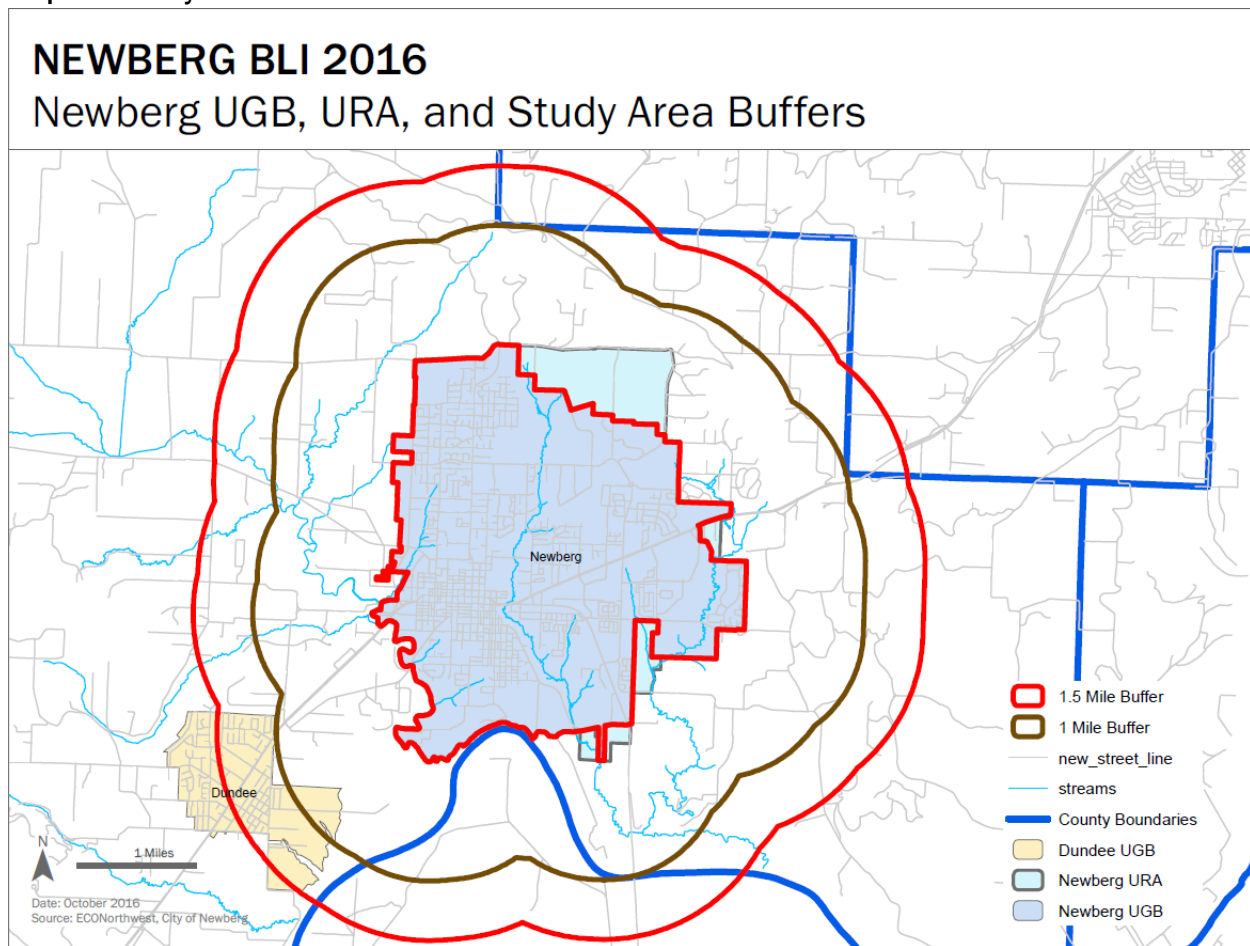
According to the Population Research Center at Portland State University, Newberg’s 2015 population was 22,900. Thus, the provisions for cities with populations over 10,000 apply to Newberg.

Based on OAR 660-038-0160(1), Newberg must include the following areas within the UGB study area:

- Established urban reserve areas (URAs). Newberg has 551 total acres in acknowledged URAs
- All lands within one mile of the UGB (and not in a UGB).
- Exceptions areas within 1.5 miles of the UGB that are contiguous to land within the one-mile buffer.

Map A-1 shows the study area boundaries based on these requirements.

Map A-1. Study Area Buffers



(2) The city may exclude land from the preliminary study area if it determines that any of the conditions in this section apply to the land:

(a) Based on the standards in section (5) of this rule, it is impracticable to provide necessary public facilities or services to the land;

(b) The land is subject to significant development hazards, due to a risk of:

(A) Landslides: The land consists of a landslide deposit or scarp flank that is described and mapped on the Statewide Landslide Information Database for Oregon (SLIDO) Release 3.2 Geodatabase published by the Oregon Department of Geology

and Mineral Industries (DOGAMI) December 2014, provided that the deposit or scarp flank in the data source is mapped at a scale of 1:40,000 or finer. If the owner of a lot or parcel provides the city with a site-specific analysis by a certified engineering geologist demonstrating that development of the property would not be subject to significant landslide risk, the city may not exclude the lot or parcel under this paragraph;

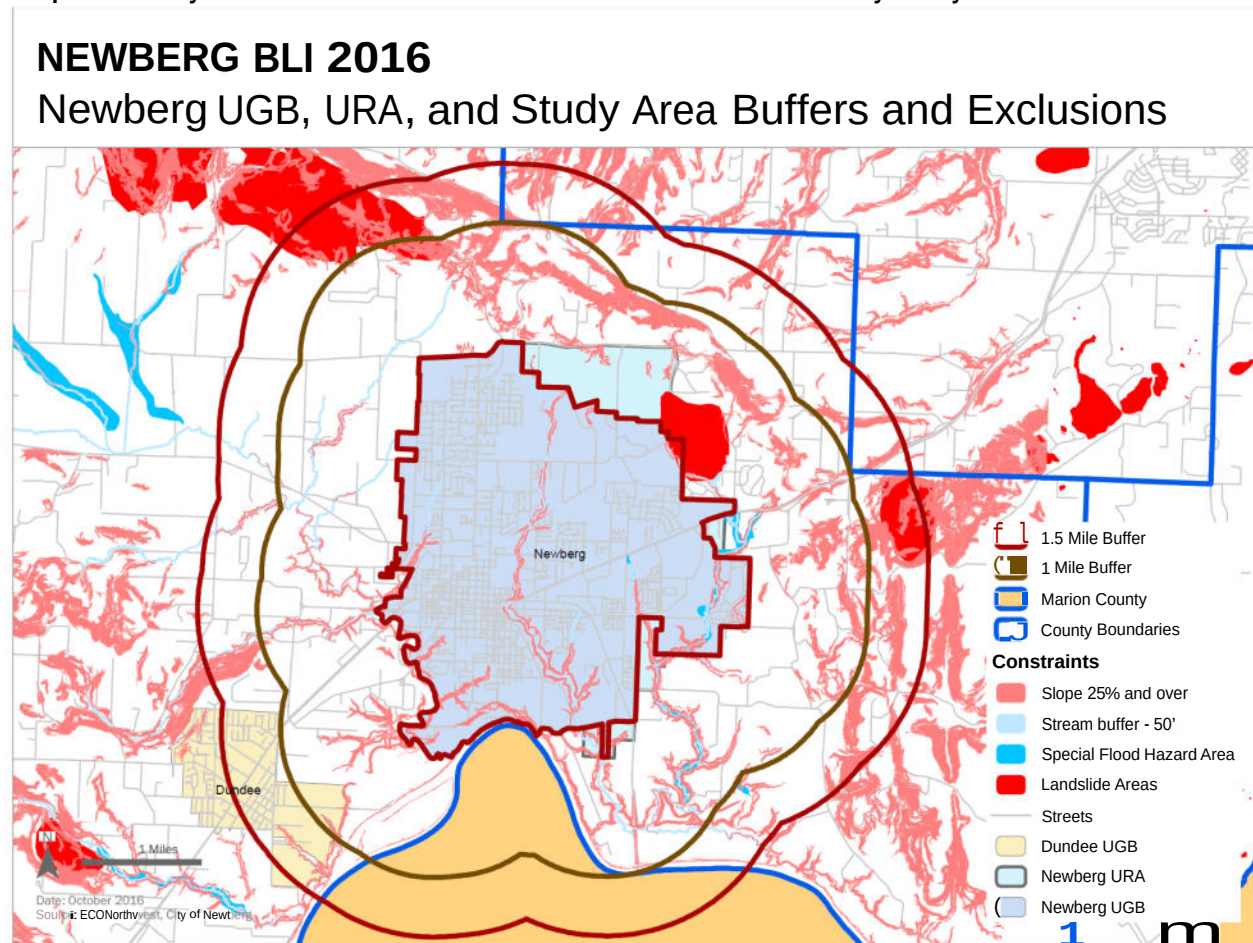
(B) Flooding, including inundation during storm surges: the land is within the Special Flood Hazard Area (SFHA) identified on the applicable Flood Insurance Rate Map (FIRM);

This section has several other provisions that are either not applicable to Newberg or which the City has chosen not to apply. Based on these provisions, the City removed the following areas from further consideration:

- **Areas in Marion County.** The Willamette River is the boundary between Yamhill and Marion County. A portion of the Newberg UGB is adjacent to the river. Moreover, areas within the one- and 1.5-mile buffers fall within Marion County. The City finds that it is impracticable to provide necessary public services to these areas as described in OAR 660-038-0160(7)(b).
- **Landslide areas.** Several areas within the one- and 1.5-mile buffer are identified in DOGAMI's SLIDO 3.2 database. These were removed from further consideration pursuant to OAR 660-038-0160(2)(b)(A).
- **Flood areas.** Several areas within the one- and 1.5-mile buffer are identified in the Special Flood Hazard Area by FEMA. These were removed from further consideration pursuant to OAR 660-038-0160(2)(b)(B).
- **Dundee UGB.** Areas within the Dundee UGB are removed from further consideration.

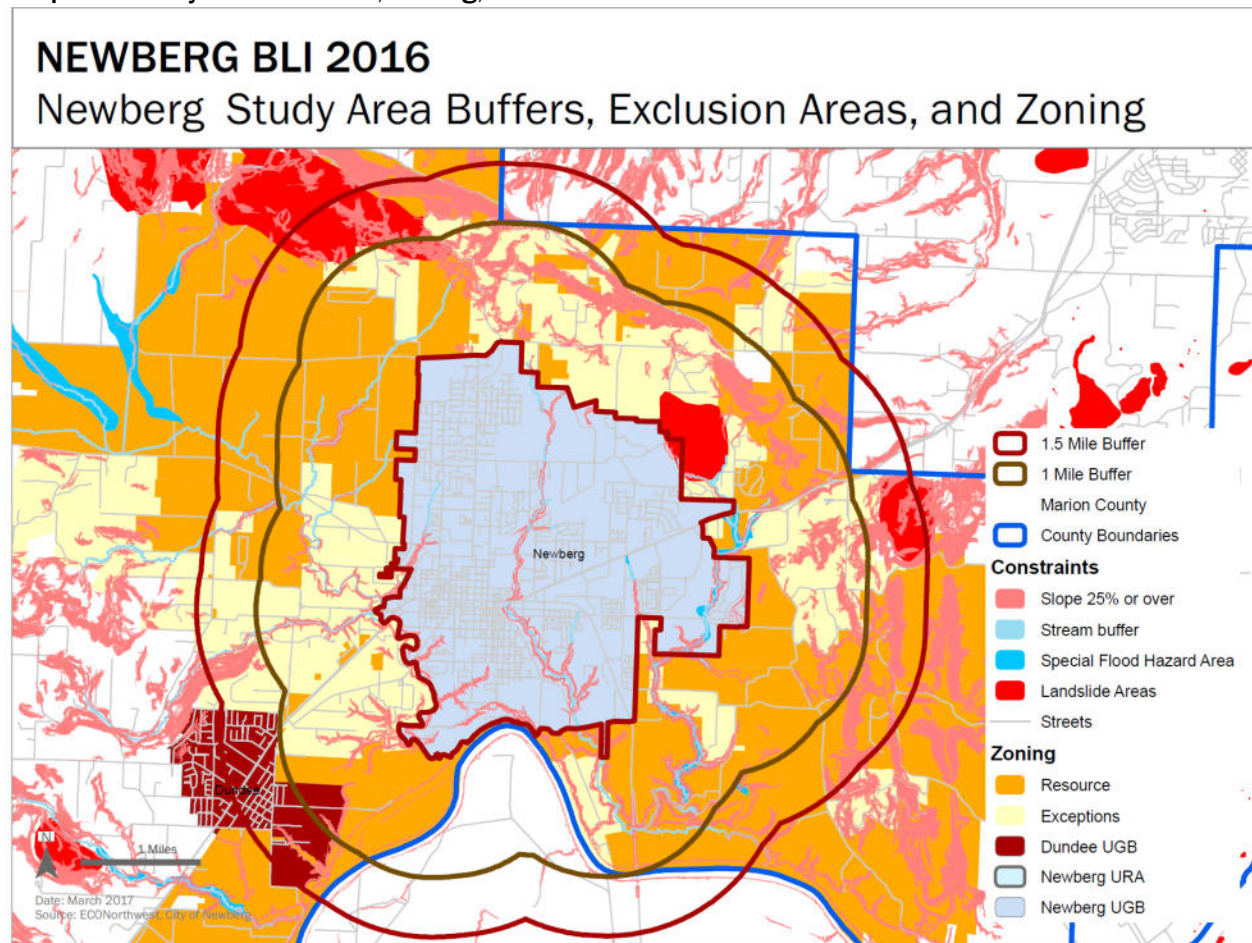
Map A-2 shows areas excluded from the preliminary study area.

Map A-2. Study Area Buffers and Areas Excluded from the Preliminary Study Area



The final step in defining the study area is to identify exception areas in the area between the one and 1.5-mile buffer that are contiguous to exception areas within the one-mile buffer. Map A-3 shows tax lots included in the preliminary study area. Note that the full area of lots that intersect the one- and 1.5-mile buffers were included. The City does not anticipate splitting tax lots based on the buffers.

Map A-3. Study Area Tax Lots, Zoning, and Exclusions



We note that additional lands could be excluded from the inventory based on the provisions of subsections 3-5. Because it is not clear what the City's land need is at this point, it is not particularly efficient to review 10,000 acres for all of these deductions. A more prudent approach would be to narrow down lands outside the UGB in to study areas and conduct more detailed analysis of those areas.

(3) After excluding land from the preliminary study area under section (2), the city must adjust the study area, if necessary, so that it includes an amount of land that is at least twice the amount of land needed to satisfy the combined need deficiency determined under OAR 660-038-0080 and 660-038-0150. Such adjustment shall be made by expanding the applicable distance specified under section (1) and applying section (2) to the expanded area.

(4) For purposes of evaluating the priority of land under OAR 660-038-0170, the "study area" shall consist of all land that remains in the preliminary study area described in section (1) of this rule after adjustments to the area based on sections (2) and (3).

(5) For purposes of subsection (2)(a), the city may consider it impracticable to provide necessary public facilities or services to the following lands:

(a) Contiguous areas of at least five acres where 75 percent or more of the land has a slope of 25 percent or greater; provided that contiguous areas 20 acres or more that are less than 25 percent slope may not be excluded under this subsection. Slope shall be measured as the increase in elevation divided by the horizontal distance at maximum ten-foot contour intervals;

(b) Lands requiring the construction of a new freeway interchange, overpass, underpass, or similar improvement to accommodate planned urban development providing such improvement is not currently identified in the Statewide Transportation Improvement Program (STIP) for construction within the planning period;

(c) Land that is isolated from existing service networks by physical, topographic, or other impediments to service provision such that it is impracticable to provide necessary facilities or services to the land within the planning period. The city's determination shall be based on an evaluation of:

(A) The likely amount of development that could occur on the land within the planning period;

(B) The likely cost of facilities and services; and,

(C) Any substantial evidence collected by or presented to the city regarding how similarly situated land in the region has, or has not, developed over time.

(d) As used in this section, "impediments to service provision" may include but are not limited to:

(A) Major rivers or other water bodies that would require new bridge crossings to serve planned urban development;

(B) Topographic features such as canyons or ridges with slopes exceeding 40 percent and vertical relief of greater than 80 feet;

(C) Freeways, rail lines, or other restricted access corridors that would require new grade separated crossings to serve planned urban development;

(D) Significant scenic, natural, cultural or recreational resources on an acknowledged plan inventory and subject protection measures under the plan or implementing regulations, or on a published state or federal inventory, that would prohibit or substantially impede the placement or construction of necessary public facilities and services.

(6) Land may not be excluded from the preliminary study area based on a finding of impracticability that is primarily a result of existing development patterns. However, a city may forecast development capacity for such land as provided in OAR 660-038-0170(1)(d).

Appendix B: Division 38 Guidelines for Buildable Land Inventories

The Division 38 Simplified Urban Growth Boundary Methods rule (OAR 660-038) was adopted by the Land Conservation and Development Commission in January 2016 after a year-long rulemaking process. We include the sections that directly pertain to buildable land inventories here for reference. A complete copy of the rule is available on the Oregon Secretary of State website: http://arcweb.sos.state.or.us/pages/rules/oars_600/oar_660/660_038.html.

660-038-0010 - Definitions

The definitions in ORS 197.015, the statewide planning goals, and the following definitions apply to this division:

- (1) “Buildable lands” means land in urban or urbanizable areas that are suitable for urban uses, as provided in ORS 197A.300(1). Note: This definition applies to this division only; a different definition of “buildable lands” is provided in laws and rules concerning needed housing (ORS 197.295; OAR 660-007-0005 and 660-008-0005 and OAR 660-024-0010).
- (2) “Commercial” and “commercial use” mean office, retail, institutional and public employment land uses described by the North American Industry Classification System (NAICS) Categories 44, 45, 51, 52, 53, 54, 55, 56, 61, 62, 71, 72, 81, 92, and 99. These are land uses that generally do not require significant space for indoor or outdoor production or logistics.
- (3) “Industrial” and “industrial use” mean employment activities including, but not limited to, manufacturing, assembly, fabrication, processing, storage, logistics, warehousing, importation, distribution and transshipment, and research and development, that generate income from the production, handling or distribution of goods or services, including goods or services in the traded sector, as defined in ORS 285A.010. “Industrial use” means NAICS Categories 11, 21, 22, 23, 31, 32, 33, 42, 48, and 49. These are land uses that generally require significant space for indoor or outdoor production or logistics.
- (4) “Initiate” means that the local government issues a public notice specified in OAR 660-018-0020, including a notice to the Department of Land Conservation and Development, for a proposed plan amendment that concerns evaluating or amending a UGB.
- (5) “Nonresource land” has the meaning specified in OAR 660-004-0005(3).
- (6) “Range” means a range of numbers specified in rules in this division (see ORS 197A.325(2)(a)). A city may choose to use the number at either end of a stated range or any number between. Ranges allow a city to make choices regarding its future growth.

(7) “Serviceable” means, with respect to land supply in a UGB, and as described in OAR 660-038-0200, that:

(a) Adequate sewer, water and transportation capacity for planned urban development is available or can be either provided or made subject to committed financing; or

(b) Committed financing can be in place to provide adequate sewer, water and transportation capacity for planned urban development.

(8) “UGB” means “urban growth boundary.”

(9) “Urbanizable land” means land inside a UGB that, due to the present unavailability of urban facilities and services, or for other reasons, either retains the zone designations assigned prior to inclusion in the UGB or is subject to interim zone designations intended to maintain the land’s potential for planned urban development until appropriate public facilities and services are available or planned.

Stat. Auth.: ORS 197.040, 197A.305, 197A.320 & 197.235

Stats. Implemented: ORS 197A.300, 197A.302, 197A.305, 197A.310, 197A.312, 197A.315, 197A.320 & 197A.325

Hist.: LCDD 6-2015, f. 12-29-15, cert. ef. 1-1-16

660-038-0060 - Buildable Lands Inventory (BLI) for Residential Land within the UGB

A city must determine the supply and development capacity of lands within its UGB by conducting a buildable lands inventory (BLI) as provided in this rule.

(1) For purposes of the BLI, the city shall classify the existing residential comprehensive plan and zoning designations within its UGB based on allowed density. The classification shall be based on either:

(a) The allowed density and housing types on the comprehensive plan map; or

(b) If the comprehensive plan map does not differentiate residential districts by density or type of housing, the applicable city or county zoning map, as follows:

(A) For cities with a UGB population less than 2,500, districts shall be classified as follows:

(i) Districts with a maximum density less than or equal to eight dwelling units per acre: low density residential. A city may classify a district as low density residential despite a maximum density of greater than eight dwelling units per acre if the majority of existing residences within the district are single-family detached and if the city has a medium density residential district as determined by subparagraph (ii);

(ii) Districts with a maximum density greater than eight dwelling units per acre: medium density residential.

(B) For cities with UGB populations greater than or equal to 2,500, districts shall be classified as follows:

(i) Districts with a **maximum density less than or equal to eight dwelling units per acre: low density residential**. A city may classify a district as low density residential despite a maximum density of greater than eight dwelling units per acre if the majority of existing residences within the district are single-family detached and the city has a medium density residential district as determined by subparagraph (ii);

(ii) Districts with a **maximum density greater than eight dwelling units per acre and less than or equal to 16 dwelling units per acre: medium density residential**, unless the district has been classified as low density residential pursuant to subparagraph (i). A city may classify a district as medium density residential despite a maximum density of greater than 16 dwelling units per acre if the majority of development within the district is developed at densities of between eight and 16 dwelling units per net acre and the city has a high density residential district as determined by subparagraph (iii);

(iii) Districts with a **maximum density greater than 16 dwelling units per acre: high density residential**, unless the district has been classified as medium density residential pursuant to subparagraph (ii);

(iv) A city may not classify as low density a district that allows higher residential densities than a district the city has classified as medium density. A city may not classify as medium density a district that allows higher residential densities than a district the city has classified as high density.

(2) The city must identify all vacant lots and parcels with a residential comprehensive plan designation. A city shall assume that a lot or parcel is **vacant if it is at least 3,000 square feet with a real market improvement value of less than \$10,000**.

(3) The city must identify all partially vacant lots and parcels with a residential comprehensive plan designation, as follows:

(a) For lots and **parcels at least one-half acre in size that contain a single-family residence, the city must subtract one-quarter acre for the residence**, and count the remainder of the lot or parcel as vacant land, and

(b) For lots and parcels at least **one-half acre in size that contain more than one single-family residence, multiple-family residences, non-residential uses, or ancillary uses such as parking areas and recreational facilities, the city must identify vacant areas using an orthophoto or other map of comparable geometric accuracy**. For the purposes of this identification, **all publicly owned park land shall be considered developed**. If the vacant area is at least one-quarter acre, the city shall consider that portion of the lot or parcel to be vacant land.

(4) The city must determine the amount and mapped location of low density, medium density, and high density vacant and partially vacant land in residential plan or zone districts within the city's UGB.

(5) The city must, within the city limits,

(a) Identify all lots and parcels within a residential district that are developed;

(b) Identify all portions of partially vacant lots and parcels within a residential district that are developed with residential uses;

- (c) Calculate the total area of land identified in (a) and (b);
- (d) Calculate the total number of existing dwelling units located on the land identified in (a) and (b); and
- (e) Calculate the net density of residential development on the land identified in (a) and (b).

Stat. Auth.: ORS 197.040, 197A.305, 197A.320 & 197.235

Stats. Implemented: ORS 197A.300, 197A.302, 197A.305, 197A.310, 197A.312, 197A.315, 197A.320 & 197A.325

Hist.: LCDD 6-2015, f. 12-29-15, cert. ef. 1-1-16

660-038-0070 - Adjust Residential Lands Inventory to Account for Constrained Lands

A city must adjust the inventory of residential lands prepared under OAR 660-038-0060 to account for constrained lands using this rule.

(1) The city must identify the following physical constraints on land inventoried as vacant or partially vacant under OAR 660-038-0060:

(a) Floodways and water bodies. For the purpose of this subsection, “water bodies” includes;

(A) Rivers; and

(B) Lakes, ponds, sloughs, and coastal waters at least one-half acre in size.

(b) Other lands within the Special Flood Hazard Area as identified on the applicable Flood Insurance Rate Map;

(c) Lands within the tsunami inundation zone established pursuant to ORS 455.446;

(d) Contiguous lands of at least one acre with slopes greater than 25 percent. Slope shall be measured as the increase in elevation divided by the horizontal distance at maximum 10-foot contour intervals;

(e) Lands subject to development restrictions as a result of acknowledged comprehensive plan or land use regulations to implement Statewide Planning Goals 5, 6, or 7, and

(f) Lands subject to development prohibitions, natural resource protections, or both in acknowledged comprehensive plan or land use regulations to implement Statewide Planning Goals 15, 16, 17, or 18.

(2) For lands identified in section (1), the city may reduce the estimated residential development capacity by the following factors in terms of acreage:

(a) For lands within floodways and water bodies: a 100 percent reduction.

(b) For other lands within Special Flood Hazard Area as identified on the applicable Flood Insurance Rate Map: a 100 percent reduction.

(c) For lands within the tsunami inundation zone: no reduction unless the acknowledged comprehensive plan or land use regulations applicable to such areas prohibits or reduces residential development, in which case the reduction shall be based upon the maximum density allowed by the acknowledged comprehensive plan or land use regulation.

(d) For lands with slopes that are greater than 25 percent: a 100 percent reduction. However, if the lot or parcel includes land with slopes less than 25 percent, the reduction applies only to the land with slopes greater than 25 percent. Slope shall be measured as the increase in elevation divided by the horizontal distance at maximum ten-foot contour intervals;

(e) For lands subject to development restrictions in an acknowledged comprehensive plan or land use regulations developed pursuant to Statewide Planning Goals 5, 6, or 7: a reduction to the maximum level of development authorized by the acknowledged comprehensive plan or land use regulations.

(f) For lands subject to development prohibitions, natural resource protections, or both, in an acknowledged comprehensive plan or land use regulations that implements Statewide Planning Goals 15, 16, 17 or 18: a reduction to the maximum level of development authorized by the acknowledged comprehensive plan or land use regulations.

(3) The residential BLI amount for each type of needed housing for a city is the amount of buildable land for that needed housing type determined in OAR 660-038-0060 reduced by the constraints as determined in this rule.

Stat. Auth.: ORS 197.040, 197A.305, 197A.320 & 197.235

Stats. Implemented: ORS 197A.300, 197A.302, 197A.305, 197A.310, 197A.312, 197A.315, 197A.320 & 197A.325

Hist.: LCDD 6-2015, f. 12-29-15, cert. ef. 1-1-16

660-038-0120 - Inventory of Buildable Employment Land within the UGB

A city must determine the supply and development capacity of employment lands within its UGB at the time of initiation by conducting a buildable lands inventory (BLI) for employment land as provided in this rule and OAR 660-038-00130.

(1) For purposes of the employment BLI, the city shall classify the existing employment zoning districts and plan map districts within its UGB as either “commercial” or “industrial” based on the applicable definitions in OAR 660-038-0010. Districts that allow both commercial and industrial uses as per the definition must be classified as one or the other, based on the intent of the plan and with consideration of whether the predominant NAICS categories allowed by the district are characteristic of a commercial or industrial use.

(2) The city must identify all lots and parcels in the UGB with either a commercial or industrial designation on the comprehensive plan map or zoning district, determine which lots or parcels are vacant, partially vacant, or developed and calculate the total area of such land, as follows:

(a) A city may assume that a lot or parcel is **vacant if the real market improvement value is less than \$5,000 or if the real market improvement value is less than or equal to 5 percent of the real market land value.**

(b) A city may assume that a lot or parcel is partially vacant if either:

(A) The real market improvement value of the lot or parcel is greater than **five percent and less than 40 percent of the real market land value, in which case, the city must assume that 50 percent of the lot or parcel is developed and 50 percent is vacant, or**

(B) Based on an orthomap, the lot or parcel is greater than **one acre in size and at least one-half acre is not improved.**

(c) A city may assume that a lot or parcel is **developed if the real market improvement value is greater than or equal to 40 percent of the real market land value.**

(3) The city must use the results of section (2) to determine the current density of employment land within the UGB under OAR 660-038-0140(4) and (5).

Stat. Auth.: ORS 197.040, 197A.305, 197A.320 & 197.235

Stats. Implemented: ORS 197A.300, 197A.302, 197A.305, 197A.310, 197A.312, 197A.315, 197A.320 & 197A.325

Hist.: LCDD 6-2015, f. 12-29-15, cert. ef. 1-1-16

660-038-0130

Adjust Employment Buildable Land Inventory to Account for Constrained Lands

A city must adjust the employment buildable lands inventory determined under OAR 660-038-0120 to account for constrained lands using this rule.

(1) The city must identify the following physical constraints on employment land inventoried under OAR 660-038-0120:

(a) Floodways and water bodies. For the purpose of this subsection, “water bodies” includes:

(A) Rivers; and

(B) Lakes, ponds, sloughs, and coastal waters at least one-half acre in size;

(b) Other lands within the Special Flood Hazard Area as identified on the applicable Flood Insurance Rate Map;

(c) Lands within the tsunami inundation zone established pursuant to ORS 455.446;

(d) Contiguous lands planned and zoned for **commercial use of at least one acre with slopes that are greater than 25 percent.** For purposes of this rule, slope shall be measured as the increase in elevation divided by the horizontal distance at maximum 10-foot contour intervals;

(e) Contiguous lands planned and zoned for **industrial use of at least one acre with slopes that are greater than 10 percent.** For purposes of this rule, slope shall be measured as the increase in elevation divided by the horizontal distance at maximum 10-foot contour intervals;

(f) Lands subject to development restrictions as a result of acknowledged comprehensive plan or land use regulations to implement Statewide Planning Goals 5, 6, or 7, and

(f) Lands subject to development prohibitions, natural resource protections, or both, in an acknowledged comprehensive plan or land use regulations that implement Statewide Planning Goals 15, 16, 17, or 18.

(2) For lands identified in section (1), the city may reduce the estimated development capacity by the following factors in terms of acreage:

(a) For lands within floodways and water bodies: a 100 percent reduction.

(b) For other lands within the Special Flood Hazard Area (SFHA) as identified on the applicable Flood Insurance Rate Map (FIRM), either (at the city's option):

(A) A 50 percent reduction, or

(B) A reduction to the levels required by the acknowledged comprehensive plan or land use regulations.

(c) For lands within the tsunami inundation zone: no reduction unless the acknowledged comprehensive plan or land use regulations applicable to such areas prohibits or reduces allowed development, in which case the reduction shall be based upon the maximum density allowed by the acknowledged comprehensive plan or land use regulations.

(d) For lands designated for commercial use, contiguous lands of at least one acre with slope greater than 25 percent: a 100 percent reduction, provided that if such land includes slopes less than 25 percent, the reduction applies only to those areas with slopes greater than 25 percent. Slope shall be measured as the increase in elevation divided by the horizontal distance at maximum ten-foot contour intervals;

(e) For lands designated for industrial use, contiguous lands of at least one acre with slope greater than 10 percent: a 100 percent reduction, provided that a lot or parcel with slopes greater than 10 percent that has at least five contiguous acres with slopes less than 10 percent, this authorized reduction does not apply to those areas.

(f) For lands subject to restrictions in density or location of development in an acknowledged comprehensive plan or land use regulations developed pursuant to Statewide Planning Goals 5, 6, or 7: a reduction to the maximum level of development authorized by the acknowledged comprehensive plan or land use regulations.

(g) For lands subject to development prohibitions, natural resource protections, or both, in an acknowledged comprehensive plan or land use regulations that implements Statewide Planning Goals 15, 16, 17, or 18: a reduction to the maximum level of development authorized by the acknowledged comprehensive plan or land use regulations.

(3) The amount of buildable land in the UGB designated for commercial and industrial uses is that amount determined in OAR 660-038-0120 reduced by the constraints determined under section (2) of this rule.

Stat. Auth.: ORS 197.040, 197A.305, 197A.320 & 197.235

Stats. Implemented: ORS 197A.300, 197A.302, 197A.305, 197A.310, 197A.312, 197A.315, 197A.320 & 197A.325

Hist.: LCDD 6-2015, f. 12-29-15, cert. ef. 1-1-16

660-038-0160 - Establishment of Study Area to Evaluate Land for Inclusion in the UGB

Cities shall comply with this rule and OAR 660-038-0170 when determining which lands to include within the UGB in response to a deficit of land to meet long-term needs determined under OAR 660-038-0080, 660-038-0150, or both.

(1) The city shall determine which land to add to the UGB by evaluating alternative locations within a “study area” established pursuant to this rule. To establish the study area, the city must first identify a **“preliminary study area”** which **shall not include land within a different UGB** or the corporate limits of a city within a different UGB. The preliminary study area shall include:

(a) All lands in the city’s acknowledged urban reserve, if any;

(b) All lands that are within the following distance from the acknowledged UGB, except as provided in subsection (d):

(A) For cities with a UGB population less than 10,000: one-half mile;

(B) For cities with a UGB population equal to or greater than 10,000: one mile;

(c) All exception areas contiguous to an exception area that includes land within the distance specified in subsection (b) and that are within the following distance from the acknowledged UGB:

(A) For cities with a UGB population less than 10,000: one mile;

(B) For cities with a UGB population equal to or greater than 10,000: one and one-half miles;

(d) At the discretion of the city, the preliminary study area may include land that is beyond the distance specified in subsections (b) and (c).

(2) The city may exclude land from the preliminary study area if it determines that any of the conditions in this section apply to the land:

(a) Based on the standards in section (5) of this rule, it is impracticable to provide necessary public facilities or services to the land;

(b) The land is subject to significant development hazards, due to a risk of:

(A) Landslides: The land consists of a landslide deposit or scarp flank that is described and mapped on the Statewide Landslide Information Database for Oregon (SLIDO) Release 3.2 Geodatabase published by the Oregon Department of Geology and Mineral Industries (DOGAMI) December 2014, provided that the deposit or scarp flank in the data source is mapped at a scale of 1:40,000 or finer. If the owner of a lot or parcel provides the city with a site-specific analysis by a certified engineering geologist

demonstrating that development of the property would not be subject to significant landslide risk, the city may not exclude the lot or parcel under this paragraph;

(B) Flooding, including inundation during storm surges: the land is within the Special Flood Hazard Area (SFHA) identified on the applicable Flood Insurance Rate Map (FIRM);

(C) Tsunamis: the land is within a tsunami inundation zone established pursuant to ORS 455.446.

(c) The land consists of a significant scenic, natural, cultural or recreational resource described in this subsection:

(A) Land that is designated in an acknowledged comprehensive plan prior to initiation of the UGB amendment, or that is mapped on a published state or federal inventory at a scale sufficient to determine its location for purposes of this rule, as:

(i) Critical or essential habitat for a species listed by a state or federal agency as threatened or endangered;

(ii) Core habitat for Greater Sage Grouse; or

(iii) Migration corridors or big game winter range, except where located on lands designated as urban reserves or exception areas;

(B) Federal Wild and Scenic Rivers and State Scenic Waterways, including Related Adjacent Lands described by ORS 390.805, as mapped by the applicable state or federal agency responsible for that scenic program;

(C) Designated Natural Areas on the Oregon State Register of Natural Heritage Resources;

(D) Wellhead protection areas described under OAR 660-023-0140 and delineated on a local comprehensive plan;

(E) Aquatic areas subject to Statewide Planning Goal 16 that are in a Natural or Conservation management unit designated in an acknowledged comprehensive plan;

(F) Lands subject to acknowledged comprehensive plan or land use regulations that implement Statewide Planning Goal 17, Coastal Shoreland, Use Requirement 1;

(G) Lands subject to acknowledged comprehensive plan or land use regulations that implement Statewide Planning Goal 18, Implementation Requirement 2.

(d) The land is owned by the federal government and managed primarily for rural uses.

(3) After excluding land from the preliminary study area under section (2), the city must adjust the study area, if necessary, so that it includes an amount of land that is at least twice the amount of land needed to satisfy the combined need deficiency determined under OAR 660-038-0080 and 660-038-0150. Such adjustment shall be made by expanding the applicable distance specified under section (1) and applying section (2) to the expanded area.

(4) For purposes of evaluating the priority of land under OAR 660-038-0170, the “study area” shall consist of all land that remains in the preliminary study area described in section (1) of this rule after adjustments to the area based on sections (2) and (3).

(5) For purposes of subsection (2)(a), the city may consider it impracticable to provide necessary public facilities or services to the following lands:

(a) Contiguous areas of at least five acres where 75 percent or more of the land has a slope of 25 percent or greater; provided that contiguous areas 20 acres or more that are less than 25 percent slope may not be excluded under this subsection. Slope shall be measured as the increase in elevation divided by the horizontal distance at maximum ten-foot contour intervals;

(b) Lands requiring the construction of a new freeway interchange, overpass, underpass, or similar improvement to accommodate planned urban development providing such improvement is not currently identified in the Statewide Transportation Improvement Program (STIP) for construction within the planning period;

(c) Land that is isolated from existing service networks by physical, topographic, or other impediments to service provision such that it is impracticable to provide necessary facilities or services to the land within the planning period. The city’s determination shall be based on an evaluation of:

(A) The likely amount of development that could occur on the land within the planning period;

(B) The likely cost of facilities and services; and,

(C) Any substantial evidence collected by or presented to the city regarding how similarly situated land in the region has, or has not, developed over time.

(d) As used in this section, “impediments to service provision” may include but are not limited to:

(A) Major rivers or other water bodies that would require new bridge crossings to serve planned urban development;

(B) Topographic features such as canyons or ridges with slopes exceeding 40 percent and vertical relief of greater than 80 feet;

(C) Freeways, rail lines, or other restricted access corridors that would require new grade separated crossings to serve planned urban development;

(D) Significant scenic, natural, cultural or recreational resources on an acknowledged plan inventory and subject protection measures under the plan or implementing regulations, or on a published state or federal inventory, that would prohibit or substantially impede the placement or construction of necessary public facilities and services.

(6) Land may not be excluded from the preliminary study area based on a finding of impracticability that is primarily a result of existing development patterns. However, a city may forecast development capacity for such land as provided in OAR 660-038-0170(1)(d).

(7) A city that has a population of 10,000 or more that evaluates or amends its UGB using a method described in this division, must notify districts and counties that have territory within the study area in the manner required by ORS 197A.315 and meet other applicable requirements in that statute.

Stat. Auth.: ORS 197.040, 197A.305, 197A.320 & 197.235

Stats. Implemented: ORS 197A.300, 197A.302, 197A.305, 197A.310, 197A.312, 197A.315, 197A.320 & 197A.325

Hist.: LCDD 6-2015, f. 12-29-15, cert. ef. 1-1-16

660-038-0170 - Evaluation of Land in the Study Area for Inclusion in the UGB; Priorities

(1) A city considering a UGB amendment must decide which land to add to the UGB by evaluating all land in the study area determined under OAR 660-038-0160, as follows:

(a) Beginning with the highest priority category of land described in section (2), the city must apply section (5) to **determine which land in that priority category is suitable to satisfy the need deficiency** determined under OAR 660-038-0080 and 660-038-0150 and select for inclusion in the UGB as much of the land as necessary to satisfy the need.

