

**Department of Land Conservation and Development
2021-23 Planning Assistance Application**

**3D RURAL HOUSING FOR REGIONAL EQUITY IN RECOVERY
PROJECT DESCRIPTION AND WORK PROGRAM
(JOHN DAY, BURNS, AND LAKEVIEW)**

PROJECT SUMMARY

John Day, Burns and Lakeview are partnering to build affordable workforce housing at scale using innovative, sustainable methods such as 3D printing. A regional integrated planning team is contributing with the goal of building up to 36 3D printed homes in new master planned developments in each community.

BACKGROUND

The cities of John Day (Grant County), Burns (Harney County) and Lakeview (Lake County) are in the process of forming a tri-city intergovernmental agreement to allow for cost sharing in a variety of new and innovative ways that to the best of our knowledge have never been attempted in Oregon.

These three cities are all located along U.S. Highway 395 South, about 4 hours apart. The three cities share similar challenges, opportunities, and constraints for land, housing and community/economic development. All are about the same size, all are natural resource communities, all are the economic centers for their respective counties, all are stagnant or in population decline, and all want to innovate, scale, and reinvest in their communities through innovation and entrepreneurship.

Under the tri-city agreement (to be formalized through Oregon Revised Statute 190), we intend to pursue new operating models, including shared: staffing; hardware/software; consulting/professional services; and capital equipment. These agreements will be focused on problem solving, with the first implementation around the problem of building quality, affordable and equitable housing in our rural-frontier communities to assist with our economic recovery.

PROBLEM STATEMENT

About one third of rural households in John Day are severely cost burdened and cannot afford a two bedroom apartment at Grant County's Fair Market Rent (FMR) of \$700. This problem is exacerbated by a lack of quality, affordable housing, by the loss of living wage jobs resulting from the decades-long recession due to the loss of the timber industry, by our delay in adapting to changing market conditions, and by macroeconomic factors currently at play that have increased the cost of building materials and disruptions to global supply chains. Similar conditions exist in both Burns and Lakeview.

John Day has adopted an aggressive housing incentive program to address these concerns that was co-sponsored and funded by DLCD technical assistance grant TA-19-163 in 2019. DLCD's financial assistance led to the formation of John Day's Urban Renewal Agency (URA) and Housing Incentive Programs, which now offer three incentive programs to assist with new home construction, major remodels, and land development. John Day's URA offers: 7 percent cash back on all new homes built

within the URA boundaries, 15 percent cash back on major renovations, full payment of all system development charges (SDCs = \$7,400 per dwelling unit), and tailored incentive packages for both public and private land development on horizontal improvements (utilities, streets, greenspace, etc.), all with the goal of increasing the supply of affordable housing that meets the needs and incomes of local area residents.

Burns and Lakeview are in the process of adopting similar incentive programs under their own URAs. These programs have successfully addressed the cost-value disconnect for land development and housing production in John Day, which went from three site built homes in the decade prior to the URA's adoption in 2018 to 14 new homes built and seven major remodels in the past three years. This program also allowed John Day to approve two master planned communities in 2021 for 115 new home sites, which were the first master planned developments approved in the City since 1994. Both Burns and Lakeview are pursuing similar master planned developments and these three communities are working together on their URA formation and through the entitlement process using shared regional planning staff and processes.

These programs are intended to reduce the cost of land development so that the builder, buyer, and/or owner nets at least a 15 percent rate of return on the land improvements, which is an industry average. In exchange, the developers have to consent to sell the individual lots at fair market value (which we would negotiate based on the location). The URA incentive programs also effectively reduce the price per square foot of the home by about 15-20% over building outside the URA, resulting in a significant cost savings to local homeowners and more affordable housing for low-to-moderate income and other socioeconomically disadvantaged residents.

This cooperative public-private partnership (P3) approach will reduce barriers to housing production, but will lead to others – namely, the lack of local builders to create this housing and the shortage of building materials caused by COVID-19 disruptions to global supply chains.

APPROACH

To address the labor and building materials supply shortage, we are proposing an innovative solution to build affordable housing at scale using innovative design and construction methodologies including 3D printing and potentially modular, prefabricated, panelized and other emerging building practices.

John Day has partnered with Alquist 3D and ECONorthwest to launch the first 3D printed homes in Oregon within The Ridge master planned development, approved by John Day's planning commission in June of this year. The Ridge will use a mixed income housing approach to create 10-12 dwelling units as housing for disabled Veterans and other socioeconomically disadvantaged groups.

Our gold standard for housing under this program is mixed income neighborhoods with a sense of place, tied to the history of the community, in neighborhoods with character and identity that resonate with the people who live there – all while keeping homes within an affordability range that doesn't price our current residents out of the market. This is difficult to achieve but these are the core principles that are driving the incentive programs and our proposal under this project.

