Building the Future
New Technology and the Changing Workforce

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Greetings!

This issue of Metroscape, our first of 2017, is also the first we’ve created with our new leadership: Liza Morehead as executive editor and Randy Morris as technical editor. Liza and Randy are working with me to create new content for our readers while preserving the mission of Metroscape: to serve as an atlas and mirror for the Portland metropolitan region.

As always, the issue begins with the Landscape, a quick portrait of a specific place in our region. Liza Morehead visited Tualatin and offers some background on how and why the city grew to what it is today.

New technologies are breathing life into the timber industry. Cross-laminated Timber, or CLT, addresses the challenges presented by urbanization while generating economic opportunity in rural areas. Andrew Crampton explains the technology’s benefits to our cities, our rural economies, and our forests.

Our evolving construction industry is generating big increases in the number of multifamily housing units throughout the region. In the Periodic Atlas, we examine the spatial dimensions of the multifamily housing boom via maps of new construction permits issued for multifamily units.

As the construction economy booms, women are expanding their role in the trades. Our interview features two women who have helped change the face of the trades in the Portland region. Nora Mullane and Connie Ashbrook describe the challenges they have overcome as women working in a traditionally male career.

Continuing our theme of transition, Election 2016 examines the outcome of the 2016 elections across the Metroscape. This was the first election affected by Oregon’s Motor Voter Law, which took effect on January 1, 2016.

Finally, the indicator page shows that wages in the Portland metropolitan area, in comparison to the average for metropolitan areas in the US, are finally rising as economic growth increases demand for labor.

As we make this transition to a new era of Metroscape, let us know how we’re doing. Share your thoughts about issues you’d like us to explore, how you want to consume content, and how we might connect you better to the history and future of our region. Feel free to comment at ims@pdx.edu, or discuss your observations about the articles on our Facebook page.

Sheila Martin,
Sheila Martin, Director
Institute of Portland Metropolitan Studies
Tualatin

by Liza Morehead

Twelve miles south of Portland on the border of Washington and Clackamas counties, Tualatin is a small town where carefully curated landscapes make up for the absence of traditional town features. Founded in 1913, Tualatin’s population remained small through much of the twentieth century. During the 1960s, Tualatin, like surrounding Washington County, experienced a population boom. The small city’s population more than doubled between 1960 and 1970, from 359 to 750 residents. The following decade saw even greater growth, with a population increase of 880% between 1970 and 1980. While the rate has slowed, the city’s population continues to grow. [1]

The city’s growth was influenced by and necessitated new infrastructure. Interstate 5 was completed in 1966, running through the eastern part of the city and strengthening connections to other parts of the region. During the 1960s and 1970s, a new connection to the Bull Run watershed supplied the city’s new reservoirs with fresh water, while a new sewage treatment plant completed the cycle. Since 1973, Legacy Meridian Park Hospital has served the area’s medical needs and is one of the city’s largest employers. [2]

As the city’s population grew, there was a mounting sense that a new type of infrastructure was needed. Developers, city planners, and residents began to reimagine existing areas of the city. City leaders created the Central Urban Renewal District in 1975. Comprising more than 327 acres, the district centered on SW Nyberg Street and SW Boones Ferry Road. Planners sought to improve infrastructure, including traffic congestion, inadequate flood protection and drainage facilities, while providing a sense of community that Tualatin was lacking. New attention would be paid to the area’s natural features, including the Tualatin River, while promoting community institutions and cultural uses. One area ripe for redevelopment was a former industrial site located in the northern section of the city between I-5 and Boones Ferry Road. Once the home of a sawmill, the site housed the Hervin Company, manufacturer of Blue Mountain Pet Food, for more than forty years. When the company closed in the late 1980s, it was sold to the city and redeveloped as the town center. [3]

In 1994, Tualatin Commons opened on more than five acres of this site. Serving as the city’s downtown, it includes a three-acre artificial lake, a plaza and signs pointing visitors to nearby nature trails. The site is ringed by small businesses, apartments, and a hotel. Events are held there throughout the year, including the Pumpkin Regatta, Holiday Lights, and a summer concert series. Trails extending from the Commons leads visitors through wetlands, past public art, and to many of the city’s community institutions, and historic homes.

Visitors to Tualatin Commons can choose from a variety of restaurants and cultural activities, but those looking to pass the day shopping go to a different carefully curated landscape. In 2005, Bridgeport Village, a thirty-acre open air shopping center, opened in the former site of a county-owned rock quarry. [4]
The Tualatin Art Walk includes five trails leading visitors to parks, public art, and civic institutions.

The Commons was once the site of the Hervin pet food company.

Concerts and other public events are held at the Commons throughout the year.

[1] US Census
In a rapidly urbanizing world fueled by the enormous demand to house and shelter billions of people in the upcoming decades, building materials must be utilized that have a lighter climate impact than today’s commonly used energy-intensive building materials.

Is there an alternative to the energy-intensive concrete jungle that is both sustainable and financially viable? How can our built environment enhance, rather than destroy, the natural environment? Part of the solution lies in a recent innovation that uses one of the world’s oldest building materials, wood, with a modern twist: cross-laminated timber, often abbreviated as CLT. These wood-based structures can create an integration between the urban built environment and the natural world.

