



JOHNSON REID
LAND USE ECONOMICS

**ECONOMIC OPPORTUNITIES ANALYSIS
& LONG-TERM URBAN
LAND NEEDS ASSESSMENT**

Prepared For:
CITY OF CORNELIUS, OREGON

July 31, 2009





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TABLE OF CONTENTS

STATEMENT OF PURPOSE	1
URBAN LAND NEED ANALYSIS	1
TRENDS ANALYSIS	2
NATIONAL ECONOMIC TRENDS	3
STATE & REGIONAL TRENDS	6
STATE & REGIONAL INDUSTRY CLUSTER TRENDS	8
TWENTY-YEAR EMPLOYMENT FORECAST	15
TWENTY-YEAR EMPLOYMENT LAND NEEDS ANALYSIS	21
SUMMARY OF COMMERCIAL AND INDUSTRIAL LAND NEED FINDINGS	21
INDUSTRIAL AND OFFICE LAND NEED METHODOLOGY	23
RETAIL COMMERCIAL LAND METHODOLOGY	24
TWENTY-YEAR EMPLOYMENT LAND DEMAND SITE QUALITIES	27
QUALITATIVE SITE REQUIREMENTS BY DESIGNATION & USE	27
PROJECTED NUMBER OF SITES DEMANDED	37
PROJECTED GROSS ACREAGE NEED BY SITE QUALITY	39
FIFTY-YEAR ECONOMIC OPPORTUNITIES ANALYSIS	42
50-YEAR ECONOMIC FORECASTING ISSUES	42
50-YEAR ECONOMIC OPPORTUNITIES ANALYSIS METHODOLOGY	42
2060 CORNELIUS POTENTIAL EMPLOYMENT FORECAST	44
2060 CORNELIUS POTENTIAL EMPLOYMENT LAND DEMAND	47
2060 EMPLOYMENT LAND DEMAND & SUPPLY RECONCILIATION	48
TWENTY-YEAR AND FIFTY-YEAR HOUSING NEED FORECAST	50
CURRENT HOUSING NEEDS	50
FUTURE HOUSING NEEDS (2035)	53
FUTURE HOUSING NEEDS (2060)	56
20-YEAR AND 50-YEAR HOUSING LAND NEEDS ANALYSIS	59
CURRENT RESIDENTIAL LANDS	59
FUTURE RESIDENTIAL LAND NEED (2035)	60
FUTURE RESIDENTIAL LAND NEED (2060)	61



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STATEMENT OF PURPOSE

INTRODUCTION

The City of Cornelius, along with all other jurisdictions in Washington County, Oregon, is currently undertaking the State-mandated process of analyzing and planning 50-Year Urban and Rural Reserve designations for lands proximate, but outside of the present Portland metropolitan area Urban Growth Boundary.

As part of this effort, the City of Cornelius retained JOHNSON REID to provide research and analysis of potential urban growth scenarios with which the City may consider urban reserves needs over the fifty-year planning period. Several economic and planning issues indicated need for independent land need analysis over the planning horizon. These include:

- The adequacy of existing, available lands suitable for target industry uses within the current Urban Growth Boundary;
- The magnitude and type of residential land needs to support growing Cornelius industries and agglomerated clusters in the context of a well-documented shortage of residential land within the City;
- The nature of commercial land need driven by new industry and population growth affected by primary industry and workforce growth over the planning horizons;
- Characterization of growth potential in the context of the physical and infrastructure qualities of lands within Urban Reserve consideration for the City; *and*
- Determination of the ability of Cornelius to accommodate economic growth potential and how sub-regional coordination with the Cities of Hillsboro, Forest Grove, North Plains and Banks may affect or enhance long-term high-tech industry growth in Washington County and the State of Oregon in general.

URBAN LAND NEED ANALYSIS

To document the potential nature of urban lands required by the City of Cornelius over a twenty-year period and a fifty-year period, JOHNSON REID formally utilized a methodology for long-range land need substantiation consistent with State of Oregon land use planning requirements. Specifically, employment land demand consistent with State Planning Goal 9 Economic Opportunities Analysis ("EOA") methodology and documentation requirements, as well as residential land demand consistent with State Planning Goal 10 methodology and documentation requirements was used in this analysis.

GOAL 9 – CORNELIUS EMPLOYMENT LAND

The State Planning Goal 9 EOA methodology guidelines call for a six-step approach to economic development planning and resulting quantification of employment (industrial, retail, office, institutional, etc.) land need for urban growth boundary planning purposes. These six steps largely guide this resulting analysis of City of Cornelius' need for urbanized land. The required Goal 9 analytical steps that roughly comprise the outline of this document are:

1. *Economic Planning Area Definition:* A determination of the geography of interest for 20-year and 50-year economic development potential, included as an appendix in this study.
2. *Economic Trends Analysis:* Identification of global, national, state, regional and local economic trends that have shaped recent economic performance as well as likely 20-year economic activity that will determine employment land need over the duration of the study period.