(b) **If the amount of suitable land in the first priority category is not adequate to satisfy the identified need deficiency**, the city must apply section (5) to determine which land in the next priority is suitable and select for inclusion in the UGB as much of the suitable land in that priority as necessary to satisfy the need. The city must proceed in this manner until all the land need is satisfied.

(c) If the **amount of suitable land in a particular priority category in section (2) exceeds the amount necessary to satisfy the need deficiency**, the city must choose which land in that priority to include in the UGB by applying the criteria in section (7) of this rule.

(d) In evaluating the sufficiency of land to satisfy a need under this section, the city may consider factors that reduce the capacity of the land to meet the need, including factors identified in sections (5) and (6) of this rule.

(e) Land that is determined to not be suitable under section (5) of this rule to satisfy the need deficiency determined under OAR 660-038-0080 or 660-038-0150 is not required to be selected for inclusion in the UGB unless its inclusion is necessary to serve other higher priority lands.

(2) Priority of Land for inclusion in a UGB:

(a) **First priority is urban reserve, exception land, and nonresource land.** Lands in the study area that meet the description in paragraphs (A) through (C) of this subsection are of equal (first) priority:

(A) Land designated as an urban reserve under OAR chapter 660, division 21, in an acknowledged comprehensive plan;

(B) Land that is subject to an acknowledged exception under ORS 197.732; and

(C) Land that is nonresource land.

(b) **Second priority is marginal land:** land within the study area that is designated as marginal land under ORS 197.247 (1991 Edition) in the acknowledged comprehensive plan.

(c) **Third priority is forest or farm land that is not predominantly high-value farmland:** land within the study area that is designated for forest or agriculture uses in the acknowledged comprehensive plan that is not predominantly high-value farmland, as defined in ORS 195.300, or that does not consist predominantly of prime or unique soils, as determined by the United States Department of Agriculture Natural Resources Conservation Service (USDA NRCS). In selecting as much of the suitable land as necessary to satisfy the need, the city must use the agricultural land capability classification system or the cubic foot site class system, as appropriate for the acknowledged comprehensive plan designation, to select lower capability or cubic foot site class lands first.

(d) **Fourth priority is farmland that is predominantly high-value farmland:** land within the study area that is designated as agricultural land in an acknowledged comprehensive plan and is predominantly high-value farmland as defined in ORS 195.300. A city may not select land that is predominantly made up of prime or unique farm soils, as defined by the USDA NRCS, unless there is an insufficient amount of other land to satisfy its land need. In selecting as much of the suitable land as necessary to satisfy the need, the city must use the agricultural land capability classification system to select lower capability lands first.

(3) Notwithstanding subsections (2)(c) or (d) of this rule, land that would otherwise be excluded from a UGB may be included if:

(a) The land contains a small amount of third or fourth priority land that is not important to the commercial agricultural enterprise in the area and the land must be included in the UGB to connect a nearby and significantly larger area of land of higher priority for inclusion within the UGB; or

(b) The land contains a small amount of third or fourth priority land that is not predominantly high-value farmland or predominantly made up of prime or unique farm soils and the land is completely surrounded by land of higher priority for inclusion into the UGB.

(4) For purposes of categorizing and evaluating land pursuant to subsections (2)(c) and (d) and section (3) of this rule:

(a) **Areas of land not larger than 100 acres may be grouped together and studied as a single unit of land;**

(b) Areas of land larger than 100 acres that are similarly situated and have similar soils may be grouped together provided soils of lower agricultural or forest capability may not be grouped with soils of higher capability in a manner inconsistent with the intent of section (2) of this rule, which requires that higher capability resource lands shall be the last priority for inclusion in a UGB;

(c) When determining whether the land is predominantly high-value farmland, or predominantly prime or unique, “predominantly” means more than 50 percent.

(5) With respect to section (1), a city must assume that vacant or partially vacant land in a particular priority category is “suitable” to satisfy a need deficiency identified in OAR 660-038-0080 or 660-038-

0150, whichever is applicable, unless it demonstrates that the land cannot satisfy the need based on one or more of the conditions described in subsections (a) through (f) of this section:

(a) Existing parcelization, lot sizes or development patterns of rural residential land make that land unsuitable for an identified **employment** need, as follows:

(A) Parcelization: the land consists primarily of **parcels 2-acres** or less in size, or

(B) Existing development patterns: the land cannot be reasonably redeveloped or infilled within the planning period due to the location of existing structures and infrastructure.

(b) The land would qualify for exclusion from the preliminary study area under the factors in OAR 660-038-0160(2) but the city declined to exclude it pending more detailed analysis.

(c) The land is, or will be upon inclusion in the UGB, **subject to natural resources protection under Statewide Planning Goals 5** such that that no development capacity should be forecast on that land to meet the land need deficiency.

(d) With respect to **needed industrial uses only, the land is over 10 percent slope**, as measured in the manner described in OAR 660-038-0160(5); is an **existing lot or parcel that is smaller than 5 acres** in size; or both.

(e) The land is subject to a **conservation easement described in ORS 271.715** that prohibits urban development.

(f) The land is **committed to a use described in this subsection and the use is unlikely to be discontinued during the planning period:**

(A) Public park, church, school, or cemetery, or

(B) Land within the boundary of an airport designated for airport uses, but not including land designated or zoned for residential, commercial or industrial uses in an acknowledged comprehensive plan or land use regulations.

(6) For vacant or partially vacant lands added to the UGB to provide for **residential** uses:

(a) **Existing lots or parcels one acre or less may be assumed to have a development capacity of one dwelling unit per lot or parcel. Existing lots or parcels greater than one acre but less than two acres shall be assumed to have an aggregate development capacity of two dwelling units per acre.**

(b) In any subsequent review of a UGB pursuant to this division, the city may use a development assumption for land described in subsection (a) of this section for a period of up to 14 years from the date the lands were added to the UGB.

(7) Pursuant to subsection (1)(c), if the amount of suitable land in a particular priority category under section (2) exceeds the amount necessary to satisfy the need deficiency, the city must choose which land in that priority to include in the UGB by first applying the boundary location factors of Goal 14 and then applying applicable criteria in the comprehensive plan and land use regulations acknowledged prior

to initiation of the UGB evaluation or amendment. The city may not apply local comprehensive plan criteria that contradict the requirements of the boundary location factors of Goal 14. The boundary location factors are not independent criteria; when the factors are applied to compare alternative boundary locations and to determine the UGB location the city must demonstrate that it considered and balanced all the factors. The criteria in this section may not be used to select lands designated for agriculture or forest use that have higher land capability or cubic foot site class, as applicable, ahead of lands that have lower capability or cubic foot site class.

(8) The city must apply the boundary location factors in coordination with service providers and state agencies, including the Oregon Department of Transportation (ODOT) with respect to Factor 2 regarding impacts on the state transportation system, and the Oregon Department of Fish and Wildlife (ODFW) and the Department of State Lands (DSL) with respect to Factor 3 regarding environmental consequences. "Coordination" includes timely notice to agencies and service providers and consideration of any recommended evaluation methodologies.

(9) In applying Goal 14 Boundary Location Factor 2, to evaluate alternative locations under section (7), the city must compare relative costs, advantages and disadvantages of alternative UGB expansion areas with respect to the provision of public facilities and services needed to urbanize alternative boundary locations. For purposes of this section, the term "public facilities and services" means water, sanitary sewer, storm water management, and transportation facilities. The evaluation and comparison under Boundary Location Factor 2 must consider:

(a) The impacts to existing water, sanitary sewer, storm water and transportation facilities that serve nearby areas already inside the UGB;

(b) The capacity of existing public facilities and services to serve areas already inside the UGB as well as areas proposed for addition to the UGB; and

(c) The need for new transportation facilities, such as highways and other roadways, interchanges, arterials and collectors, additional travel lanes, other major improvements on existing roadways and, for urban areas of 25,000 or more, the provision of public transit service.

(10) The adopted findings for UGB amendment must describe or map all of the alternative areas evaluated in the boundary location alternatives analysis.

Stat. Auth.: ORS 197.040, 197A.305, 197A.320 & 197.235

Stats. Implemented: ORS 197A.300, 197A.302, 197A.305, 197A.310, 197A.312, 197A.315, 197A.320 & 197A.325

Hist.: LCDD 6-2015, f. 12-29-15, cert. ef. 1-1-16

DATE: March 27, 2017
TO: Doug Rux
FROM: Bob Parker
SUBJECT: Comparison of Division 38 and Traditional BLI Methods

The City of Newberg is preparing to evaluate the sufficiency of lands within its Urban Growth Boundary (UGB). That process has two steps: (1) documentation of land needed for housing, employment and public facilities; and (2) documentation of land supply. Newberg intends to pursue the boundary amendment in the second half of 2017 with the potential of using the Division 38 (OAR 660-038) simplified urban growth boundary method. As an initial step in the process, the City contracted ECONorthwest to prepare a buildable lands inventory (BLI) that complies with applicable state statutes and administrative rules.

The requirements for establishment of a UGB are defined in Statewide Planning Goal 14. The Goal 14 administrative rule (OAR 660-024) provides specific guidance with respect to the adoption and amendment of UGBs. In 2015, however, the Land Conservation and Development Commission (LCDC) developed a new administrative rule that created a simplified pathway for boundary reviews, which is codified as OAR 660-038 (Simplified Urban Growth Boundary Method).

ECONorthwest prepared a BLI using the Division 38 method. The results of the analysis are presented in a report titled “Newberg Buildable Lands Inventory: Division 38 Simplified Method.” That report concluded that the rules governing the methods had a number of problems. As a supplement to that study, ECONorthwest developed a BLI using the standard rules to provide a point of comparison to the Division 38 results and to assist City staff in decision making related to the upcoming UGB review. This memorandum summarizes the results of the Standard BLI and compares them to the Division 38 results.

1 Results of Traditional BLI

To our knowledge, Newberg is the first city to implement a BLI using the Division 38 methods, and this is the first document to compare the results to a traditional BLI. While it was outside of our scope of work for this project, as we got deeper into the analysis, we were curious about what differences, if any, would emerge between the Division 38 methods and a traditional BLI.

ECO used methods consistent with the many other acknowledged BLIs we have completed for Oregon cities. We also used all the same data for the traditional BLI as for the Division 38 BLI. **The standard BLI presented in this memo does not rely on any previous work done by the**

City and uses the same data sets as the Division 38 BLI it is compared to¹. The methods used for the standard BLI are described in Appendix A.

Table 1 shows a comparison of land by classification using the Division 38 methods and the standard methods. The results show significant differences. As one would expect, the total number of tax lots and acres is the same for both methods—they build from the same land base. Major differences emerge in the classifications. For reasons explained in the previous section the Division 38 method results in many more tax lots being classified as vacant or partially vacant. The overall result is a 386-acre difference in buildable lands.

Table 1. All Land by Classification, Division 38 Method and Standard Method, Newberg UGB

Classification	Tax Lots	Total Acres	Developed Acres	Constrained Acres	Buildable Acres
Division 38 Method					
Developed	6,275	1,362	1,323	40	0
Partially Vacant	389	1,047	300	139	608
Vacant	487	654	0	75	579
Public	215	688	617	71	0
Total	7,366	3,751	2,240	324	1,187
Standard Method					
Developed	6,569	1,860	1,768	92	0
Partially Vacant	169	515	85	72	358
Vacant	277	492	3	47	443
Public	351	884	770	113	0
Total	7,366	3,751	2,626	324	801
Difference					
Developed	-294	-498	-446	-52	0
Partially Vacant	220	532	216	66	250
Vacant	210	162	-3	28	136
Public	-136	-196	-153	-42	0
Total	0	0	-386	0	386

Table 2 shows a more detailed comparison by plan designation. Following is a comparison by broad land use categories:

- **Residential.** The Division 38 method identifies 952 buildable acres; the Standard Method identifies 625 acres. Differences exist across all categories, but the biggest difference (203 acres) is in the MDR category. Based on reviewing the data in detail, this is due to several reasons—developments that have no improved value and condo/homeowner association common areas are two key reasons.

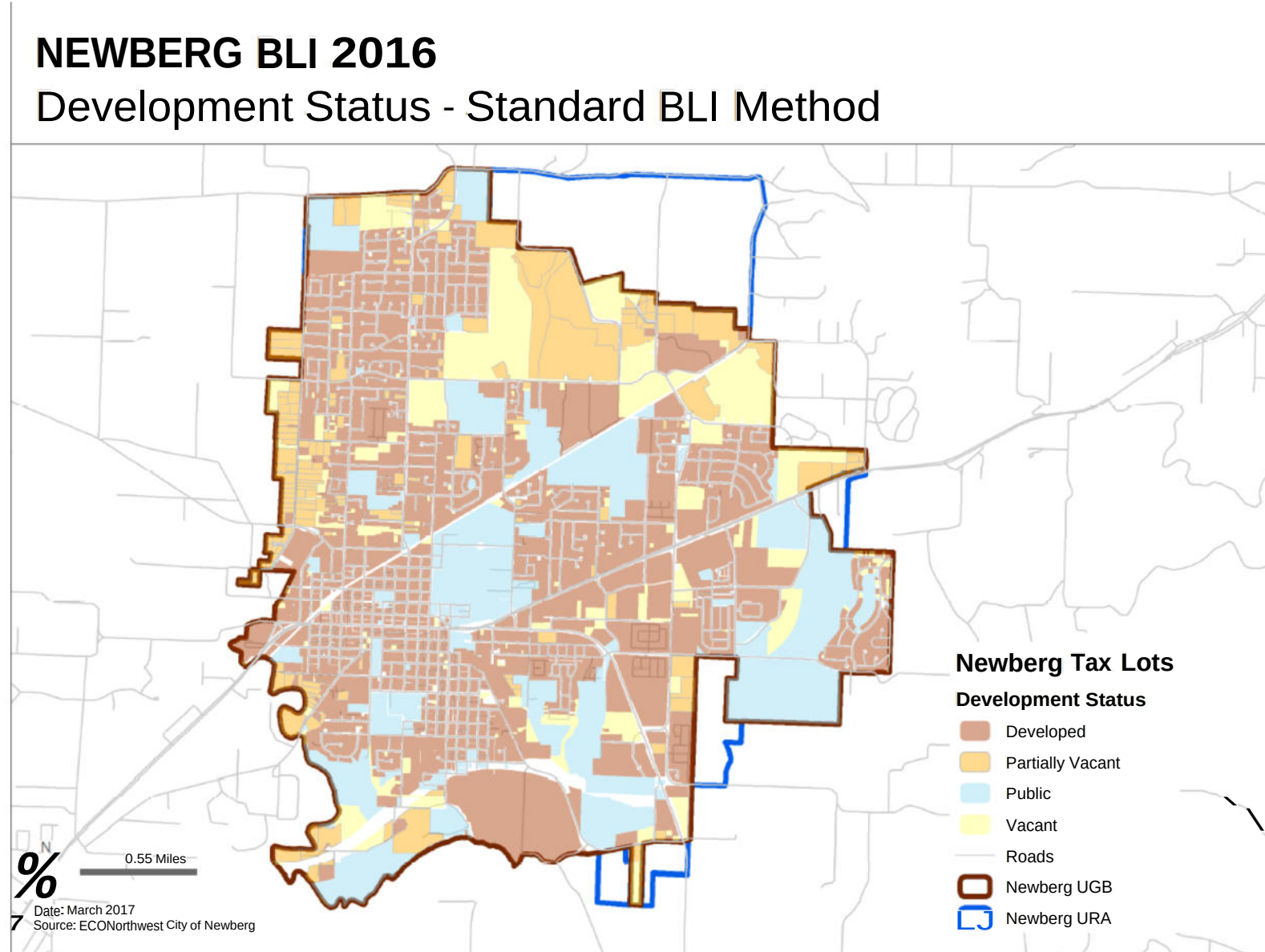
¹ The City completed a residential BLI in 2009 and an employment BLI in 2013. Those studies were not referenced as part of this effort.

- **Commercial.** The two methods result in a 20-acre difference in vacant commercial land. The Division 38 method yields 146 acres, while the standard method yielded 126. One key difference here is the Division 38 requirement that all lots that have improvement to land value ratios of between 0.05 and 0.40 and are less than one acre be considered 50% vacant.
- **Industrial.** The Division 38 method identifies 89 vacant industrial acres; the Standard Method 50.

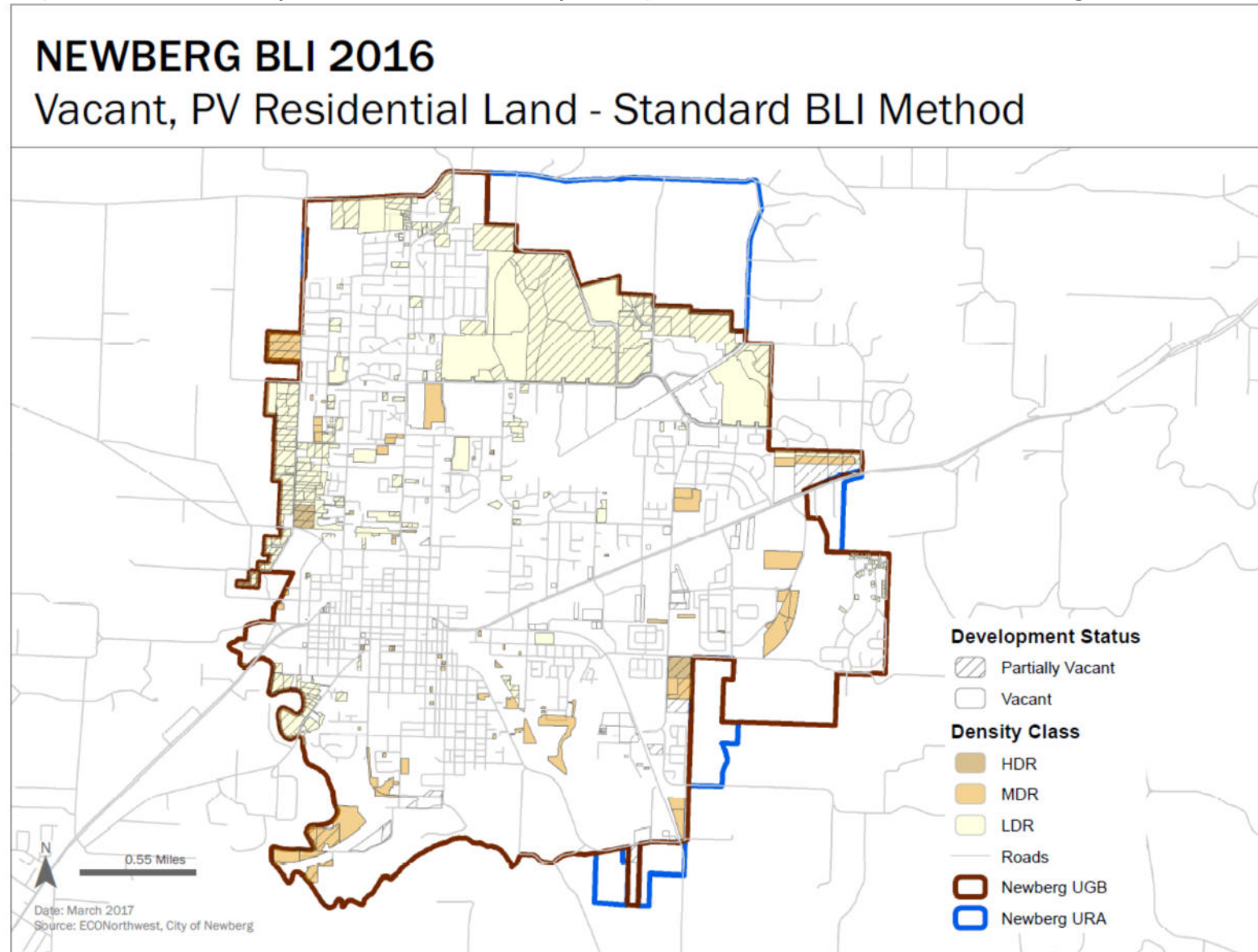
Table 2. Vacant and Partially Vacant Land by Generalized Plan Designation, Comparison of Division 38 Method and Standard Method, Newberg UGB

Generalized Plan Designation	Tax Lots	Total Acres	Developed Acres	Constrained Acres	Buildable Acres
Division 38 Method					
Residential					
LDR	349	728	80	82	565
MDR	264	423	42	70	311
HDR	52	94	9	8	76
Subtotal	665	1,244	132	160	952
Employment					
Commercial	155	164	13	5	146
Industrial	55	282	144	49	89
Subtotal	210	446	157	54	235
Total	875	1,690	289	214	1,187
Standard Method					
Residential					
LDR	280	644	66	72	506
MDR	77	149	7	34	108
HDR	11	15	3	1	12
Subtotal	368	809	76	107	625
Employment					
Commercial	48	140	6	8	126
Industrial	30	58	5	4	50
Subtotal	78	198	11	12	176
Total	446	1,007	87	119	801
Difference					
Residential					
LDR	69	83	14	10	59
MDR	187	273	35	35	203
HDR	41	78	7	7	64
Subtotal	297	435	55	53	327
Employment					
Commercial	107	24	7	-3	20
Industrial	25	224	139	45	39
Subtotal	132	247	146	42	59
Total	429	683	202	95	386

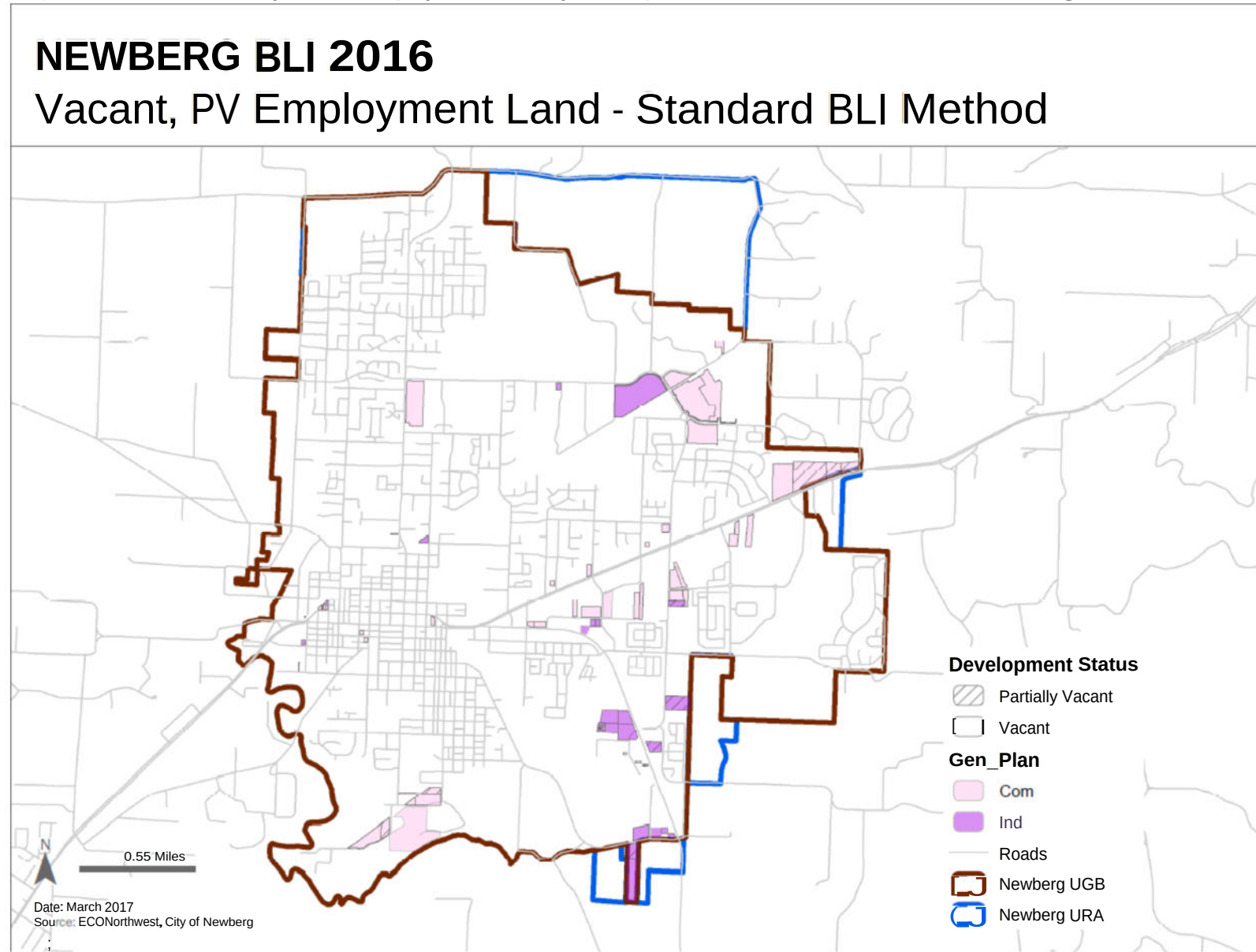
Map 1. Land by Development Status, Traditional Method, Newberg UGB



Map 2. Vacant and Partially Vacant Residential Land by Development Status, Traditional Method, Newberg UGB



Map 3. Vacant and Partially Vacant Employment Land by Development Status, Traditional Method, Newberg UGB



Appendix A: Buildable Land Inventory Methods

The general structure of the standard method buildable land inventory (BLI) analysis is based on the DLCD HB 2709 workbook “*Planning for Residential Growth – A Workbook for Oregon’s Urban Areas*,” which specifically addresses residential lands. The steps and sub-steps in the supply inventory are:

1. Calculate the gross vacant acres by plan designation, including fully vacant and partially vacant parcels.
2. Calculate gross buildable vacant acres by plan designation by subtracting unbuildable acres from total acres.
3. Calculate net buildable acres by plan designation, subtracting land for future public facilities from gross buildable vacant acres.
4. Calculate total net buildable acres by plan designation by adding redevelopable acres to net buildable acres. (note: this study did not evaluate redevelopment potential)

The methods used for this study are consistent with many others completed by ECONorthwest that have been acknowledged by DLCD and LCDC. These include Harrisburg, Grants Pass, Lebanon, Sweet Home, and Newberg to name a few.

This Appendix describes the methods and definitions ECONorthwest used to complete the Newberg buildable lands inventory using traditional methods consistent with Goals 9, 10, and 14.

1.1 BLI Methods

The BLI only includes lands within the Newberg UGB—we did not address study areas outside the UGB in this process. The buildable lands inventory uses methods and definitions that are consistent with OAR 660-008, OAR 660-009 and OAR 660-024. The steps in the inventory were:

- **Generate employment “land base.”** This involved “clipping” all of the tax lots in the Newberg UGB with the comprehensive plan layer. The GIS function was followed by a quality assurance step to review the output and validate that the resulting dataset accurately represents all lands designated for employment use in the Newberg UGB.
- **Classify lands.** Each tax lot was classified into one of the following categories:
 - Vacant land
 - Partially vacant land
 - Developed land
 - Public land
- **Identify constraints.** The City identifies areas in steep slopes (over 25%), floodways, 100-year floodplains, areas with landslide hazard, and land identified

for future public facilities (including the Newberg-Dundee Bypass) as constrained or committed lands. These areas are deducted from lands that were identified as vacant or partially vacant. To estimate the constrained area within each tax lot, all constraints listed above were merged into a single constraint file which was overlaid on tax lots.

- **Tabulation and mapping.** The results are presented in tabular and map format with accompanying narrative. The maps include lands by classification, and maps of vacant and partially vacant lands with constraints.

ECO did not evaluate redevelopment potential for this analysis. Consistent with previous efforts, the City will need to assess redevelopment potential if it pursues a traditional UGB review process. Table A-1 shows data sources used for the BLI.

Exhibit A-1. Data Sources for Newberg BLI

Data	Source	Description
Tax lots – Yamhill	Yamhill County Assessor, provided by City of Newberg	Tax lot fabric for entire county. Fabric includes roads.
City Boundaries	City	Includes city limit, UGB and urban reserve areas
UGB	Oregon Spatial Explorer	2015 UGBs
Counties	Oregon Spatial Explorer	2015 County boundaries
Streets	City of Newberg	City / county roads
Streams	City of Newberg	Perennial streams
Zoning	Yamhill County; Metro RLIS (Washington); Marion County GIS	Zoning outside incorporated city boundaries
Landslide areas	DOGAMI SLIDO 3.2 database	DOGAMI mapped landslide areas
Special Flood Area	Oregon Spatial Explorer – statewide FEMA FIRM database	Areas of special flood hazard
Building Footprint	City of Newberg	Building footprints for land inside the Newberg UGB

1.2 Definitions

The first step in the buildable inventory was to develop working definitions and assumptions. ECO began the buildable lands analysis with a tax lot database provided by the City’s GIS staff. The tax lot database was current as of October 2016. The inventory builds from the tax lot-level database to estimates of buildable land by plan designation.

A key step in the buildable lands inventory was to classify each tax lot into a set of mutually exclusive categories. Consistent with applicable administrative rules, all tax lots in the UGB are classified into one of the following categories:

- *Vacant land.* Tax lots that have no structures or have buildings with very little value. For the purpose of this inventory, residential and employment lands with improvement values under \$10,000 are considered vacant. These lands were subject to aerial photo review; if photos showed the land was in a committed use such as a parking lot, an assessment was made to determine if it should be classified as partially vacant or developed.
- *Partially vacant land.* Partially vacant tax lots are those occupied by a use but which contain enough land to be further subdivided without need of rezoning. This determination was made through review of aerial photographs.
- *Developed land.* Land that is developed at densities consistent with zoning with improvements that make it unlikely to redevelop during the analysis period. Lands not classified as vacant, partially-vacant, or undevelopable are considered developed.
- *Public land.* Lands in public ownership are mostly considered unavailable for employment uses. This includes lands in Federal, State, County, City, or other public ownership. Public lands were identified using the Yamhill County Assessment property tax exemption codes and verified by reviewing ownership. This category only includes public lands that are in a public plan designation and those located in residential or employment plan designations.

ECO initially classified land using a rule-based methodology. ECO then generated maps that show the results of the application of those rules, with some adjustments made through a validation step based on review of aerial photos and building permit data.

1.3 Development constraints

Consistent with state guidance on buildable lands inventories, ECO deducted certain constraints from the buildable lands inventory including wetlands and steep slopes. We use categories that are more restrictive than the definition provided in OAR 660-009-0005(2):

(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.

Based on the Division 9 rule and data provided by the City of Newberg and discussions with City staff, ECO deducted the following constraints from the employment lands inventory.

- *Land constrained by natural hazards.* This includes:
 - *Land within floodways.* We deducted lands within floodways as identified on the FEMA FIRM maps.

- *Lands within floodplains.* We deducted lands in the Special Flood Hazard Area (the 100-year floodplain) from the buildable lands inventory.
- *Land with slopes over 25%.* Lands with slopes over 25% are considered unsuitable for development.
- *Lands with landslide potential.* This included lands identified in DOGAMI's SLIDO 3.0 database.
- *Land within natural resource protection areas.* This includes wetlands and stream corridors.

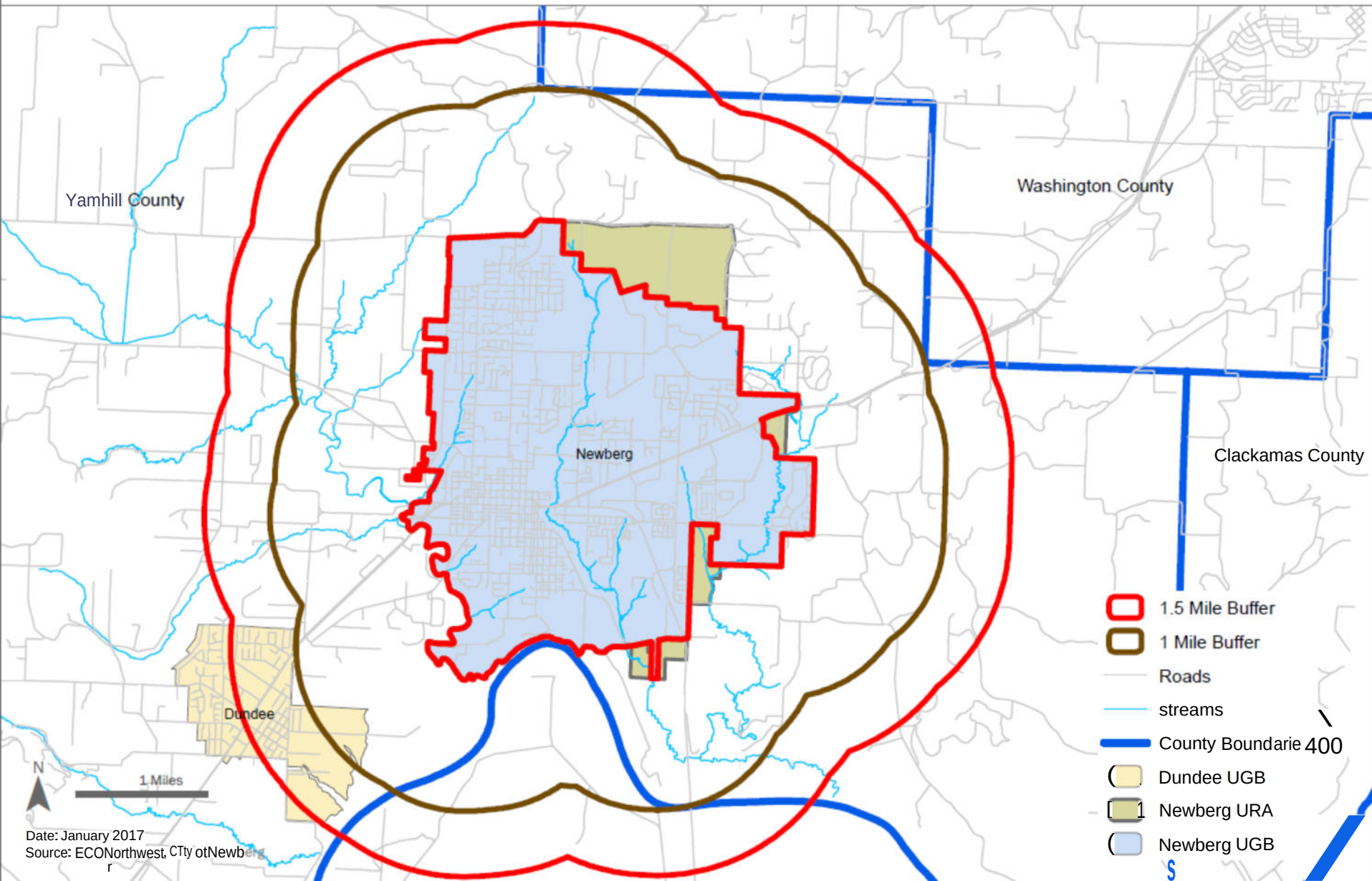
Newberg Buildable Lands Inventory: Preliminary Results

Purpose

- Develop and updated land inventory using the Division 38 simplified methods
- Prepare Newberg for a UGB amendment process in 2017 based on new population forecasts from PSU

NEWBERG BLI 2016

Newberg UGB, URA, and Study Area Buffers



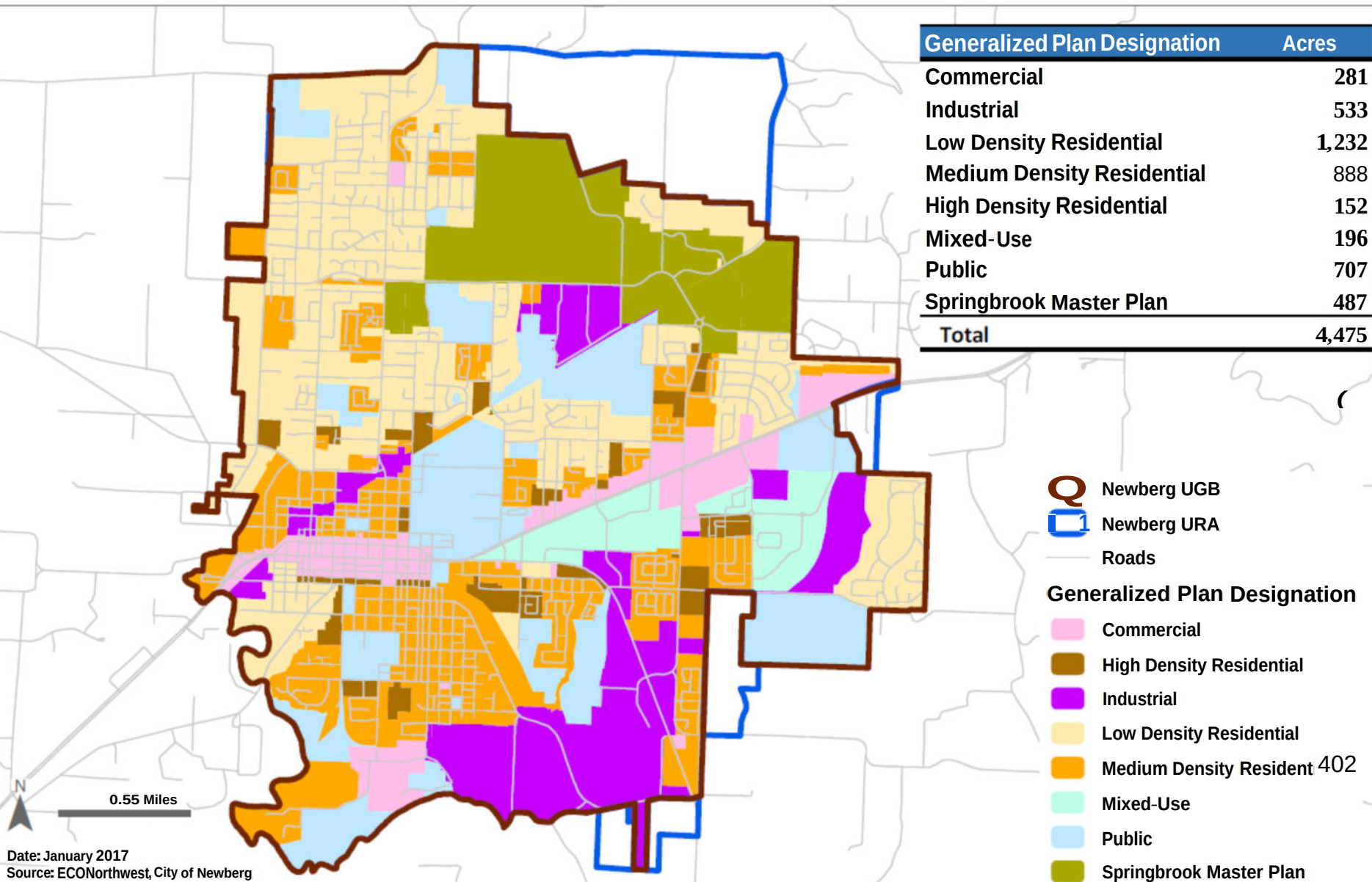
General Characteristics

- Four key geographies
 - Newberg UGB
 - Newberg URA
 - All lands within 1-mile buffer
 - Exceptions lands within 1.5 mile buffer