Cross-laminated timber is a wood panel consisting of multiple layers of lumber oriented at right angles to one another and then bonded together.
with glue adhesives to a solid, straight rectangular panel. Structurally, this is a much stronger material than conventional wood structures that consist of smaller components such as two-by-fours tied together by plywood and plaster board. The Portland region has become a national leader in promoting this material, fostering research, production, and innovation in constructing buildings that utilize CLT. The region is such a focal point for CLT research that the 2016 International Mass Timber Conference was held in Portland, and is scheduled to occur again in Portland in 2017. This conference attracts the world’s leading industry professionals in research, production, design and construction of mass timber products. In addition to being a leader in CLT research, the Portland region is one of the first American cities to support the construction of all-wood mid-rise buildings.

Portland's position as a hub of CLT production, research and design is important because local leaders are increasingly concerned about addressing pent-up demand for building construction while ensuring that these buildings are constructed with materials that have a lighter climate impact than energy-intensive materials such as steel or concrete.

Construction and operation of buildings are responsible for up to 40 percent of global energy use, and at least one third of the anthropogenic greenhouse gas (GHG) emissions. This is primarily due to fossil fuel consumption in building operations such as heating, cooling, and lighting. Thus, the large carbon footprint of buildings must be reduced for the world to address climate change. Concrete and steel, which are the primary building materials for commercial structures, have a large carbon footprint and use highly energy-intensive foundation materials. Carbon dioxide is the world's dominant greenhouse gas, and concrete production is responsible for eight percent of CO₂ emissions.

Trees foster carbon sequestration by utilizing the sun’s energy to convert carbon dioxide to oxygen while storing the carbon. The reduction in carbon emissions occurs when the trees are sustainably harvested to be used as wood products. After a tree has been harvested, 50 percent of the weight of the wood is carbon. The wood stores carbon until it begins to decompose, meaning the more structures built out of wood, the more carbon is stored, which in turn reduces the greenhouse gases in the atmosphere.

Engineered wood is becoming an increasingly viable sustainable alternative to typical steel or concrete structural systems needed to support dense, urban buildings. Imagine a future city where the forest is sustainably reproduced in an urban cityscape of timber skyscrapers; the concrete jungle is replaced with an ecological urbanism consisting of wooden structures woven together with landscaping and green infrastructure.

Numerous local and national grant programs have incentivized the advancement of CLT research and production. Oregon BEST, which funds and supports Oregon cleantech startups, and a newly established collaboration between Oregon State University and the University of Oregon called the Center for Advanced Wood Products Manufacturing and Design are working to
CLT was originally created in Europe in the early 1990s. It consists of panels with multiple layers of wood oriented crosswise that are bonded with structural adhesives, and pressed to form a solid, straight, rectangular panel. Finished CLT panels are typically from two to ten feet wide, with lengths up to sixty feet and thickness up to twenty inches. This allows it to be used for long spans in floors, walls, or roofing. The prefabricated nature of CLT panels makes them fast and easy to install, generating almost no waste on the job site. CLT panels are prefabricated with pre-cut openings for doors, windows, stairs, service channels, and ducts, and shipped directly from the manufacturer where they can be quickly and efficiently lifted into place. The panels are shipped with preinstalled lifting straps to effectively utilize the just-in-time construction method and provide substantial savings on construction timelines, creating financial viability for the innovative building material. The strength of the material supports a taller, mid-rise building typology compared to the four or five story maximum height supported by traditional wood construction.

support expansion of Oregon’s capacity to manufacture CLT.

Framework, a twelve-story wood building scheduled to open in Portland’s Pearl District at Northwest Tenth Avenue and Northwest Glisan Street in early 2018, was one of two projects to win a $1.5 million prize at the U.S. Tall Wood Building Prize Competition, a contest sponsored by the U.S. Department of Agriculture, the Softwood Lumber Board, and the Binational Softwood Lumber Council. Framework’s design is intended to showcase the nature of an innovative mass timber structure at both the street level and on the city skyline. The building mass is split around a central vertical core and lifted at the north street corner to create a double height daylight community space that showcases the building structure and brings together the main entrances into the retail, housing, and office spaces.

The project architects, LEVER Architecture, articulates a vision of utilizing CLT as part of a symbiotic cycle between natural resources and the rural industries that rely on these resources. Principal architect Thomas Robinson says, “Oregon produces an incredible amount of wood, and most of it is exported overseas. CLT provides an opportunity to leverage the value produced from rural communities into a sustainable building model in urban areas. This relationship completes and perpetuates a sustainable lifecycle.”

LEVER Architecture also designed the Albina Yard building, which is a 16,000-square-foot office building in North Portland on North Albina Avenue. The building is the first to use American-produced CLT as a building-
wide structural system. The wood materials create a building that exudes a natural, vibrant aura. “People like to be in wood buildings,” says Robinson. “They have character, and create healthy environments since fewer chemicals such as paint go into these types of buildings.”

Forest policy advocates based in Portland believe that CLT can provide a sustainable building material while reinvigorating rural forest production. Timm Locke of the Oregon Forest Resources Institute has long advocated for the sustainable environmental impacts of wood construction. He says that the net carbon emissions associated with producing a ton of softwood lumber is 33 kg carbon per metric ton. For comparison, a ton of recycled steel results in 220 kg carbon per metric ton and poured concrete is 265 kg carbon per metric ton. “Because of this huge discrepancy in embodied energy, the carbon savings from simply using wood instead of concrete as your primary building material can offset decades of emissions associated with the building’s operation,” says Locke.