3. *Public/Stakeholder Input Process:* Outreach for this effort was limited to key Economic Stakeholders identified as being able to provide targeted, existing and emerging industry perspective.
4. *Industry & Job Growth Forecasts:* Detailed forecasts of job growth by industry within Cornelius over the planning period that will in turn drive demand, if any, for different employment land categories.
5. *Land Need Forecasts:* Job growth forecasts translated into land demand forecasts based on industry and space type usage and floor area ratio (FAR) patterns anticipated into the future.
6. *Land/Parcel Need Quality:* A detailed treatment of employment land need in terms of specific parcel types, sizes, quantities and other qualities appropriate to economic growth anticipated by the jurisdiction.

GOAL 10 – CORNELIUS RESIDENTIAL LAND NEED

In addition to providing estimates of residential land and residential unit demand characteristics over the 20-year and 50-year planning horizons consistent with State Planning Goal 10 documentation requirements, JOHNSON REID modeled residential land need as a direct, interactive function of economic opportunities analysis and resulting employment forecasts.

TRENDS ANALYSIS

INTRODUCTION

The Trend Analysis section provides the foundation of economic information that will shape realizable economic opportunity potential for a jurisdiction, resulting potential job growth scenarios, and ultimately employment land need over the determined planning horizon.

In conducting the Trend Analysis, it is underscored that during the course of analysis, economic circumstances at the global, national, state and local levels have significantly shifted and continue to do so significantly at the publication date of this document. Through March of 2008 and since, the economy has experienced the following:

- New Presidential administration and significant changes in federal economic policies, including in response to economic distress of recent months;
- Numerous federal bail-out proposals and agreements for numerous financial institutions and U.S. automakers;
- Continued credit crisis in the financial markets due to the uncertain future of “toxic” financial assets that include billions of dollars in “sub-prime” mortgages;
- A return of the Dow Jones Industrial Average to pre-1998 levels; and
- A fourth quarter 2008 drop in U.S. GDP of 6.2%, the worst since the severe 1980-82 U.S. recession.

Alternatively, the Federal government passed an unprecedented \$850 billion stimulus bill meant to help create jobs with targeted infrastructure investments, state and local government budget stop-gaps, and various tax credits and investment incentives for housing, alternative energy and numerous other targeted industries and economic activities nationwide.

Ultimately, current economic times make it virtually impossible to produce a highly timely national trend analysis. JOHNSON REID, therefore, has continued to utilize the economic forecast “of record” by the federal government, the non-partisan Congressional Budget Office biannual economic forecast. As that official forecast makes clear, economic times are uncertain, but Trend Analysis consistent with its findings – even those that have changed in only a few months – is preferable to constantly shifting speculation. Where appropriate, changes to economic performance or expectations have been updated for accuracy.



NATIONAL ECONOMIC TRENDS

SHORT-TERM OUTLOOK

Economic turbulence is likely to remain in the national economy in the near-term. The decline in housing prices has contributed both to slower consumer spending growth and a sharp falloff in residential construction activity. The effect of falling home values, slow real income growth, and a sputtering economy will delay the recovery in housing construction until late 2009 as excess inventory is drawn down.

Foreclosures and delinquencies have created large losses for many financial institutions and holders of mortgage backed securities, thereby reducing capital value and limiting banks' ability to support new lending. As a result, a climate of risk aversion has emerged in financial markets, as banks are tightening credit standards for new loans, not only for residential mortgages and consumer loans, but also for business loans, such as those for commercial real estate and industrial loans. Additionally, interbank lending has come to a halt, compounding liquidity problems among wavering banks, with the spread between the Federal Funds Rate and the 3-month LIBOR skyrocketing. However, the Federal government's financial bailout plan includes elements to foster liquidity, and the LIBOR has since fallen sharply, although Fed rate cuts have kept the spread high. Ultimately, lingering weakness in the housing market may lead to additional mortgage losses, forcing lenders to markedly curtail the availability of credit. If realized, this effect will delay the pace of economic recovery.