Location/Attribute	Acres
UGB	4,476
Area in Private Tax Lots	3,072
Public Land in Tax Lots	687
Roads/Right-of-Way	717
URA	551
Area in Private Tax Lots	527
Area in Roads	24
Buffer (outside UGB and URA)	
1-mile	4,700
1.5-mile	10,069

NEWBERG BLI 2016

Newberg UGB Generalized Plan Designation



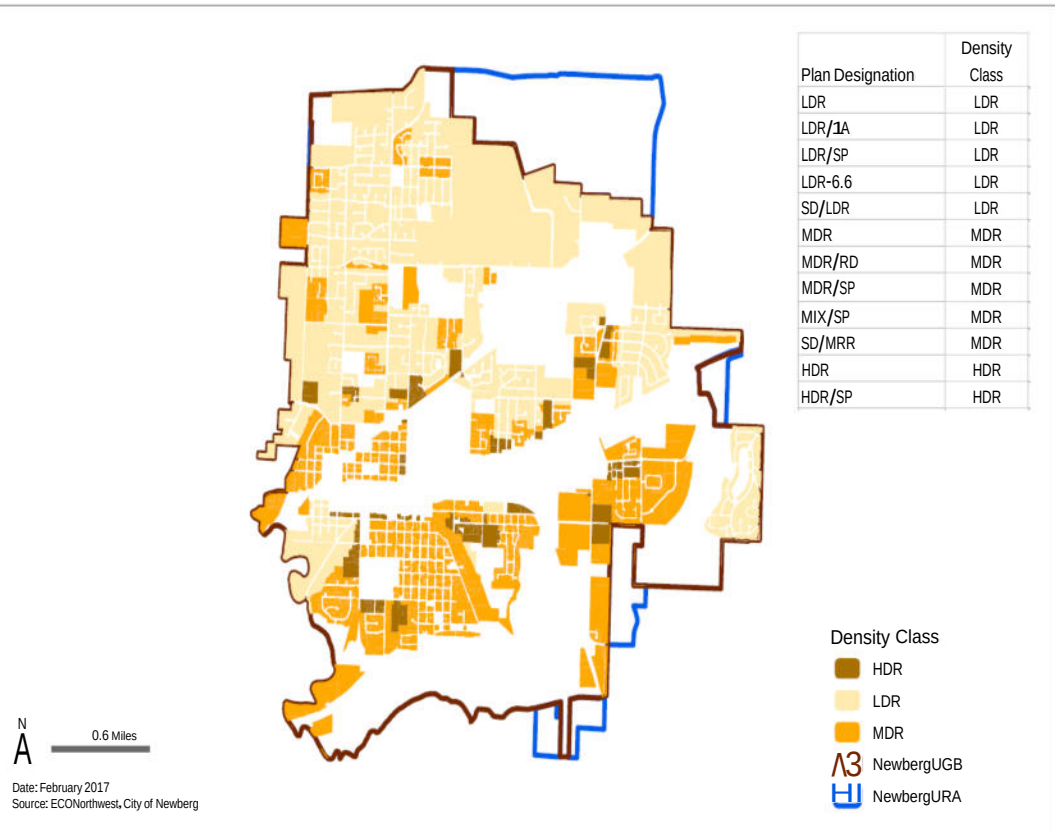
Residential BLI

Residential BLI: Steps

1. Classify plan designations/zones by allowed density
2. Classify land by improvement status
3. Identify and summarize land by improvement status
4. Deduct constraints

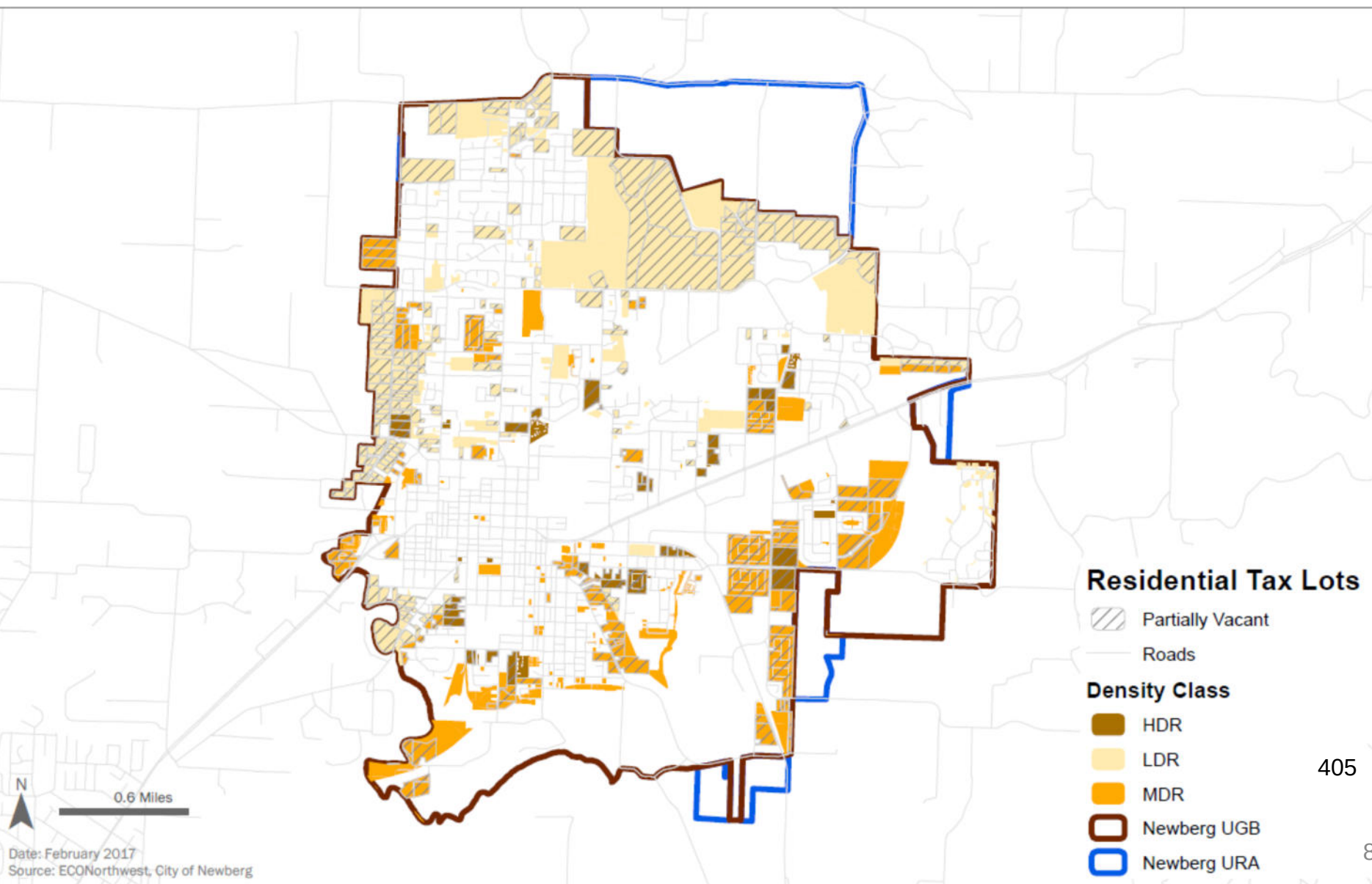
NEWBERG BLI 2016

Division 38 - Residential Density Class



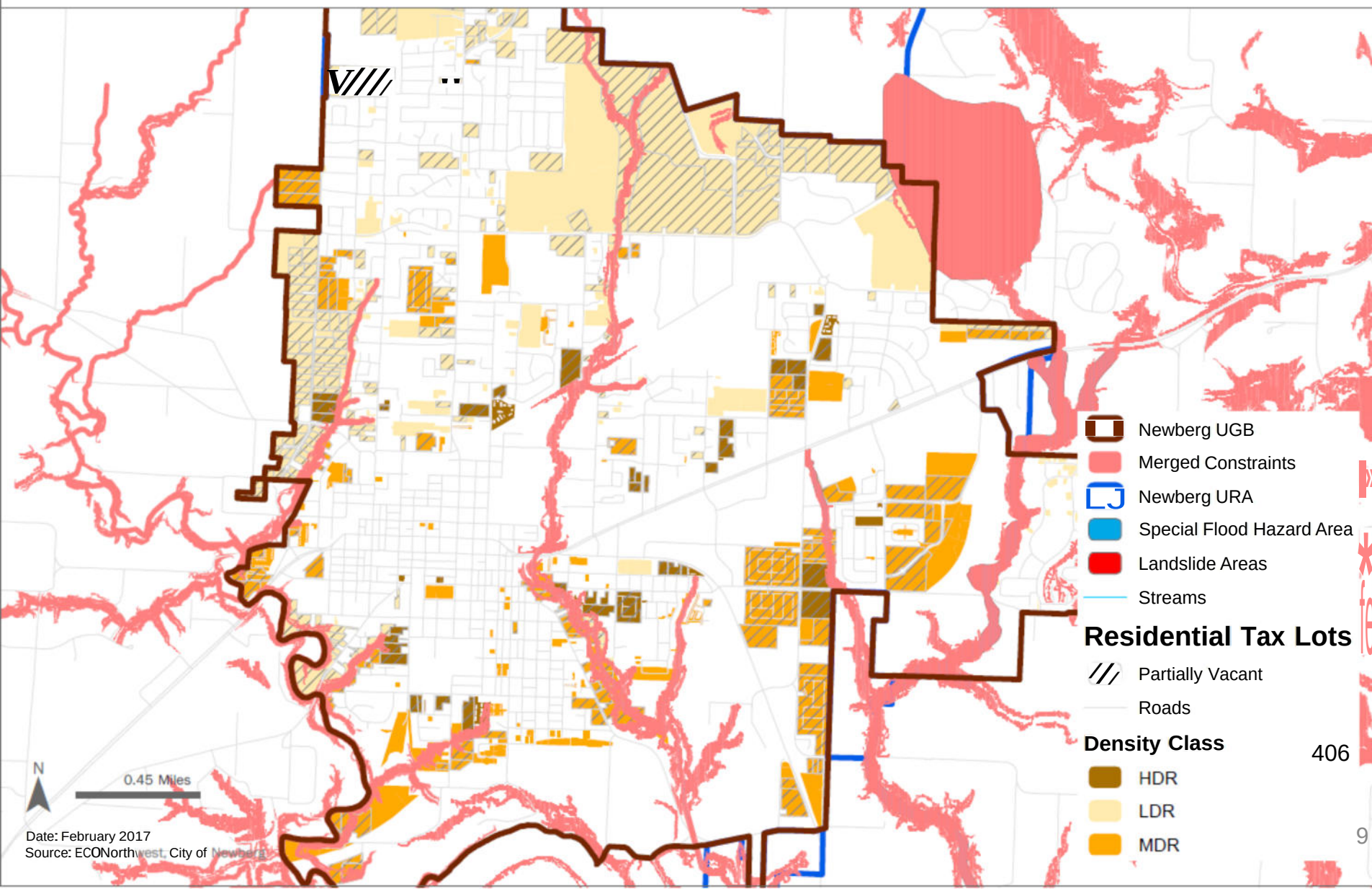
NEWBERG BLI 2016

Vacant and Partially Vacant Residential Land by Density Class



NEWBERG BLI 2016

Vacant and Partially Vacant Residential Land by Density Class



Residential Land –Results

Total Acres by Status and Density

Status	Density Category			Total
	LDR	MDR	HDR	
Developed	564	350	33	948
Partially Vacant	448	261	81	790
Vacant	279	162	12	454
Total	1,292	773	127	2,192

Vacant/PV Acres by Density (and development status)

Div 38 Density Class	Tax Lots	Total Acres	Improved Acres	Constrained Acres	Vacant Acres
LDR	3,339	1,292	634	93	565
MDR	2,800	773	385	77	311
HDR	407	127	42	9	76
Total	6,546	2,192	1,061	179	952

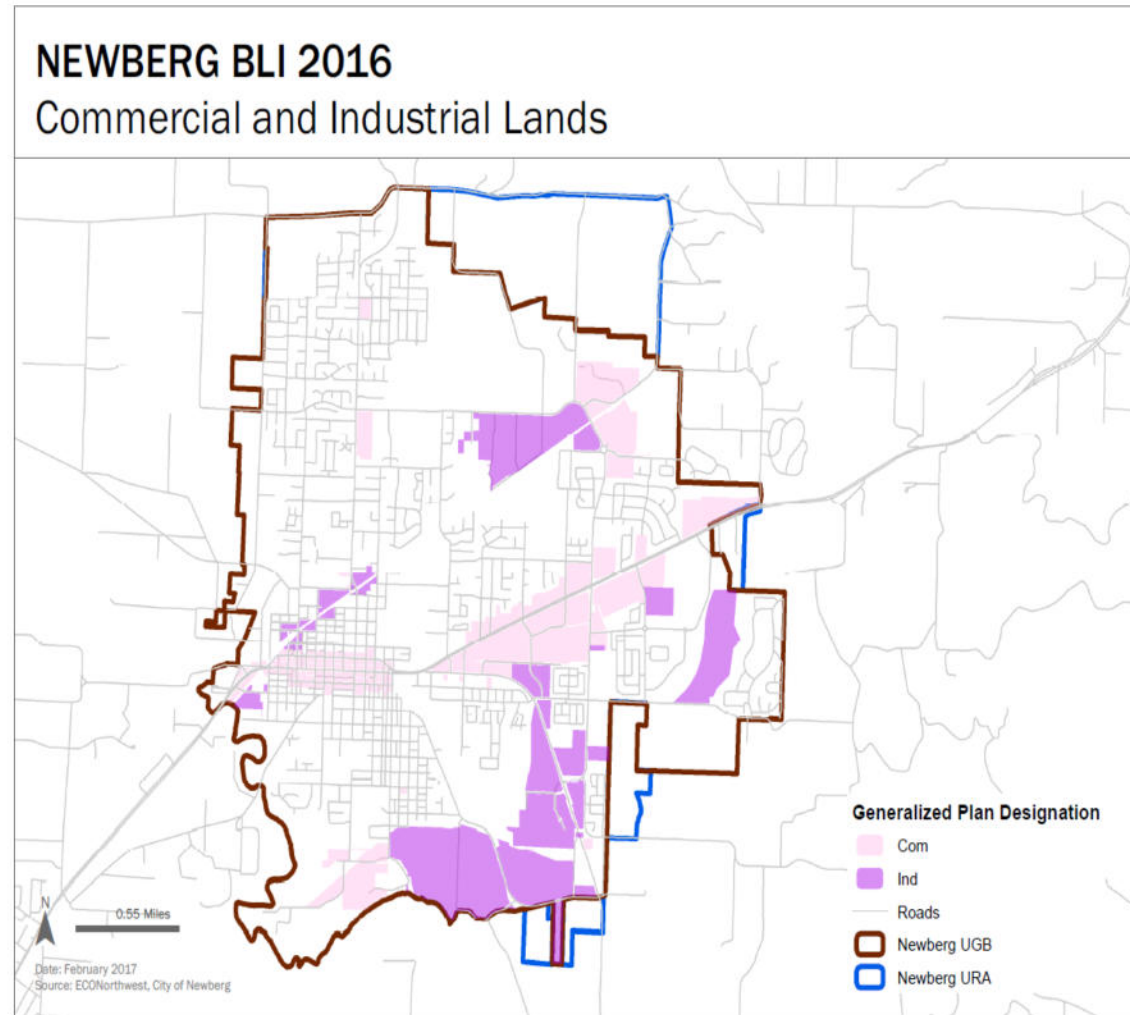
Constraints:

- Slope 25% +
- Floodway, 100 yr floodplain
- Stream corridors
- Landslide hazard

Employment BLI

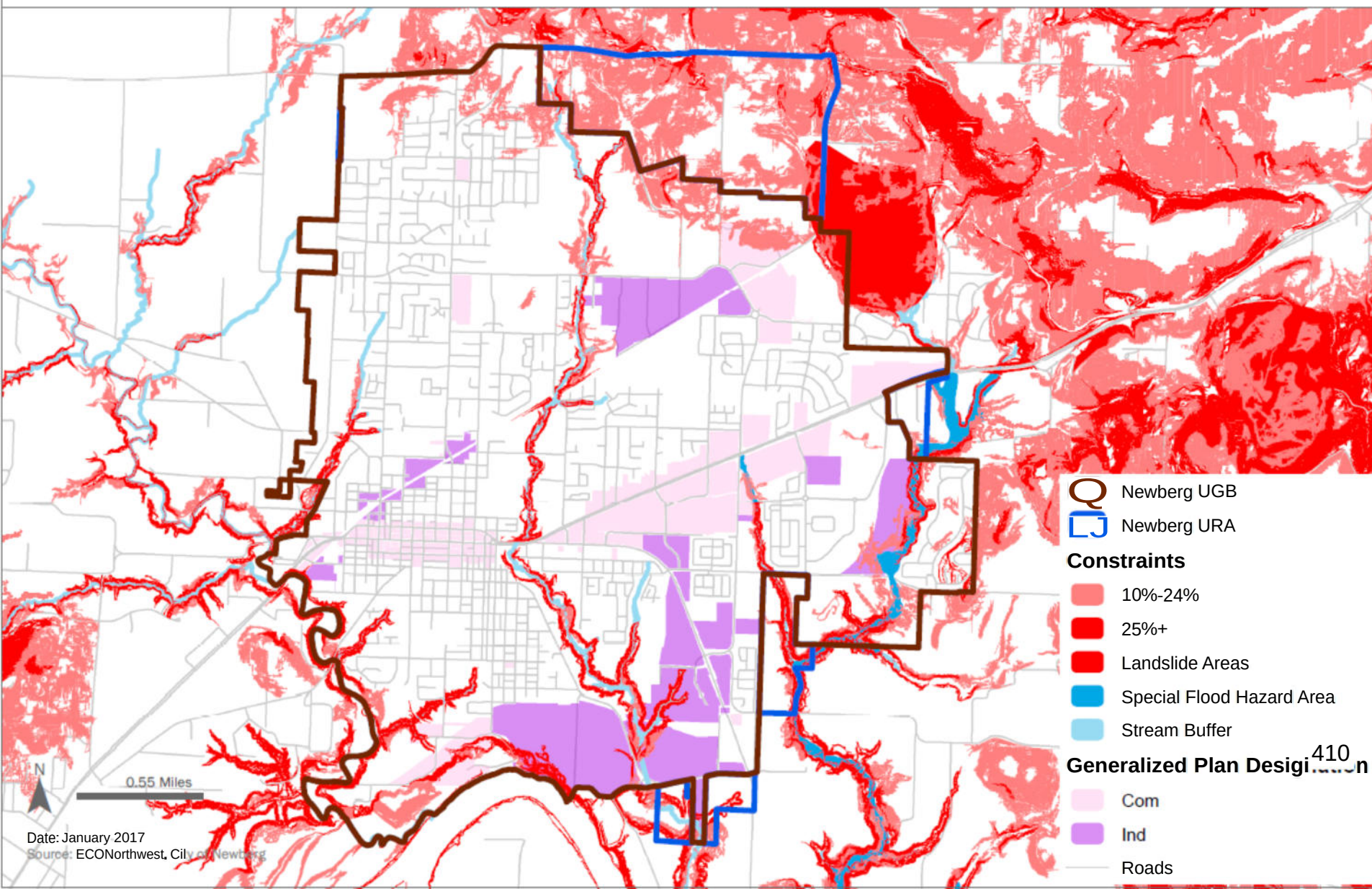
Employment BLI: Steps

1. Classify existing employment districts as “commercial” or “industrial”
2. Classify lands by improvement status
3. Deduct constraints



NEWBERG BLI 2016

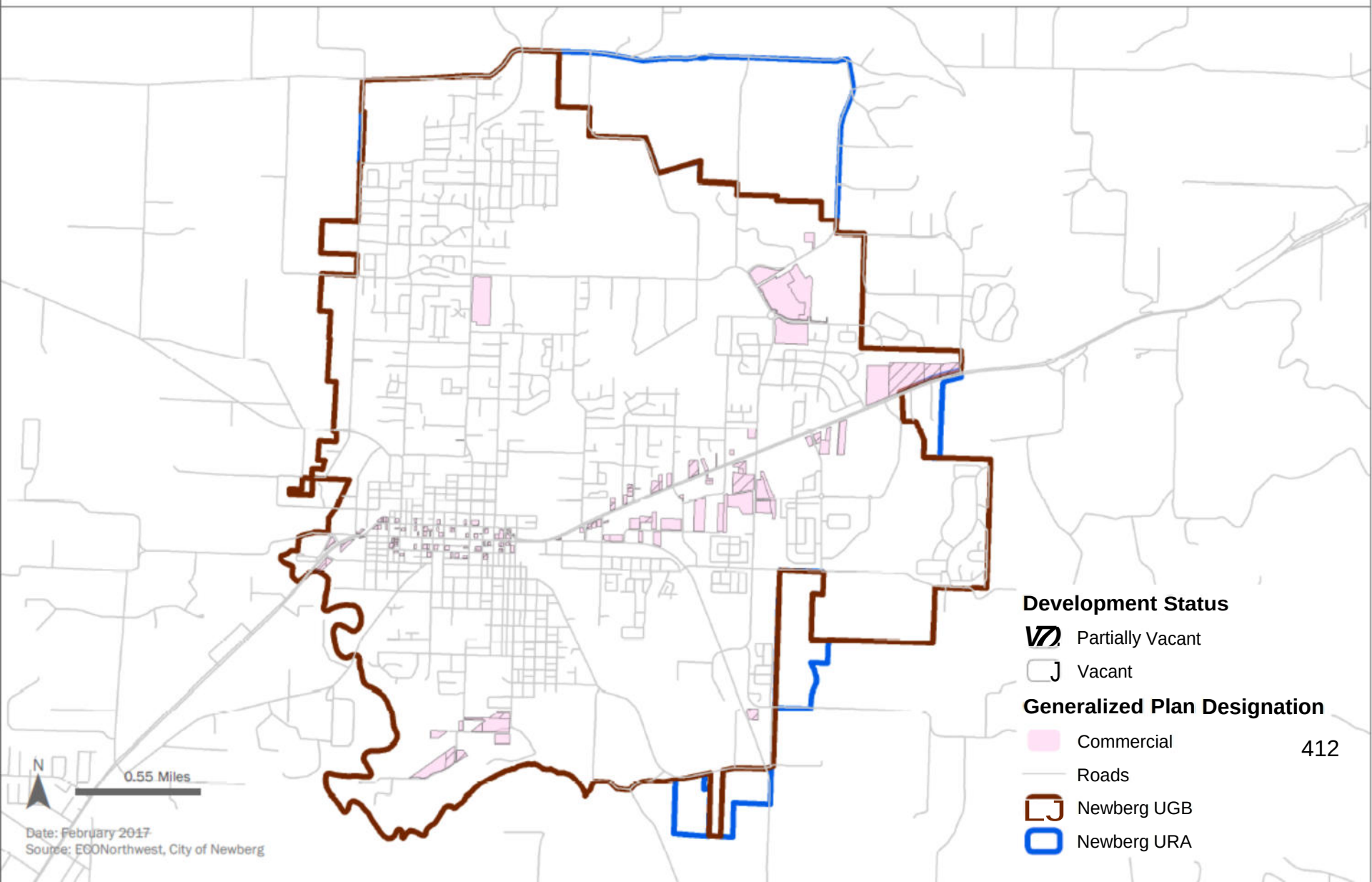
Commercial and Industrial Lands



Commercial Lands

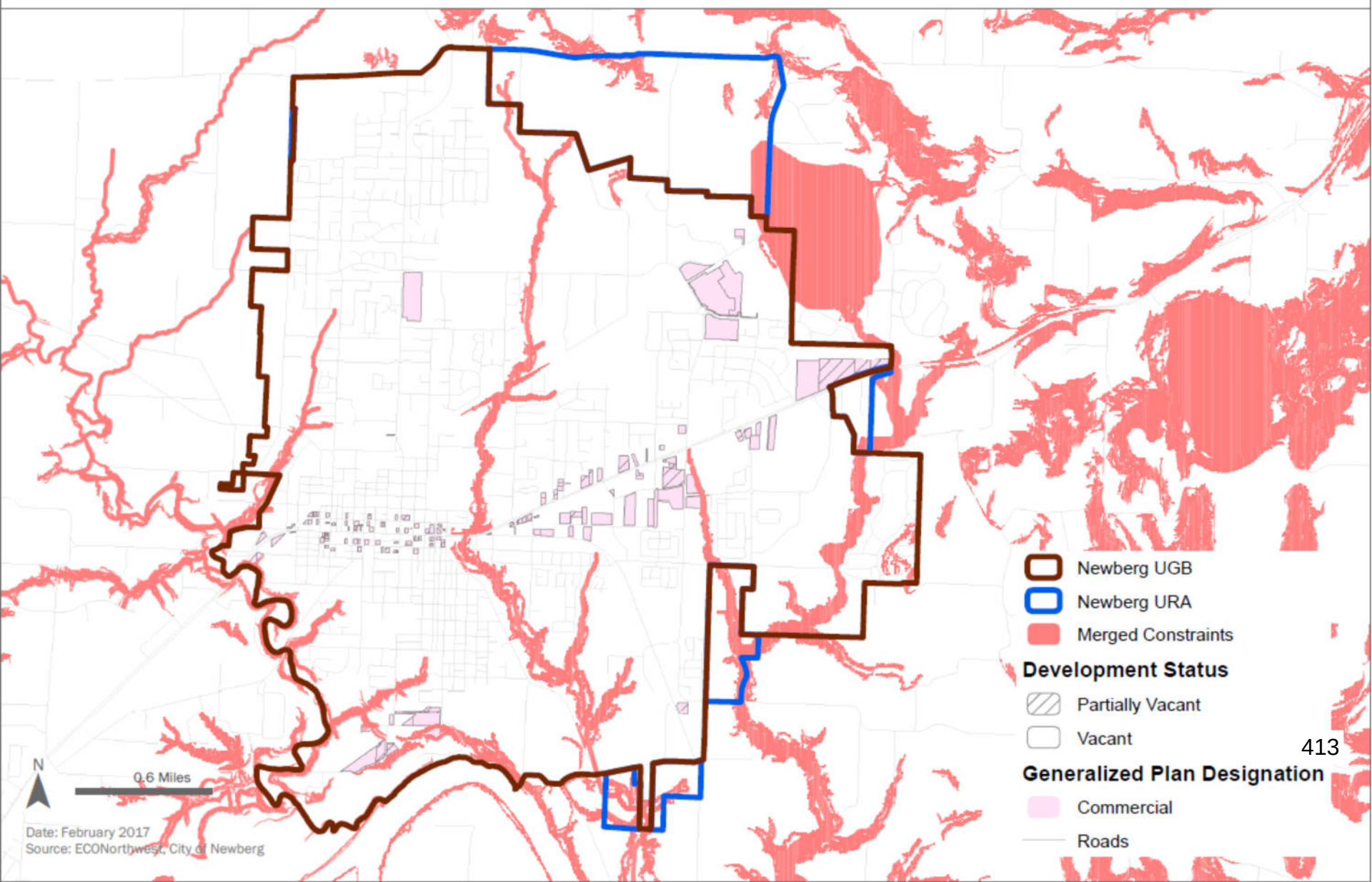
NEWBERG BLI 2016

Vacant and Partially Vacant Commercial Lands



NEWBERG BLI 2016

Vacant and Partially Vacant Commercial Lands and Constraints



Commercial BLI: Results

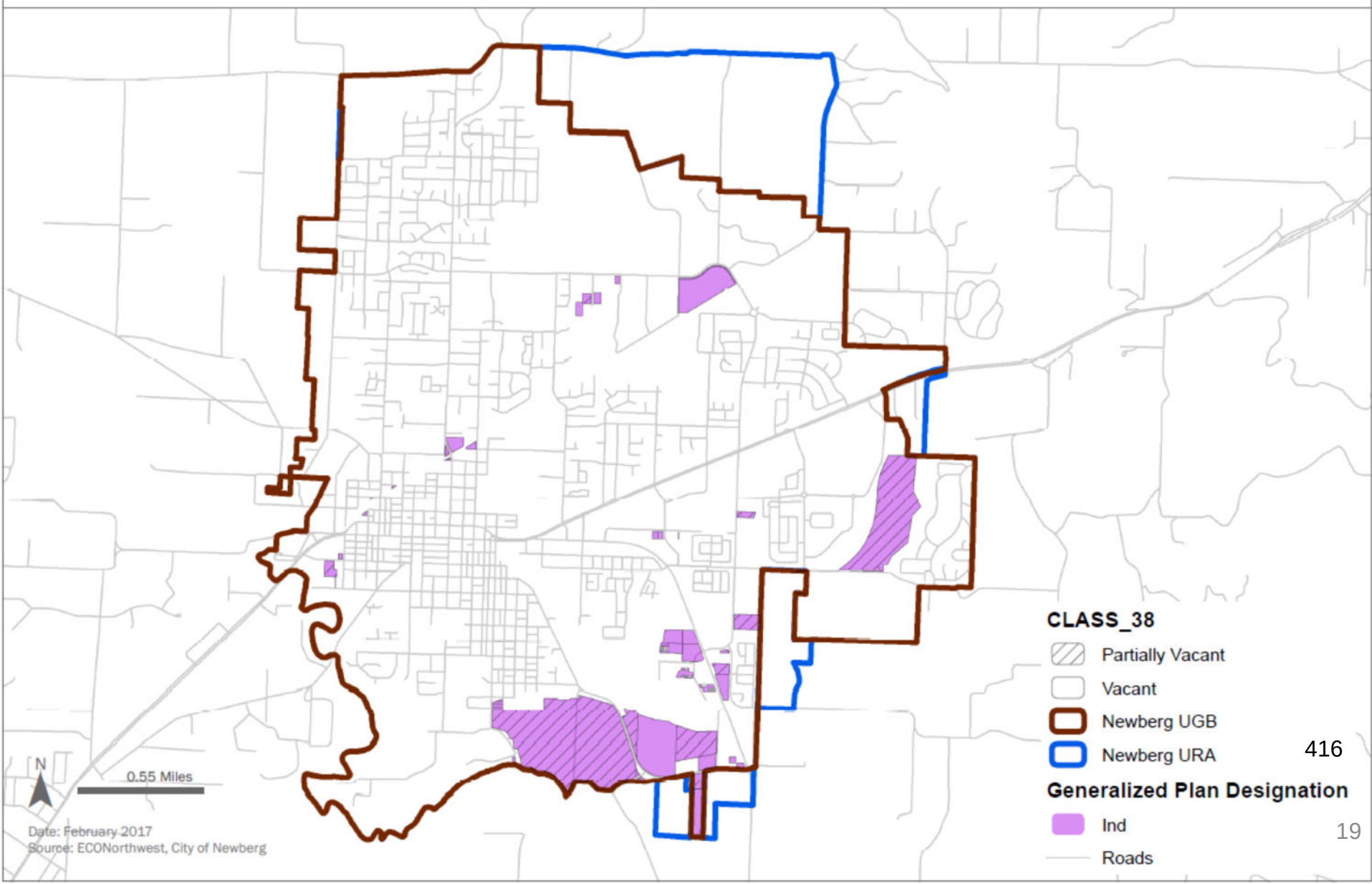
Commercial Acres by Status

Development Status	Tax Lots	Total Acres	Developed Acres	Constrained Acres	Vacant Acres
Developed	275	218	212	6	0
Partially Vacant	64	46	13	1	32
Vacant	91	118	0	4	114
Total	430	381	225	10	146

Industrial Lands

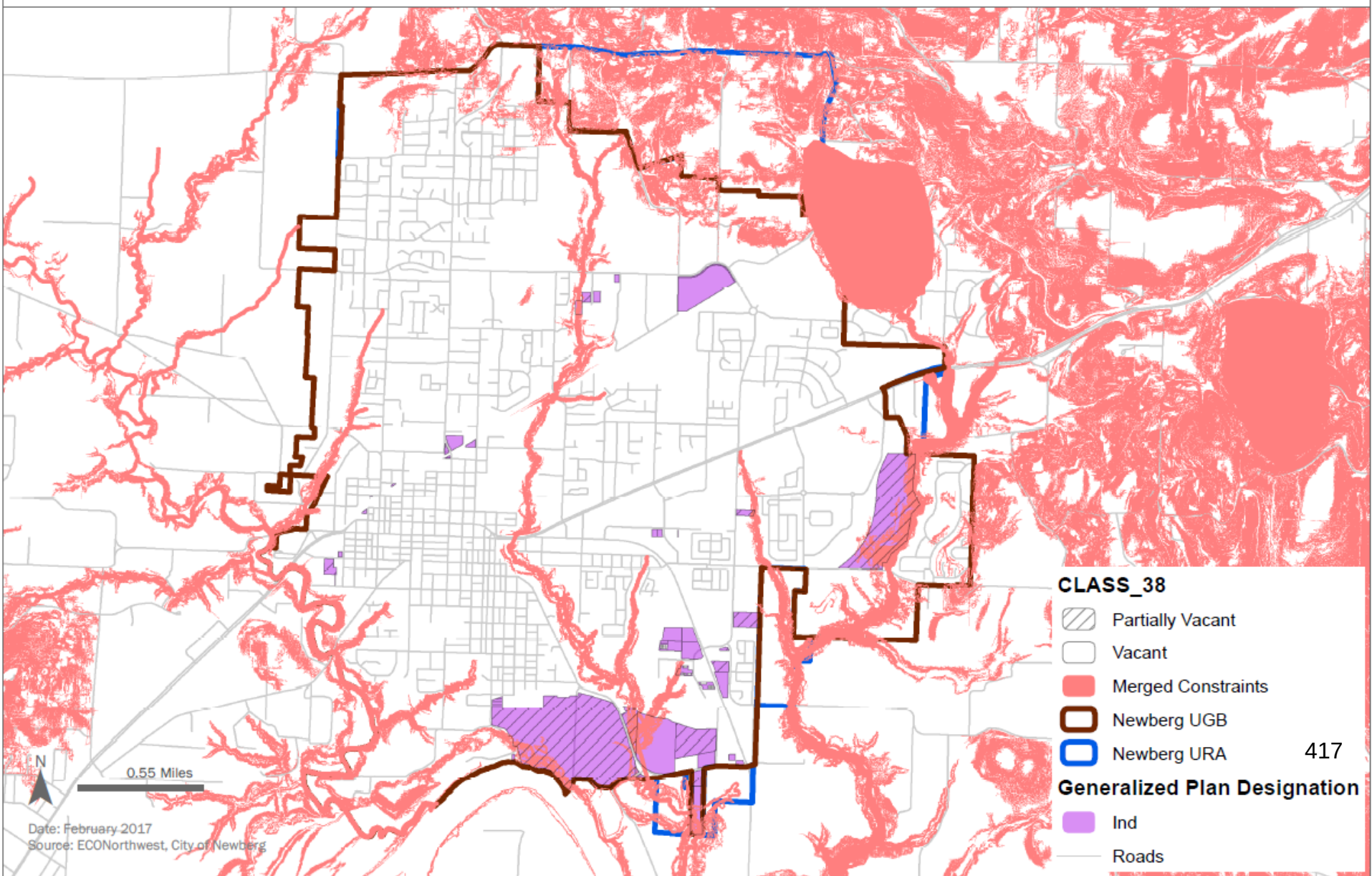
NEWBERG BLI 2016

Vacant and Partially Vacant Industrial Lands



NEWBERG BLI 2016

Vacant and PV Industrial Lands, Constraints - Slope 10%+



Industrial BLI: Preliminary Results

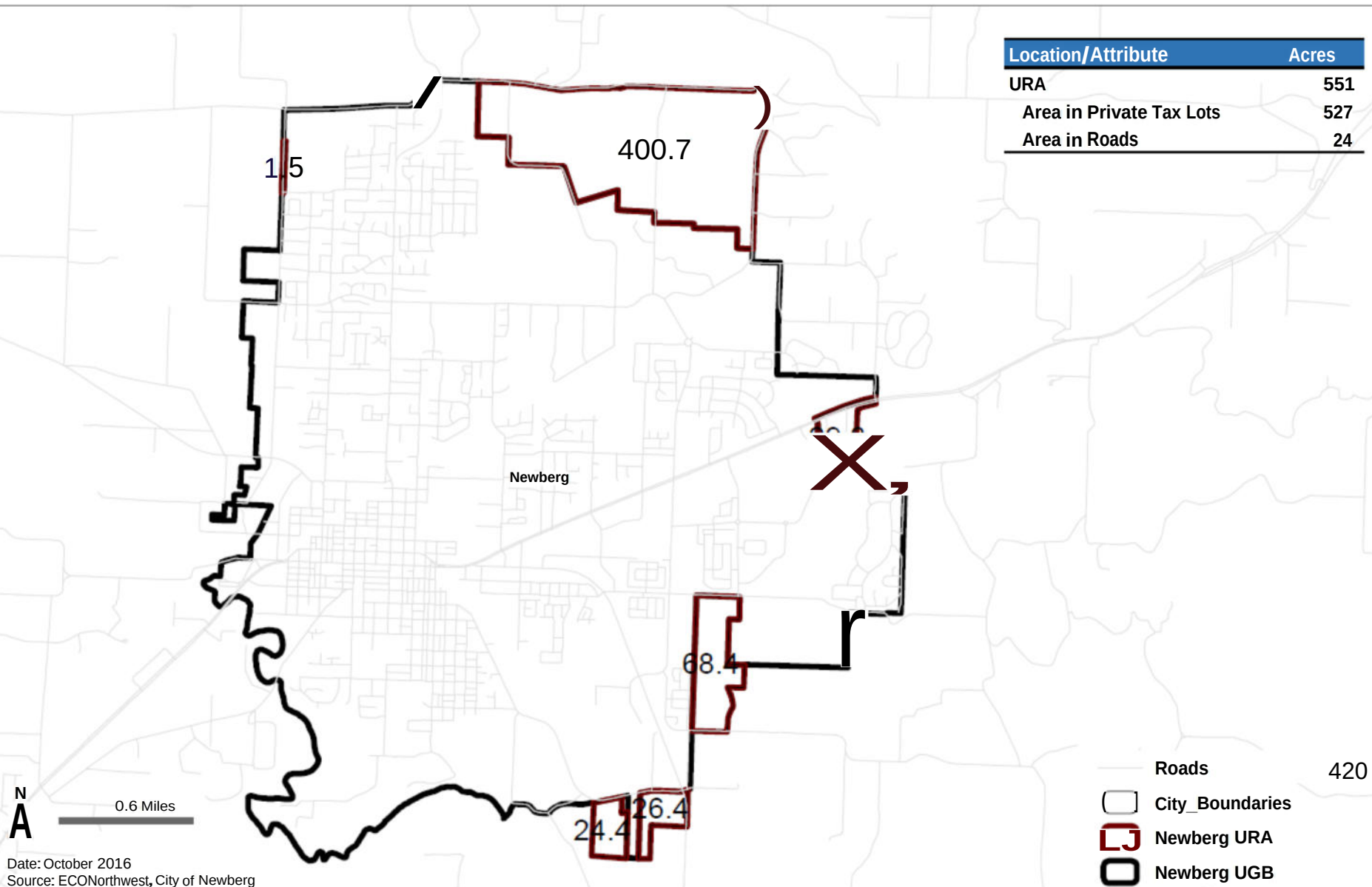
Total Industrial Acres by Status and Plan Designation