In addition to the carbon-sink function that wood buildings provide, the material can have a positive impact on proper

Figure 3: Framework building rendering, Portland OR. Courtesy of LEVER Architecture
utilization of forest resources. Modern, scientific forestry is sustainable and subject to regulatory rigor. Harvested trees in the Pacific Northwest are required to be replanted, which increases the vitality of the forest.

CLT will play an important role in sustainable forest management because it can be manufactured using limited-value trees with diameters as small as four inches, including many dead trees. National forests on either side of the Cascades are filled with thin thickets of Western hemlock, Douglas fir and other trees that are conducive to wildfires and pest outbreaks. Harvesting thin trees is not normally economically feasible because they have so little value, and federal and state forest managers don’t have the budget to clear them. These lower-grade trees can be incorporated into CLT panels giving economic viability to at-risk forest materials. The composite nature of CLT panels provides an important outlet for these diseased or damaged lower-quality trees that otherwise present substantial forest fire risks.

D.R. Johnson Wood Innovations located in Riddle, Oregon, recently became the first manufacturer in the United States to receive certification from the American Plywood Association (APA) to produce cross-laminated timber. Instead of Oregon lumber being exported, "[T]he carbon savings from simply using wood instead of concrete as your primary building material can offset decades of emissions."
CLT constructed buildings can help keep materials in the local life cycle and decrease shipping costs.

Post-tensioned concrete is the most common structural system currently used for mid-rise commercial construction between approximately six and twelve stories tall. CLT construction is specialized and as a result requires primarily crane operators and carpenters, while post-tensioned concrete requires an array of workers to set the structural framework, lay the rebar and tensioning cables, and to pour the concrete. The CLT construction process is efficient due to the prefabricated timber panels, allowing a simpler, more efficient construction timeline. This will help alleviate a difficult labor issue commonly reported among developers in the Portland market: an increasingly limited supply of available construction workers to meet high construction demand in a booming development cycle. This highlights a labor mismatch in Oregon: while development firms in the Portland area struggle to fill construction jobs, rural Oregon continues to experience economic stagnation and high unemployment despite the overall thriving Oregon economy. CLT could potentially transfer the labor demand from the labor-constrained Portland market to desperately needed rural timber production jobs. Figure 5 shows that employment in logging and wood

Figure 5: Employment and timber harvest levels, Oregon, 1990-2015

Sources: Oregon Current Employment Statistics; Oregon Department of Forestry
Promoting CLT can create a linkage that addresses the growth in urban cities in a sustainable manner while reinvigorating rural areas with needed timber production jobs.

Cross-laminated timber presents a triple net solution to urban design, environmental, and housing affordability challenges. The planet benefits from the carbon sink of wood buildings while also promoting sustainable forest management. CLT also presents a social opportunity by promoting desperately needed rural timber production jobs. Finally, the pre-fabricated material addresses the needed profit margin in a capitalist real estate development industry by providing financial savings from reduced construction times. By merging the forest with the city, cross-laminated timber will play a key role in a sustainable, financially viable, and high-quality future built environment.

Figure 6: A logging truck near Brightenbush, Oregon. Courtesy of Wonderlane / Flickr
A strong regional economy, rising wages, and rapid population growth throughout the Portland region have driven rapidly increasing demand for housing. Housing development lagged the region’s economic recovery, as permitting activity fell to a 20-year low in 2009 and 2010, leading to acute shortages and rapidly rising rents and home prices as the economy recovered. Over the past few years, the housing market has responded and new housing, particularly multifamily housing, is coming online rapidly.

In this edition of the Periodic Atlas, we provide a glimpse of housing construction that has been permitted over the past few years, with a focus on multifamily housing. Focusing on recently-permitted units provides a perspective on how the newest housing is and will be different from existing housing. The type of housing that will be built, where it is built, its characteristics, and its price will shape the Portland region in the years to come.

To provide additional perspective, we examine where multifamily housing is being permitted in relation to fast growing population areas, and areas with the greatest concentration of people of color. Finally, we explore a few recently completed multifamily projects to provide a better understanding of the characteristics of multifamily projects coming on line.

We are drawing from a number of data sources in this Atlas, including Metro’s multifamily housing inventory (RLIS, November 2016), multifamily unit data gleaned from Clark County’s taxlot dataset, demographic data from the Census Bureau, and permit data from Construction Monitor. Although there are different sources of permit data with different strengths and weaknesses, they draw from the same source: the permitting offices of local jurisdictions. The Portland State University Population Research Center and the Institute of Portland Metropolitan Studies cleaned, checked, augmented, and geocoded the Construction Monitor raw data and joined it with the other data sources to create the maps in this version of Atlas.
Historical data show that over 90 percent of permitted projects are eventually completed, although the lag time varies from six to 18 months. Thus, many of the permitted units shown in these maps, which are from 2014 through October of 2016, have been completed; but at least 7,500 units in Clackamas, Washington, and Multnomah counties that have been permitted since 2014 had not been completed as of the date of the last multifamily inventory.

Density Downtown

Figure 1 shows all permits issued by city development departments for housing in January 2014 through October of 2016 in Clackamas, Multnomah, and Washington counties in Oregon, as well as Clark County in Washington. The dark blue areas indicate the most dense areas of multifamily permitting (150 units per square mile or greater). Blue rings show areas with less dense multifamily permitting. Yellow areas show dense single-family permitting, and the yellow rings show areas of less dense single family permitting. Scattered multifamily units are shown by red squares; scattered single family units are shown with grey squares.