In John Day, The Ridge developers will make land available for the home construction within their newly approved master-planned community. The City of John Day will provide incentives for the land

development, utilities and home construction through its URA. DLCD Technical Assistance funds will be used to contract with Alquist 3D to deploy a single-story printer to John Day in 2022 to print the foundations and both the exterior and interior walls of these dwelling units with a concrete printer. This advanced technology endeavors to print each dwelling unit in 48 hours or less, completing the entire project in about three weeks. Mahogany Ridge Properties LLC (owners of The Ridge and licensed general contractors) will then complete the roofs and finish work of the housing, which will be leased at affordable rates to Veterans in Grant County and other socioeconomically disadvantaged residents.

Mahogany Ridge Properties LLC will retain ownership of these units and the City of John Day will provide appropriate protections to ensure affordability over time for each tenant. ECONorthwest will model the economics of the development through assessments like benefit-cost analysis and case studies of the project with a focus on potential cost and building efficiencies achieved through the use of 3D printing technology. Lessons learned will be provided to DLCD and used to adapt this approach for Burns and the Town of Lakeview, who will be going through the master planned development process concurrently for their new subdivisions. The 3D printer will travel south to Burns and then to Lakeview and will modify its approach as needed based on the lessons learned in John Day, with the goal of creating up to 36 new homes in southeastern Oregon in a single season at or below FMR for each city. This model will then be refined and used to scale housing in these areas in 2023 and beyond.

DLCD funds will be used to facilitate the entitlement process and help finance the economic analysis and modeling needed by ECONorthwest to affordably scale this new technology in rural Oregon communities. These communities will partner through their proposed cost sharing agreement under ORS 190 to help fund housing construction using innovative practices that will include, among other things, 3D printer deployment, site planning and permitting needed to approve 3D homes through the DCBS Building Codes Division in Salem. Work will begin immediately upon award by DLCD, with professional services agreements issued to ECONorthwest, Walker Macy and Alquist 3D. Both Sisul Engineering and STRUX Engineering are already under contract with Mahogany Ridge Properties LLC to provide civil and structural engineering services for this Project.

GOALS AND OBJECTIVES

The goal of this project is to build up to 50 affordable homes in rural-frontier Oregon over a two-year period. We aspire to build up to 36 of those homes using 3D printing technology, with the remainder to be determined based on the needs of each community.

The specific objectives this project intends to achieve are as follows:

Objective 1. Land Use Entitlement Process. The project will coordinate land use entitlement across all three cities and with DLCD and DCBS Building Codes Division. To the best of our knowledge, no 3D homes have ever been printed in Oregon. Working with these state and local agencies, we will coordinate the entitlement process to allow for single family, cottage cluster and multi-family plan sets and developments to be approved using 3D printing technology and other innovative construction methods. The result of this objective will be a set of model codes for rural-frontier communities to allow for 3D housing and other innovative housing products to be built throughout Oregon.

Objective 2. Concept and Project Design. Each master planned development has an initial concept and development group associated with it. This objective will refine these concepts and move through preliminary engineering for the horizontal improvements and project design for the housing units. Alquist 3D began printing 3D concrete homes in 2021 and their plans will be used as a major element to create a concept and project design plan for The Ridge in John Day that can be adjusted for master planned developments in Burns and Lakeview. Other construction types will also be crucial to support the local economy and to address existing and emerging market demand. Landscape architects and design staff from Walker Macy will assist with the concept development and renderings for each community while STRUX and Sisul Engineering work with Alquist 3D on the site-specific plans.

Objective 3. Project Management Master Plan and Development Agreements. Upon completion of the concept and project design, a project master plan will be created to guide the development, including incentives for the land developers and builders through development agreements tailored to each project. These agreements will outline the roles and responsibilities of each party to the agreement as well as the obligation to make the housing available to socioeconomically disadvantaged groups with the goal of promoting regional equity in recovery. The development agreement for The Ridge will form a template for the agreements in Burns and Lakeview.

Objective 4. Innovative Home Construction. The goal of this project is to create at least 12 dwelling units in each development/community, using innovative approaches informed by the concept and project design developed in Objective 2. The gold standard of mixed income housing with a sense of place, tied to the history of the community and one that creates a neighborhood feel will be the guiding principle for each development. Alquist 3D will deploy the 3D printer and staff with the expertise to print the home foundations and interior/exterior walls for both the homes and a community building centrally located within the developments. Licensed general contractors will then add the roofs and complete the finish work for each dwelling unit.

Objective 5. Economic Analysis and Lessons Learned. ECONorthwest will model the development in John Day and provide economic expertise through benefit-cost analysis, case studies and lessons learned. From a narrow perspective, the analysis will look at the costs of developing 3D printed housing relative to traditional site built housing. More broadly, the analysis will look at life cycle costs of 3D printed housing compared to traditional site built housing. These findings will then be used to adjust and refine the process for Burns and Lakeview, with the goal of gaining efficiencies, economies of scale and achieving the ultimate goal of this project by providing quality, affordable workforce housing.