Development Status	Tax Lots	Total Acres	Developed Acres	Constrained Acres	Vacant Acres
Developed	121	197	182	15	0
Partially Vacant	11	200	144	36	19
Vacant	44	82	0	13	70
Total	176	479	326	64	89

Urban Reserve Areas

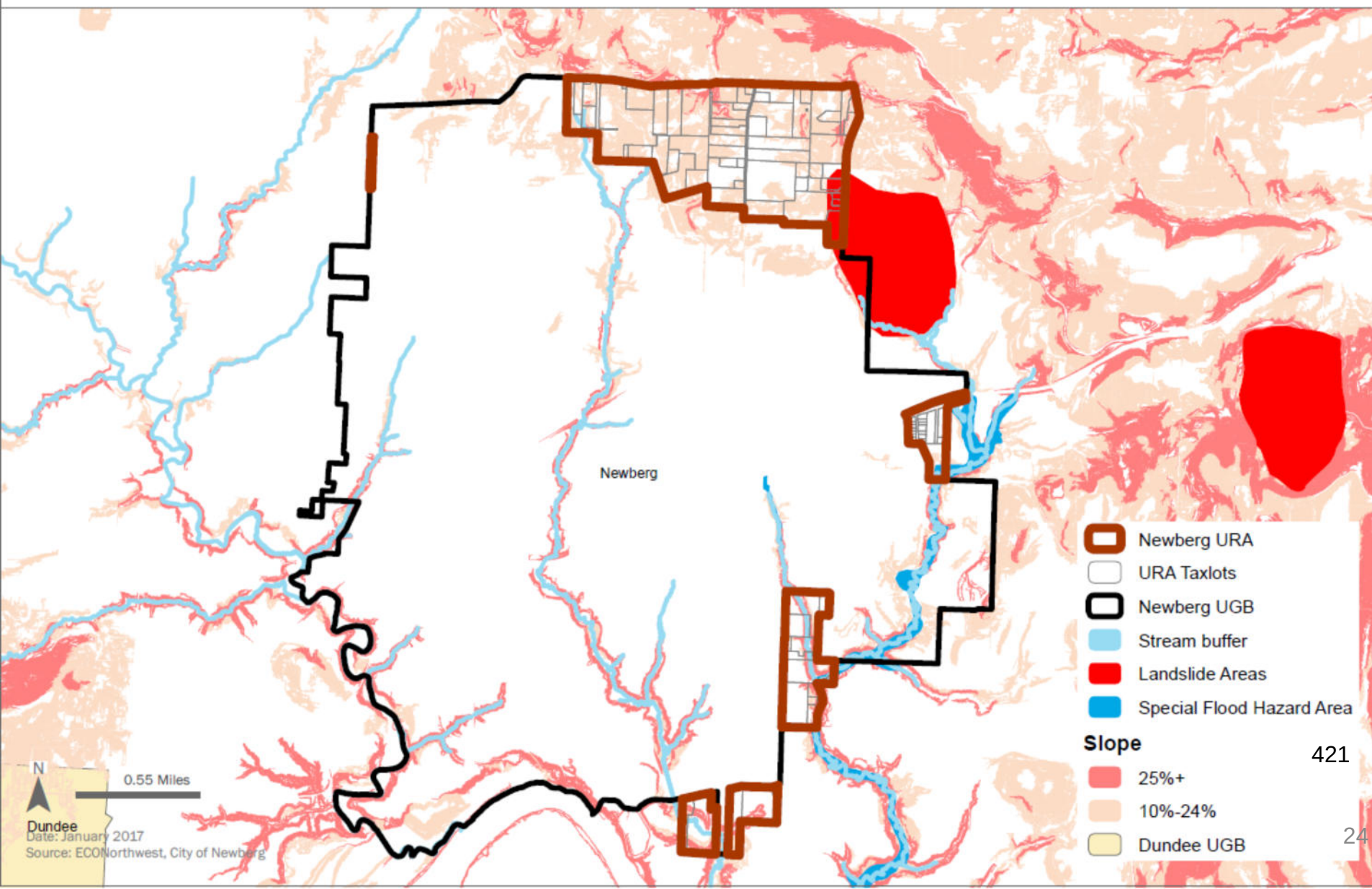
NEWBERG BLI 2016

Newberg Urban Reserve Areas



NEWBERG BLI 2016

Newberg URA and Constraints



Urban Reserve Land

- 551 Acres in URAs
- 527 in TL
- 75 Dwelling Units
- ~50% of land in lots over 10 acres

Lot Size (Ac)	Tax Lots	Acres	DU
<=1	42	17	22
>1 and <2	6	8	6
>=2 and <5	27	89	20
>=5 and <10	20	153	19
>=10 and <20	14	195	6
>=20 and <50	2	64	2
Total	111	527	75

Urban Reserve Areas

Total URA Acres by Development Status

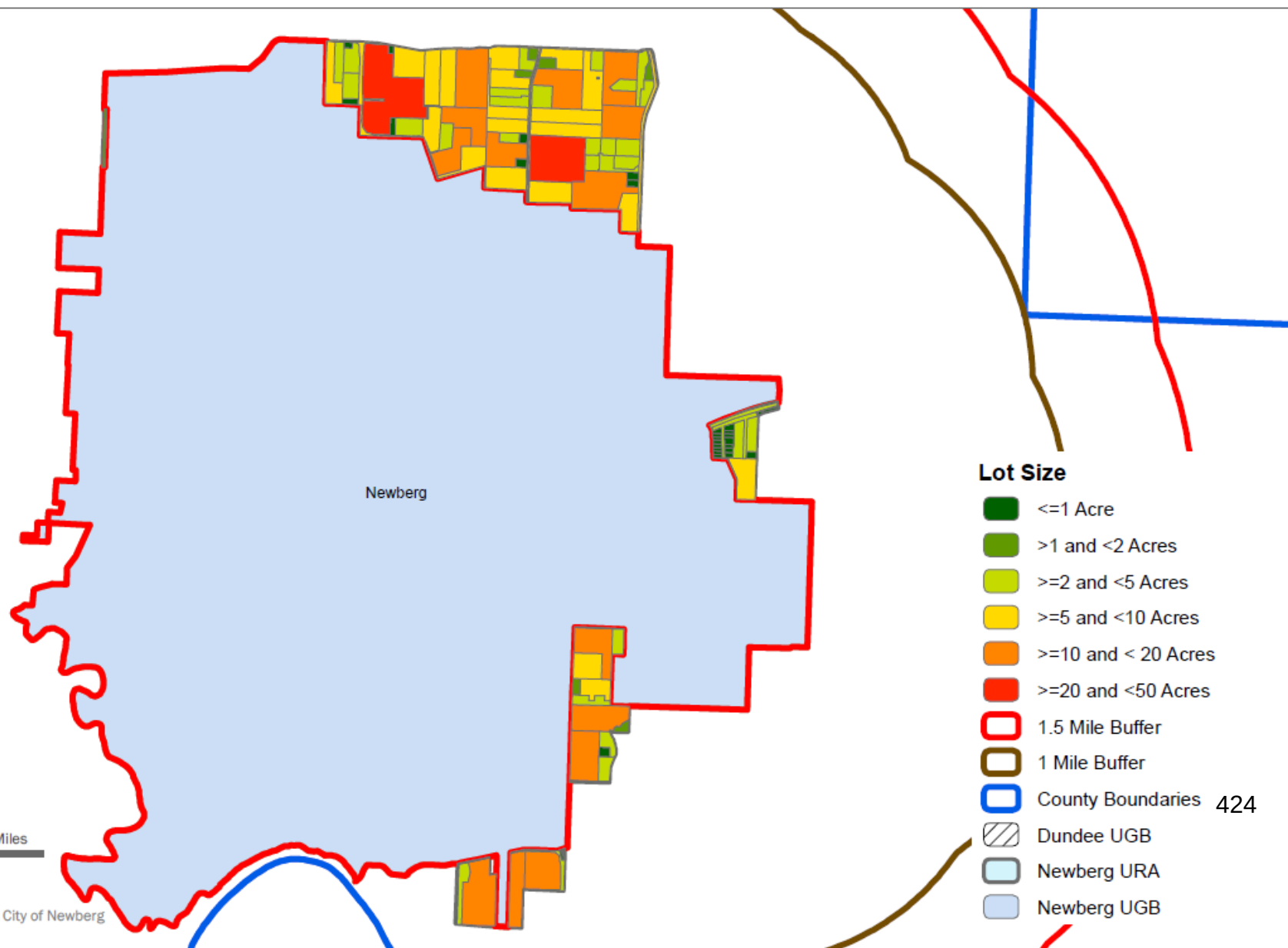
Classification	Tax Lots	Total Acres	Developed Acres	Constrained Acres	Suitable Acres	
					>25% slope	>10% slope
Developed	24	12	12	3	9	7
Partially Vacant - <2 Ac	49	386	25	39	347	200
Partially Vacant - >=2 Ac	6	8	4	2	6	5
Vacant	32	121	0	22	99	60
Total	111	527	40	66	461	272

URA Acres by Lot Size (25% slope)

Lot Size (Ac)	Tax Lots	Total Acres	Buildable Acres	Existing DU
<=1	42	17	14	42
>1 and <2	6	8	6	6
>=2 and <5	27	89	76	27
>=5 and <10	20	153	133	20
>=10 and <20	14	195	167	14
>=20 and <50	2	64	64	2
Total	111	527	461	111

NEWBERG BLI 2016

Newberg URA - Lots by Size



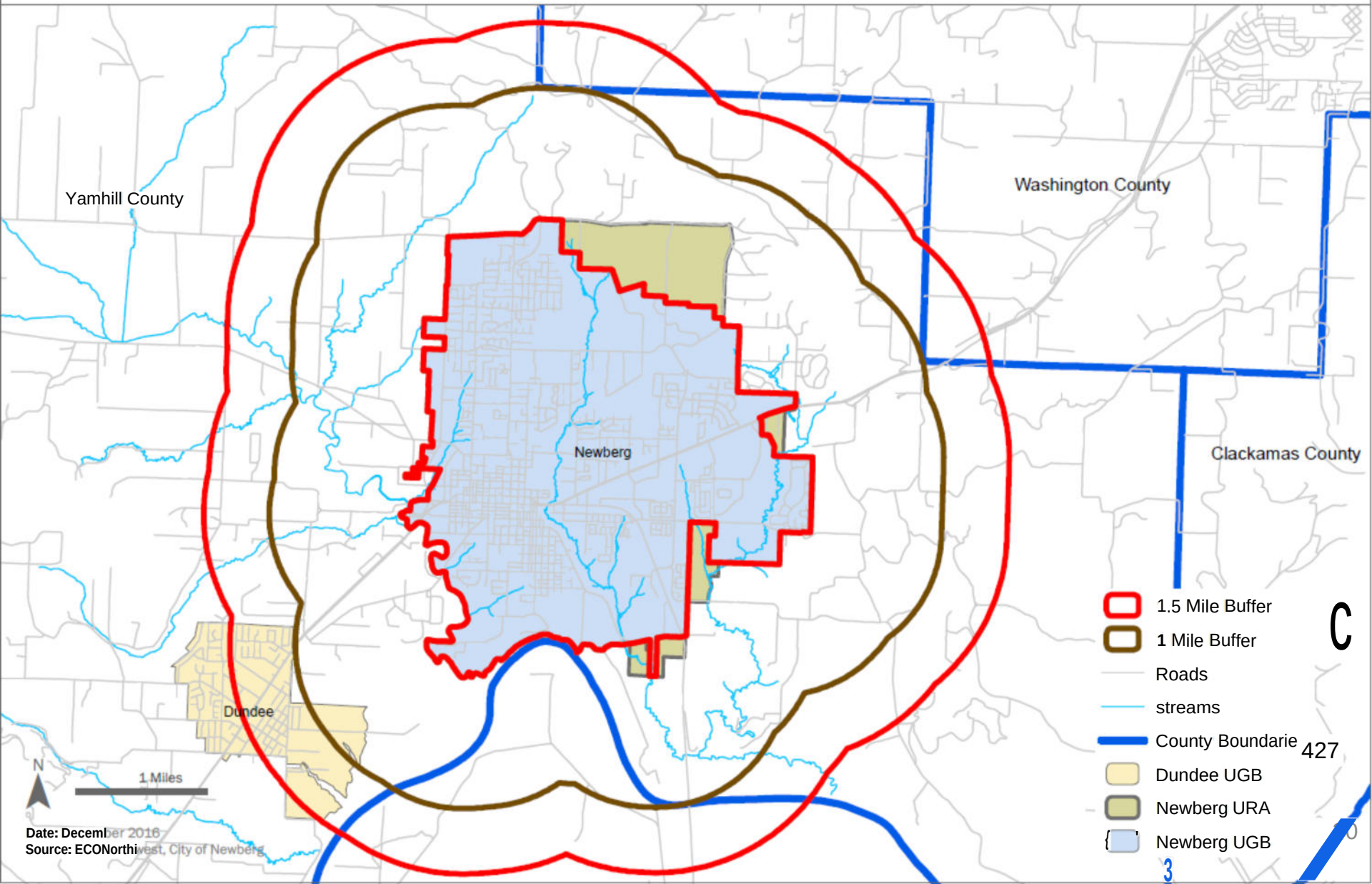
UGB Study Area Determination

Study Area: Steps

- OAR 660-038-0160(1) – Preliminary Study Area
 - All lands in the city's acknowledged urban reserve
 - All lands within one mile of the UGB
 - Exceptions areas within 1.5 miles of the UGB
- Exclusions
 - Areas in Marion County - impracticable service (OAR 660-038-0160(7)(b))
 - Landslide areas – identified in DOGAMI “SLIDO” 4.3 database (OAR 660-038-0160(2)(b)(A))
 - Flood areas – areas in FEMA Special Flood Hazard Area (OAR 660-038-0160(2)(b)(B))
 - Dundee UGB – Shall not include areas within another UGB (660-038-0160(1))

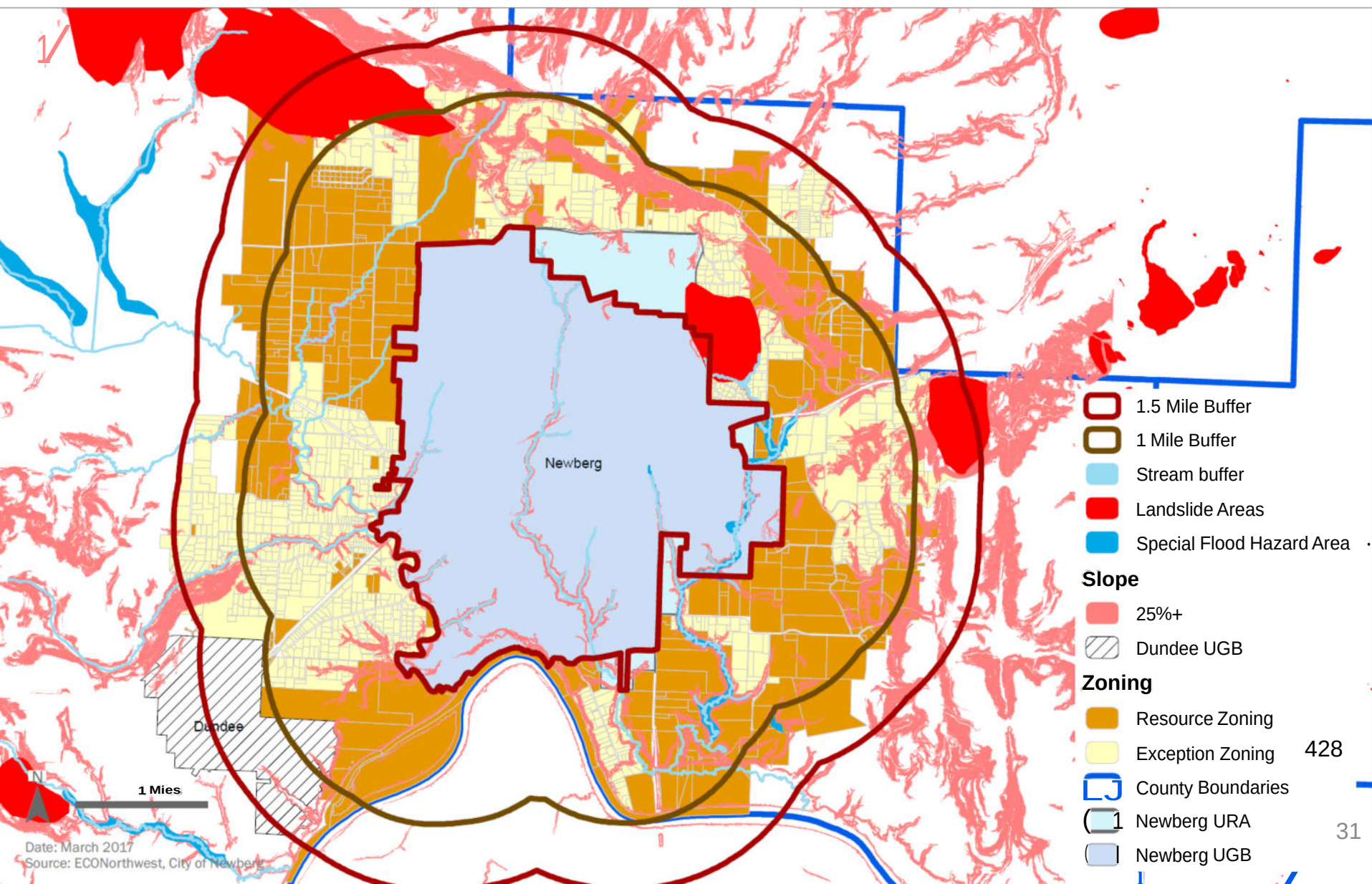
NEWBERG BLI 2016

Newberg UGB, URA, and Study Area Buffers



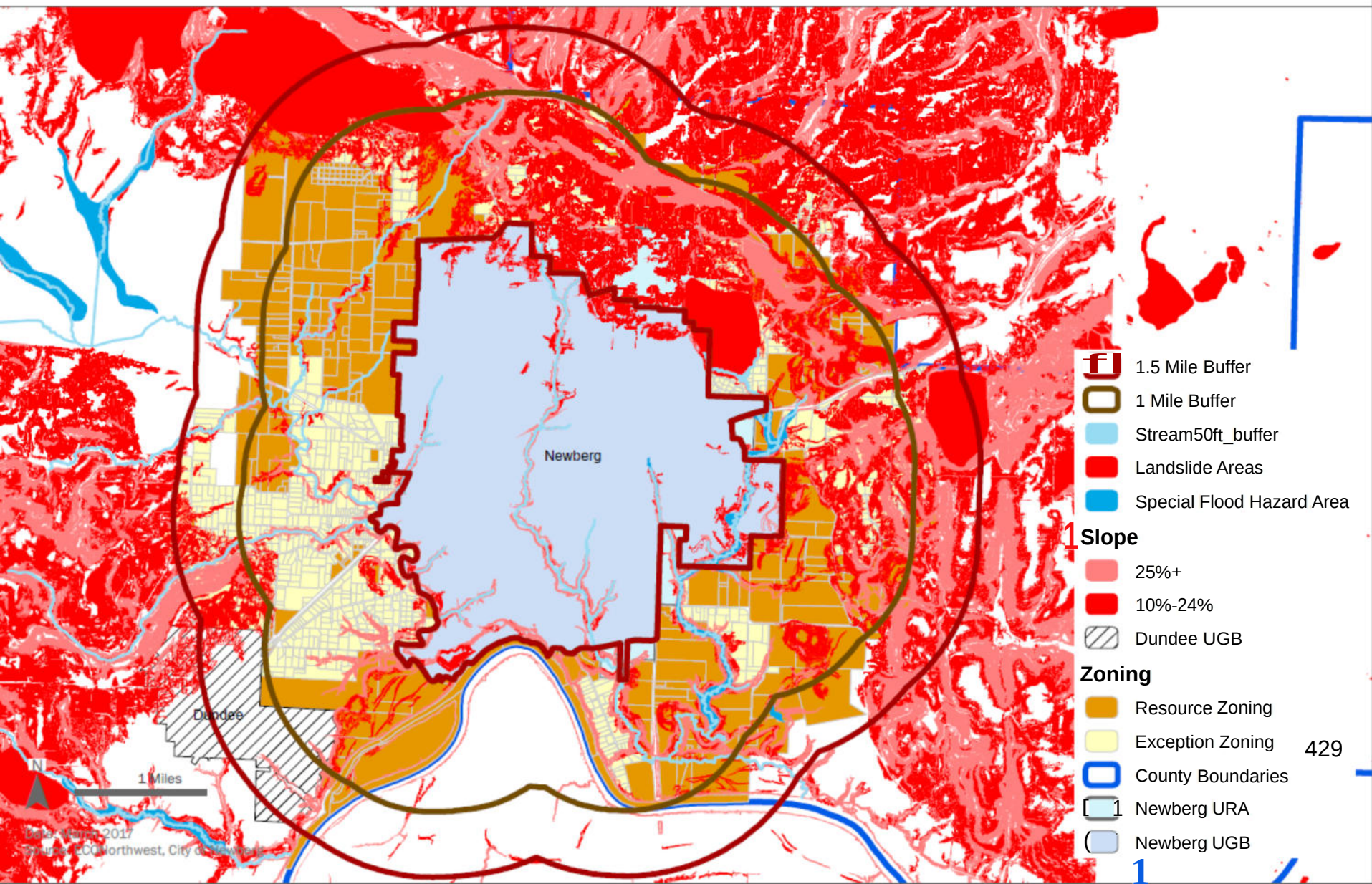
NEWBERG BLI 2016

Newberg Study Area Zoning, Exclusion Areas and Constraints



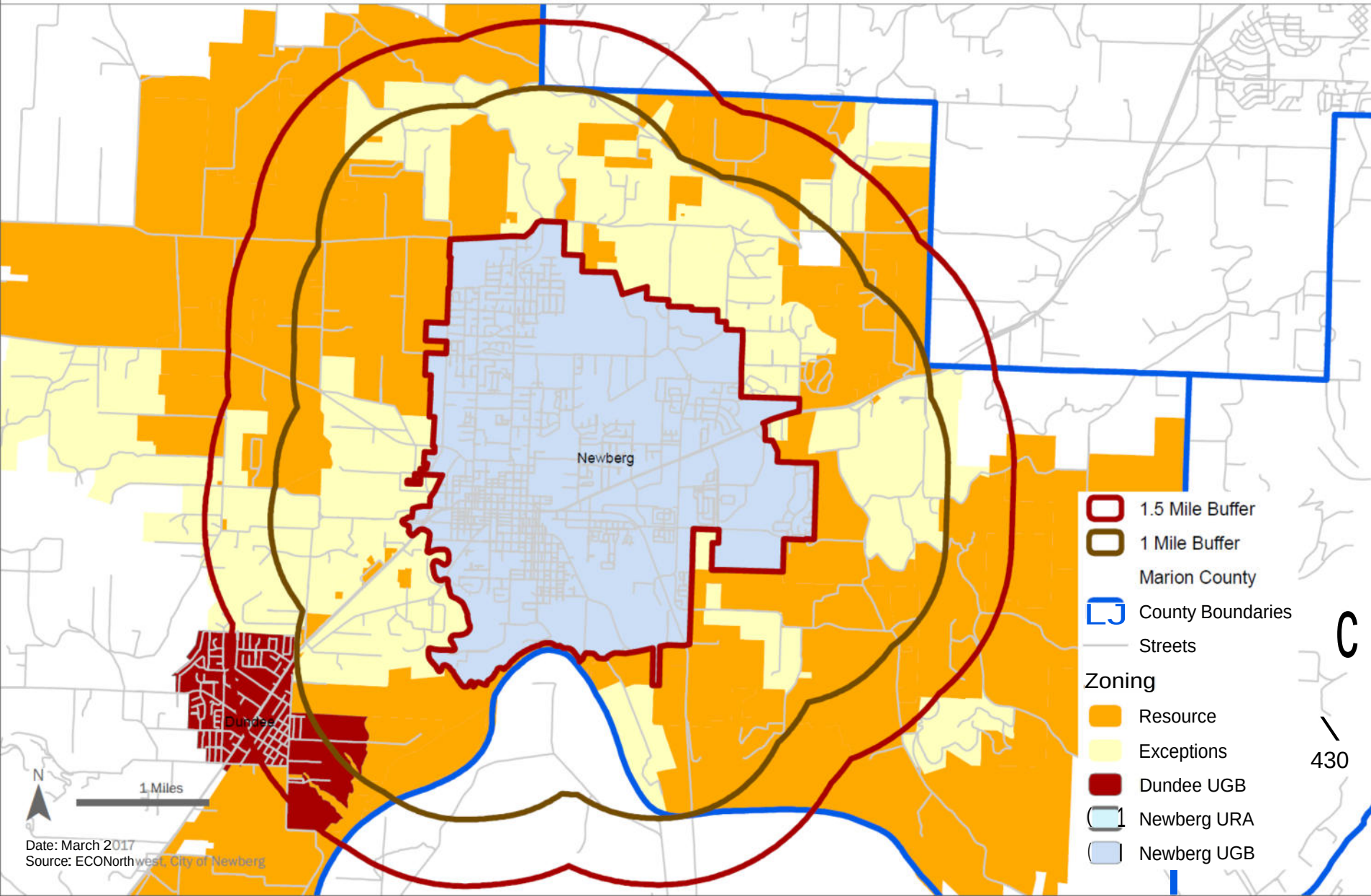
NEWBERG BLI 2016

Newberg Study Area Zoning, Exclusion Areas and Constraints



NEWBERG BLI 2016

Newberg Study Area Buffers and Zoning



Priority of Land for Inclusion in UGB

1. Urban reserve, exception land, and nonresource land
2. Marginal land
3. Forest or farm land that is not predominantly high-value farmland
4. Farmland that is predominantly high-value farmland

With >4000 ac of exceptions areas, lower priority is difficult to justify

UGB Study Area: Statistics

- More than 19,800 acres in 1.5-mile study area (does not include URA)
- 4,325 acres in exceptions areas
- Few lots over 20 acres in exceptions areas

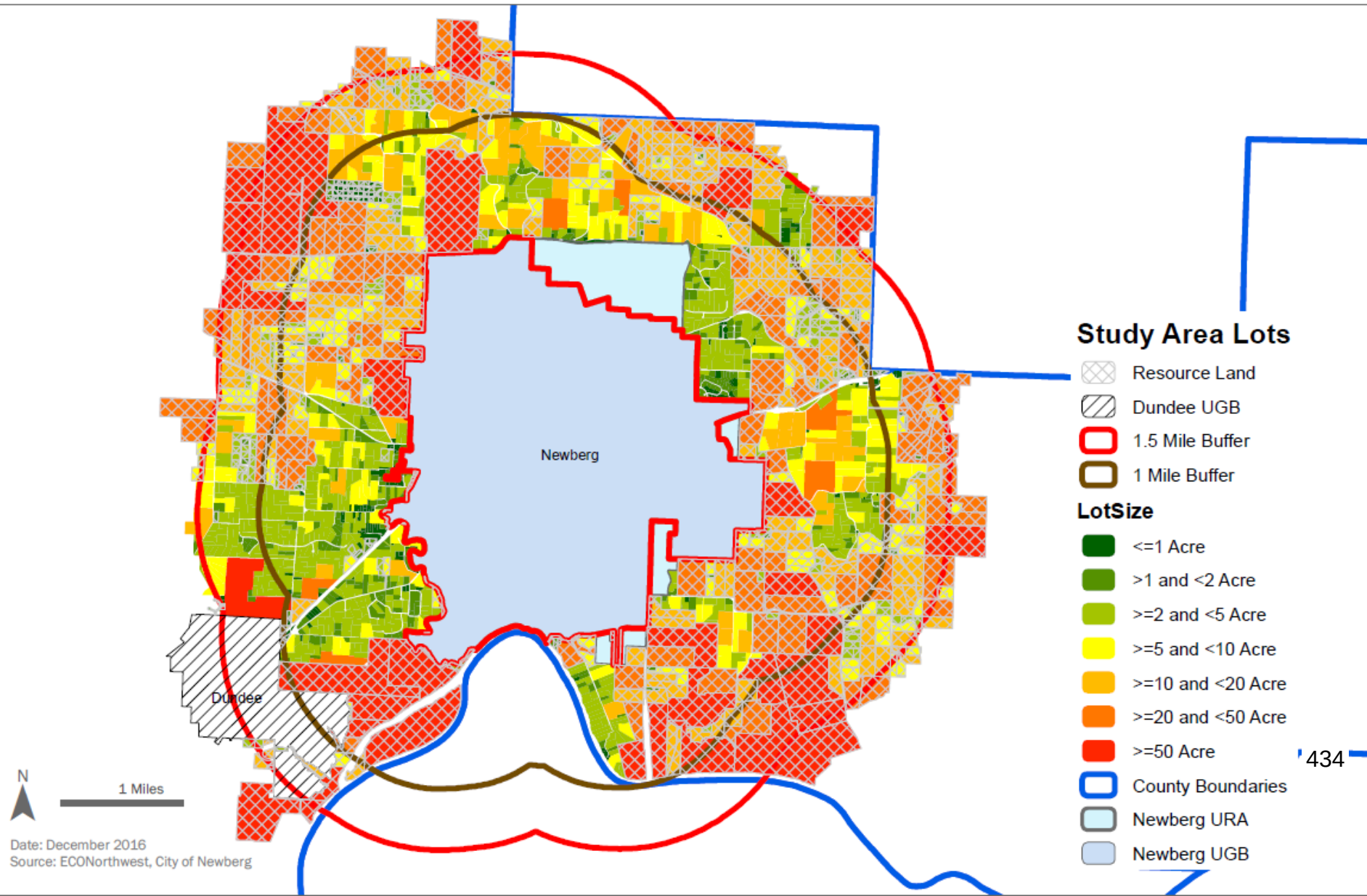
Lot Size (Ac)	Resource			Exceptions			Total		
	Tax Lots	Acres	% of Acres	Tax Lots	Acres	% of Acres	Tax Lots	Acres	% of Acres
<=1	69	41	1%	216	122	3%	285	163	2%
> 1 and <2	45	67	1%	250	368	9%	295	435	4%
>=2 and <5	61	206	4%	612	1,797	42%	673	2,003	20%
>=5 and <10	69	509	9%	138	968	22%	207	1,477	15%
>=10 and <20	63	955	17%	60	784	18%	123	1,738	18%
>=20 and <50	56	1,694	31%	6	178	4%	62	1,873	19%
>=50	19	2,024	37%	1	107	2%	20	2,131	22%
Total	382	5,497	100%	1,283	4,325	100%	1,665	9,821	100%

Study Area Lots by Zoning and Classification

Development Status	Tax Lots	Total Acres	Developed Acres	Slope 25% or over		Slope 10% or Over	
				Constrained Acres	Suitable Acres	Constrained Acres	Suitable Acres
Resource Lands							
Developed	21	9	7	2	0	2	0
Partially Vacant - <2 ac	16	27	8	2	17	5	14
Partially Vacant - >=2 ac	184	3,724	92	480	3,152	1,127	2,505
Vacant	161	1,737	0	277	1,461	537	1,200
Subtotal	382	5,497	107	761	4,629	1,671	3,719
Exceptions Areas							
Developed	145	93	82	11	0	20	-9
Partially Vacant - <2 ac	219	320	104	69	147	113	103
Partially Vacant - >=2 ac	727	3,342	338	788	2,215	1,669	1,335
Vacant	192	570	0	148	421	300	270
Subtotal	1283	4,325	525	1,016	2,783	2,101	1,698
TOTAL	1,665	9,821	632	1,777	7,413	3,772	5,417

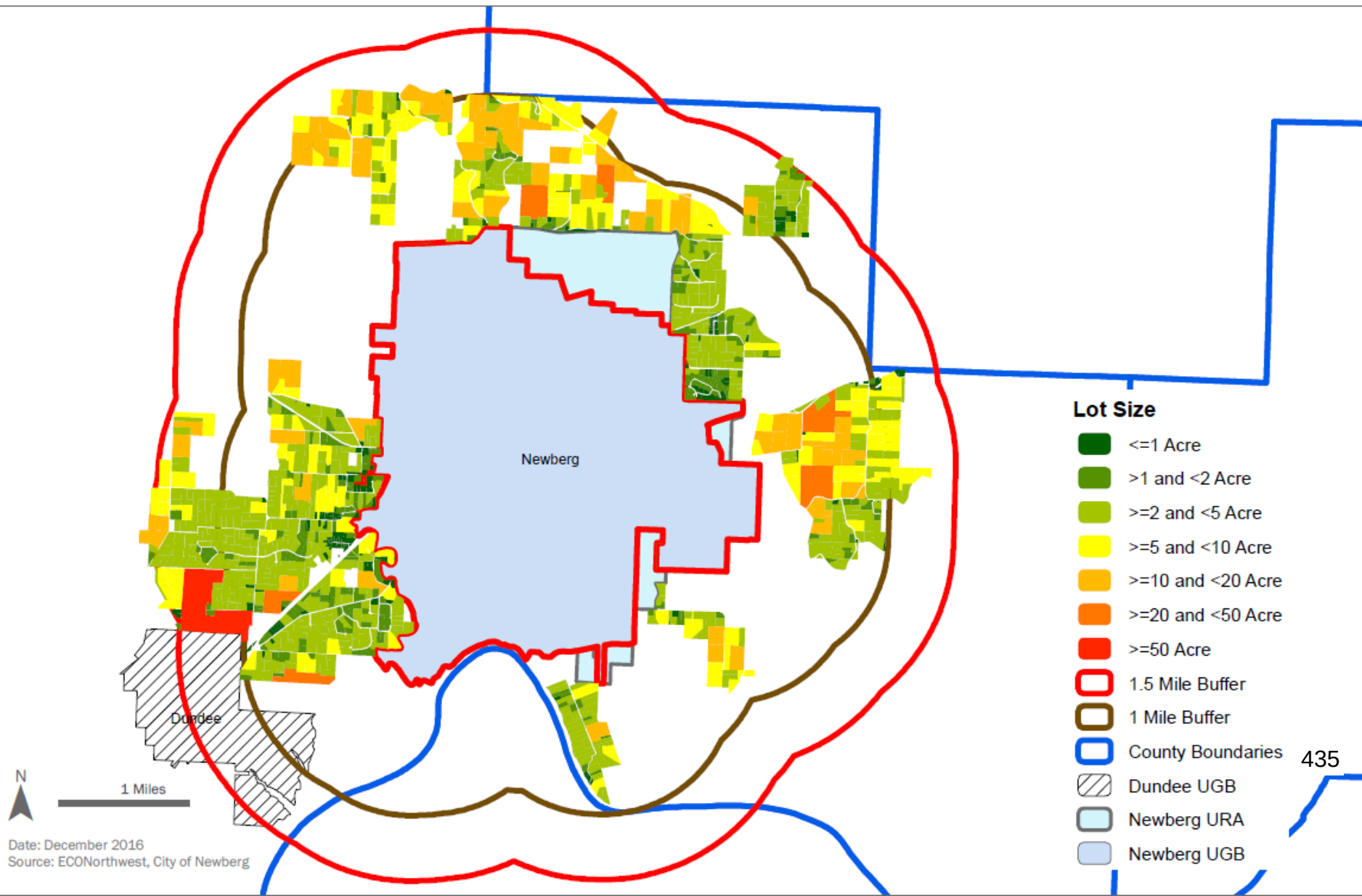
NEWBERG BLI 2016

Newberg Study Area - Lot Size



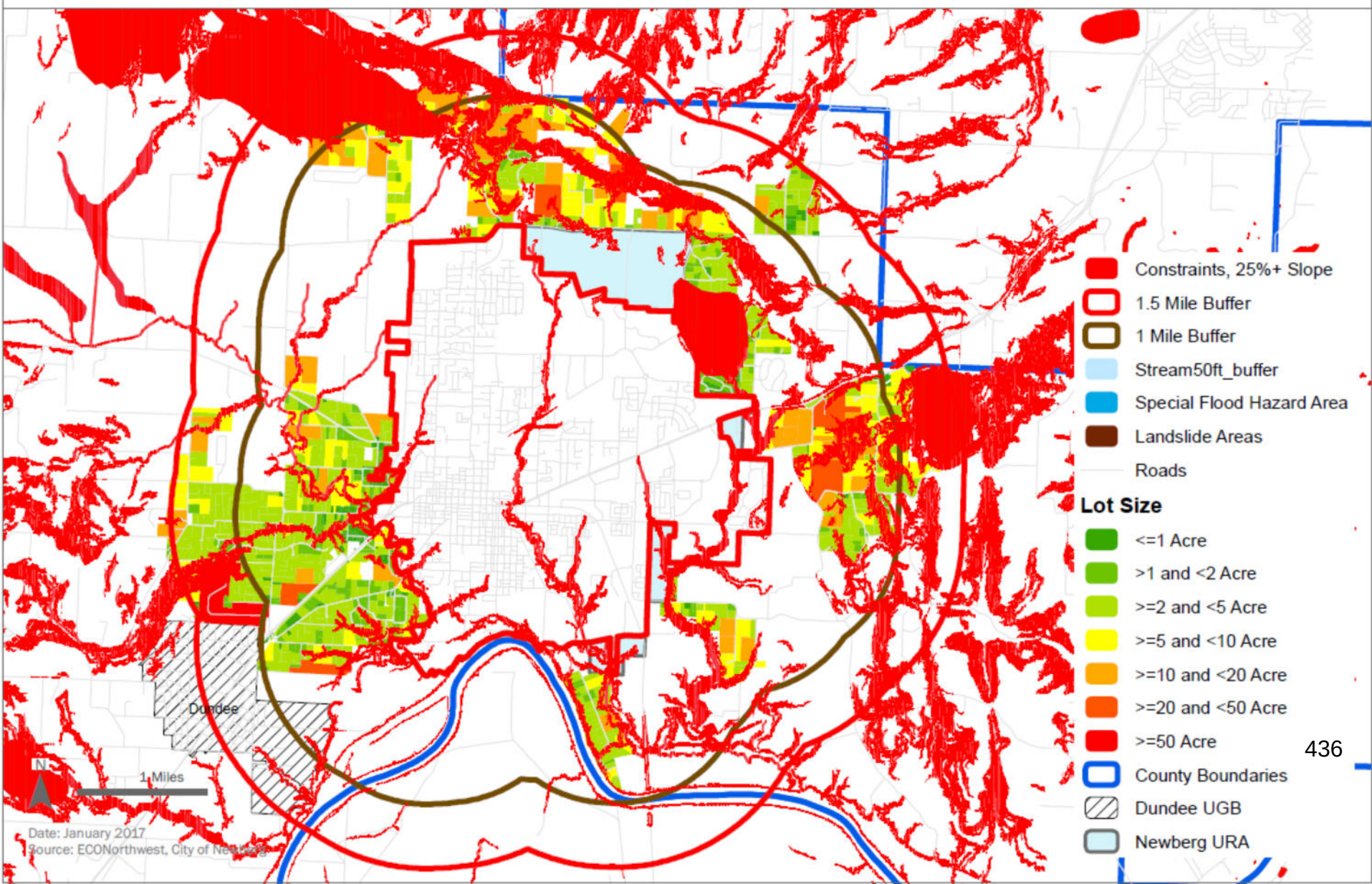
NEWBERG BLI 2016

Newberg Study Area - Exceptions Areas by Lot Size



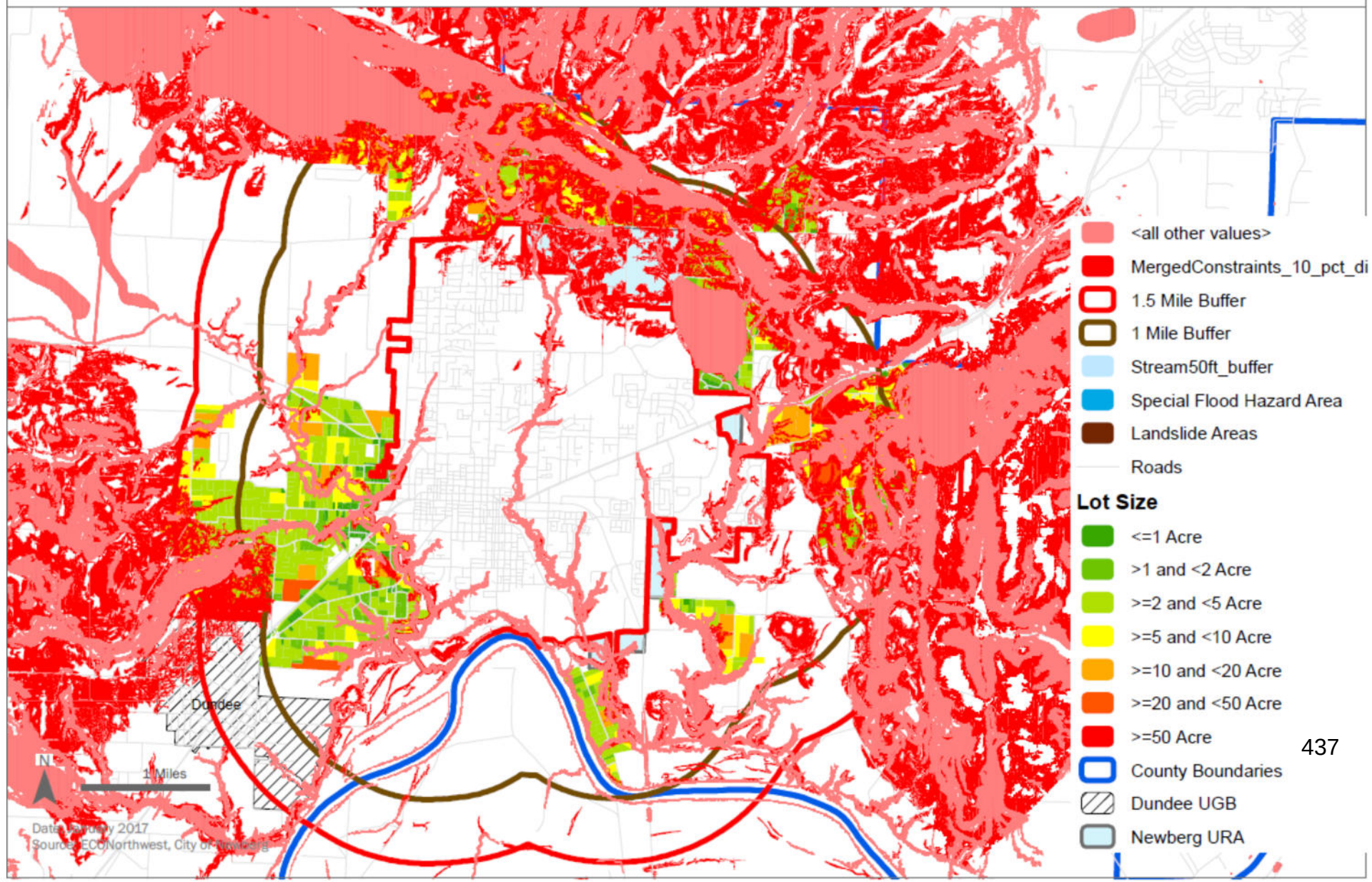
NEWBERG BLI 2016

Newberg Study Area - Exceptions Areas by Lot Size



NEWBERG BLI 2016

Newberg Study Area - Exceptions Areas by Lot Size



Issues with the Division 38 BLI Rule

- Split Plan Designations
 - The rule provides no guidance on split designations
 - The Newberg BLI splits areas in lots that are split by plan designations to accurately account for land in different designations