The permitting pattern is as expected by any casual observer watching construction cranes rise in the region. The densest clusters of multifamily permits appear in close-in areas of Portland, in Washington Coun-

Permits Realized

As the market responds to demand from higher-income residents, vacancy rates may rise and rent increases may moderate as thousands of new units become available.

However, affordable projects, subsidized by programs such as the HELP grant program and the HOME Investment Partnerships Program, are also needed to serve lower-income families.

The following pages highlight examples of various multifamily apartment projects which have recently been completed.
LL Hawkins apartments at 1510 NW 21st Avenue were completed in 2015. This market-rate apartment development in the Slabtown neighborhood of Northwest Portland contains 113 units, with studio, one- and two-bedroom units. A two-bedroom two-bath unit rents for about $3,000 per month. Thus, a couple or family would need to earn a combined income of about $120,000 per year to consider this apartment affordable.

https://thellhawkins.com/
ty near Intel and Rock Creek, and in Bethany. There are also several clusters of multifamily permitting in Clark County, including Vancouver’s central city, and in the Bennington neighborhood near SE Mill Plain Blvd. and SE 164th Ave.

Dense permitting for single family units overlap the areas with the greatest multifamily density in areas such as Bethany, Hillsboro, and Happy Valley. Less dense clusters of single family units occur throughout the region, mostly outside of the urban core, where scattered infill is the only source of single family housing.

Figure 2 shows the number of permitted multifamily units by county and year. Keep in mind that 2016 is only partial-year data (January to October). The boom in permitting that began in 2014 followed a crash in newly-permitted units during the recession that left the housing pipeline nearly empty. Our comparison of these permit data with Metro’s latest multi-unit inventory shows that more than half of the housing units permitted since 2014 still have not yet been completed. Over 7,000 of the new units in the three counties that have been permitted since 2014 have not yet become available, with the greatest number in Multnomah County, where over 6,500 units have yet to be delivered to the market.

How does the location of these units compare with areas that have experienced strong population growth? And what do these permits tell us about where population growth will occur in the future?

A Growing City

Figure 3 shows the census tracts with the highest rates

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**Figure 2: Single and multifamily units permitted, 2014 - 2016**

<table>
<thead>
<tr>
<th>County</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>Total</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>Total</th>
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</thead>
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<td></td>
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<td></td>
<td></td>
<td></td>
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<td>1,735</td>
<td>1,353</td>
<td><strong>4,495</strong></td>
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<tr>
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<td>1,058</td>
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<td>3,815</td>
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<td><strong>8,640</strong></td>
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<tr>
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<td>1,652</td>
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<td>1,060</td>
<td>653</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
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<td><strong>5,961</strong></td>
<td><strong>5,360</strong></td>
<td><strong>14,209</strong></td>
<td><strong>2,944</strong></td>
<td><strong>6,316</strong></td>
<td><strong>5,007</strong></td>
<td><strong>14,267</strong></td>
</tr>
</tbody>
</table>

*Source: Construction Monitor, Metro Multifamily Inventory*
The D Street Salal apartments at 17101 SE Division were completed in 2015. The development by PHC Northwest was designed to fill the vast need for units affordable for families and individuals with lower incomes. “Mini” units rent for $495, and are therefore affordable to people with incomes of about $20,000 per year. The one-bedroom units rent for $719, and two-bedroom units are $859 per month. Thus, the two-bedroom units are affordable to families that earn about $34,000 per year.

Source: Construction Monitor, Inc., U.S. Census, Metro

https://www.phcnw.com/breakingbarriers/2015/10/19/a-home-of-their-own/
of population growth from 2010 to 2015 in relation to the permitted units. The areas with the greatest population growth are dark green. Some of these areas, Northwest Portland, the South Waterfront, Bethany, and Hillsboro show strong growth in the past as well as a concentration of permits that will lead to continued growth. Other areas with significant permitting activity but no significant population growth in the past five years will likely see significant increases in population as those units come on line and fill.

**Race to the Periphery**

Figure 4 shows the permitted units in relation to geographic areas with high concentrations of people in three racial or ethnic identities according to the U.S. Census: Asian, African American, and Hispanic/Latino. The Portland region as a whole is diversifying; from 2000 to 2010 the Hispanic population nearly doubled, the Asian population grew by 50 percent, and the African American population grew by about 35 percent. But the region in 2015 was still 74 percent white, and the map shows that people of color are concentrated in specific areas of the region, many of them on its periphery.

Some areas of racial or ethnic concentration—in particular the Asian areas in Washington County and the Latino areas of Beaverton—are experiencing significant new multifamily projects. There are also many new multifamily projects in the North Williams corridor, a traditionally African American area of Northeast Portland that has already experienced rapid and significant changes in its racial makeup. But most of the recent multifamily activity has occurred in areas that are mostly white.

As these new units come online, the region’s housing market may experience some relief from the rapid rent increases we’ve experienced over the past few years. According to Co-Star, vacancy rates in the region have returned to normal as the inventory has climbed. Whether the increased supply improves affordability depends on population and household growth in the region. We will continue to monitor changes in our population, housing, and economy to understand how these forces will shape our region.