PRODUCTS AND OUTCOMES

The products and outcomes expected from the proposed project are shown in Table 1.

Objective	Product/Deliverable	Outcome
1. Land Use Entitlement Process	Model codes for innovative (especially 3D printed) homes in rural-frontier Oregon (single	DCBS-approved building plans and local building permits approved for new housing

	family, cottage cluster and multi-family designs)	types, including 3D printed housing developments
2. Concept and Project Design	Preliminary engineering and conceptual design for horizontal improvements and vertical construction for housing developments	Approved concept plans Preliminary Engineering plans Final Engineering/Design plans
3. Project Management Master Plan and Development Agreements	Master planned schedule with development milestones and contractual agreements for the public-private partnerships	Multi-party agreements signed with clear development objectives, roles and responsibilities for each party
4. Innovative Home Construction	Completion of land development and vertical construction for new homes using 3D printing technology and other sustainable and innovative methods	12 new dwelling units in The Ridge (John Day) followed by up to 12 units in Burns and Lakeview, respectively
5. Economic Analysis and Lessons Learned	Benefit-cost analysis, lessons learned and case studies on the project and its approach	Economic reports that frame the benefit-cost of using novel approaches (esp. 3D printing) for rural home construction

This project represents a novel approach to addressing Oregon’s housing affordability crisis. It builds off several innovations that have not been broadly tested, but that are ripe at this time:

1. *Coordinating planning and entitlement processes across multiple jurisdictions.* This may not be unprecedented, but it is certainly unusual—particularly for rural frontier communities. The hypothesis is that economies of scale will exist in running parallel entitlement processes in the three communities (John Day, Burns, Lakeview).
2. *Deploying 3d printing technology for affordable housing.* To the best of our knowledge, no 3D homes have ever been printed in Oregon. The possibility of challenges related to the State Uniform Building Code emerging at the plan review stage seems high. Consolidating design review and working directly with the appropriate local and state agencies will help transcend barriers to plan review which would likely be perceived as too risky for small developers.
3. *Addressing housing needs in rural communities.* It is no secret that little growth is forecast for the participating communities. That does not equate to little or no housing needs. A 2019 Housing Needs Analysis ECONorthest conducted for Lakeview identified need for more affordable housing options and identified deteriorating housing stock as a challenge.
4. *Creating economic opportunity through housing.* Housing availability and affordability constrains economic development in rural communities.

WORK PROGRAM, TIMELINE AND PAYMENT SCHEDULE

A sample work program is provided in a separate attachment for your convenience and to outline the fundamental steps necessary to complete the work products listed above. Local governments should review this sample to develop a comprehensive work program that best fits their community. Per Statewide Planning Goal 1, Public Involvement, public engagement is a necessary component of any planning process, but may be adjusted by the local government. Please also provide a preliminary schedule for the project, with identified target completion dates for each task. If other changes are necessary, please consult with your Regional Representative.

Please note that applicants are expected to submit detailed proposals that specify the work tasks, products, and timelines unique to their proposal. The attached sample work programs are not complete and will require refinement to suit specific proposals. Priority will be given to proposals that provide well-defined tasks, products, and timelines.

Task 1: Project Kick-Off

Timeline: SEPTEMBER 2021 – OCTOBER 2021

The purpose of the project kick-off is for the team to coordinate and become familiar with local conditions and with team's planning documents, confirm the objectives of the project and refine the project schedule, and prepare for the Project.

The City of John Day (City) will develop professional services agreements with ECONorthwest, Alquist 3D and Walker Macy as part of the project kickoff. These consultants will work with city managers and planning staff in all three cities via a conference call, or in person, to ask preliminary questions, establish project expectations, and familiarize themselves with city-specific concerns about the project.

Alquist 3D's CEO, ECONorthwest's project staff, and Walker Macy design staff (collectively, the Consultants) have worked previously with John Day on other projects, including John Day's housing market assessment (2019), Innovation Gateway Area Plan (2019) and various community development projects like the *Touchstone Energy Cooperative* Planning Assistance grant (2020). ECONorthwest also completed Lakeview's Housing Needs Analysis in 2019 and has performed various economic analysis, including EOA's, in this region. These consultants will verify the action items and objectives identified through this initial conference call with the City and will develop and share a proposed schedule for the actions required for the completion of all tasks, with the level of detail required for the proposed project schedule determined with mutual agreement by the City and the Consultants.