Public lands with residential plan designations

- Newberg has about 70 acres of public lands with residential plan designations



Partially vacant employment land

- *The real market improvement value of the lot or parcel is greater than five percent and less than 40 percent of the real market land value, in which case, the city must assume that 50 percent of the lot or parcel is developed and 50 percent is vacant.*



Errors/anomalies/exemptions in County Assessment data

- Residential land with improvement value less than \$10,000 and great than 3,000 SF
- The Yamhill County Assessor assessed churches in residential areas as \$0 improvement



442

Condo common areas

- Residential land with improvement value less than \$10,000 and great than 3,000 SF



Table 14. All Land by Classification, Division 38 Method and Standard Method, Newberg UGB

Classification	Tax Lots	Total Acres	Developed Acres	Constrained Acres	Buildable Acres
Division 38 Method					
Developed	6,275	1,362	1,323	40	0
Partially Vacant	389	1,047	300	139	608
Vacant	487	654	0	75	579
Public	215	688	617	71	0
Total	7,366	3,751	2,240	324	1,187
Standard Method					
Developed	6,569	1,860	1,768	92	0
Partially Vacant	169	515	85	72	358
Vacant	277	492	3	47	443
Public	351	884	770	113	0
Total	7,366	3,751	2,626	324	801
Difference					
Developed	-294	-498	-446	-52	0
Partially Vacant	220	532	216	66	250
Vacant	210	162	-3	28	136
Public	-136	-196	-153	-42	0
Total	0	0	-386	0	386

444

Generalized Plan Designation	Tax Lots	Total Acres	Developed Acres	Constrained Acres	Buildable Acres
Division 38 Method					
Residential					
LDR	349	728	80	82	565
MDR	264	423	42	70	311
HDR	52	94	9	8	76
Subtotal	665	1,244	132	160	952
Employment					
Commercial	155	164	13	5	146
Industrial	55	282	144	49	89
Subtotal	210	446	157	54	235
Total	875	1,690	289	214	1,187
Standard Method					
Residential					
LDR	280	644	66	72	506
MDR	77	149	7	34	108
HDR	11	15	3	1	12
Subtotal	368	809	76	107	625
Employment					
Commercial	48	140	6	8	126
Industrial	30	58	5	4	50
Subtotal	78	198	11	12	176
Total	446	1,007	87	119	801
Difference					
Residential					
LDR	69	83	14	10	59
MDR	187	273	35	35	203
HDR	41	78	7	7	64
Subtotal	297	435	55	53	327
Employment					
Commercial	107	24	7	-3	20
Industrial	25	224	139	45	39
Subtotal	132	247	146	42	59
Total	429	683	202	95	386

445

Comparison of Div 38 and Std result

Difference

Residential

LDR	69	83	14	10	59
MDR	187	273	35	35	203
HDR	41	78	7	7	64
Subtotal	297	435	55	53	327

Employment

Commercial	107	24	7	-3	20
Industrial	25	224	139	45	39
Subtotal	132	247	146	42	59

Total

429	683	202	95	386 ⁴⁴⁶
------------	------------	------------	-----------	---------------------------

Conclusion

- **The simplified BLI method is not simple**
 - In many respects it is more complicated than a standard BLI method
 - Many areas are still unclear
 - Provides no consideration for data errors and exceptions (nor was it intended to)
- Results prove unworkable for Newberg in our view

ECONorthwest

ECONOMICS • FINANCE • PLANNING



Hfe

Eugene



GJU

Portland



KJL

Seattle



PS

Boise



Oregon

Kate Brown, Governor

Department of Land Conservation and Development

635 Capitol Street NE, Suite 150

Salem, Oregon 97301-2540

Phone: (503) 373-0050

Fax: (503) 378-5518

www.oregon.gov/LCD



May 18, 2017

TO: Doug Rux, Newberg Community Development Director

FROM: Gordon Howard, Principal Urban Planner

RE: Response to Newberg Buildable Lands Inventory Issues

The Department of Land Conservation and Development has reviewed the issues with OAR chapter 660, division 38 raised by ECO Northwest in its buildable lands inventory document dated February 2017. This memo explains the department's response to the issues identified.

As a preliminary matter, examination of the results of applying the requirements of Oregon Administrative Rules (OAR) chapter 660, division 38 to individual parcels misconstrues the intent of the simplified UGB amendment process. An intent of the rule was to trade precision for speed and certainty. It is not surprising that the results applied to a specific property appear unusual or wrong relative to a more detailed (and therefore more time-consuming and expensive) analysis. The point is not to get every parcel right, but rather to get the city as a whole a reasonable approximation of its capacity.

With that said, we appreciate identification of rough spots encountered in using the new rules. We understand that some of the issues may cumulatively affect that bigger picture that we are looking to address.

1. STANDARDIZATION OF DATA SOURCES

The department appreciates the suggestion regarding standardized data sets. We will determine whether it is feasible for us to generate and post approved data sets for many of the attributes required, such as natural hazards.

2. SPLIT PLAN DESIGNATIONS

ECO Northwest's rule evaluation notes two kinds of split plan-map designations: those that are the function of poor registration of different mapping inputs (the "sliver" problem) and those that reflect individual parcels split between two different land use designations. The "sliver" problem is not an issue with the rule so it would presumably be a problem regardless. Regarding the parcels truly "split" in the plan, this is an issue that often bedevils the administration of local land use plans and codes, and is addressed in different ways by different jurisdictions.

In our experience, the most logical way to resolve parcels with split designations is to divide the parcel into two (or more) sub-parcels, each with a unified designation, and then apply the standards of that designation to the sub-parcel for the purposes of the inventory. This practice would seem to be the logical approach when applying the “simplified” UGB analysis methodology of OAR chapter 660, division 38. However, we understand that this approach is not the only methodology available, and the division 38 rules should specify how such split parcels should be classified.

3. DEDUCTION OF CONSTRAINTS

The rule evaluation notes the complexity of applying different constraints with different values upon parcels, for example, a 100-percent reduction of development capacity in floodplains for residential lands versus a 50-percent reduction, or a reduction based upon local codes, of development capacity in floodplains for employment lands. The department notes, however, that existing buildable lands inventories treat constraints differently for different types of lands (for example, slope of lands for employment vs. residential lands, floodplains for residential vs. employment lands). The department would welcome suggestions on how to simplify this process. Regarding the half-acre minimum size for deduction of water bodies, the adopted rules make an assumption that smaller water bodies, even if they are not filled or eliminated for development, are often avoided by approval of “clustered” development in a manner that retains a site’s building capacity. The department would be open to further discussion on this particular aspect of the rules.

4. PUBLIC LANDS WITH RESIDENTIAL PLAN DESIGNATIONS

Many cities designate and zone public lands such as schools and parks as residential land, and the rule evaluation asserts this could result in these lands being considered vacant for the residential buildable lands inventory despite the fact that they are not available for residential use. To a much lesser extent the same issue could rise related to employment-designated or zoned land.

The rule includes language regarding vacant residentially designated or zoned land in OAR 660-038-0070(2):

(2) The city must identify all vacant lots and parcels with a residential comprehensive plan designation. A city shall assume that a lot or parcel is vacant if it is at least 3,000 square feet with a real market value of less than \$10,000.

This provision, taken by itself, led ECO Northwest to its conclusion. However, OAR 660-0038-0070(3) provides:

The city *must* identify all partially vacant lots and parcels with a residential comprehensive plan designation, as follows:

* * *

(b) For lots and parcels at least one-half acre in size that contain more than one single-family residence, multiple-family residences, *non-residential uses*, or ancillary uses such as parking areas and recreational facilities, the city *must identify vacant areas* using an orthophoto or other map of comparable geometric accuracy. For the purposes of this identification, all publicly owned park land shall be considered developed. If the vacant area is at least one-quarter acre, the city shall consider that portion of the lot or parcel to be vacant land (italics added).

The rule does not require a buildable lands inventory to consider built sites vacant. For public uses such as schools and community centers that are residentially designated or zoned, the orthophoto test would eliminate such parcels from a residential buildable lands inventory. The additional language regarding park land eliminates not only developed park sites, but city-owned and undeveloped park sites from the buildable lands inventory. The rules do not include the same allowance for schools because there is a history among some Oregon school districts of selling undeveloped and unneeded school sites for residential development – thus a school site is not considered committed to a non-residential use until it is actually developed. A part of the parcel developed with play areas, even if there are no buildings, is still developed. The department considers this rule appropriate for these circumstances, although it acknowledges the rule could be clearer.

A similar situation exists for employment land – OAR 660-038-0120(2)(b)(B) allows a city to consider a parcel as having buildable land only if, “based on an orthomap, the lot or parcel is greater than one acre in size and at least one-half acre is not improved.”

5. DEVELOPED EMPLOYMENT LAND

The rule evaluation notes that review of aerial photos is an option for determining developed and vacant employment land, but notes that it can be time consuming. The department agrees that this is true, but alternative methods for determining vacant versus developed employment land, such as use of assessed value, are also criticized (see section 6, below).

6. PARTIALLY VACANT EMPLOYMENT LAND

The rule evaluation provides examples that question the appropriateness of the requirement that, for employment lands of less than one acre, the only method for determining whether a parcel is partially vacant is an improvement value that “is greater than five percent and less than 40 percent of the real market land value, in which case the city must assume that 50 percent of the lot or parcel is developed and 50 percent is vacant.” OAR 660-038-0120(2)(b)(A). The market-value test in the rule resulted from review of many previous economic opportunities analyses (EOAs) completed in Oregon, many of them completed by the same consultant who prepared this evaluation, which found that many of the EOAs used the ratio of assessed improvement value to assessed land value to determine whether employment land had additional development potential. These EOAs ranged in the percentages used from 20 percent to 50 percent, and so the 40 percent figure used in the rule was derived from an intermediate point of this range.

The department would welcome additional research on this topic to inform a potential adjustment of the percentage set forth in the rule. However, we also question whether it would be better for all parties to concede that the current rule is “close enough,” that results might tend to even out, with parcels redeveloping despite having a ratio of improvement to land value greater than 40 percent balancing parcels not redeveloping despite having a ratio less than 40 percent. We question whether the cost and effort of additional research justifies what is likely to be a marginally more accurate outcome in an employment buildable lands inventory. Finally, please see the opening comments in this memo regarding the expected accuracy of the simplified method when applied to an individual lot.

7. DETERMINATION OF SLOPES USING CONTOUR DATA

The rule evaluation suggests that most GIS experts build slope thresholds from digital elevation models and not contours, while the simplified method’s administrative rules require measurement of slopes by contours, using a maximum contour interval of 10 feet. If the digital elevation models are more precise than a 10-foot contour elevation analysis then use of such models is allowed by the rule. (See OAR 660-038-0070(2)(d) for residential lands and OAR 660-038-0130(2)(d) for employment lands) However, a technical rule adjustment specifically allowing use of digital elevation models may be appropriate. The rule evaluation also suggests that the state provide a standardized data set of slopes for cities to use, the feasibility of which the department can investigate.

8. ERRORS/ANOMALIES IN COUNTY ASSESSMENT DATA

The rule evaluation asserts that the reliance on assessor valuation in making determinations about the availability of land for development or redevelopment suspect because county assessment data is often rife with errors or anomalies. However, OAR 660-038-0070(2) requires a city to “identify all vacant lots and parcels with a residential comprehensive plan designation.” It goes on to provide, “A city shall assume that a lot or parcel is vacant if it is at least 3,000 square feet with a real market improvement value of less than \$10,000.”

During discussions on the rule adoption, an assertion was made that county assessment data was accurate regarding assessed value since counties depended upon such accurate assessments to generate tax revenue. ECO Northwest’s identification of particular parcels in Newberg being inaccurately assessed has called this into question. The department recognizes that, in cases where property is tax-exempt, such as for religious institutions, a county assessor may have no incentive to appraise the improvement’s value accurately, and that county assessors may not be error-free in such matters despite economic incentives to be so. However, OAR 660-038-0020(16) states that the city *may* use tax lot data shown on the most recent tax assessment rolls. While it is assumed that the relevant tax assessor data will be used in almost all cases, if there is a solid reason not to use that data, such as a clear error or incorrect assessment by the county assessor, then the city may substitute alternative information to determine the value of improvements on a property. The department will consider whether rule language could be modified to further clear up this point.

9. CONDOMINIUM COMMON AREAS

The rule evaluation asserts that the common areas of condominiums, which are often undeveloped and created as separate parcels by the condominium development, must be counted as vacant developable land because they are often shown with no assessed improvement value by county assessor. The department does not agree with this assertion because such common areas, as part of a condominium development, can be excluded pursuant to a review of orthophotography under OAR 660-038-0060(3)(b). However, the department would consider adjustments to rule language to put this interpretation into writing.

10. CLASSIFICATION OF LANDS IN THE UGB STUDY AREA

The rule evaluation states that the classification of lands in the UGB study areas are convoluted and difficult to interpret, particularly regarding the thresholds of redevelopment for rural residential lots of less than two acres. The rule evaluation itself is confusing on several points:

- The study-area rule applies to lands outside of a UGB, and thus is subject to the rules regarding location of lands to be added to a UGB, rather than the determination of land need and inventory of supply within an existing UGB. The assignment of residential densities to land outside of a UGB that is being added to a UGB is identical for both the “simplified” (OAR 660 Division 38) and “standard” (OAR 660 Division 24) UGB amendment methods.
- The rule evaluation implies that the determination of development potential in study areas is stricter than that allowed within the existing UGB. In fact, it is more lenient. Within a UGB, any lot of at least one-half acre with a single residence on it is assumed to be partially vacant while, for lands outside of a UGB, a lot must be at least one acre (with a single residence on it) to have any additional development capacity, at least for a 14-year period following that parcel’s inclusion in the UGB. A similar standard of one-half acre was not used for lands outside of a UGB based upon the University of Oregon’s research on the topic.
- The rule evaluation states that the method used in Newberg may not “pass legal muster given that the rule does not provide any guidance.” The department is confused by this statement. The rule provides clear guidance allowing cities to assume that any rural residential parcel outside of a UGB that is proposed to be added to the UGB would have no additional development capacity if smaller than one acre (unless the parcel is vacant, in which case it would have capacity for one dwelling unit), and would have an overall development capacity of two dwelling units per acre if the parcel is between one and two acres in size. This assumption would apply for such lands added to the UGB as part of the current UGB analysis process, and would apply to any subsequent analysis of these lots once brought into the UGB for a period of 14 years. While the rule is silent regarding parcels greater than two acres, this silence means the city must assume that such lands will develop with urban residential densities. The rule language sets forth clear, legal standards for determining the residential capacity of such parcels added to a UGB.

To summarize, the department believes that the rules provide clear guidance for determining the development capacity of smaller-lot rural residential lands that are being considered for addition to a UGB. The development capacities provided in the rule are based upon research conducted by the University of Oregon in a study commissioned by the department to resolve this very topic.

CONCLUSION

ECO Northwest has identified several sections in OAR chapter 660, division 38 that could be improved and warrant consideration of amendment. The Land Conservation and Development Commission will consider which rulemaking projects it will undertake during the 2017-2019 biennium in coming months. The commission's decision is scheduled for September, and projects could commence soon thereafter.

cc: Angela Carnahan, Mid-Willamette Valley Regional Representative
Bob Parker, ECONorthwest

NEWBERG CITY COUNCIL MEETING INFORMATION

Meeting Date: June 5, 2017

Prepared by: Sue Ryan

Councilors	Roll Call	Consent 5/2 Minutes Res 3378 Keller & Associates Res 3370 James W. Fowler	Continue hearing on Ord 2815 Dutchman's Ridge to June 19th	Res 3371 State Revenue Sharing And Res 3372 Proof of Municipal Services	Res 3373 Adoption of FY 17-18 Budget	Ord 2816 Water Master Plan Waiver of 2 nd reading	Ord 2816 Water Master Plan
ANDREWS, Bob, Mayor	X	Yes	Yes	Yes	Yes	Yes	Yes
BACON, Denise	X	Yes	Yes	Yes	Yes	Yes	Yes
COREY, Mike	X	Yes	Yes	Yes	Yes	Yes	Yes
District 1 seat vacant							
ESSIN, Scott	X	Yes	Yes	Yes	No	Yes	Yes
JOHNSON, Patrick	X	Yes	Yes	Yes	Yes	Yes	Yes
McKINNEY, Stephen	X	Yes	Yes	Yes	Yes	Yes	Yes
ROLL CALL VOTES		YES: 6 NO: 0 District 1 seat vacant	YES: 6 NO: 0 District 1 seat vacant	YES: 6 NO: 0 District 1 seat vacant	YES: 5 NO: 1 [Essin] District 1 seat vacant	YES: NO: District 1 seat vacant	YES: NO: District 1 seat vacant
MOTION (1 st /2 nd):		Bacon/Corey	McKinney/ Johnson	McKinney/ Bacon	Corey/ Bacon	Bacon/Corey	Bacon/Corey

Executive Session # 1 ORS 192.660 (2) I City Attorney Evaluation
Staff Present: Truman Stone, City Attorney
Start: 6:05 p.m. Stop: 6:50 p.m.
Meeting adjourned at 10:15 p.m.

Exec Session # 2 ORS 192.660 (2) h Legal Counsel re: Pending litigation
Staff Present: Joe Hannan, City Manager; Truman Stone, City Attorney
Start: 6:50 p.m. Stop 7:20 p.m.

Councilors	Roll Call	Res 3376 Water SDC	Res 3381 Supplemental Budget # 2 for FY 16-17				
ANDREWS, Bob, Mayor	X	Yes	Yes				
BACON, Denise	X	Yes	Yes				
COREY, Mike	X	Yes	Yes				
District 1 seat vacant							
ESSIN, Scott	X	Yes	Yes				
JOHNSON, Patrick	X	Yes	Yes				
McKINNEY, Stephen	X	Yes	Yes				
ROLL CALL VOTES		YES: 6 NO: 0 District 1 seat vacant	YES: 6 NO: 0 District 1 seat vacant	YES: NO: District 1 seat vacant	YES: NO: District 1 seat vacant	YES: NO: District 1 seat vacant	YES: NO: District 1 seat vacant
MOTION (1st/2nd):		Essin/Johnson	Corey/ Bacon				

June 5, 2017

To the Newberg City Council:

I will be participating in the Public Comments portion of tonight's Council meeting and want to give a "heads-up" to the Council with regard to the issue I'll be raising. I will be submitting a petition to ask that you direct Staff to prepare an RCA to initiate the process of amending the City Charter. I will submit a list of signatures at the meeting. The purpose of the amendment will be to restrict the Council's authority to levy the effective portion of property taxes that is being used to fund the TVF&R contract, when and if the City annexes into the TVF&R district.

This petition is NOT about whether or not the annexation should occur, nor is it about the requirement for a binding public vote, nor about the transfer of assets. Those are considered to be very separate issues. This is strictly about the authority of the Budget Committee and of the Council to continue levying the full Permanent Tax Rate Limit once the obligation to fund the Fire/EMS services is removed.

I have provided a copy of the petition below to give you the opportunity to read it before the meeting.

I thank you in advance for your careful consideration of this matter.

Robert Soppe

503 784-8695

Petition to the Newberg City Council

We, the undersigned, have serious concerns about the property tax implications that will occur if Newberg annexes into the Tualatin Valley Fire & Rescue district. Specifically, the Newberg Budget Committee and Newberg City Council will have the sole authority to continue to levy the property taxes that are presently being used to fund Fire and EMS services even though the liability of funding such services will be removed. We strongly feel that it is inappropriate for such authority to continue.

To this end we petition the Newberg City Council to request Staff to prepare a Request for Council Action to initiate a process of adopting an amendment to the Newberg City Charter, to be heard by the Council in the near future. The Charter amendment shall prohibit the Council from levying any part of the taxes that are presently being used to fund the TVF&R contract. To be more specific, Newberg staff has estimated this amount as \$1.88/\$1,000 of assessed value. The limitation shall begin in the first fiscal year during which Newberg is annexed into the TVF&R district. It would have no effect if no annexation ever occurs.

We recognize that this keeps with the spirit of Ballot Measures 47 and 50 and leaves the City of Newberg with the same funding for non-Fire/EMS services as it has now.

We feel that it is important for the City Council to initiate the Charter amendment process for three reasons:

- 1) It will demonstrate to Newberg residents that the move from the Newberg Fire Department to the TVF&R district that the Council initiated in 2016 was motivated by a desire for public safety and not for purposes of avoiding the property tax limitations placed by the voters with Ballot Measures 47 and 50.
- 2) With such a good-faith effort on the part of the Council, it will be much easier to get support for the annexation by the citizens of Newberg.
- 3) If the Council does not choose to initiate the Charter amendment, it very likely will be done by citizens, further damaging the reputation of the Council.

We urge the City Council to be respectful of what voters intended with Ballot Measures 47 and 50. To that end, we implore you to direct Staff to prepare an RCA for the Charter amendment and to pass that RCA when it comes back before you.

Date: _____

Copies of petitions signed by the following individuals have been submitted to the City Recorder:

Donna Proctor
Newberg Resident
Former Newberg Mayor

Mike McBride
Newberg Resident and Property Owner
Former Newberg City Council Member

Roger Currier
Newberg Resident and Property Owner
Former Newberg City Council Member

Robert Hurford
Newberg Resident and Property Owner
Former Newberg City Council Member

Dei Ellis
Newberg Resident and Property Owner
Former Newberg City Council Member

Robert Soppe
Newberg Resident and Property Owner
Former Newberg City Council Member

Lon Wall
Newberg Resident and Property Owner
Newberg Budget Committee Member
Former Newberg Planning Commission Member

Michael Gougler
Newberg Property Owner

Rick Rogers
Newberg Resident and Property Owner

Terry Emery
Newberg Property Owner
Former Chamber of Commerce President

City Council Meeting

Date: 6/5/17

Re: Water Annexation / Tax Levy

Topic: Charter Amendment

Petition to the Newberg City Council

We, the undersigned, have serious concerns about the property tax implications that will occur if Newberg annexes into the Tualatin Valley Fire & Rescue district. Specifically, the Newberg Budget Committee and Newberg City Council will have the sole authority to continue to levy the property taxes that are presently being used to fund Fire and EMS services even though the liability of funding such services will be removed. We strongly feel that it is inappropriate for such authority to continue.

To this end we petition the Newberg City Council to request Staff to prepare a Request for Council Action to initiate a process of adopting an amendment to the Newberg City Charter, to be heard by the Council in the near future. The Charter amendment shall prohibit the Council from levying any part of the taxes that are presently being used to fund the TVF&R contract. To be more specific, Newberg staff has estimated this amount as \$1.88/~~\$1,000~~ of assessed value. The limitation shall begin in the first fiscal year during which Newberg is annexed into the TVF&R district. It would have no effect if no annexation ever occurs.

We recognize that this keeps with the spirit of Ballot Measures 47 and 50 and leaves the City of Newberg with the same funding for non-Fire/EMS services as it has now.

We feel that it is important for the City Council to initiate the Charter amendment process for three reasons:

- 1) It will demonstrate to Newberg residents that the move from the Newberg Fire Department to the TVF&R district that the Council initiated in 2016 was motivated by a desire for public safety and not for purposes of avoiding the property tax limitations placed by the voters with Ballot Measures 47 and 50.
- 2) With such a good-faith effort on the part of the Council, it will be much easier to get support for the annexation by the citizens of Newberg.
- 3) If the Council does not choose to initiate the Charter amendment, it very likely will be done by citizens, further damaging the reputation of the Council.

We urge the City Council to be respectful of what voters intended with Ballot Measures 47 and 50. To that end, we implore you to direct Staff to prepare an RCA for the Charter amendment and to pass that RCA when it comes back before you.



Del Ellis
Newberg Resident and Property Owner
Former Newberg City Council Member

Date:

6/5/17

City Council Meeting

Date: 6/5/17

Re: TVF&R Annexation / Tax Levy

Topic: Charter Amendment

Petition to the Newberg City Council

We, the undersigned, have serious concerns about the property tax implications that will occur if Newberg annexes into the Tualatin Valley Fire & Rescue district. Specifically, the Newberg Budget Committee and Newberg City Council will have the sole authority to continue to levy the property taxes that are presently being used to fund Fire and EMS services even though the liability of funding such services will be removed. We strongly feel that it is inappropriate for such authority to continue.

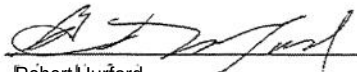
To this end we petition the Newberg City Council to request Staff to prepare a Request for Council Action to initiate a process of adopting an amendment to the Newberg City Charter, to be heard by the Council in the near future. The Charter amendment shall prohibit the Council from levying any part of the taxes that are presently being used to fund the TVF&R contract. To be more specific, Newberg staff has estimated this amount as \$1.88/\$1,000 of assessed value. The limitation shall begin in the first fiscal year during which Newberg is annexed into the TVF&R district. It would have no effect if no annexation ever occurs.

We recognize that this keeps with the spirit of Ballot Measures 47 and 50 and leaves the City of Newberg with the same funding for non-Fire/EMS services as it has now.

We feel that it is important for the City Council to initiate the Charter amendment process for three reasons:

- 1) It will demonstrate to Newberg residents that the move from the Newberg Fire Department to the TVF&R district that the Council initiated in 2016 was motivated by a desire for public safety and not for purposes of avoiding the property tax limitations placed by the voters with Ballot Measures 47 and 50.
- 2) With such a good-faith effort on the part of the Council, it will be much easier to get support for the annexation by the citizens of Newberg.
- 3) If the Council does not choose to initiate the Charter amendment, it very likely will be done by citizens, further damaging the reputation of the Council.

We urge the City Council to be respectful of what voters intended with Ballot Measures 47 and 50. To that end, we implore you to direct Staff to prepare an RCA for the Charter amendment and to pass that RCA when it comes back before you.



Robert Hurford
Newberg Resident and Property Owner
Former Newberg City Council Member

Date: 6/2/17

City Council Meeting

Date: JWf 24th

Re: TVF&R Annexation Tax Levy

Topic: Charter Amendment

Petition to the Newberg City Council

We, the undersigned, have serious concerns about the property tax implications that will occur if Newberg annexes into the Tualatin Valley fire & Rescue district. Specifically, the Newberg Budget Committee and Newberg City Council will have the sole authority to continue to levy the property taxes that are presently being used to fund fire and EMS services even though the liability of funding such services will be removed. We strongly feel that it is inappropriate for such authority to continue.

To this end we petition the Newberg City Council to request Staff to prepare a Request for Council Action to initiate a process of adopting an amendment to the Newberg City Charter, to be heard by the Council in the near future. This Charter amendment shall prohibit the Council from levying any part of the taxes that are presently being used to fund the TVF&R contract. To be more specific, Newberg staff has estimated this amount as \$1.58/\$1,000 of assessed value. The limitation shall begin in the first fiscal year during which Newberg is annexed into the TVF&R district. It would have no effect if no annexation ever occurs.

We recognize that this keeps with the spirit of Ballot Measures 47 and 50 and leaves the City of Newberg with the same funding for non-Fire/EMS services as it has now.

We feel that it is important for the City Council to initiate the Charter amendment process for three reasons:

- 1) It will demonstrate to Newberg residents that the move from the Newberg Fire Department to the TVF&R district that the Council initiated in 2016 was motivated by a desire for public safety and not for purposes of avoiding the property tax limitations placed by the voters with Ballot Measures 47 and 50.
- 2) With such a good-faith effort on the part of the Council, it will be much easier to get support for the annexation by the citizens of Newberg.
- 3) If the Council does not choose to initiate the Charter amendment, it very likely will be done by citizens, further damaging the reputation of the Council.

We urge the City Council to be respectful of what voters intended with Ballot Measures 47 and 50. To that end, we implore you to direct Staff to prepare an RCA for the Charter amendment and to pass that RCA when it comes back before you.



Robert Currier
Newberg Property Owner
Former Newberg City Council Member

Date:

6-2-2017

City Council Meeting

Date:

6/5/17

Re:

TyHK mune XL Jrn

Topic:

Cbcu64tj\ rh- \n\ SA

Petition to the Newberg City Council

We, the undersigned, have serious concerns about the property tax implications that will occur if Newberg annexes into the Tualatin Valley Fire & Rescue district. Specifically, the Newberg Budget Committee and Newberg City Council will have the sole authority to continue to levy the property taxes that are presently being used to fund Fire and EMS services even though the liability of funding such services will be removed. We strongly feel that it is inappropriate for such authority to continue.

To this end we petition the Newberg City Council to request Staff to prepare a Request for Council Action to initiate a process of adopting an amendment to the Newberg City Charter, to be heard by the Council in the near future. The Charter amendment shall prohibit the Council from levying any part of the taxes that are presently being used to fund the TVF&R contract. To be more specific, Newberg staff has estimated this amount as \$1.88/\$1,000 of assessed value. The limitation shall begin in the first fiscal year during which Newberg is annexed into the TVF&R district. It would have no effect if no annexation ever occurs.

We recognize that this keeps with the spirit of Ballot Measures 47 and 50 and leaves the City of Newberg with the same funding for non-Fire/EMS services as it has now.

We feel that it is important for the City Council to initiate the Charter amendment process for three reasons:

- 1) It will demonstrate to Newberg residents that the move from the Newberg Fire Department to the TVF&R district that the Council initiated in 2016 was motivated by a desire for public safety and not for purposes of avoiding the property tax limitations placed by the voters with Ballot Measures 47 and 50.
- 2) With such a good-faith effort on the part of the Council, it will be much easier to get support for the annexation by the citizens of Newberg.
- 3) If the Council does not choose to initiate the Charter amendment, it very likely will be done by citizens, further damaging the reputation of the Council.

We urge the City Council to be respectful of what voters intended with Ballot Measures 47 and 50. To that end, we implore you to direct Staff to prepare an RCA for the Charter amendment and to pass that RCA when it comes back before you.

Msk iAL
Mike McBride
Newberg Resident and Property Owner
Former Newberg City Council Member

Date: 6-Z-17

City Council Meeting
Re: TVF&R Annexation / Tax Levy
Topic: Charter Amendment

[illegible][illegible]

[Handwritten notes:]

- ejec
- Auj
- Meeting
- 7/5/17
- 7/28/17
- Clayton's presentation
- 10x bay

[illegible][illegible]

- [Handwritten notes:]*
- Meeting
7/5/17
Chatterbox
Jax boy

[Handwritten notes:]

- ejec
- Auj
- Meeting
- 7/5/17
- 7/28/17
- Clayton's presentation
- 10x bay

Date: 06/07/2021

Donna Proctor
Newberg Resident
Former Newberg Mayor

Petition to the Newberg City Council

We, the undersigned, have serious concerns about the property tax implications that will occur if Newberg annexes into the Tualatin Valley Fire & Rescue district. Specifically, the Newberg Budget Committee and Newberg City Council will have the sole authority to continue to levy the property taxes that are presently being used to fund Fire and EMS services even though the liability of funding such services will be removed. We strongly feel that it is inappropriate for such authority to continue.

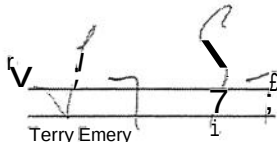
To this end we petition the Newberg City Council to request Staff to prepare a Request for Council Action to initiate a process of adopting an amendment to the Newberg City Charter, to be heard by the Council in the near future. The Charter amendment shall prohibit the Council from levying any part of the taxes that are presently being used to fund the TVF&R contract. To be more specific, Newberg staff has estimated this amount as \$1.88/\$1,000 of assessed value. The limitation shall begin in the first fiscal year during which Newberg is annexed into the TVF&R district. It would have no effect if no annexation ever occurs.

We recognize that this keeps with the spirit of Ballot Measures 47 and 50 and leaves the City of Newberg with the same funding for non-Fire/EMS services as it has now.

We feel that it is important for the City Council to initiate the Charter amendment process for three reasons:

- 1) it will demonstrate to Newberg residents that the move from the Newberg Fire Department to the TVF&R district that the Council initiated in 2016 was motivated by a desire for public safety and not for purposes of avoiding the property tax limitations placed by the voters with Ballot Measures 47 and 50.
- 2) With such a good-faith effort on the part of the Council, it will be much easier to get support for the annexation by the citizens of Newberg.
- 3) If the Council does not choose to initiate the Charter amendment, it very likely will be done by citizens, further damaging the reputation of the Council.

We urge the City Council to be respectful of what voters intended with Ballot Measures 47 and 50. To that end, we implore you to direct Staff to prepare an RCA for the Charter amendment and to pass that RCA when it comes back before you.


Terry Emery

Newberg Property Owner
Former Chamber of Commerce President

Date: Cfs/i7

City Council Meeting
Date: 6/5/17
Re: TVF&R Annexation
Topic: Charter Amendment

Petition to the Newberg City Council

We, the undersigned, have serious concerns about the property tax implications that will occur if Newberg annexes into the Tualatin Valley Fire & Rescue district. Specifically, the Newberg Budget Committee and Newberg City Council will have the sole authority to continue to levy the property taxes that are presently being used to fund Fire and EMS services even though the liability of funding such services will be removed. We strongly feel that it is inappropriate for such authority to continue.

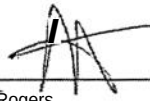
To this end we petition the Newberg City Council to request Staff to prepare a Request for Council Action to initiate a process of adopting an amendment to the Newberg City Charter, to be heard by the Council in the near future. The Charter amendment shall prohibit the Council from levying any part of the taxes that are presently being used to fund the TVF&R contract. To be more specific, Newberg staff has estimated this amount as \$1.88/\$1,000 of assessed value. The limitation shall begin in the first fiscal year during which Newberg is annexed into the TVF&R district. It would have no effect if no annexation ever occurs.