In the Bethany area, one of the newest developments is West Parc at Bethany Village. The 149 units completed in 2015 include studio, one-bedroom, two-bedroom, and three-bedroom one-bedroom, two-bedroom and three-bedroom units, making them appropriate even for larger families. The three-bedroom units rent for from $1,700 to $2,700 per month, meaning that a family could afford the apartment with an income of between $68,000 and $108,000 per year.

http://www.westparcathethany.com/

The 15 West Apartments in Vancouver is a five-story affordable housing project with 120 one-, two-, or three-bedroom units. The income-restricted units are designed to be affordable to residents making no more than 60 percent of the area’s median income. Studio units cost $714; the largest one-bedroom unit is $754, a two-bedroom unit is $854, and a three-bedroom unit is $954.

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The 15 West Apartments in Vancouver is a five-story affordable housing project with 120 one-, two-, or three-bedroom units. Income-restricted units are designed to be affordable to residents making no more than 60 percent of the area’s median income. Studio units cost $714; the largest one-bedroom unit is $754, a two-bedroom is $903, and a three-bedroom unit is $1,040. Thus, a three-bedroom unit is affordable to families making $41,600 per year.

[http://www.gsl15west.com/](http://www.gsl15west.com/)
Women in the Trades:
An Interview with Connie Ashbrook and Nora Mullane

by Liza Morehead

Connie Ashbrook is the Executive Director and founder of Oregon Tradeswomen, Inc. Previous to her years with OTI, she worked in the trades for seventeen years as a dump truck driver, carpenter apprentice, and elevator constructor. She was the first woman in Oregon to become licensed as an elevator mechanic.

Nora Mullane has been a union journey-person carpenter, general contractor, building inspector, and City of Portland Bureau of Developments Services supervisor. Nora says that successfully completing her carpenter’s apprenticeship program has served her well throughout her entire career, and life in general, giving her confidence in her abilities and her self.

Liza: How did you first get involved in the trades?

Nora: I first started in the trades through a carpenters’ apprenticeship program in 1979, in Ohio. Came to Oregon and worked here in the apprenticeship program for about four and a half, five years. And within the Union for probably another four or five years following that and then went out on my own as a general contractor doing small remodeling projects and home additions.

Connie: That experience as a carpenter gave you the credentials to apply for the City jobs. And you were very influential as one of the first women to get into those positions.

Nora: When I started in my apprenticeship program in Ohio, I was the only one. They weren’t really sure what to do with me. When I came to Oregon, there were a couple of other women in the carpenters' apprenticeship program. My first job, which was working on the I-205 exchanges, big bridge work and construction and concrete form work for those…the big walls and the platforms and everything. There was one other woman on the job site. And it was wonderful, you know, that I had one other female face. I mostly did heavy construction and bridge work in my
program, because that was a lot of what union carpenters did out here. I worked on the KOIN building and a lot of bridge work which was really tough.

**Liza:** Physically difficult?

**Nora:** Physically very hard. The skills I learned during my apprenticeship program of getting on the job site and just doing what you had to do that day and forcing yourself to have confidence in yourself, helped me then be on my own working. And taking on new jobs that I’d never done before and saying, oh sure, I can do that. And then going home and quick-studying up whatever I could to figure out: how do I build a cabinet?

The work in the union and the heavy construction had a whole different set of challenges in terms of being alone, being in a male environment, having it be such hard work, physically, and for quite a while being in that alone setting. But then we organized, through a lot of Connie’s work and others…other women in the trades by a group called Oregon Tradeswomen Network, which became kind of this tremendous support, psychologically for going back out every day, even though you were in this, sometimes, not-friendly environment. But knowing that you were part of a larger community of women who were all trying to do this and make their way.

So then working on my own and knowing after a while in that kind of work that I couldn’t go through my entire work history as a carpenter. I worried about how my body would hold up. So then I applied for a job at the City of Portland and became a building inspector. And was a building inspector for quite a number of years before I went into management for the City. But then I was kind of in that same situation again of mostly in a male environment and working out in the field with mostly males, the contractors, almost exclusively. Again, having to kind of make my way. There were more women hired as inspectors. So eventually it didn’t feel quite so alone. There was one woman there before I was. So I had some sense of camaraderie.

**Liza:** As a woman, were the challenges significantly different when you were working in the field of construction than when you were working for the Bureau of Development Services?

**Nora:** I think the difference might have just been that the City was more subtle…in terms of my co-workers, because there was more oversight and more…I was part of the Union program there as well. And I think there was more education and care and support in that environment, but still people who did not like that I was there. I never felt so much difficulty out in the field, on the job site where I was doing the inspections. There was just a little bit more of it in the office environment.

In construction, it could be pretty blatant, unpleasant and scary, and bewildering. [I remember] multiple times someone saying to me, you are taking the job from a man. And when I was younger, I was bewildered by it. That didn’t make any sense to me. And I had to grow into a better understanding of gender inequity and struggle.

I did have terrific people too; lots of great folks that I worked with and was very appreciative of their willingness to be alongside of me.

**Liza:** Can you tell me a little bit about how you got started?

**Connie:** Very similar experience to Nora. 1979 or ’78. I didn’t go to college. I’d been working waiting tables. A friend of mine was going into a crane operator job. She suggested that I check out working in construction. I thought it sounded interesting. But I wasn’t sure if I could
operate heavy equipment. So she told me about a dump truck driving, pre-apprenticeship program that was going to be run by the Department of Labor. It was short-term, five weeks or so. I learned how to drive an off-the-road dump truck, and on the road too. I worked for about six months, maybe seven. Most of the time that I worked I was out in Eastern Oregon straightening out a section of Highway 26 between John Day and Vale. I’m a city girl. It was quite the experience to be in Eastern Oregon and living in a little, tiny campground in one of those campers that fit on the back of a pickup. It was wonderful and exciting and scary all at the same time.