Task 1 Consultant Deliverables:

- Summary of major tasks and action items for the Project
- Proposed Project schedule

Task 1 City Deliverables:

- Copy of relevant City data or documents for each community
- Professional services agreements for Consultants
- Tri-city cooperative agreement between John Day, Burns and Lakeview under ORS 190

- Project Management Site using Basecamp 3

Task 2: ROI Modeling and Development Agreements

Timeline: OCTOBER 2021 – DECEMBER 2021

The City and its Consultants will jointly create development agreements with The Ridge and Alquist 3D to ensure milestones, incentives and project deliverables are clear and achievable within the proposed timelines.

Task 2 Consultant Deliverables:

- Return on Investment (ROI) calculator for The Ridge

Task 2 City Deliverables:

- Development Agreements with Mahogany Ridge Properties LLC, Alquist 3D, City of John Day and the John Day Urban Renewal Agency

Task 3: Plans and Land Use Entitlement

Timeline: NOV 2021 – FEB 2022

The City and its Consultants will develop concept plans and structural plans for twelve (12) 3D printed homes in John Day in the first phase of The Ridge along with a centrally-located community center and surrounding greenspace. These plans will include final engineering plans for the streets and utilities and structural plans for the model units to be built at The Ridge (up to four distinct housing types) to create a mixed-income community.

Task 3 Consultant Deliverables:

- Refine concept plan, prepare draft grading concept, street cross-sections and other supporting diagrams; Preliminary and Final Renderings – Walker Macy
- Preliminary and Final Engineering Plans – Sisul Engineering
- Structural Plans submitted to Grant County Planning Department – Mahogany Ridge Properties LLC

Task 3 City Deliverables:

- Land Use Approval

Task 4: Project Construction

Timeline: MARCH 2022 – AUGUST 2022

Upon approval of the structural plans, the team will proceed with site preparation and construction of the dwelling units at The Ridge, which will proceed from March thru August 2022.

Task 4 Consultant Deliverables:

- Construction engineering/oversight – Sisul Engineering
- Project Construction – Mahogany Ridge Properties LLC, Alquist 3D

Task 4 City Deliverables:

- Incentive/milestone payments

Task 5: Project Evaluation & Kickoff for Phase 2/3 – Burns/Lakeview

Timeline: AUGUST 2022 – JUNE 2023

The team will evaluate the success and economics of the John Day project and begin the process again for Burns (Phase 2) and then Lakeview (Phase 3), who will leverage the work product from the John Day build and adapt the techniques, procedures and processes learned in John Day for their communities' unique conditions.

Task 5 Consultant Deliverables:

- Project Economic Analysis – ECONorthwest

Task 5 City Deliverables:

- Preliminary Design Plans / Land Use Entitlement – Burns, OR (Phase 2)
- Preliminary Design Plans / Land Use Entitlement – Lakeview, OR (Phase 3)
- City's will repeat Tasks 1-5 in each of their respective communities with a revised timeline and approach, which may include alternative building materials/methods as conditions warrant for these communities.

EVALUATION CRITERIA

This proposal directly addresses priorities 1 (Promote Economic Development) and 2 (Promote provision of affordable and workforce housing) as outlined in the grant application packet. It also indirectly supports priority 5 (Update Comprehensive Plans and Implementing Codes).

1. *Promote Economic Development.* John Day's strategy for growth is predicated on attracting new residents and economic activity to the area. Housing is a pre-requisite for success. Moreover, housing is one of the six focal areas identified in the John Day Community Investment Strategy and is a key priority in Burns and Lakeview as well. The availability of new affordable housing will send a strong signal to businesses who are considering investing in these communities.
2. *Promote provision of affordable and workforce housing.* This project would result in new master planned developments in three rural frontier communities that have seen little housing development over recent decades. Most importantly, while this project includes planning and entitlements for the developments, it will result in new affordable housing stock in each of the communities.
3. *Update comprehensive plans and implementing codes to respond to changes in state law or regulatory streamlining.* This project would facilitate 3D printing technology throughout Oregon by developing the first set of building plans for 3D printed structures in Oregon. Lessons learned from the project can also be applied for future plan and code revisions (as needed) to remove barriers to housing production and land use entitlement that may be overly restrictive or prohibit this type of approach in other Oregon communities.

PROJECT PARTNERS

We have assembled a robust team consisting of three local cities/governments, two nonprofit partners, three world class consulting firms, and three local private development groups. This integrated project team has the experience and expertise needed to successfully pull off a project of this magnitude successfully.