We recognize that this keeps with the spirit of Ballot Measures 47 and 50 and leaves the City of Newberg with the same funding for non-Fire/EMS services as it has now.

We feel that it is important for the City Council to initiate the Charter amendment process for three reasons:

- 1) It will demonstrate to Newberg residents that the move from the Newberg Fire Department to the TVF&R district that the Council initiated in 2016 was motivated by a desire for public safety and not for purposes of avoiding the property tax limitations placed by the voters with Ballot Measures 47 and 50.
- 2) With such a good-faith effort on the part of the Council, it will be much easier to get support for the annexation by the citizens of Newberg.
- 3) If the Council does not choose to initiate the Charter amendment, it very likely will be done by citizens, further damaging the reputation of the Council.

We urge the City Council to be respectful of what voters intended with Ballot Measures 47 and 50. To that end, we implore you to direct Staff to prepare an RCA for the Charter amendment and to pass that RCA when it comes back before you.



Rick Rogers
Newberg Resident and Property Owner

Date: 6-5-17

City Council Meeting

Date: top of

Re: TVF&R Annexation Tax levy

Topic: Clteg4e. org ndment

Petition to the Newberg City Council

We, the undersigned, have serious concerns about the property tax implications that will occur if Newberg annexes into the Tualatin Valley Fire & Rescue district. Specifically, the Newberg Budget Committee and Newberg City Council will have the sole authority to continue to levy the property taxes that are presently being used to fund Fire and EMS services even though the liability of funding such services will be removed. We strongly feel that it is inappropriate for such authority to continue.

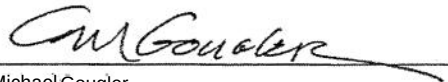
To this end we petition the Newberg City Council to request Staff to prepare a Request for Council Action to initiate a process of adopting an amendment to the Newberg City Charter, to be heard by the Council in the near future. The Charter amendment shall prohibit the Council from levying any part of the taxes that are presently being used to fund the TVF&R contract. To be more specific, Newberg staff has estimated this amount as \$1.88/\$1,000 of assessed value. The limitation shall begin in the first fiscal year during which Newberg is annexed into the TVF&R district. It would have no effect if no annexation ever occurs.

We recognize that this keeps with the spirit of Ballot Measures 47 and 50 and leaves the City of Newberg with the same funding for non-Fire/EMS services as it has now.

We feel that it is important for the City Council to initiate the Charter amendment process for three reasons:

- 1) It will demonstrate to Newberg residents that the move from the Newberg Fire Department to the TVF&R district that the Council initiated in 2016 was motivated by a desire for public safety and not for purposes of avoiding the property tax limitations placed by the voters with Ballot Measures 47 and 50.
- 2) With such a good-faith effort on the part of the Council, it will be much easier to get support for the annexation by the citizens of Newberg.
- 3) If the Council does not choose to initiate the Charter amendment, it very likely will be done by citizens, further damaging the reputation of the Council.

We urge the City Council to be respectful of what voters intended with Ballot Measures 47 and 50. To that end, we implore you to direct Staff to prepare an RCA for the Charter amendment and to pass that RCA when it comes back before you.



Michael Gougler
Newberg Resident Property Owner

Date:

6/2/2017

City CoupcU Mooting

Date: 6/2/17

Re: ~~CH~~ TVFR Annexation / tax levy

Topic: Chapter Amendment

Petition to the Newberg City Council

We, the undersigned, have serious concerns about the property tax implications that will occur if Newberg annexes into the Tualatin Valley Fire & Rescue district. Specifically, the Newberg Budget Committee and Newberg City Council will have the sole authority to continue to levy the property taxes that are presently being used to fund Fire and EMS services even though the liability of funding such services will be removed. We strongly feel that it is inappropriate for such authority to continue.

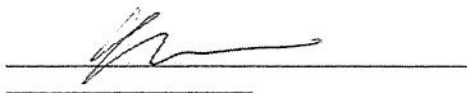
To this end we petition the Newberg City Council to request Staff to prepare a Request for Council Action to initiate a process of adopting an amendment to the Newberg City Charter, to be heard by the Council in the near future. The Charter amendment shall prohibit the Council from levying any part of the taxes that are presently being used to fund the TVF&R contract. To be more specific, Newberg staff has estimated this amount as \$1.88/\$1,000 of assessed value. The limitation shall begin in the first fiscal year during which Newberg is annexed into the TVF&R district. It would have no effect if no annexation ever occurs.

We recognize that this keeps with the spirit of Ballot Measures 47 and 50 and leaves the City of Newberg with the same funding for non-Fire/EMS services as it has now.

We feel that it is important for the City Council to initiate the Charter amendment process for three reasons:

- 1) It will demonstrate to Newberg residents that the move from the Newberg Fire Department to the TVF&R district that the Council initiated in 2016 was motivated by a desire for public safety and not for purposes of avoiding the property tax limitations placed by the voters with Ballot Measures 47 and 50.
- 2) With such a good-faith effort on the part of the Council, it will be much easier to get support for the annexation by the citizens of Newberg.
- 3) If the Council does not choose to initiate the Charter amendment, it very likely will be done by citizens, further damaging the reputation of the Council.

We urge the City Council to be respectful of what voters intended with Ballot Measures 47 and 50. To that end, we implore you to direct Staff to prepare an RCA for the Charter amendment and to pass that RCA when it comes back before you.



Ion Wall
Newberg Resident and Property Owner
Newberg Budget Committee Member
Former Newberg Planning Commission Member

Date: 6-2-17

City Council Meeting
Date: 6/5/17
Re: TVF&R Annexation / Tax 14/
Topic: Charter Amendment

Petition to the Newberg City Council

We, the undersigned, have serious concerns about the property tax implications that will occur if Newberg annexes into the Tualatin Valley Fire & Rescue district. Specifically, the Newberg Budget Committee and Newberg City Council will have the sole authority to continue to levy the property taxes that are presently being used to fund Fire and EMS services even though the liability of funding such services will be removed. We strongly feel that it is inappropriate for such authority to continue.

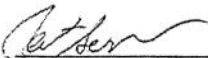
To this end we petition the Newberg City Council to request Staff to prepare a Request for Council Action to initiate a process of adopting an amendment to the Newberg City Charter, to be heard by the Council in the near future. The Charter amendment shall prohibit the Council from levying any part of the taxes that are presently being used to fund the TVF&R contract. To be more specific, Newberg staff has estimated this amount as \$1.88/\$1,000 of assessed value. The limitation shall begin in the first fiscal year during which Newberg is annexed into the TVF&R district. It would have no effect if no annexation ever occurs.

We recognize that this keeps with the spirit of Ballot Measures 47 and 50 and leaves the City of Newberg with the same funding for non-Fire/EMS services as it has now.

We feel that it is important for the City Council to initiate the Charter amendment process for three reasons:

- 1) It will demonstrate to Newberg residents that the move from the Newberg Fire Department to the TVF&R district that the Council initiated in 2016 was motivated by a desire for public safety and not for purposes of avoiding the property tax limitations placed by the voters with Ballot Measures 47 and 50.
- 2) With such a good-faith effort on the part of the Council, it will be much easier to get support for the annexation by the citizens of Newberg.
- 3) If the Council does not choose to initiate the Charter amendment, it very likely will be done by citizens, further damaging the reputation of the Council.

We urge the City Council to be respectful of what voters intended with Ballot Measures 47 and 50. To that end, we implore you to direct Staff to prepare an RCA for the Charter amendment and to pass that RCA when it comes back before you.



Robert Soppe
Newberg Resident and Property Owner
Former Newberg City Council Member

Date: 6-5-2017

City Council Meeting

Date: W5/17

Re: TVF&R Annexation Tax Levy

Topic: Charter Amendment

I am before you tonight with regard to the issue of the TVF&R annexation and its impact on taxation. As you know, if Newberg annexes into the TVF&R District, Newberg will lose the obligation of funding Fire services but will retain the authority to continue to levy the \$1.88/\$1,000 in taxes it presently uses to fund these services. Many Newberg citizens would like to see that authority removed.

You should have received a copy of a petition earlier today from the City Recorder. I've handed out a list of individuals who have signed this petition. I had originally intended to make this simply a personal request from myself as a local resident. As I talked to local people about the issue, I kept getting asked how they could support what I was doing. With little effort, I received the signatures you have listed before you. You should recognize many of the names. There is a former Newberg Mayor, 5 former City Council members, a former Planning Commission member, a former president of the Chamber of Commerce, and others.

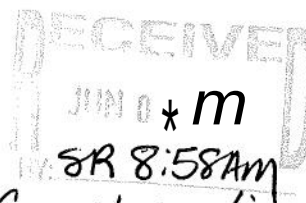
The petition requests that you direct Staff to come back to you with a Request for Council Action to put an amendment to the City Charter on the ballot. The Charter Amendment approach is being requested as it is the only practical way to put the authority to collect any of the \$1.88 in the hands of the voters.

I want to emphasize that the request tonight is only to have the issue brought before you. If you think that this is a serious enough issue, then it should be easy to decide to have this formally heard at a later meeting.

I also want to emphasize what this request does not represent. It is not a referendum on the whether or not the annexation should occur. Nor is it about what should happen with the City's assets. Lastly, it does not in any way address whether or not there should be a binding public vote about the annexation itself. The request is only about the taxation issue that would occur when and if the annexation happens.

I think that the voters spoke loudly and clearly when they passed ballot Measures 47 and 50 that set up our current property tax limitations. While I won't argue that keeping the \$1.88 is a violation of those measures, I think it is easy to see that it is contrary to the spirit of those measures.

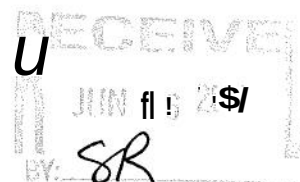
By agreeing to have a formal hearing on the Charter Amendment, the Council can show that the move toward TVF&R was strictly on the basis of providing better service to the community. To not have such a hearing would send a loud signal to the citizens of Newberg that working around Measures 47 and 50 and gaining the ability to raise property taxes without voter approval was also part of the motivation.



I would like to thank all of you for having allowed me to meet with each of you personally to discuss this issue. I greatly appreciate that all of you were willing to give up some of your personal time to try to better understand my point of view on the issue. As I have told each of you in these meetings, you should expect that this Charter Amendment will be on the ballot if the annexation occurs. The Council can choose to do it or it can be left to the citizens to do it. If the Council does it, you will be making a clear statement about your integrity on this issue and you will find much better support from Newberg residents toward the annexation.

I urge you to give careful consideration to this matter and to give the Charter Amendment a formal hearing in the near future.

Thank you for your consideration of this very important issue.



Subject: Historic Oregon White Oak Trees on Villa Road

Dear Mayor Andrews and Newberg City Council,

I would like to request that the Council take immediate action to protect the two historic Oregon White Oak trees on the west side of Villa Road that will be killed by the City's road project. These trees are living history and have been living for hundreds of years, peacefully providing clean air, oxygen, acorns, and beauty since before Newberg was even on the map. These trees can live for hundreds more years if we value them enough to protect them.

In Oregon we have lost over 95% of oak habitat. They are an imperiled species that deserves protection. Other cities protect their trees and Oregon white oaks specifically. The local vineyards have formed a network to save oaks on vineyards and the Yamhill Soil and Water Conservation District has been working with landowners over the past 10 years to protect oaks. But Newberg has no tree ordinance and does not seem to value its trees, which are public assets.

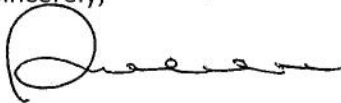
Trees in cities have been shown to provide a variety of benefits, including cleaner air, reducing stormwater runoff, providing wildlife habitat, and reducing stress. Trees can also slow and calm traffic. This area of Newberg is experiencing increased growth and increased traffic. Making roads wider and faster has been proven to be detrimental to neighborhoods, especially if it comes with the loss of mature trees.

So now the City is going to cut down two huge Oregon white oaks to widen and flatten Villa Road to improve traffic flow through a residential area. If these trees were buildings they would be protected by a state agency. But historic century-old trees are not protected so it is up to us, and to you, to protect these magnificent trees. Protecting these trees is in keeping with Goals D, E, G and J of the City's Comprehensive Plan: retaining and protecting wooded areas; protecting air, water and land; protecting natural, scenic and historic resources, and maintaining the natural beauty and visual character of the city. Removing these trees would go in the face of these goals in your Comprehensive Plan.

Mayor Andrews and councilors, please ask your City engineer and your consultants to develop an alternative plan that preserves the oaks. I do not believe that a design that would preserve the oaks was even considered and would like to see if there are options. Until there is a save-the-oaks priority the City will be remiss in fulfilling its duties as described in the Comprehensive Plan.

It is not too late to do the right thing and save these historic city trees. We will not see their likes again.

Sincerely,



Patricia Farrell

City Council Meeting
Date: 6/5/17
Re: White Oak Trees
Topic: Public Comment - Villa Road



P.O Box 1083
McMinnville, OR 97128

June 1, 2017

Helping to shape the use of our natural resources to protect the quality of life in Yamhill County.

Newberg City Council
City of Newberg Planning Department
414 E. First Street
Newberg OR 97132

Re: Newberg 2030 Project Update – Tasks 2 and 3

City Council Meeting

Date: 6/5/17

Re: flat agenda item VIII (a)

Topic: Division 38 Unfit update

Dear City Councilors and Staff:

Friends of Yamhill County (FYC) works to protect natural resources through the implementation of land use planning goals, policies, and laws that maintain and improve the present and future quality of life in Yamhill County for both urban and rural residents. We appreciate the opportunity to comment on the Draft Buildable Lands Inventory and the consultant's critique of the Division 38 rules.

Before going through specific comments, a couple of general comments:

On the issue of Division 38 vs. "standard methods," ECO makes some good points as to areas where the rule may need some fine-tuning, but other criticisms seem misplaced. We support use of these rules. While use of the streamlined method does not resolve all potential issues with a UGB amendment, especially with respect to which lands are included, it greatly reduces the prospect for extended arguments and appeals regarding the more technical issues of how much land is available and how much land is needed.

This is especially so when compared to what the "Friends" organizations view as the overly-aggressive approach previously taken by the city which resulted in numerous remands. The 2009 Buildable Lands Inventory was remanded by LUBA in part because it improperly discounted and eliminated land without adequate justification and the 2013 EOA was remanded by LCDC in part because of defects in the employment land inventory.

Use of the streamlined UGB rules includes trade-offs. In return for the greater certainty that comes with the more prescriptive rules, a city foregoes the "opportunity" to include more land that may be more difficult to justify. (See previous remands).

Because the Division 38 rules leave less discretion, there will almost always be examples of some parcels that were misclassified one way or the other, but that is the nature of a streamlined process. I support the use of the Division 38 rules in Newberg and believe they present an opportunity to move past years of litigation and appeals, while allowing the city an opportunity to meet its legitimate needs and obligations to provide for future growth.

Split plan designations: The consultant raises a good point and the city and ECO have addressed it in what seems to be a reasonable manner. This may be an area where the rule would benefit by fine-tuning.

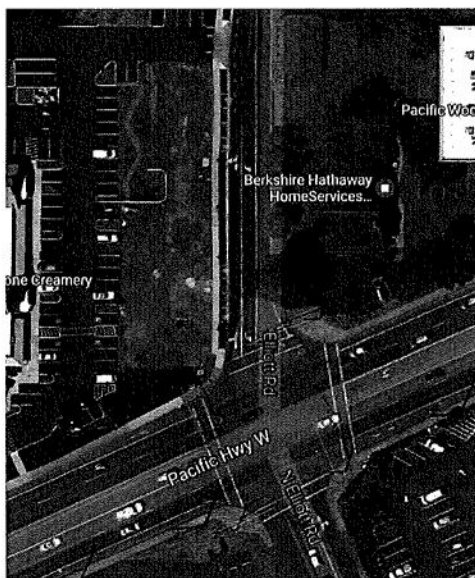
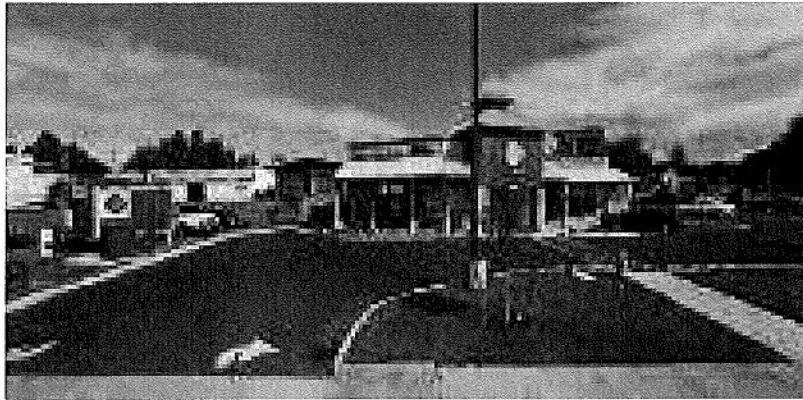
Public Lands with residential plan designations. This is not an issue in Newberg. Newberg has a public land designation and schools or other land in public use that is designated residential can be redesignated public, thereby eliminating any potential problem.

Partially Vacant Employment Land. ECO has given two examples of lots they believe are misclassified as partially vacant under the rule, but there are, of course, compelling examples on the other side as well.

The nearly empty used car lot between the Eden Gate and Chehalem Brewing was classified as fully developed by Newberg's "traditional" BLI and EOA, but is properly classified as partially vacant under the Division 38 rules:



The new building that houses the new Starbucks and ATT wireless at Elliott and Portland Roads sits on a previously under-developed lot that was classified as fully developed in Newberg's "traditional" BLI and EOA. That classification was clearly wrong since the existing structure was torn down and replaced with a more intensive use:



Errors/Anomalies in County Assessment Data (Churches):

ECO points to what they believe are erroneous County Assessment data of \$0 improvement value as a fault with the rule. Errors in the county data are not a problem with the rule. The rule itself allows but *does not require* use of county tax assessor data. See OAR 660-038-0020(16).

“When a city is required to undertake an analysis or make a determination concerning lots or parcels under the rules in the division, the city may conduct such analyses using tax lot data shown on the most recent tax assessment rolls in the county in which the land is located.”

Traditional Buildable Land Inventories, including ones prepared by ECO, also use improvement value to classify lots as developed, partially developed, or vacant. If there is substantial evidence of improvement value- and photographs of churches would certainly seem to be substantial evidence- the rule allows the city to use that evidence instead of tax assessor data.

Condo common areas: ECO points to an example of a condo common area with \$0 improvement value at the west end of Newberg by W First St. and Old Hwy 99W. While the aggregate impact they identified in Newberg is not large (10 acres), the county need not rely on assessor data if other evidence (i.e. photographs) shows these areas are developed as ancillary uses. Nonetheless, this may be an area where the rule would benefit by fine-tuning.

Classification of lands in UGB study area: ECO believes the rule uses vague criteria for determining whether land in the UGB study area is vacant, partially vacant, or developed. The rule is not vague:

For employment land, "lot sizes or development patterns of rural residential land make that land unsuitable for an identified employment need, as follows: (A) Parcelization: the land consists primarily of parcels 2-acres or less in size." That is not vague. It is a clear and objective standard.

For residential uses:

"Existing lots or parcels one acre or less may be assumed to have a development capacity of one dwelling unit per lot or parcel. Existing lots or parcels greater than one acre but less than two acres shall be assumed to have an aggregate development capacity of two dwelling units per acre."

Neither of these standards are vague; they are clear and objective.

ECO's Recommendation. ECO states that they cannot recommend use of the streamlined UGB process because of the greater amount of residential land considered to have development potential under those rules. As explained above, the discrepancy is actually less than stated by ECO. Moreover, ECO's criticisms rest, at least in part, on comparisons to "traditional methods" that resulted in an older BLI and EOA that were remanded, and on an apparent assumption that a potentially larger UGB amendment based on the "flexibility" of "standard methods" is both desirable and will survive the greater scrutiny it will receive.

Conclusion. The surest, fastest, and least expensive path to a successful UGB amendment is to either continue with the "Simplified UGB Method," or to ask that DLCD and LCDC first fine-tune those rules and then proceed with them. In our view, either of those two paths present the best options for a timely, less contentious, and less costly way to address Newberg's land supply.

We hope these comments are helpful. Please include them in the official record of this proceeding.

Sincerely,

A handwritten signature in black ink, appearing to read 'Sid Friedman', followed by a horizontal line.

Sid Friedman
Friends of Yamhill County

Cc: DLCD
1000 Friends of Oregon

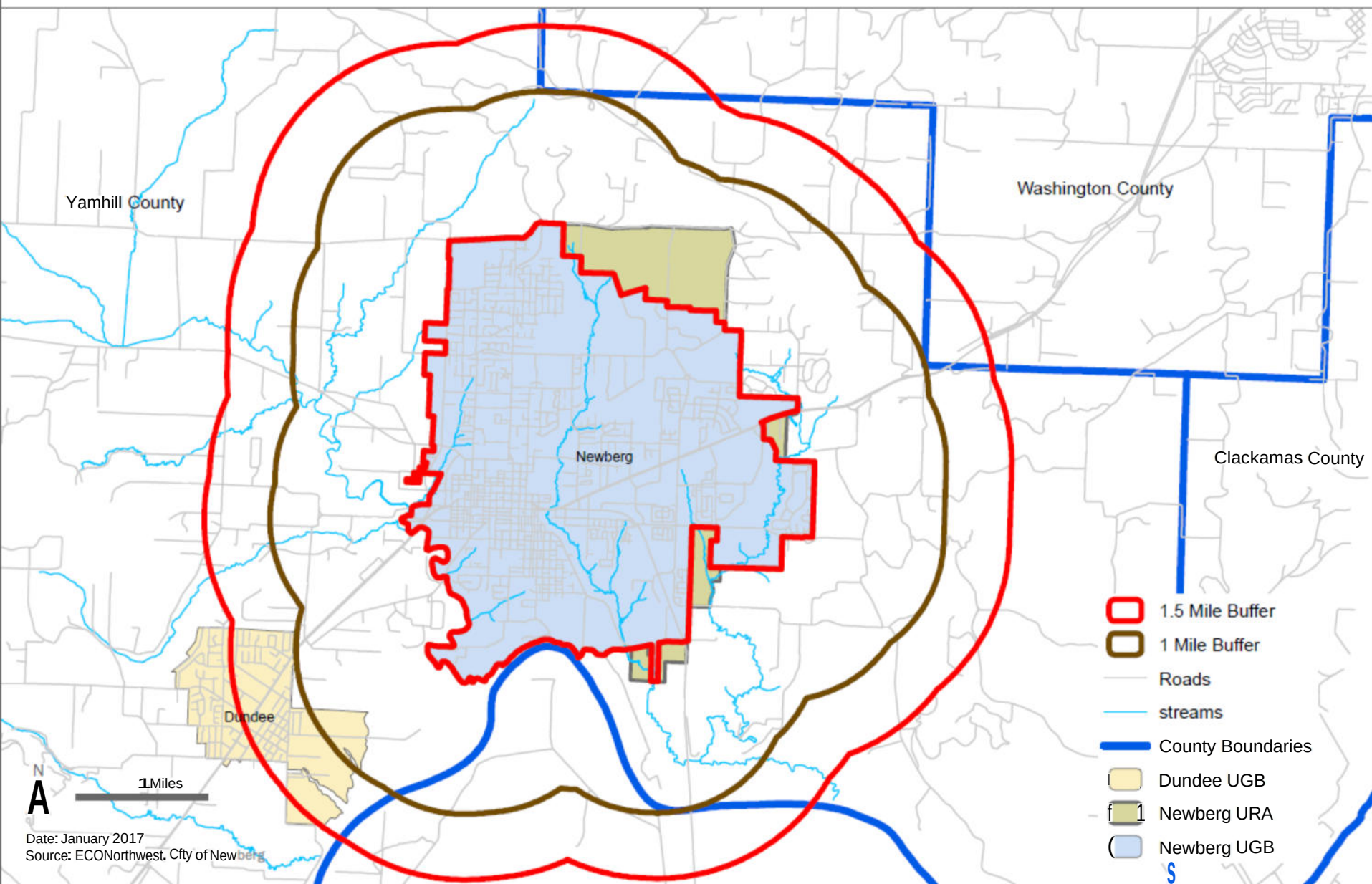
Newberg Buildable Lands Inventory: Preliminary Results

Purpose

- Develop and updated land inventory using the Division 38 simplified methods
- Prepare Newberg for a UGB amendment process in 2017 based on new population forecasts from PSU

NEWBERG BLI 2016

Newberg UGB, URA, and Study Area Buffers



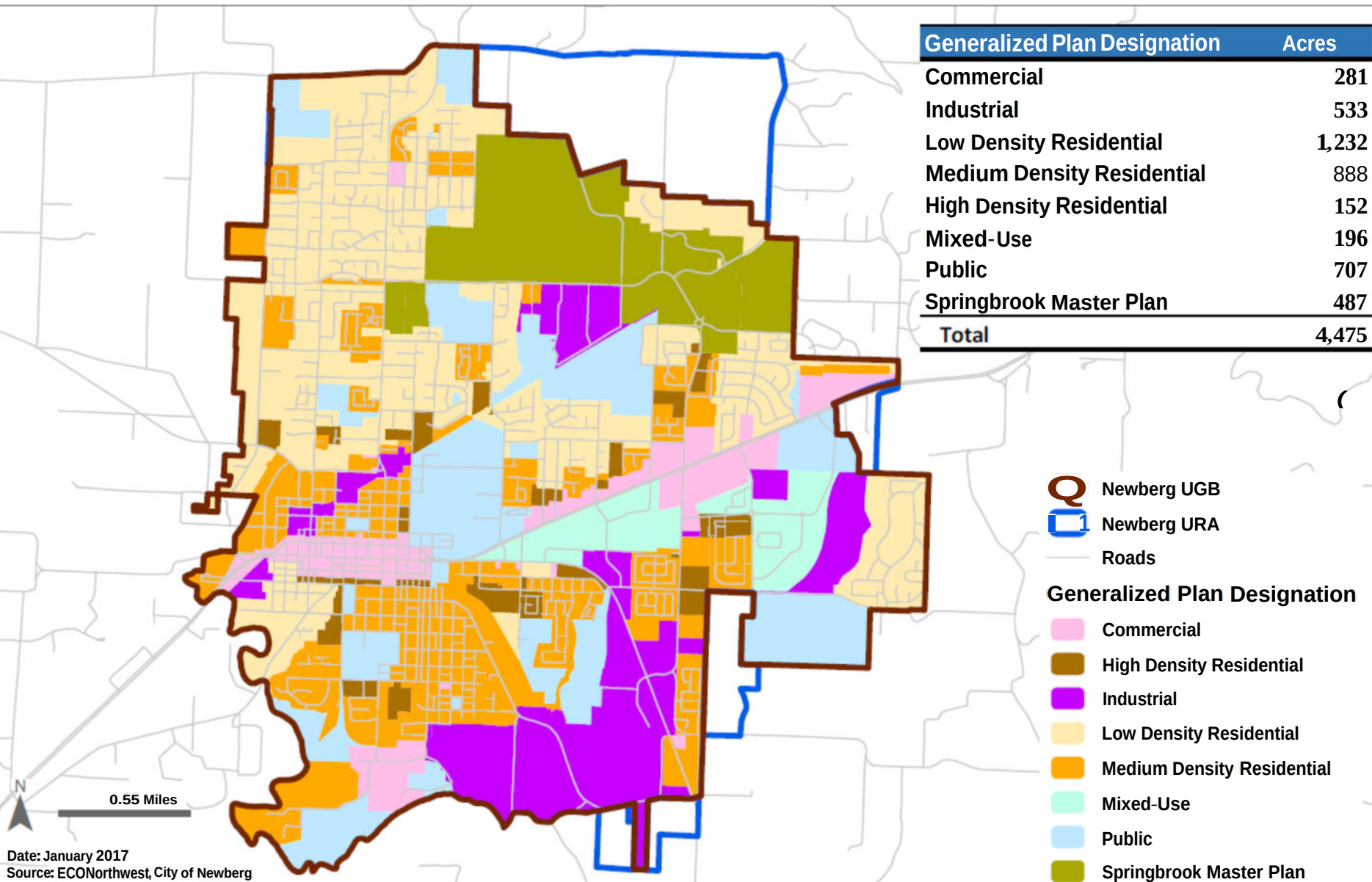
General Characteristics

- Four key geographies
 - Newberg UGB
 - Newberg URA
 - All lands within 1-mile buffer
 - Exceptions lands within 1.5 mile buffer

Location/Attribute	Acres
UGB	4,476
Area in Private Tax Lots	3,072
Public Land in Tax Lots	687
Roads/Right-of-Way	717
URA	551
Area in Private Tax Lots	527
Area in Roads	24
Buffer (outside UGB and URA)	
1-mile	4,700
1.5-mile	10,069

NEWBERG BLI 2016

Newberg UGB Generalized Plan Designation



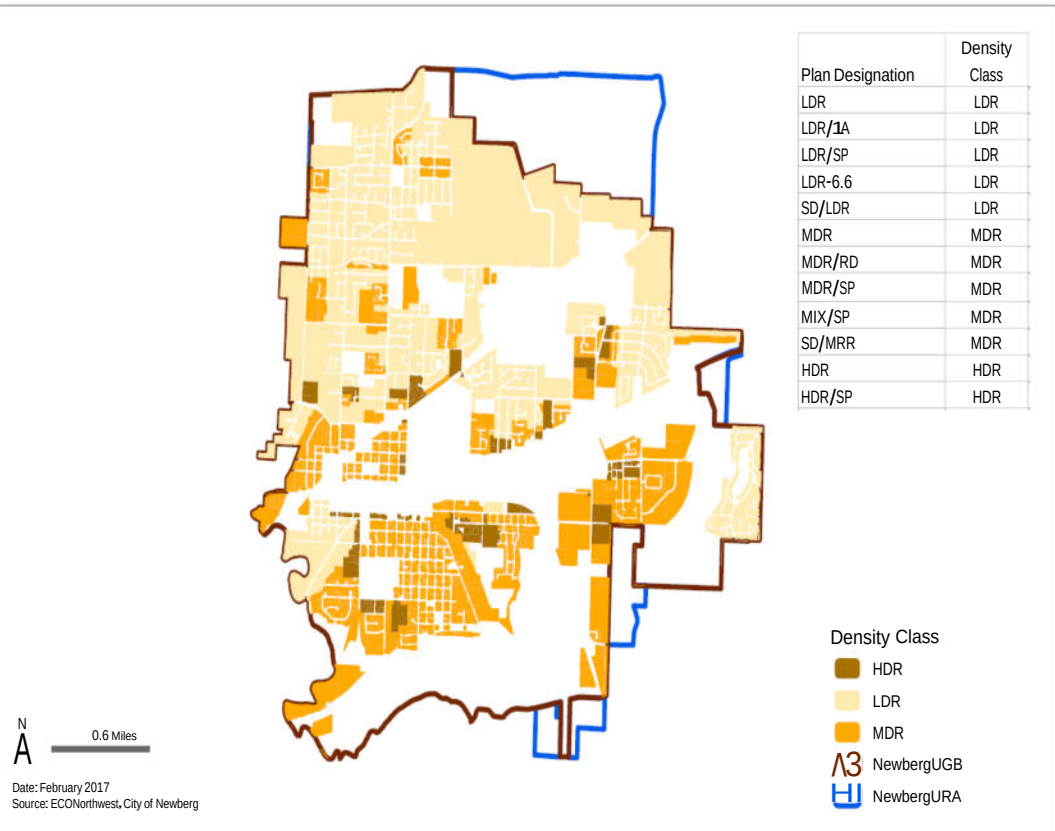
Residential BLI

Residential BLI: Steps

1. Classify plan designations/zones by allowed density
2. Classify land by improvement status
3. Identify and summarize land by improvement status
4. Deduct constraints

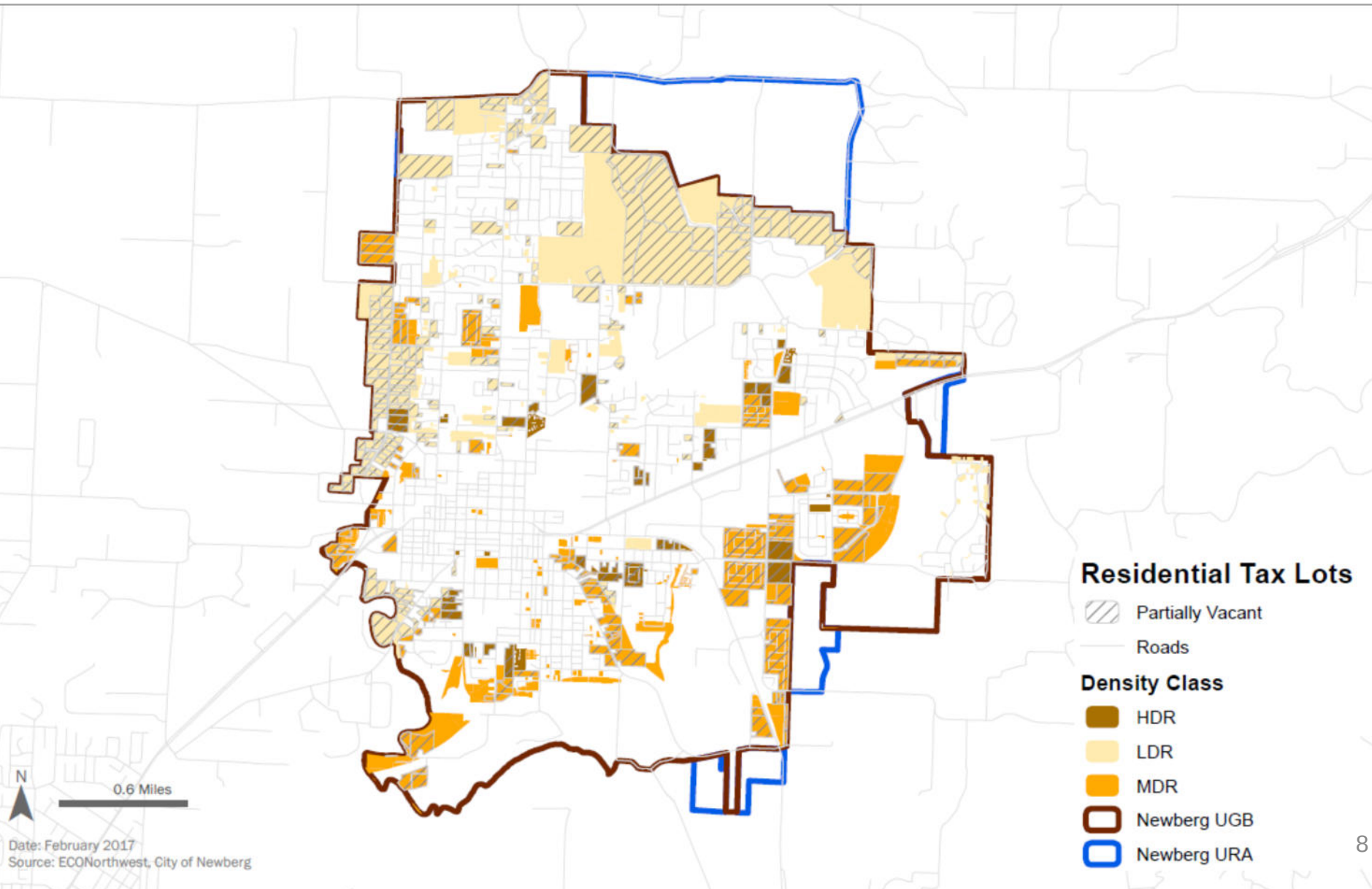
NEWBERG BLI 2016

Division 38 - Residential Density Class



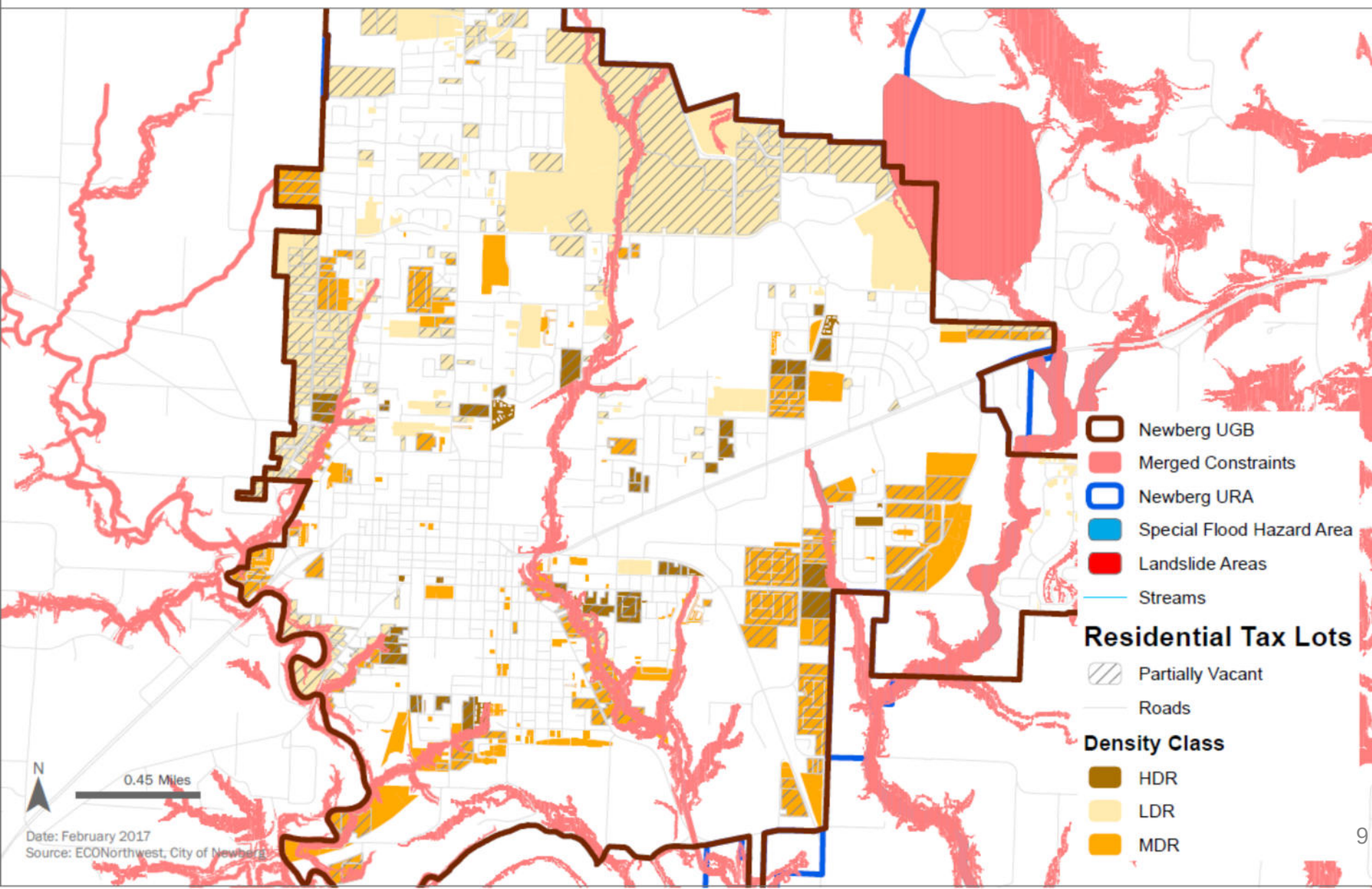
NEWBERG BLI 2016

Vacant and Partially Vacant Residential Land by Density Class



NEWBERG BLI 2016

Vacant and Partially Vacant Residential Land by Density Class



Residential Land –Results

Total Acres by Status and Density

Status	Density Category			Total
	LDR	MDR	HDR	
Developed	564	350	33	948
Partially Vacant	448	261	81	790
Vacant	279	162	12	454
Total	1,292	773	127	2,192