I got laid off from that job. I’d gotten into this network of women who were working in the trades, just through word of mouth. I heard about another pre-apprenticeship program helping women learn to be carpenters. Like Nora, I worked on the I-205 interchange system, the I-205 to the airport. I still get a thrill when I go down this beautiful, curving off-ramp from I-205 to the airport. It was really exciting to see that come out of the dirt, from just flat dirt to all the pillars and the decking and the support systems and the barricades. I worked with my team to build all these wooden concrete forms that then were filled with concrete and paved with this bridge. I loved that part of it, to see the results of your work every day and to work with a team.

I had similar experiences with Nora with my team. They had mixed feelings. Sometimes they accepted me as a coworker, we enjoyed each other’s company, and we got things done. And we laughed and had fun. Other times they were bewildered and didn’t know what to do with me, or how to talk around me or act with me. So I was very lucky, I had a great foreman, Joe Cogan. He was tickled to have a woman apprentice. He liked to teach. I liked to learn. So it was a good match. He taught me as much as he could. The weird thing was that he started talking about how if two carpenters would get married they’d make a lot of money together. He just kind of… I believe he was teasing me. He knew that it made me uncomfortable to have him say these things. But anyway, it did make me…I didn’t know how to handle it. So I just kind of ignored it. But it did get to me after a while.

So then, the recession hit of the early 80s, like around ’81 or so. I had gotten laid off from the bridge. It was done, basically. So I enjoyed being laid off for a while. But then I was ready to go back to work and couldn’t find work. As carpenters at that time – it’s still true today – you get your work by going to a job site and asking the foreman to hire you. So this is a really scary process because you go to these huge jobs, you have to find the foreman and you have to ask them for work. You’re supposed to go there dressed for work, with all your tools with you and look like you’re ready to start right that minute. And you’re supposed to go early in the morning. So I did that to a lot of jobs. I kept being laughed at. I mean, Nora is tall. I’m very short. [chuckles] And so, I think they took her more seriously as somebody who could be a carpenter. I think they were not quite sure about me. I mean, there were plenty of small guys, my size, working as carpenters. But I’m 5’3”, 5’2” and a half, 5’3”. But just this image of this little woman coming on the job asking for work, they laughed at me. It was very discouraging.

So then a friend of mine… Again, this is very typical for construction, most jobs are gotten through word of mouth. So a friend told me about a job, it was similar to apprenticeship but not quite apprenticeship that was opening up in the elevator constructors. So I went and applied at the Union and applied at my company. So I had to do both. I had to be accepted by the union and accepted by my company. So if there were no apprentices on the out of work
list, then my company could choose somebody.

They had never hired a woman before and they were not sure about hiring me. The general manager said, well, we need to have a woman for our job because it’s federal money, so we’re considering you, but we’re not sure if you could do the work. One of us thinks you’re too small. So we went in the back of the shop area where they had these heavy…they called them rails that elevators ride on inside a building. Elevators are sort of like building a little train inside of a building and instead of going horizontal, it goes vertically. So it has tracks and wheels that hold the elevator on the tracks and a lot of machinery and motors. So we looked at these rails. I had been weightlifting. And so I knew I was strong enough to pick that up. I said, I’ll pick up this end if you pick up the other, because I was pretty sure that two people always lifted this thing, because it was a couple hundred pounds. They had suits on, and it was dirty and greasy. And so they said, no, no, that’s alright. We believe you. And they hired me. [All laugh] So I like to say I got my job because of affirmative action, but I kept it because I was good at it.

Connie: My first job as an elevator constructor was installing the elevators at the Justice Center, then I worked a year installing at the KOIN tower, and from there I went to the VA Hospital. Worked there for a year. And then I got into the service department. Two years after that I passed my mechanics exam and got my license. And then I had my own service route that went around the area servicing and repairing elevators and escalators. So my customers had to get used to me as a woman. They were good. They would say, oh good, the girl's here. Now it's going to be fixed right. That was very flattering. But we took turns doing trouble calls at night, if something broke down and had an emergency fix. So I still ran into maintenance department people or building owners that would look at me and were like, whoa. I'm not sure if she can…Can she really fix my equipment? They offered to carry my toolbox up the stairs. Because if the elevator is not working, you have to take the stairs up, however many stairs, to the mechanical room where the controls are. So I would laugh at them and I'd say, no. My one arm is longer than the other, so I have to carry it to even myself out. Just make some kind of silly joke.

Liza: What are the barriers that you see as the largest impediments to more women working in the trades? Has that changed over time?

Connie: It has changed. There’s triple the number of women than there were. It starts young with girls being told girls don’t do this. Then in middle and high school if you don’t take the math or the shop classes. And then if your neighbors and friends and family don’t think to say, oh hey, this is great summer job being a carpenter’s helper. It would be perfect for you. And so you accumulate those information, experiences and money that all positions you to take the next step and rise through the mostly invisible career ladder in the trades. It’s not something they teach in high school. They’re starting to teach more about apprenticeship. But most high school counselors and people that are providing career information will only know about college jobs and only teach about college jobs.