Local Governments:

City of John Day. John Day (project lead) will coordinate the ORS 190 agreements, development agreement templates for the public private partnerships, and will provide regional planning assistance through its Community Development department staff and project management staff. John Day successfully formed Oregon's first housing incentive program under ORS 457 (Urban Renewal) and has three years' experience implementing housing incentive programs in rural Oregon that are now being modeled and adopted in other areas of the state, including Madras, Burns and Lakeview. John Day's City Manager, Nick Green, has successfully managed prior DLCD technical assistance grants as well as over a dozen state and federal grants valued at more than \$20 million and will be the grant administrator for this Project. Prior to joining the City of John Day, Mr. Green worked as a technology integrator with Booz Allen Hamilton, Jacobs Engineering and for the U.S. Intelligence Community, where he oversaw a multi-billion dollar technology investment portfolio. His team includes Aaron Lieuallen, John Day's Senior Project Manager, who worked previously as a large scale private housing developer in the Seattle area with over eight years of experience in master planned home development project management and over 300 homes built during his tenure with Toll Brothers and CamWest development, national leaders in new home construction.

City of Burns. Burns will pursue the entitlement process for their proposed master planned development in parallel with the construction in John Day, in order to receive the 3D printer and begin construction following John Day's project completion. Burns will also contribute financially to the project. Burns is currently in the process of establishing an Urban Renewal Agency to help eradicate blight in the community and enhance buildable lands to a project ready status. ECONorthwest authored an Economic Opportunities Analysis (EOA) for Burns in 2019, which is being adopted by Burns city council. The Burns city council also recently completed a lengthy strategic planning process that resulted in a 5-year plan that places housing as one of the top priorities for the community.

Town of Lakeview. Lakeview will pursue the entitlement process for their proposed master planned development in parallel with the construction in John Day, in order to receive the 3D printer and begin construction following John Day's project completion. Lakeview will also contribute financially to the project. Lakeview is in a unique position with access to both solar and geothermal energy sources that could be coupled with this approach to build more energy efficient housing, which could allow for the conversion to net zero energy homes as part of their project, further decreasing their carbon footprint. This is not an initial goal of this proposal, but environmental benefits could be achieved and evaluated as part of the Lakeview build once the initial parameters for the 3D home printing have been worked out in John Day and Burns.

Non-Profits / Co-operatives:

The Ford Family Foundation. The Ford Family Foundation has invited the community of John Day to join the first cohort of the Growing Rural Oregon (GRO) program. They are launching the program this summer with a small cohort of four communities to allow for shared learning and deep engagement with the GRO Core Team, which consists of Community Coaches, consultants, Central Oregon Intergovernmental Council staff, and Foundation staff. The Ford Family Foundation is providing \$30,000 per year for five years (\$150,000 total) in direct financial assistance to John Day for its community development staff, along with indirect contribution through its contract consultants and in-house expertise. This project will be part of the GRO initiative to help tell our community's unique story with a focus on entrepreneur-led development through innovative regional planning (in this case, through a P3 approach that pairs local governments, nonprofits, contractors and land developers with innovative technologies through civic entrepreneurship that solves regional housing production challenges).

Oregon Trail Electric Cooperative (OTEC). OTEC is the power cooperative serving John Day and Burns. They are participating as a partner and are exploring methods to increase the energy efficiency of each home through solar and other renewable energy approaches.

Consultants:

Alquist 3D. Alquist 3D (Des Moines, IA) uses 3D printing technology to create exceptional design while lowering the cost of housing and infrastructure in economically distressed and underserved communities. Alquist 3D has invested over 4 years of research into this new technology, partnering with printer manufacturer COBOD (based in Copenhagen, DK). Alquist's partner company, Atlas Community Studios, has helmed rural revitalization and economic development projects in 20 different states. Atlas provides roadmaps for community revitalization, creating and building new businesses, child-care options, technological advancements, cultural centers, and marketing/incentive plans, among other concepts, and worked with John Day on a *Touchstone Energy Cooperative* planning assistance grant in 2020. The Alquist team will develop new single family, multifamily, mixed-use, and senior living units in each of the three communities through this Project, based on the work they have pioneered in 3D home printing in Virginia (see Enclosure 2).

ECONorthwest. ECONorthwest (Portland, OR) is an independent economic consulting firm serving the Pacific Northwest since 1974. They have worked with a variety of public and private clients across the country, offering economic perspectives on issues ranging from wildfire recovery to education inequities and affordable housing. They have previously worked with John Day on a number of projects, including the City of John Day Housing Market Assessment, Investment Prospectus, and Community Investment Strategy / Comprehensive Economic Development Strategy, and with Lakeview on their Housing Needs Assessment. ECONorthwest will provide economists to assist with the lessons learned and housing implementation plans for each of the three communities.

Walker Macy. Walker Macy (Portland, OR) is recognized as a leader in landscape architecture, urban design and planning including urban parks and plazas; waterfront revitalization; higher education and mixed-use development. Walker Macy led the award-winning John Day Innovation Gateway Area Plan strategy and has remained engaged with the City of John Day on its integrated park system since 2019. They will work with this team to create concepts and renderings that accomplish the goal of creating a sense of place and community around each master planned development.