Vacant/PV Acres by Density (and development status)

Div 38 Density Class	Tax Lots	Total Acres	Improved Acres	Constrained Acres	Vacant Acres
LDR	3,339	1,292	634	93	565
MDR	2,800	773	385	77	311
HDR	407	127	42	9	76
Total	6,546	2,192	1,061	179	952

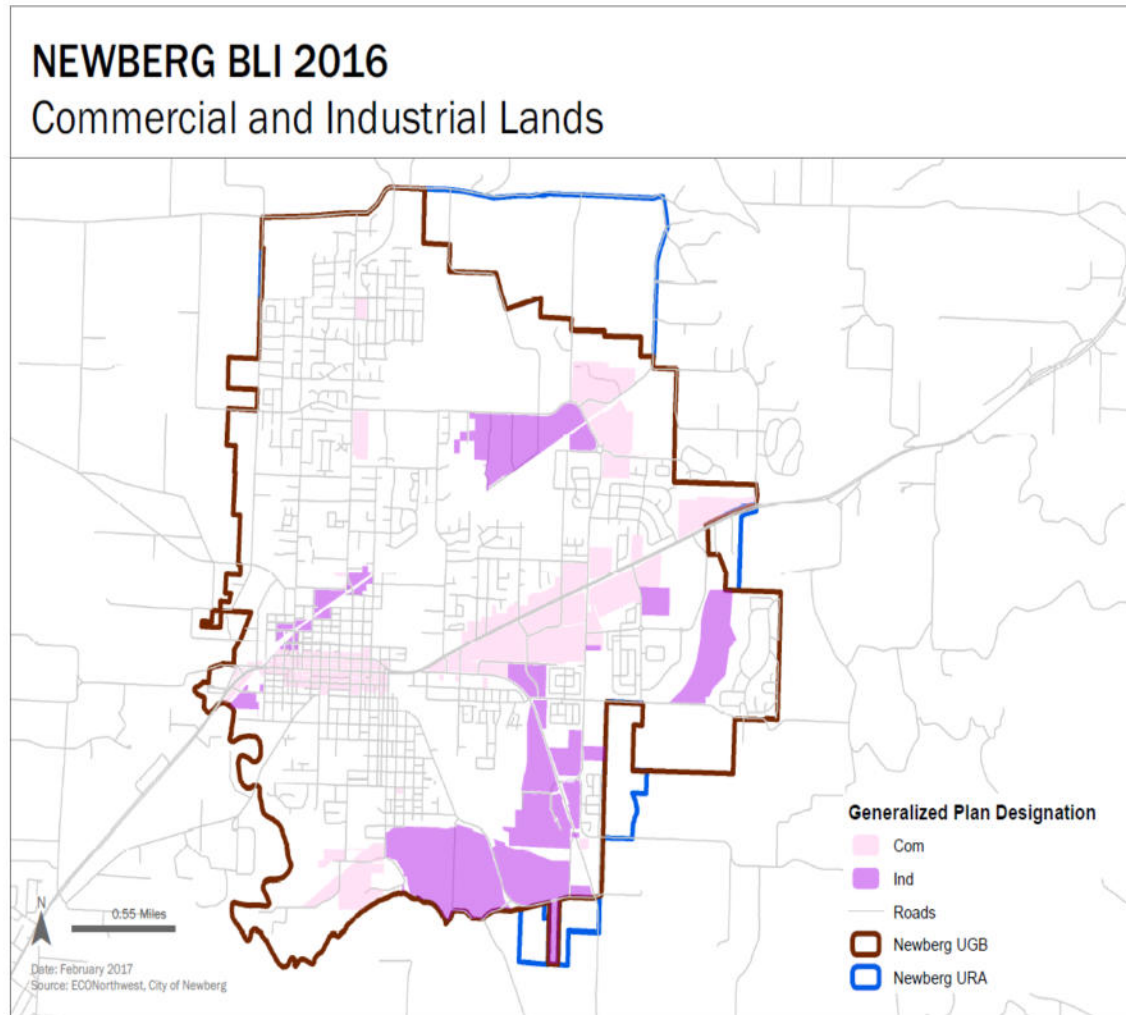
Constraints:

- Slope 25% +
- Floodway, 100 yr floodplain
- Stream corridors
- Landslide hazard

Employment BLI

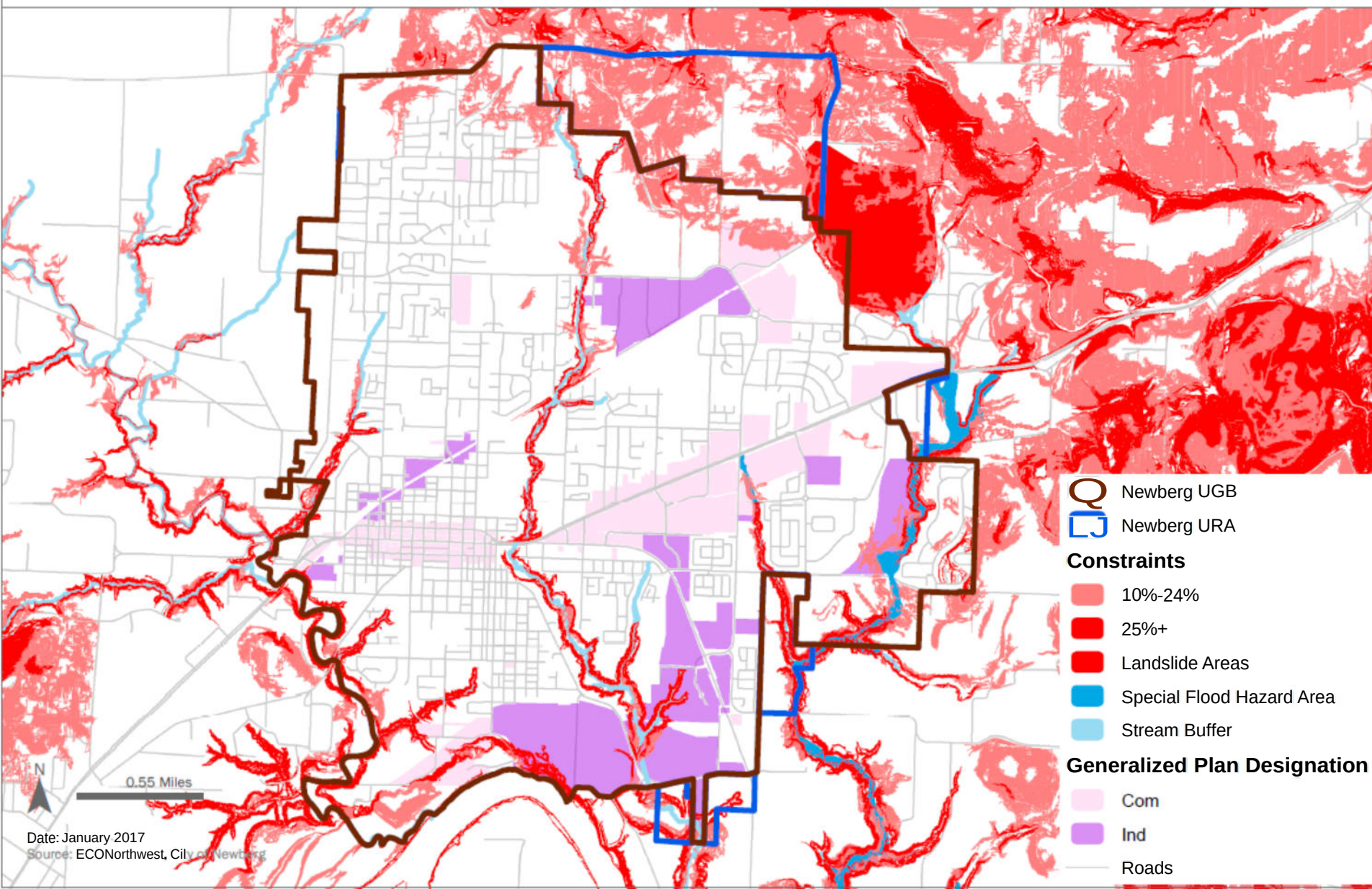
Employment BLI: Steps

1. Classify existing employment districts as “commercial” or “industrial”
2. Classify lands by improvement status
3. Deduct constraints



NEWBERG BLI 2016

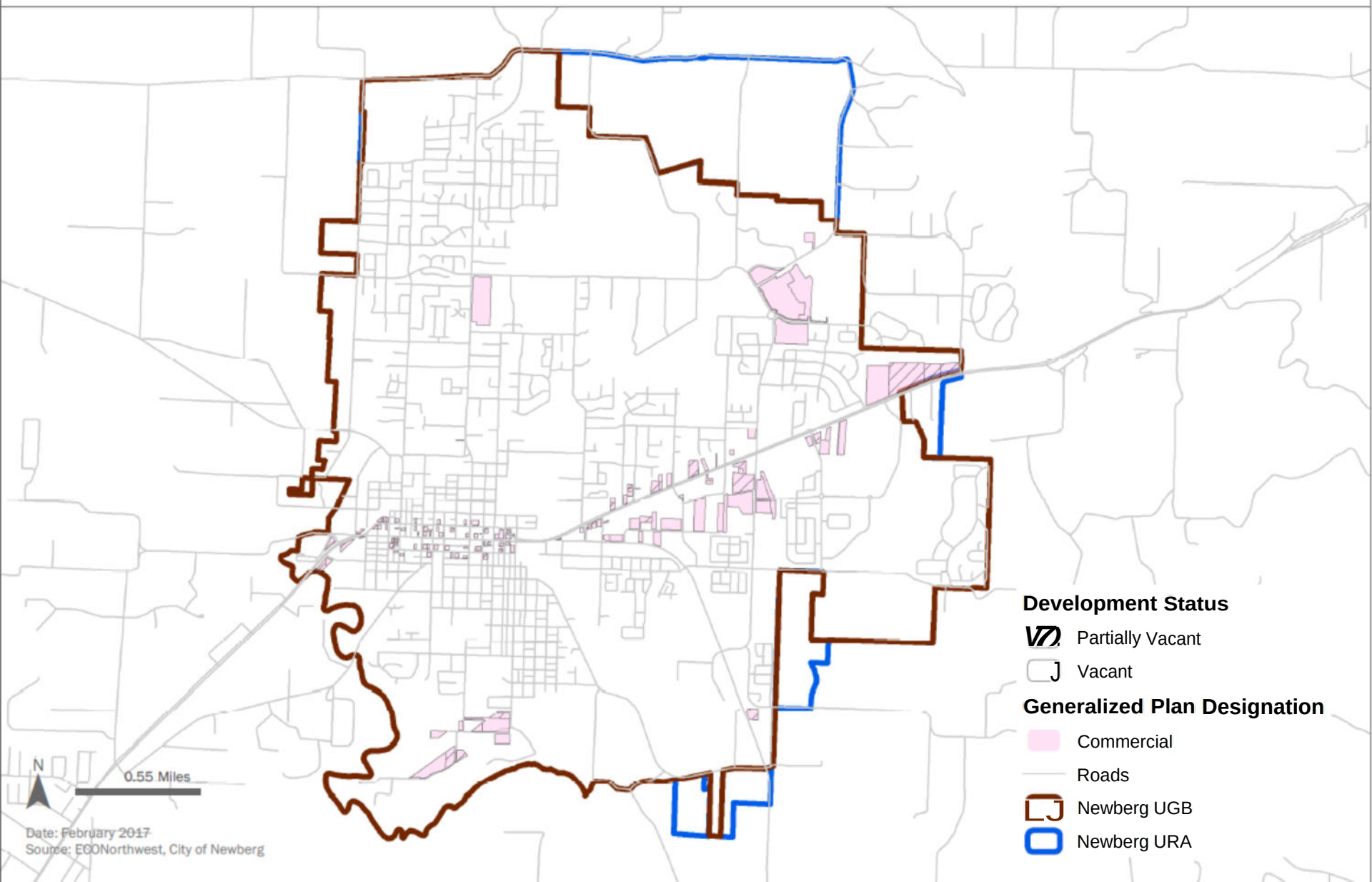
Commercial and Industrial Lands



Commercial Lands

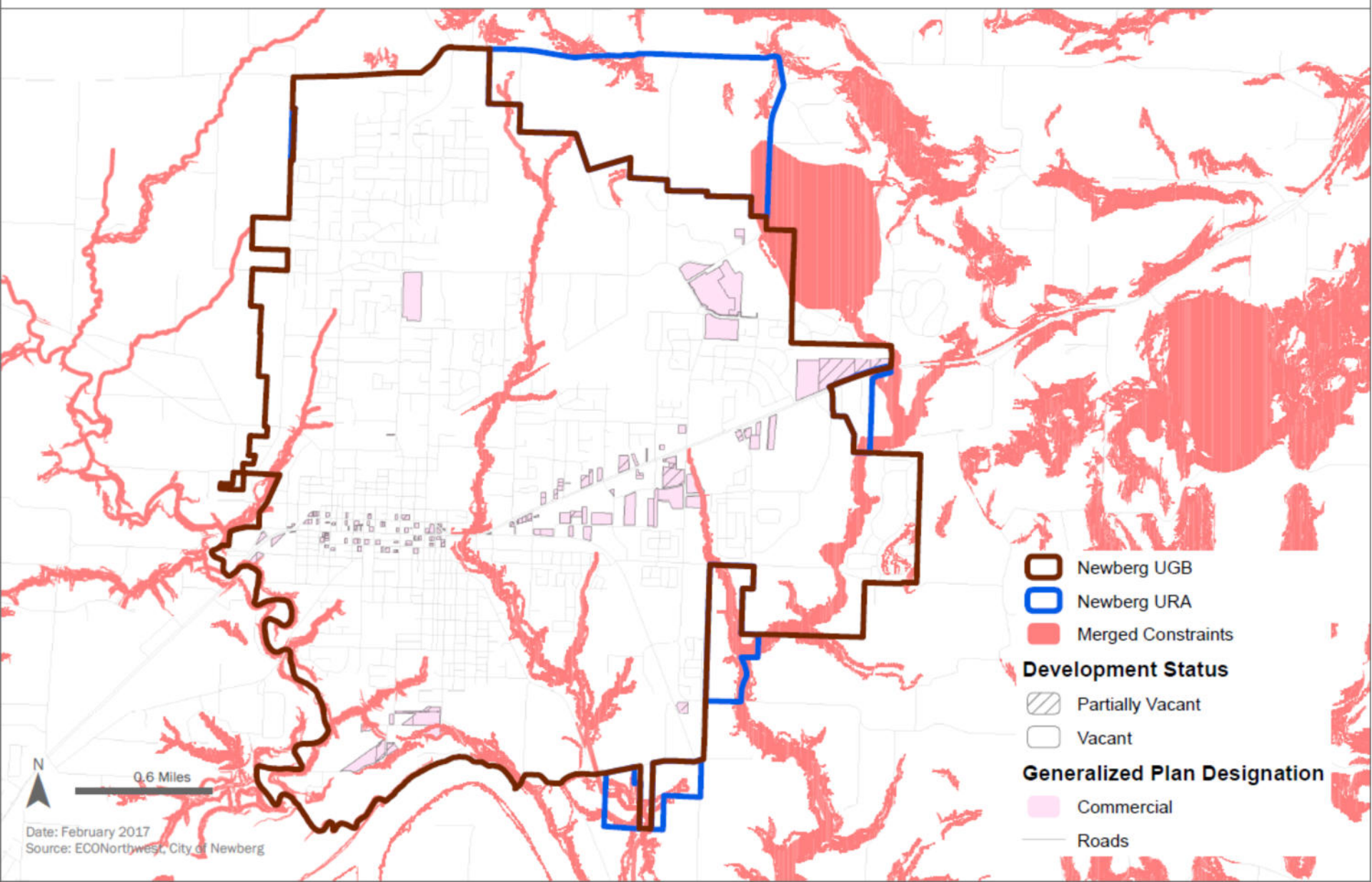
NEWBERG BLI 2016

Vacant and Partially Vacant Commercial Lands



NEWBERG BLI 2016

Vacant and Partially Vacant Commercial Lands and Constraints



Commercial BLI: Results

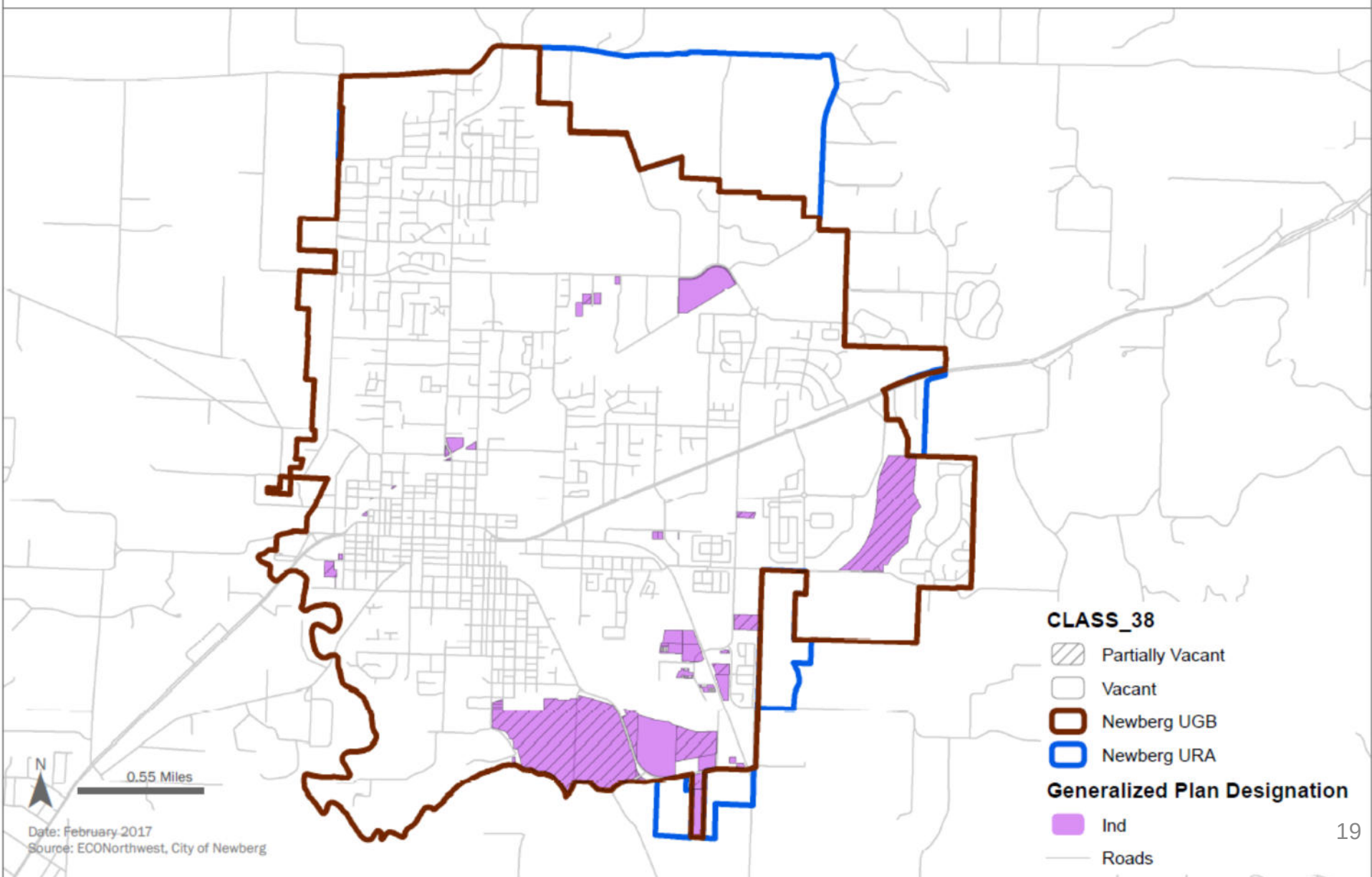
Commercial Acres by Status

Development Status	Tax Lots	Total Acres	Developed Acres	Constrained Acres	Vacant Acres
Developed	275	218	212	6	0
Partially Vacant	64	46	13	1	32
Vacant	91	118	0	4	114
Total	430	381	225	10	146

Industrial Lands

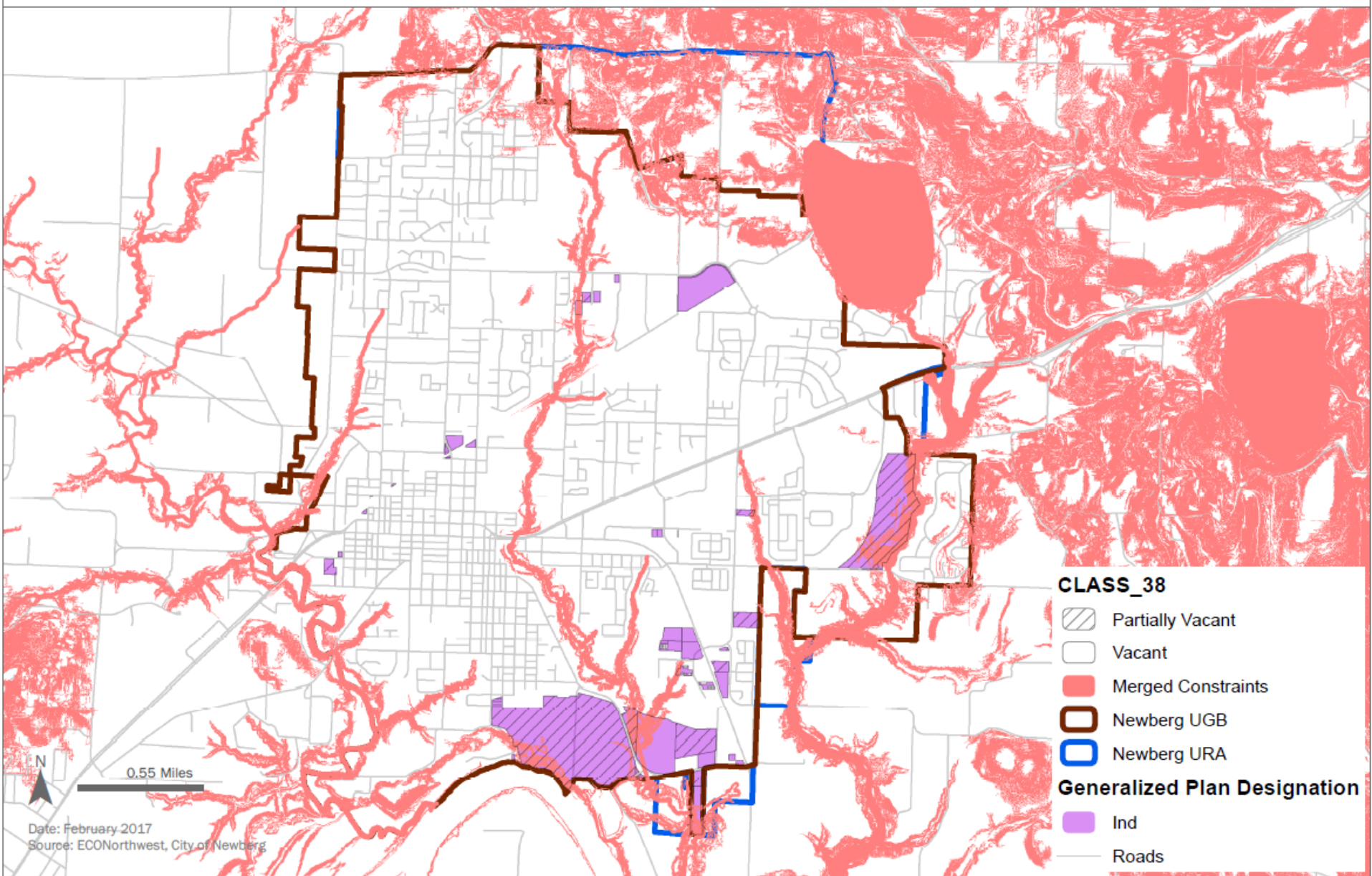
NEWBERG BLI 2016

Vacant and Partially Vacant Industrial Lands



NEWBERG BLI 2016

Vacant and PV Industrial Lands, Constraints - Slope 10%+



Industrial BLI: Preliminary Results

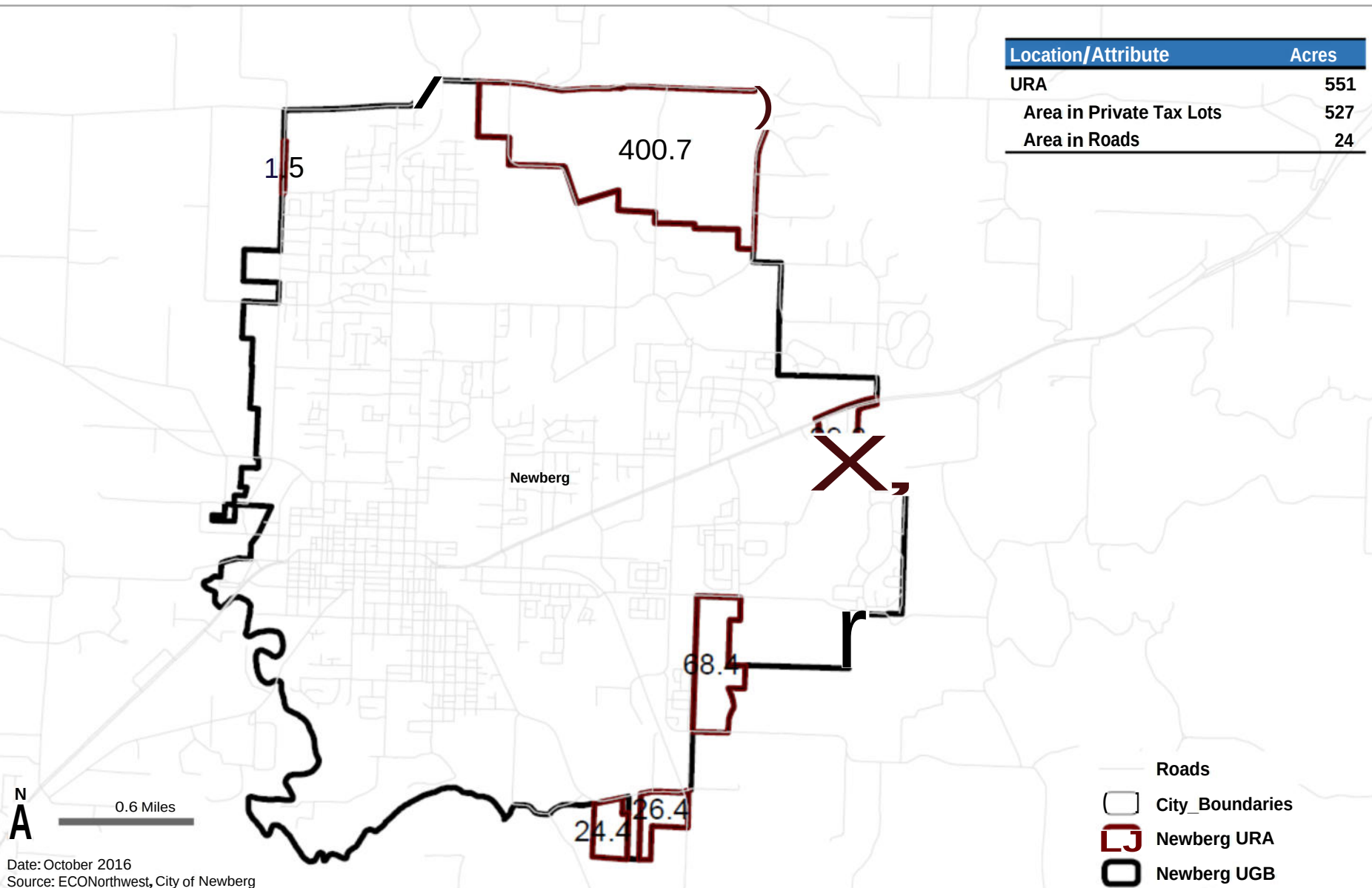
Total Industrial Acres by Status and Plan Designation

Development Status	Tax Lots	Total Acres	Developed Acres	Constrained Acres	Vacant Acres
Developed	121	197	182	15	0
Partially Vacant	11	200	144	36	19
Vacant	44	82	0	13	70
Total	176	479	326	64	89

Urban Reserve Areas

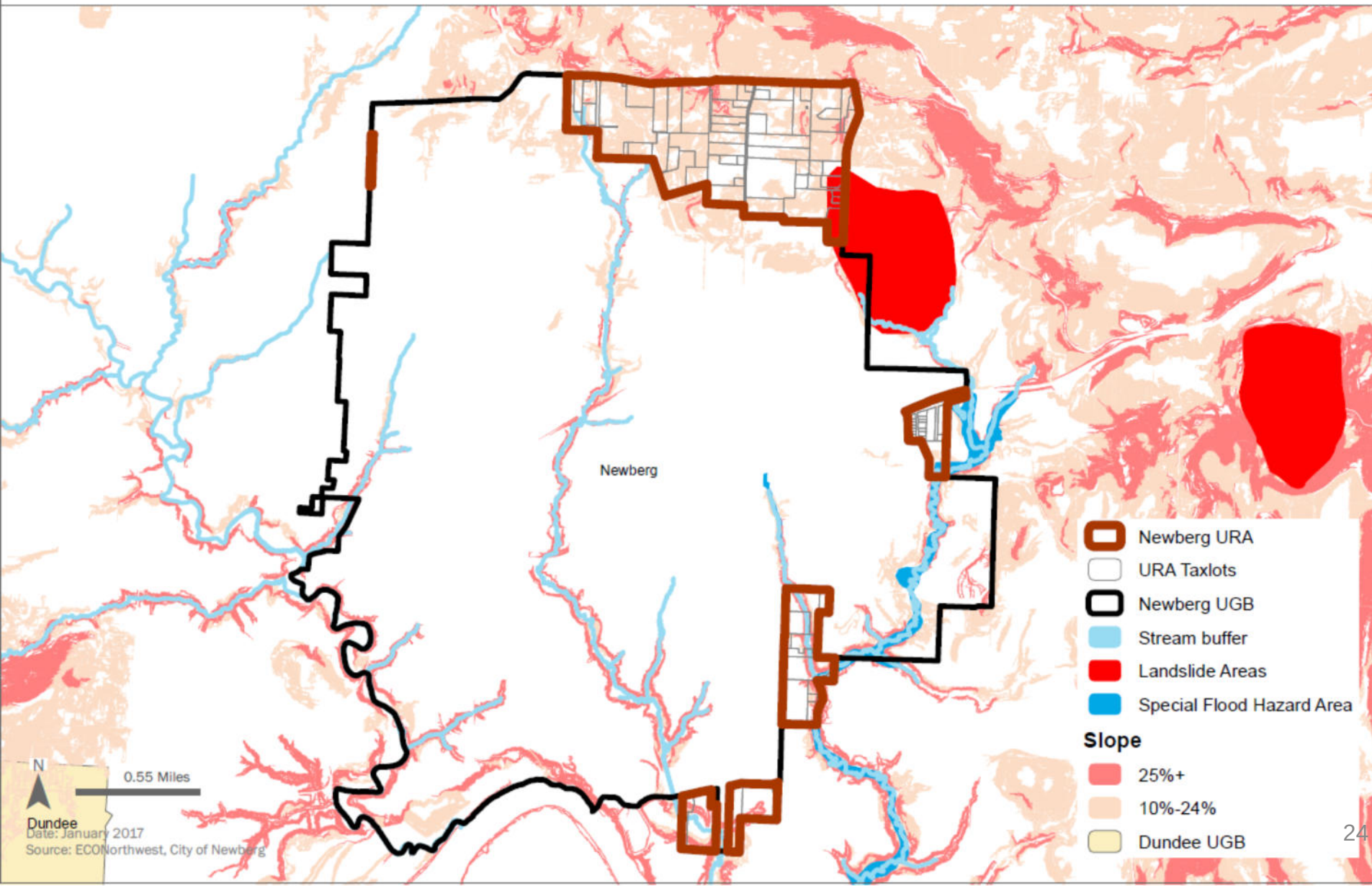
NEWBERG BLI 2016

Newberg Urban Reserve Areas



NEWBERG BLI 2016

Newberg URA and Constraints



Urban Reserve Land

- 551 Acres in URAs
- 527 in TL
- 75 Dwelling Units
- ~50% of land in lots over 10 acres

Lot Size (Ac)	Tax Lots	Acres	DU
<=1	42	17	22
>1 and <2	6	8	6
>=2 and <5	27	89	20
>=5 and <10	20	153	19
>=10 and <20	14	195	6
>=20 and <50	2	64	2
Total	111	527	75

Urban Reserve Areas

Total URA Acres by Development Status

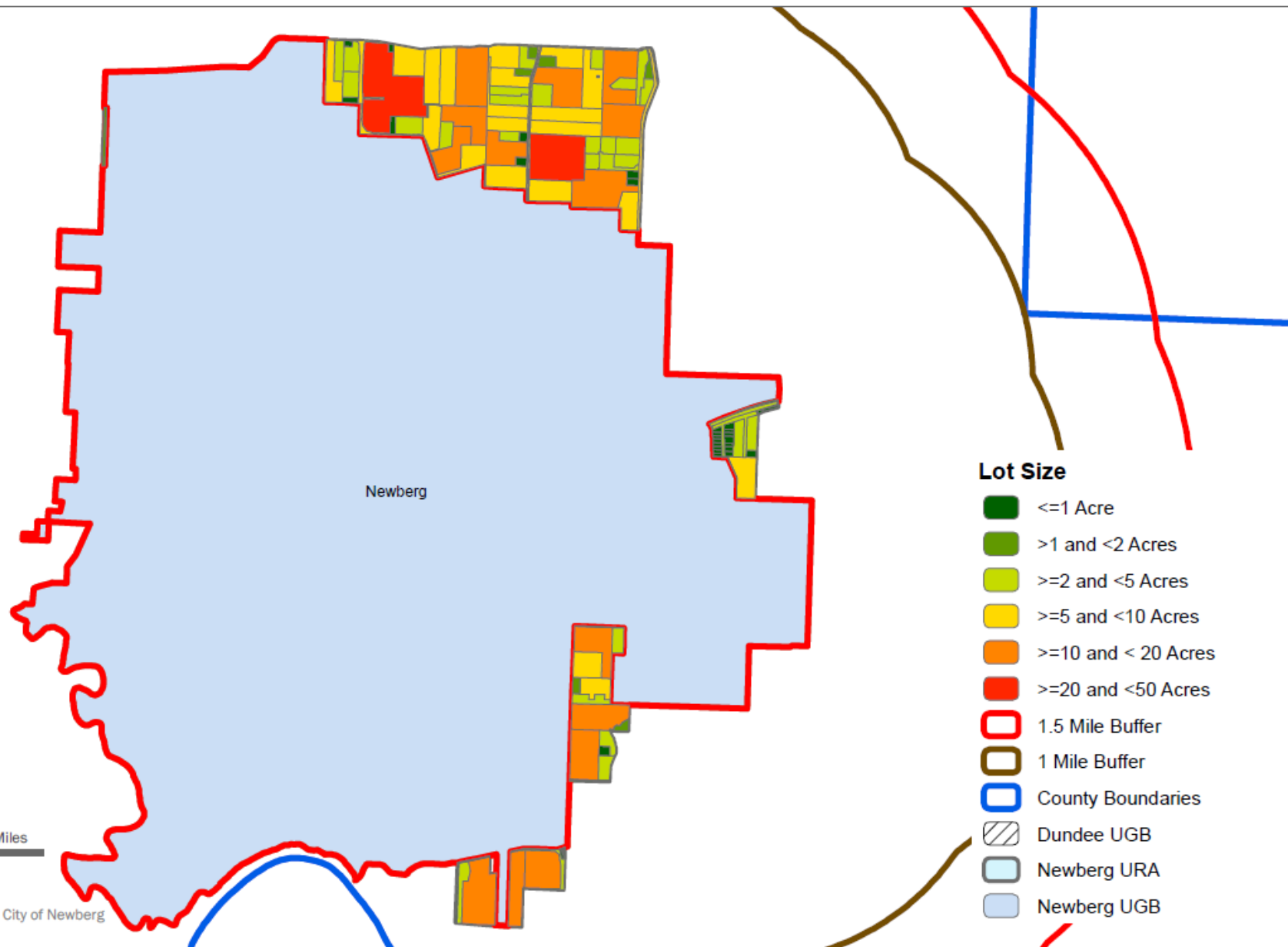
Classification	Tax Lots	Total Acres	Developed Acres	Constrained Acres	Suitable Acres	
					>25% slope	>10% slope
Developed	24	12	12	3	9	7
Partially Vacant - <2 Ac	49	386	25	39	347	200
Partially Vacant - >=2 Ac	6	8	4	2	6	5
Vacant	32	121	0	22	99	60
Total	111	527	40	66	461	272

URA Acres by Lot Size (25% slope)

Lot Size (Ac)	Tax Lots	Total Acres	Buildable Acres	Existing DU
<=1	42	17	14	42
>1 and <2	6	8	6	6
>=2 and <5	27	89	76	27
>=5 and <10	20	153	133	20
>=10 and <20	14	195	167	14
>=20 and <50	2	64	64	2
Total	111	527	461	111