"My customers had to get used to me as a woman."
But we have seen a big difference. It helps a lot that the economy is better. During the recession women were laid off earlier and more often, and not hired more and dropped out more. Now that that recession is over and there’s a building boom, employers are really scrambling for women. At the same time, the people making hiring decisions, the foreman, superintendent, project managers, well, more of them are women. Women have risen through the ranks. More women have gone to engineering school. And they’re project engineers on construction sites. So they’re influencing their colleagues and also making hiring decisions. Most male construction workers have now worked with competent women construction workers. Not all. There’s still companies that refuse to hire women. But on most big jobs there’s at least a couple women that are great workers and great co-workers.

And men were raised by the feminists of the 70s. So many more men are accepting of women’s place in the workplace and authority and leadership and competence. At the same time, with Title 9 passing in 1972, more women got access to athletics where they could become physically strong and do those physically challenging things, so that they were more ready, physically, for the heavy construction work.

Liza: Oh, that’s a really interesting connection. I hadn’t thought about before.

Nora: That would totally be my story. Because I went to college Title 9 had just…Well, the first year, it wasn’t there. And the second year it was there. And I was on the rowing team. And it was the first time I really was like strong. It was like, wow, this is great. I love this. So the physical part of being in construction, I liked it. It was hard work. But I liked it. And I knew my body could do it. That was, really, a confidence builder.

You know, my own story about that was I had finished college but moved home afterwards. And I was sitting, looking, knowing I can’t just live at my parents’ house without doing something. So looking for work and saw the ad for the apprenticeship program. I didn’t have a clue, anything about it. And my dad came home from work that night and I said, so Dad, what do carpenters do on the job site? We kind of talked about it a little bit. And then I just said, is that something I could do? And he paused and said, yeah. Yeah, you could do that. And I, forever, am grateful to him to be open to the idea. Because it was really what then gave me huge confidence to go do the application process.

Liza: In closing, is there anything else that you would like to add or you would like to share with our readers?

Nora: My own regard for my work in the business was valuable and important to me, as a person. I like to think that other women have that opportunity, because it’s been a huge basis of who I am to have overcome obstacles, worked hard, accomplished big things and made friendships and relationships with people who initially weren’t sure what to do with me. And finding the good there was an important part of my life. And breaking down those barriers and having people know that anybody could do this job if they’re able to put some muscle. [And] the financial benefit of it and being covered by a Union that makes sure everybody is paid equally was huge…a huge thing when I was starting…all those years ago.

To read more from our interview with Connie Ashbrook and Nora Mullane visit our website https://www.pdx.edu/ims/metroscape
Overall Turnout

If you look at the percentage of eligible voters who turned out on November 8, you might think it was a down election year in Oregon. After all, only 78.7 percent of eligible voters cast a ballot. Of the 15 general elections over the past 30 years, Oregon has cracked 80% turnout five times, and the 2016 turnout only ranks 8th on the list. You would miss a bigger story, however, by focusing on turnout percentage versus raw vote total.

Largely due to Oregon’s new "motor voter" law[1], Oregon clocked its largest voter turnout in history at 1,979,048 votes cast. This exceeded the previous record turnout from the 2004 General Election by more than 127,000 votes cast. Certainly, some of the increase can be attributed to population growth in general, but with nearly 100,000 of this fall’s ballots coming from motor voter registrants, this new law cannot be ignored (Figure 1).

Oregon’s New Motor Voter Law

Starting January 1, 2016, Oregon began automatically registering eligible citizens to vote when they go to the DMV to apply for, renew, or replace a driver’s license, permit or ID card. With this new law, Oregon continues to be a leader in

the field of elections, becoming the first state in the nation to implement this system.

After being automatically registered at the DMV, new voters receive a postcard from the Oregon State Election Office giving them three options. If they do nothing, new voters are registered as non-affiliated voters. If they want to join a party, they can return a postcard indicating which party they want to affiliate with. Finally, if they wish to opt-out of registration, they can return a card to do that as well.

According to statewide data from the Oregon Secretary of State’s office, by the end of October, 269,630 new voters had been forwarded to county election offices. Of these, more than 244,000 maintained their registration and 25,112 opted out. The New York Times reported on December 2 that nearly 100,000 of these new registrants voted in the 2016 General Election.

As one might expect, the vast majority of new registrants (237,200) decided to do nothing after receiving notice from the Elections Division and remain non-affiliated voters. Of the 28,709 citizens who chose to affiliate with a party, the breakdown is:

- 50.4% Democratic Party
Thus, one of the main effects of the new motor voter law is to increase the percentage of Oregonians who are not registered with a political party. In December 2015, party breakdown looked like this:

- 38% Democratic Party
- 29.6% Republican Party
- 24.3% “Non-affiliated” with any party
- 5.1% Independent Party

With more than 237,000 added to the non-affiliated ranks, Oregon’s party breakdown now looks like this:

- 38.3% Democratic Party
- 28% Republican Party
- 26.6% “Non-affiliated” with any party
- 4.6% Independent Party

One of the most interesting numbers from year one of motor voter is how many people opted out of being registered to vote. As noted above, 25,112 (8.3%) of automatic registrants chose to return the postcard and not be registered to vote. This number will be interesting to track over time as Oregon continues to automatically register people to vote.