Sisul Engineering. Sisul Engineering (John Day, OR) is John Day's Engineer of Record and has developed the preliminary engineering plans and site plans for The Ridge, approved by the John Day Planning Commission in June 2021. Sisul will continue as the engineer for The Ridge and will complete the final design plans and oversee the project construction.

STRUX Engineering LLC. STRUX Engineering (Prairie City, OR) operates as a multi-disciplinary Civil Engineering firm fully qualified in providing professional services in the areas of Hydraulic, Aquatic, and Structural Engineering. Driven by work ethic and pride, STRUX's dedication to delivering high standards for engineering solutions defines their company's mission.

Developers:

Mahogany Ridge Properties LLC. Mahogany Ridge Properties LLC (John Day, OR) is a licensed contractor and land developer in John Day who are in the process of creating The Ridge, a mixed income housing development approved by the John Day Planning Commission in June 2021 (see Enclosure 1 for detailed plans). The City of John Day through its Urban Renewal Agency is partnering with Mahogany Ridge Properties LLC to create a veterans village of 12 affordable housing units and a community space, which will be the first 3D printed housing development in Oregon.

Cobalt Development. Cobalt Development (Tualatin, Oregon) is working with a private stakeholder in Burns to bring quality, middle-income housing to Burns. The goal is to eventually build more than 100 homes in Burns. A master plan is currently underway by Cobalt, who is working independently with the needs of Burns and Harney County to provide sustainable, eco-friendly housing opportunities.

Lakeview Development Group. Lakeview has not yet secured a development group, licensed contractors or land developers, but has developed a Housing Needs Analysis (2019) that they will work to adopt prior to proceeding. The Town of Lakeview will learn from the approaches in John Day and Burns and will adapt their approach to meet the unique needs and circumstances of their community based on lessons learned from the other two cities.

State Agencies:

DLCD. DLCD will provide financial and technical assistance on the project through this grant. We are also requesting DCLD provide in-kind assistance with the land use entitlement process through its regional staff.

DCBS Building Codes Division (Salem). The Building Codes Division will need to partner with these communities to permit the 3D homes. To the best of our knowledge, no 3D housing has been permitting in Oregon. Alquist 3D will advise the Division on the approaches taken in Virginia, California and Iowa where homes have been approved or are in the process of approval, with the goal of creating a standardize review process and plan set for permitting this type of construction approach.

Regional Solutions Teams. The Regional Solutions Teams for John Day, Burns and Lakeview have been briefed on this approach and are supportive of the project. They will be involved to help

capture lessons learned and address any policy and/or regulatory barriers encountered during the project implementation.

Federal Partners:

TBD. The communities are coordinating with various federal agencies, including USDA Rural Development, the Economic Development Administration, and our congressional staff, to explore federal funding opportunities to assist with this project. Local funds will be sufficient for the initial pilot, but additional federal funding will likely be needed to scale this approach. We will engage with these and other agencies as opportunity allows throughout the project and will be monitoring the passage of the HOME Affordability Act sponsored by Senator Merkley to determine if there is an opportunity to combine the Act with our local incentives.

ADVISORY COMMITTEES

Early and ongoing community engagement will be critical for the success of these programs. Affordable housing is unfortunately stigmatized in various communities for all the wrong reasons. We hope to overcome this implicit bias by framing the housing developments as affordable workforce housing for industries desperately in need of housing for their employees. The project will also emphasize innovative building solutions using local contractors to promote economic recovery in each community and providing the housing to those who need it most. Each city will form an advisory committee/steering committee at the project outset who will be engaged throughout the project. This committee will host town halls and provide other forums for engagement the broader community to ensure local, ground up communication for the project goals, objectives, successes and challenges.