NEWBERG BLI 2016

Newberg URA - Lots by Size



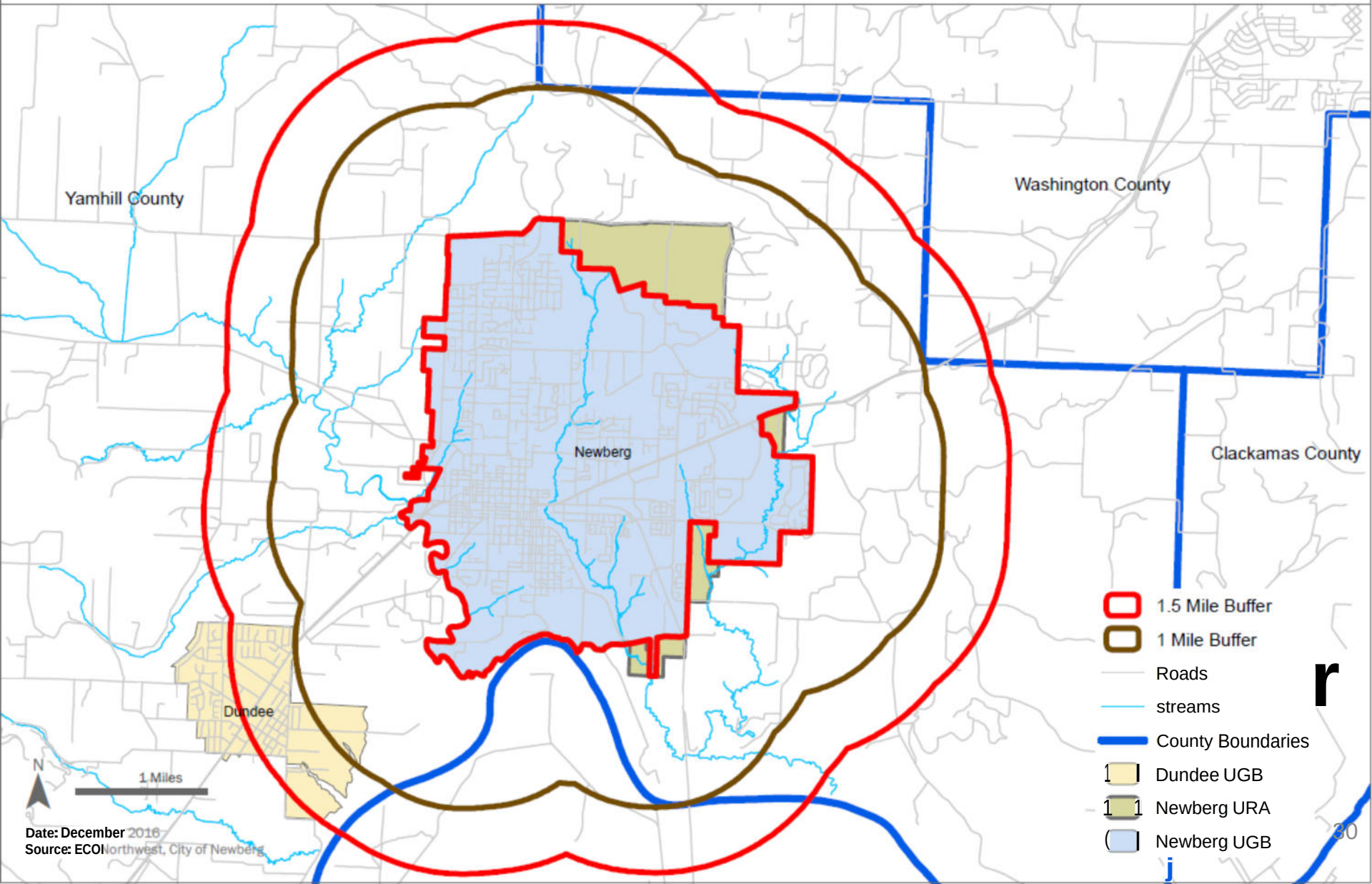
UGB Study Area Determination

Study Area: Steps

- OAR 660-038-0160(1) – Preliminary Study Area
 - All lands in the city's acknowledged urban reserve
 - All lands within one mile of the UGB
 - Exceptions areas within 1.5 miles of the UGB
- Exclusions
 - Areas in Marion County - impracticable service (OAR 660-038-0160(7)(b))
 - Landslide areas – identified in DOGAMI “SLIDO” 4.3 database (OAR 660-038-0160(2)(b)(A))
 - Flood areas – areas in FEMA Special Flood Hazard Area (OAR 660-038-0160(2)(b)(B))
 - Dundee UGB – Shall not include areas within another UGB (660-038-0160(1))

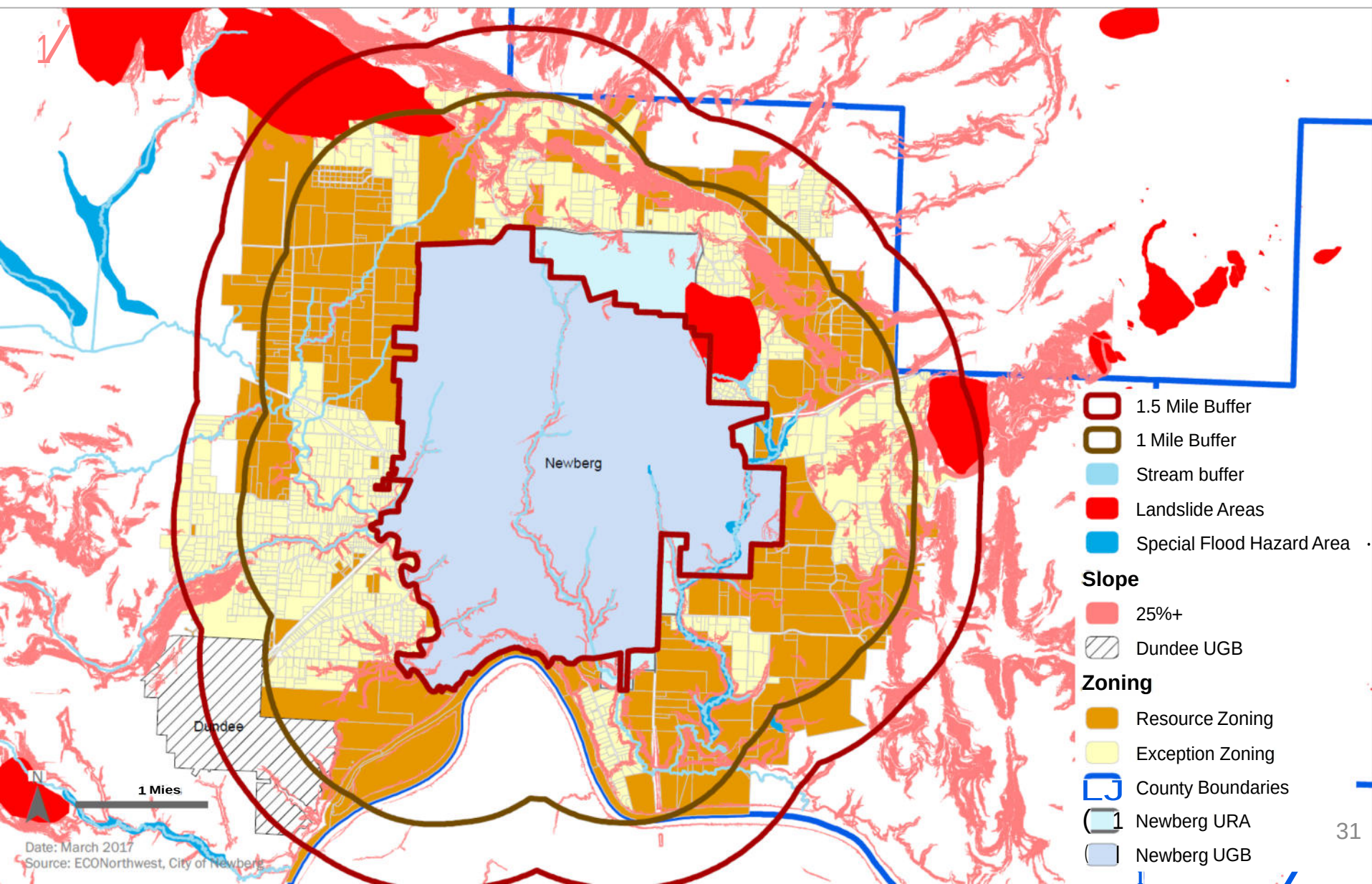
NEWBERG BLI 2016

Newberg UGB, URA, and Study Area Buffers



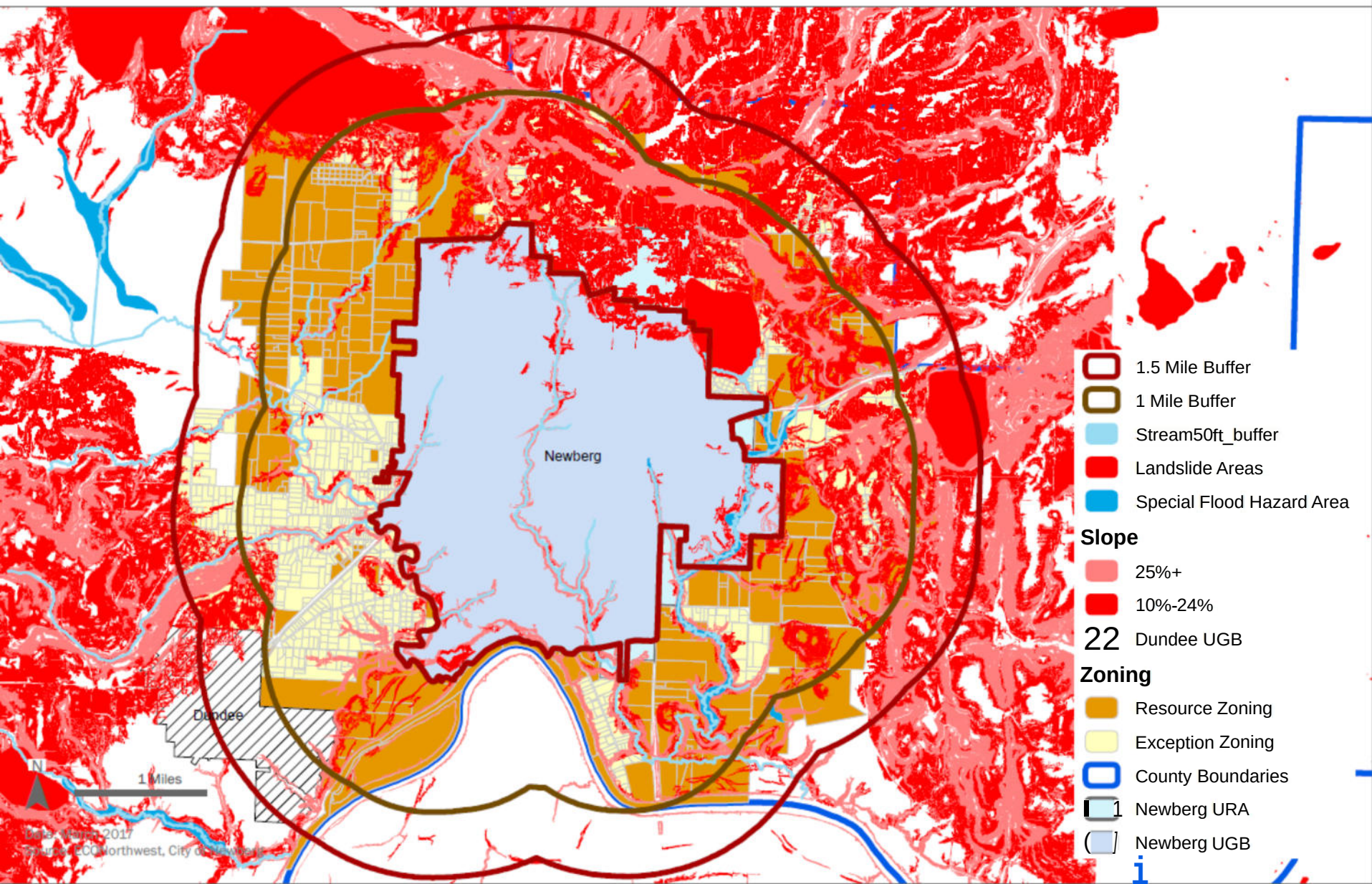
NEWBERG BLI 2016

Newberg Study Area Zoning, Exclusion Areas and Constraints



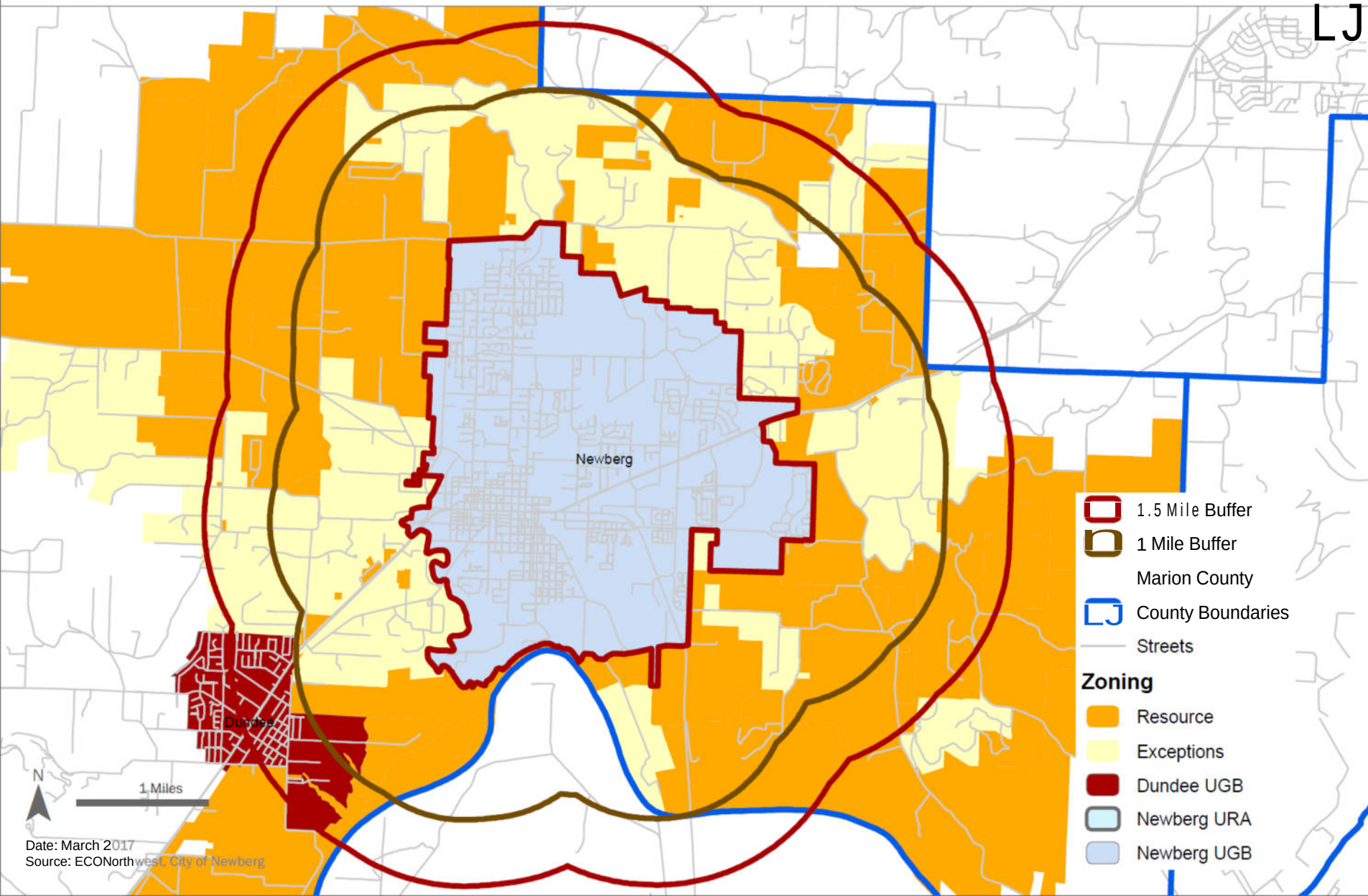
NEWBERG BLI 2016

Newberg Study Area Zoning, Exclusion Areas and Constraints



NEWBERG BLI 2016

Newberg Study Area Buffers and Zoning



Priority of Land for Inclusion in UGB

1. Urban reserve, exception land, and nonresource land
2. Marginal land
3. Forest or farm land that is not predominantly high-value farmland
4. Farmland that is predominantly high-value farmland

With >4000 ac of exceptions areas, lower priority is difficult to justify

UGB Study Area: Statistics

- More than 19,800 acres in 1.5-mile study area (does not include URA)
- 4,325 acres in exceptions areas
- Few lots over 20 acres in exceptions areas

Lot Size (Ac)	Resource			Exceptions			Total		
	Tax Lots	Acres	% of Acres	Tax Lots	Acres	% of Acres	Tax Lots	Acres	% of Acres
<=1	69	41	1%	216	122	3%	285	163	2%
> 1 and <2	45	67	1%	250	368	9%	295	435	4%
>=2 and <5	61	206	4%	612	1,797	42%	673	2,003	20%
>=5 and <10	69	509	9%	138	968	22%	207	1,477	15%
>=10 and <20	63	955	17%	60	784	18%	123	1,738	18%
>=20 and <50	56	1,694	31%	6	178	4%	62	1,873	19%
>=50	19	2,024	37%	1	107	2%	20	2,131	22%
Total	382	5,497	100%	1,283	4,325	100%	1,665	9,821	100%

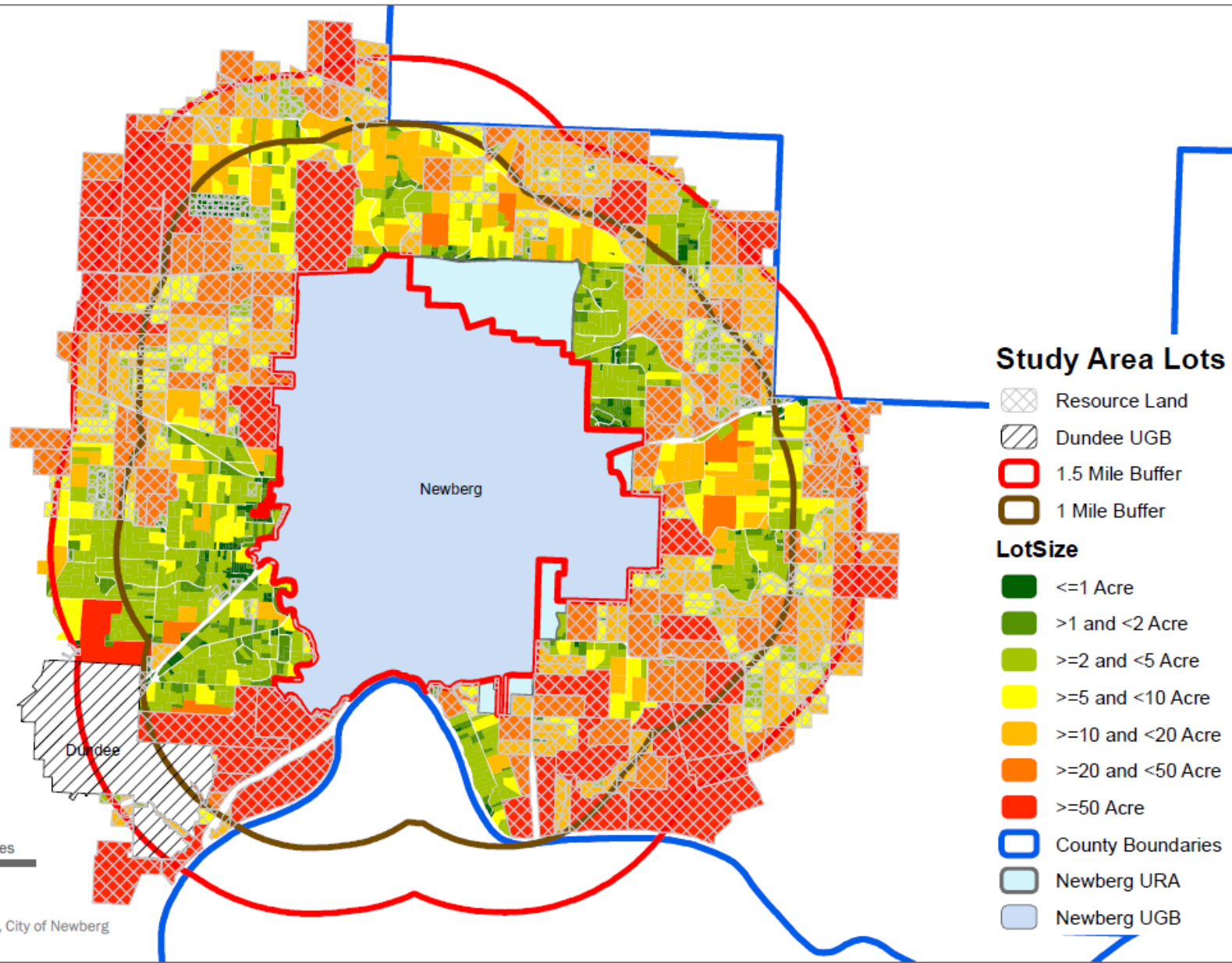
Study Area

Study Area Lots by Zoning and Classification

Development Status	Tax Lots	Total Acres	Developed Acres	Slope 25% or over		Slope 10% or Over	
				Constrained Acres	Suitable Acres	Constrained Acres	Suitable Acres
Resource Lands							
Developed	21	9	7	2	0	2	0
Partially Vacant - <2 ac	16	27	8	2	17	5	14
Partially Vacant - >=2 ac	184	3,724	92	480	3,152	1,127	2,505
Vacant	161	1,737	0	277	1,461	537	1,200
Subtotal	382	5,497	107	761	4,629	1,671	3,719
Exceptions Areas							
Developed	145	93	82	11	0	20	-9
Partially Vacant - <2 ac	219	320	104	69	147	113	103
Partially Vacant - >=2 ac	727	3,342	338	788	2,215	1,669	1,335
Vacant	192	570	0	148	421	300	270
Subtotal	1283	4,325	525	1,016	2,783	2,101	1,698
TOTAL	1,665	9,821	632	1,777	7,413	3,772	5,417

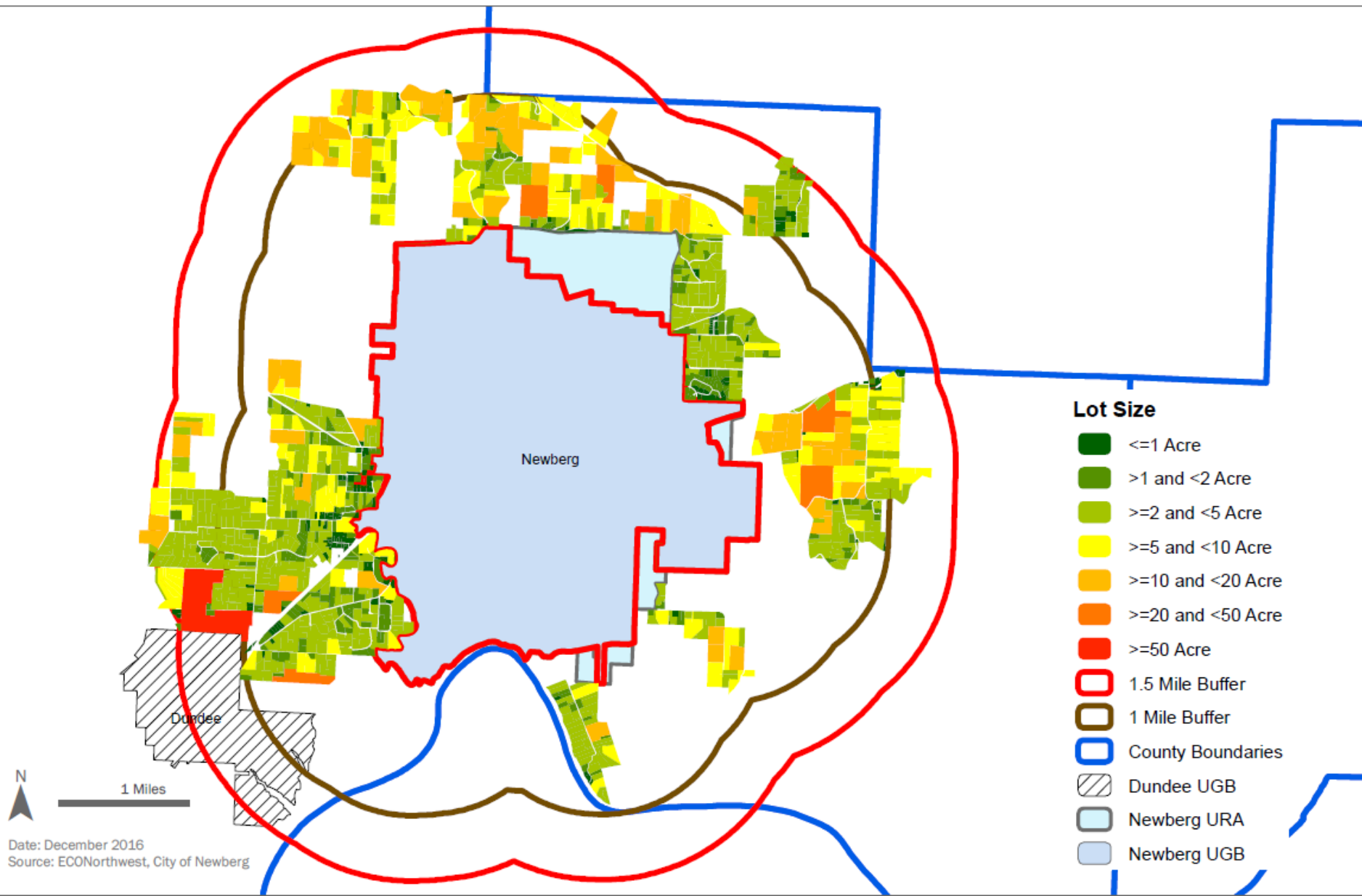
NEWBERG BLI 2016

Newberg Study Area - Lot Size



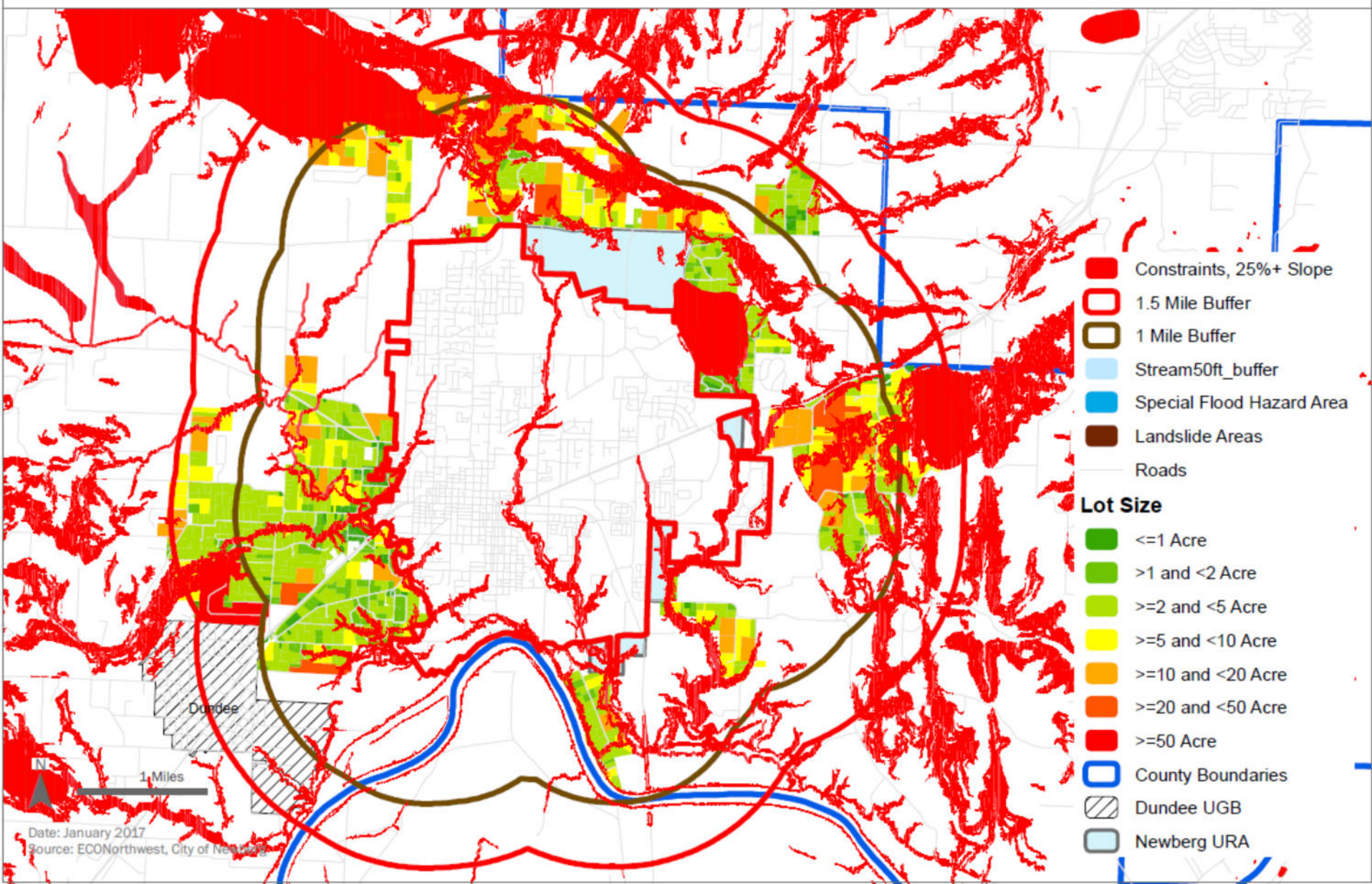
NEWBERG BLI 2016

Newberg Study Area - Exceptions Areas by Lot Size



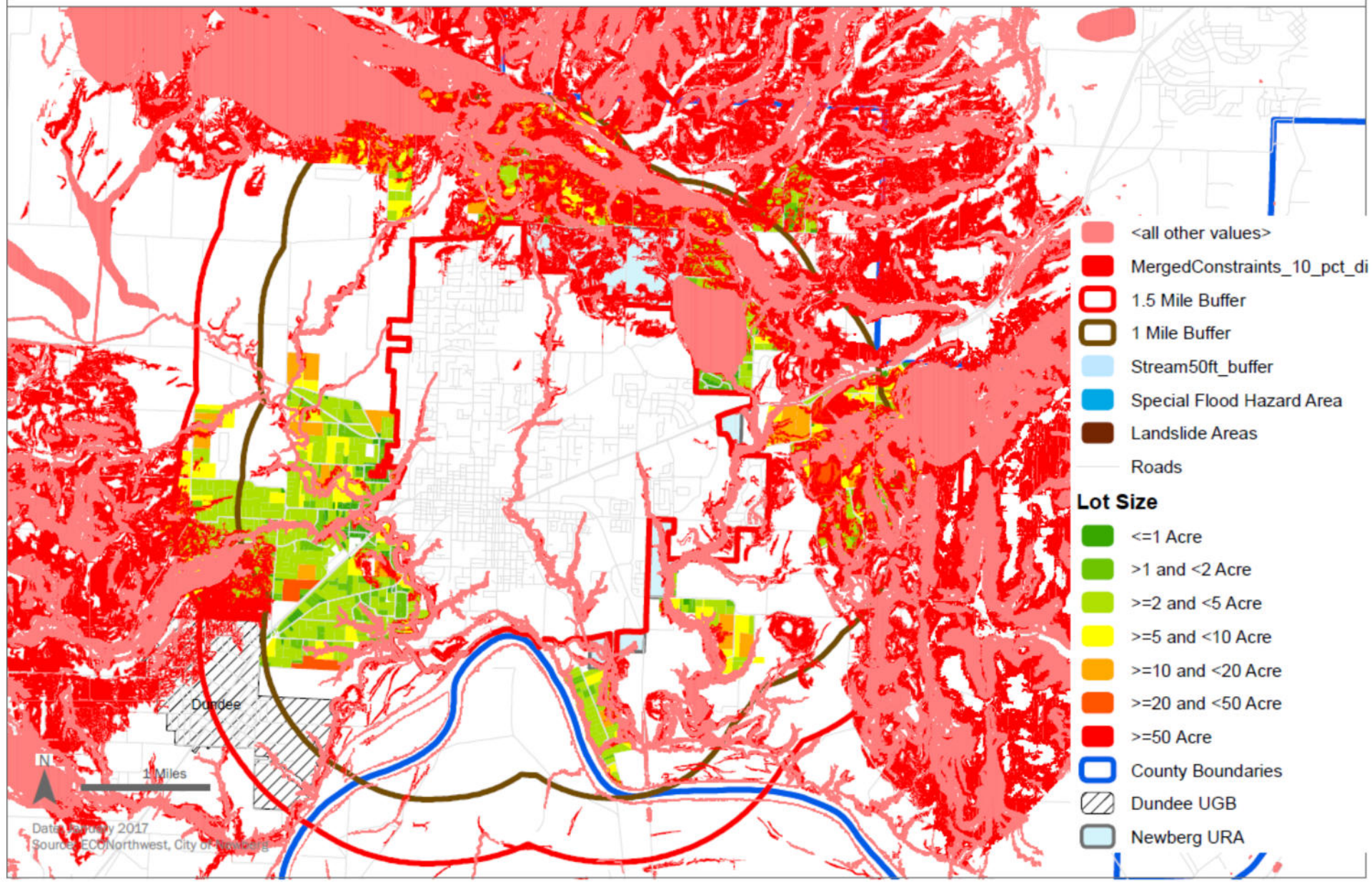
NEWBERG BLI 2016

Newberg Study Area - Exceptions Areas by Lot Size



NEWBERG BLI 2016

Newberg Study Area - Exceptions Areas by Lot Size



Issues with the Division 38 BLI Rule

- Split Plan Designations
 - The rule provides no guidance on split designations
 - The Newberg BLI splits areas in lots that are split by plan designations to accurately account for land in different designations

Public lands with residential plan designations

- Newberg has about 70 acres of public lands with residential plan designations



Partially vacant employment land

- *The real market improvement value of the lot or parcel is greater than five percent and less than 40 percent of the real market land value, in which case, the city must assume that 50 percent of the lot or parcel is developed and 50 percent is vacant.*



Errors/anomalies/exemptions in County Assessment data

- Residential land with improvement value less than \$10,000 and great than 3,000 SF
- The Yamhill County Assessor assessed churches in residential areas as \$0 improvement



Condo common areas

- Residential land with improvement value less than \$10,000 and great than 3,000 SF



Table 14. All Land by Classification, Division 38 Method and Standard Method, Newberg UGB

Classification	Tax Lots	Total Acres	Developed Acres	Constrained Acres	Buildable Acres
Division 38 Method					
Developed	6,275	1,362	1,323	40	0
Partially Vacant	389	1,047	300	139	608
Vacant	487	654	0	75	579
Public	215	688	617	71	0
Total	7,366	3,751	2,240	324	1,187
Standard Method					
Developed	6,569	1,860	1,768	92	0
Partially Vacant	169	515	85	72	358
Vacant	277	492	3	47	443
Public	351	884	770	113	0
Total	7,366	3,751	2,626	324	801
Difference					
Developed	-294	-498	-446	-52	0
Partially Vacant	220	532	216	66	250
Vacant	210	162	-3	28	136
Public	-136	-196	-153	-42	0
Total	0	0	-386	0	386

Generalized Plan Designation	Tax Lots	Total Acres	Developed Acres	Constrained Acres	Buildable Acres
Division 38 Method					
Residential					
LDR	349	728	80	82	565
MDR	264	423	42	70	311
HDR	52	94	9	8	76
Subtotal	665	1,244	132	160	952
Employment					
Commercial	155	164	13	5	146
Industrial	55	282	144	49	89
Subtotal	210	446	157	54	235
Total	875	1,690	289	214	1,187
Standard Method					
Residential					
LDR	280	644	66	72	506
MDR	77	149	7	34	108
HDR	11	15	3	1	12
Subtotal	368	809	76	107	625
Employment					
Commercial	48	140	6	8	126
Industrial	30	58	5	4	50
Subtotal	78	198	11	12	176
Total	446	1,007	87	119	801
Difference					
Residential					
LDR	69	83	14	10	59
MDR	187	273	35	35	203
HDR	41	78	7	7	64
Subtotal	297	435	55	53	327
Employment					
Commercial	107	24	7	-3	20
Industrial	25	224	139	45	39
Subtotal	132	247	146	42	59
Total	429	683	202	95	386

Comparison of Div 38 and Std result

Difference

Residential

LDR	69	83	14	10	59
MDR	187	273	35	35	203
HDR	41	78	7	7	64
Subtotal	297	435	55	53	327

Employment

Commercial	107	24	7	-3	20
Industrial	25	224	139	45	39
Subtotal	132	247	146	42	59
Total	429	683	202	95	386

Conclusion

- **The simplified BLI method is not simple**
 - In many respects it is more complicated than a standard BLI method
 - Many areas are still unclear
 - Provides no consideration for data errors and exceptions (nor was it intended to)
- Results prove unworkable for Newberg in our view

ECONorthwest

ECONOMICS • FINANCE • PLANNING



Hfe

Eugene



GJU

Portland



kjL

Seattle



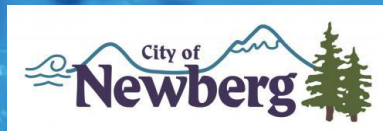
PS

Boise

Water SDC Methodology Public Hearing

June 5, 2017

Presented by:
Deb Galardi



Presentation Overview

- SDC Component/Costs
- SDC Schedule
- Summary of Findings

SDC Components/Costs

Reimbursement Fee

- Costs of **existing or in-process** facilities
- Related to **available capacity**
- Exclusive of grants & contributions

Improvement Fee

- Projects included on an **adopted list**
- Related to **capacity for growth**

Compliance Costs

- SDC methodology development
- Master planning

SDCs Per Equivalent Dwelling Unit

Description	Combined Cost	Unit Cost ¹	SDC per EDU ²	
			Potable	Nonpotable
Supply	\$8,935,378	\$2,308,883	\$1,396	\$1,396
Pump & Storage	\$5,164,396	\$1,334,469	\$807	\$0
Delivery	\$11,149,091	\$2,880,902	\$1,742	\$1,742
Upper Elevation Infrastructure	\$5,589,999	\$1,444,444	\$873	\$0
Planning	\$291,830	\$75,408	\$46	\$46
Other	\$207,661	\$53,659	\$32	\$32
Total	\$31,338,356	\$8,097,766	\$4,896	\$3,216

¹ Cost divided by 3.9 mgd

² Unit cost X 0.000605 mgd

EDU = Equivalent Dwelling Unit

SDC Schedule

Meter Size	Potable SDC	Nonpotable SDC	Factor 3/4"
3/4"	\$4,896	\$3,216	1.0
1"	\$8,323	\$5,467	1.7
1 1/4"	\$12,240	\$8,040	2.5
1 1/2"	\$16,157	\$10,613	3.3
2"	\$25,949	\$17,044	5.3
3"	\$48,961	\$32,159	10.0
4"	\$81,765	\$53,706	16.7
6"	\$161,572	\$106,125	33.0
8"	\$259,494	\$170,443	53.0

Summary of Findings

- Revised fee of \$4,896 for a $\frac{3}{4}$ " meter is \$1,352 less than the current SDC (for potable)
 - Revised project list excludes new water treatment plant and large storage reservoirs
- A new SDC of \$3,216 per EDU proposed for non-potable system
 - Excludes pumping, storage and upper elevation costs

Questions