Why are people opting out? Christopher Shortell, associate professor of political science at Portland State University, suggests it could be several factors including a statement against the law itself, a fear of the government tracking citizens, or religious reasons.

“Or some combination of those factors or others,” Shortell said. “It is definitely something to watch.”

Metroscape also asked both Governor Kate Brown’s office and the Secretary of State’s office if they had any thoughts on why so many citizens opted out of being registered to vote. Neither office wanted to speculate.

“Governor Brown is not judgmental about why someone would opt out,” said her communication director, Kristen Grainger. “She believes Oregon has the best policy, which errs on the side of participation, and assumes eligible voters should be registered unless they indicate otherwise, and respect their right to opt out.”
“We don’t question people’s motives, we merely respect their right to opt out of the process,” said Molly Woon, communications director for Secretary of State Jeanne Atkins, who oversaw the implementation of the law and first year of the program. “I imagine that there is testimony from when the bill was heard in 2014 and 2015 from people not wanting to be on a voter list, those with religious exemptions, or people concerned with personal autonomy, etc. But we don’t require a reason, nor do we keep track of reasons, for opting out of the process. We simply respect people’s wishes.”

Drama in the Presidential Election, Not As Much Down the Ballot

While the national presidential election provided a measure of excitement and surprise, down the ballot in Oregon and Washington things remained status quo for the most part. In Congress, like the rest of the country, voters in Oregon and Washington returned all of their congressional representatives as well as US Senators, up for reelection or replaced them in open seats with members of the same party. Nationally, of the 466 races for seats in the US Senate and House, 445 of them were retained by the same party.

The exception to the status quo was Oregon’s secretary of state race, where Republican Dennis Richardson broke the Democratic Party’s 10 year hold on statewide offices by winning the race.

Despite the relative sameness of these results, there are interesting numbers to

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**Figure 4**

*How Red did Your Precinct Go?*

2016 Oregon Secretary of State Election Results By Precinct

- Red: Both Trump and Richardson
- Pink: Richardson Only
- Gray: Neither

*Election data courtesy of Clackamas, Columbia, Multnomah, Washington, and Yamhill counties.*
look at within the counties Metroscape examines. Figure 2 breaks down results for president, governor and secretary of state for major party candidates in Oregon.

Four out of five of the counties examined voted for the same party across the three races. The exception is Clackamas County, which went Republican for governor and secretary of state but voted Democratic in the race for president.

Looking more closely at the percentages for candidates in each race, Trump underperformed his fellow Republican candidates in four of the five counties examined. The exception is Columbia County where he received the same percentage of votes as Pierce did for governor. In fact, in the raw votes Trump did better, receiving 13,217 votes to Pierce’s 12,925. Everywhere else, the Republican candidates for governor and secretary of state did better than Trump. This indicates that a number of voters either voted for a non-Republican candidate for president or did not vote in that race (Figure 4).

This is most apparent in is Clackamas county where Richardson won but Trump lost. Richardson won his race with about 17,500 more votes than the total Trump received for president. Multnomah County also provides a good example, where Richardson received about 35,000 more votes than Trump.

In Oregon, Richardson’s win in the race for secretary of state was perhaps the most surprising. His success was even reflected in Multnomah and Washington counties which he lost. In both counties, Richardson lost by a smaller amount compared to the other two races analyzed. In the same manner, his win in the counties that voted straight Republican was also wider. What cannot be discerned merely from looking at the numbers is how much of this difference, and that described above relating to the Trump vote, is due to pro-Richardson sentiment versus anti-Avakian votes. As Figure 2 indicates, Avakian underperformed his fellow Democratic candidates in all five counties.

In Washington, weakness at the top of the Republican ticket was also demonstrated via results in Clark and Skamania counties. As Figure 3 indicates, Republican gubernatorial candidate Bill
Bryant won both counties. In the race for president, however, Hillary Clinton won Clark County by a razor-thin margin.

Looking Ahead

It will be interesting to keep an eye on Oregon’s motor voter law to see if it continues to sign up as many new voters and what those voters choose to do in terms of party affiliation. One big question that needs further analysis is what to make of the more than 25,000 Oregonians who opted out of being registered to vote. Why do these citizens make the effort to unregister to vote? Finally, Oregon Governor Kate Brown is up for reelection in 2018, since this year’s contest was just to fill out the remainder of John Kitzhaber’s term. Have Republicans identified a campaign model based on Dennis Richardson’s success that might make them competitive in the 2018 gubernatorial contest?

Jessica Sammin Liedtke’s son helped his mom prepare her ballot.

Kevin Curry is completing a doctorate in public affairs and policy at Portland State University’s Hatfield School of Government. He is the director of integrated media at Linfield College, where he also teaches communication courses.

The Jordan family poses with their completed ballots.
Across the region, the average wage per job as a percentage of the US Metro Wage per Job has been increasing since 2013. In 2015, the average wage per job in the Portland-Vancouver-Hillsboro MSA was 107 percent of the average wage per job in the Metro United States. However, of the region’s seven counties, just two have an average wage per job higher than the US Metro average wage ($55,102): Multnomah County ($54,393) and Washington County ($57,057). Skamania County has consistently had the lowest average wage, just 71% of the US Metro in 2015.

To learn more visit http://portlandpulse.org/average_wage_per_job

**Portland MSA average wage as a percentage of the US metro average wage, 2001 - 2015**

*Source: Bureau of Economic Analysis, Table CA30*
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