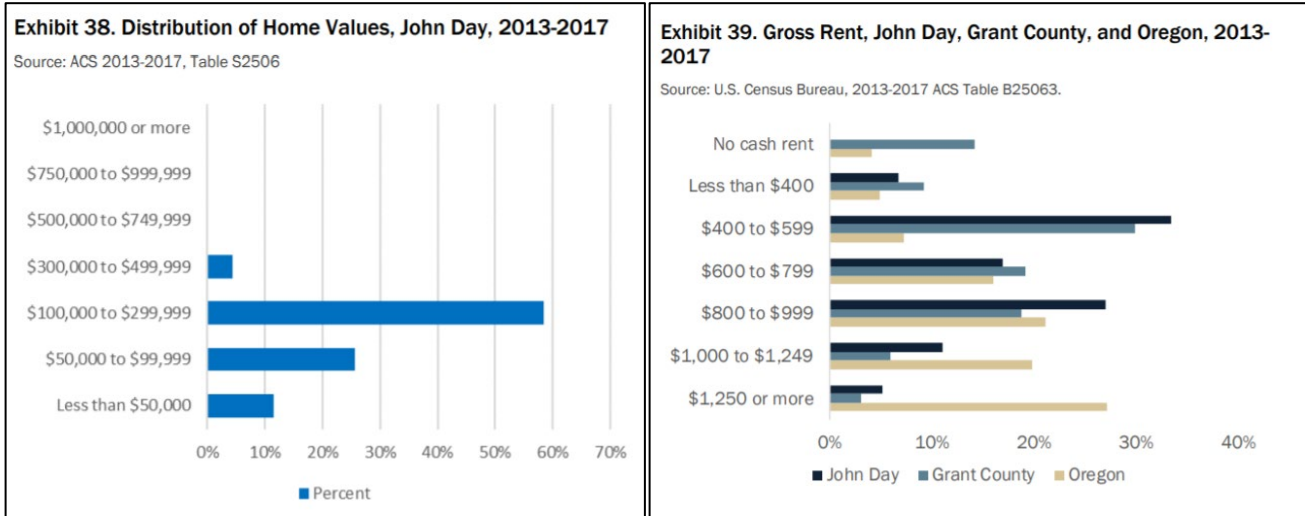
HOUSING MARKET DATA & HOUSING AFFORDABILITY CHALLENGES (JOHN DAY)

John Day currently has a deficit of 52 housing units affordable to households earning between \$10,000 and \$25,000 (between 15% and 37% of MFI), resulting in these households potentially living in housing that is more expensive than they can afford. Households in this income range are generally unable to afford market rate rents. When lower cost housing (such as government subsidized housing) is not available, as is the case in John Day, these households pay more than they can afford in rent. This is consistent with the data about renter cost burden in John Day described below (data taken from John Day Housing Market Analysis, 2019).

John Day's median home value is \$120,000 per unit as of 2017. About 25% of homes were valued between \$50,000 and \$99,999, and 11% were valued at less than \$50,000. No homes were valued more than \$500,000 (see Exhibit 38). Rent costs in John Day are higher than average for Grant County and are lower than average for Oregon. Over 80% of renters in John Day pay less than \$1,000 per month. Exhibit 39 shows gross rent (which includes the cost of rent plus utilities) for John Day in comparison to Grant Count and the State of Oregon rent levels. Median gross rent for John Day in 2013-17 was \$723.

A typical standard used to determine housing affordability is that a household should pay no more than a certain percentage of household income for housing, including payments and interest or rent, utilities, and insurance. The Department of Housing and Urban Development's guidelines indicate that households paying more than 30% of their income on housing experience "cost burden," and households paying more than 50% of their income on housing experience "severe cost burden."

Using cost burden as an indicator for housing affordability is consistent with the Goal 10 requirement to provide housing that is affordable to all households in a community.



About 31% of John Day’s households are cost burdened. About 48% of renter households are cost burdened, compared with 20% of homeowners. Twenty percent of households in John Day are rent burdened households. Overall, John Day has a slightly smaller share of cost-burdened households than Oregon.

About 24% of John Day's households have an income of less than \$20,000 per year. These households can afford rent of less than \$625 per month, or a home with a value of less than \$62,500. Most, but not all of these households are cost burdened. **In the 2013-2017 period, about 48% of renters in John Day were cost burdened, compared to 31% of homeowners.**

Cost burden rates vary by income. Nearly all households that earn less than \$20,000 per year in John Day are cost burdened. **About one third of John Day’s households have income less than \$27,150 and cannot afford a two bedroom apartment at Grant County’s Fair Market Rent (FMR) of \$700 (see Exhibit 43).**

Fair Market Rent for a 2-bedroom apartment in Grant County is \$700.	Exhibit 43. HUD Fair Market Rent (FMR) by Unit Type, Grant County, 2019 Source: U.S. Department of Housing and Urban Development.				
	\$532 Studio	\$598 1-Bedroom	\$700 2-Bedroom	\$1,012 3-Bedroom	\$1,126 4-Bedroom

ECONorthwest estimates John Day has a deficit of 52 housing units at or below FMR because of the lack of housing types affordable at lower income levels such as new and used government-assisted housing, apartments, duplexes, tri- and quad-plexes, and manufactured housing (see Exhibit 47). John Day also has a deficit of housing types affordable for higher income levels such as market-rate apartments, single-family attached, and single-family detached housing. This has two important implications for our housing market:

Implication 1. Some lower-income households live in housing that is more expensive than they can afford because affordable housing is not available. These households are cost-burdened.

Implication 2. Some higher-income households choose housing that costs less than they can afford. This may be the result of the household's preference or it may be the result of lack of higher-cost and higher-amenity housing that would better suit their preferences

This project has the potential to address both implications by increasing the supply of affordable housing for lower income residents, while pioneering a new and innovative approach through 3D home printing that can be applied to housing of all types, not only in John Day but also in Burns, Lakeview and other rural-frontier communities.

HOUSING MARKET DATA & HOUSING AFFORDABILITY CHALLENGES (BURNS)

In Burns, there currently exists a high-demand for middle-income, quality housing to attract a sustainable workforce. On nearly a weekly basis, small business owners from around the United States are requesting information related to relocating to the City of Burns. The geographic location, which includes major highways and a municipal airport, along with the affordable cost of living in the region has made Burns a highly probable destination location for small, upcoming businesses. Burns intends to complete a housing market analysis and background data gathering for a future housing needs analysis independent of this project, in preparation for quantifying these housing demands.

HOUSING MARKET DATA & HOUSING AFFORDABILITY CHALLENGES (LAKEVIEW)

In Lakeview, like John Day and Burns, there is a mismatch between the housing products on the market and what the market is seeking. There currently is a deficit of affordable workforce housing, subsidized housing, and market rate housing, described in greater detail in their 2019 Housing Needs Analysis.

COST SHARING & LOCAL CONTRIBUTION

Alquist 3D is in the process of printing the first 3D homes in Richmond, VA. They will learn more as they proceed in the coming weeks, but at this point are estimating for 1,000 sq ft homes and to do 36 at a time it will take 4-5 months to complete all 36 with Alquist printing all the walls of each home. They will do up to four designs so each development has unique features and can start printing in March or April once weather is warm enough.

Each unit will be \$55,000 for Alquist 3D to print all the walls. We anticipate that there will be another \$100,000 on top of that for the general contractor to finish building out the home, possibly less depending on finishes, etc., but we are estimating the total build price for vertical construction to be approximately \$150,000 per unit, resulting in a rental price of approximately \$750 per month before land development costs.

To achieve a market rate of return for the private sector investors, we need to reduce the cost per unit by approximately \$30,000 to reach the median home price – more if we wish to beat the market and provide more affordable housing.

John Day is in the process of developing a return on investment (ROI) calculator that will be used to

inform the net incentives needed to produce housing using this approach that will be at or below FMR. This will be achieved through a variety of cash and in-kind local contributions, including:

- John Day's URA housing incentive (7 percent cash back) est. at \$10,500 per unit based on a \$150,000 assessed value (\$126,000 total contribution for 12 units)
- John Day's URA System Development Charge (SDC) payment incentive of \$7,400 per unit (\$88,800 total contribution for 12 units)
- John Day's URA Land Development Incentive proposed contribution of \$100,000 for utility system improvements for The Ridge.

These local incentives, totaling \$314,800, are approved by the URA Board of Directors and The Ridge is already included within the URA boundaries. No additional amendments or approvals are needed to provide these incentives. This will result in a net reduction of just over \$26,000 in the total price per dwelling unit for the 12 units proposed.

Mahogany Ridge Properties LLC will invest \$940,000 in cash and in-kind contributions (equipment and labor) toward the development.

Additional in-kind contributions may also be provided from our partner agencies like OTEC through line extension fee reductions, solar energy incentives, and other cost-savings packages.

The City of John Day public works department can also contribute manpower and equipment such as a skid steer, fork lift, and generator.

The City of Burns and Town of Lakeview are committed to ensuring quality, sustainable housing in their communities. Burns plans to utilize funding, saved for Economic Development, to contribute to this housing project during Phase 2 and the Town of Lakeview will contribute funding toward their project in Phase 3.

For Phase 1, we are requesting \$314,800 in funding from DLCD (apx. \$26,000 per dwelling unit for 12 units) to match John Day's investment and further reduce the cost per unit to achieve affordability targets for our local residents. These DLCD Funds will be used to offset the cost of deploying the 3D printer to Eastern Oregon, building the first development at The Ridge, redeploying the 3D printer to Burns and Lakeview, and for the economic modeling, concept development, and entitlement procedures for each of the three communities.

DLCD REIMBURSEMENT SCHEDULE

Based on our proposed schedule, DLCD disbursements will be requested as follows:

March 2022 – \$28,000 (Task 3 Deliverables)

August 2022 – \$250,800 (Task 4 Deliverables)

October 2022 – \$30,000 (Task 5 Deliverables)

LOCAL OFFICIAL SUPPORT

The local city councils will provide resolutions in support of this project prior to award and will be engaged throughout this process, particularly during the formation of the partnership development agreements and ORS 190 cost sharing agreement. John Day, Burns and Lakeview share the same legal counsel and many of the same consultants and have been in discussion for several months on the legal framework for creating a tri-city agreement. Each community will work expeditiously to ensure these agreements are in place early in the project.

ENCLOSURES

Enclosure 1. The Ridge master planned development site plans and preliminary engineering (CAD files available upon request).

Enclosure 2. Recent articles on Alquist 3D printing the first 3D home site in Richmond, VA in association with Virginia Tech University.