FIGURE 1: HOUSING STARTS

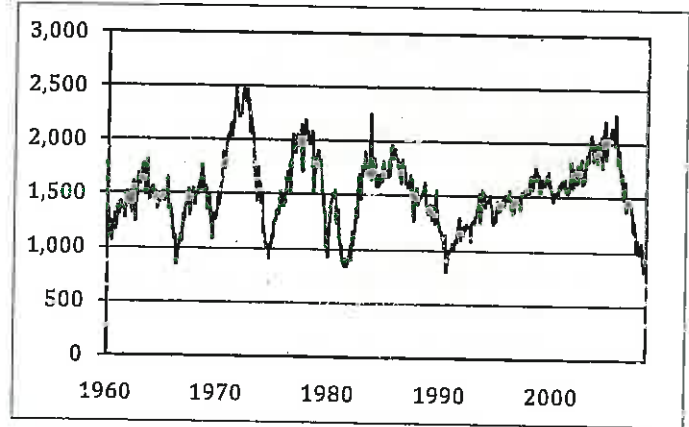
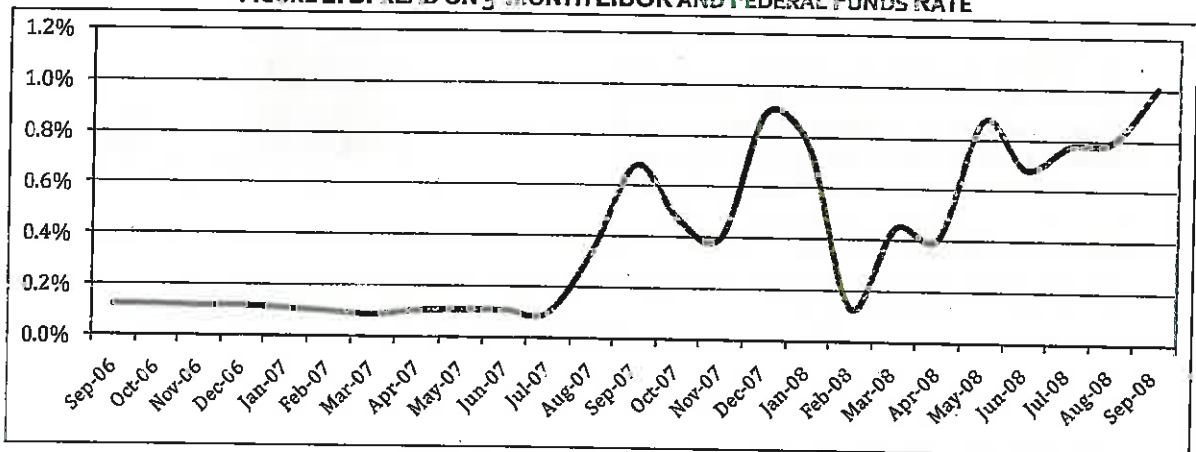


FIGURE 2: SPREAD ON 3-MONTH LIBOR AND FEDERAL FUNDS RATE



In addition to woes in the housing market, rising food and energy prices have seen notable escalation in recent years, further limiting real purchasing power and putting upward pressure on consumer prices. The higher price of agricultural products has had a smaller effect on the economy than oil, but the increased cost of food has constrained non-food spending. To many, the extent of the rise in agricultural food prices was unexpected. As with oil, a steady increase in global demand played a key role in the run-up. Supply shocks as a result of poor weather (in the case of wheat) and rising demand for biofuel feedstocks also drove agricultural prices.

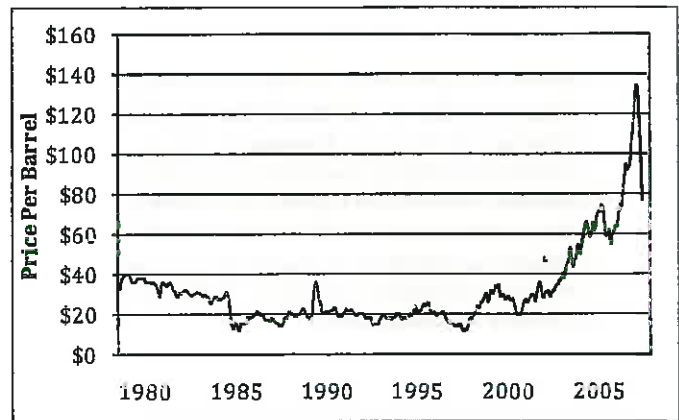
Nevertheless, energy and commodity prices are not likely to lead to persistently high inflation similar to the 1970's. During the 1970s large price hikes for commodities and import goods triggered higher inflation by igniting a wage-price spiral in which an initial price shock sets off higher wage growth. However, measures of wages and salaries from the BLS have not yet provided evidence that higher prices are affecting wages. Moreover, unlike the 1970s, the



Federal Reserve is far more likely to utilize monetary influence to prevent such an outcome from transpiring. As a result, we find that Inflation in both food and energy is likely to abate in the near term. The price of oil has fallen sharply since July 2008 and strong global harvests are likely to push food commodity prices lower. Prices for corn, wheat, and soybeans have already begun this trend. Additionally, slowing global economic growth is likely to curb demand for both food and energy in the near-term.

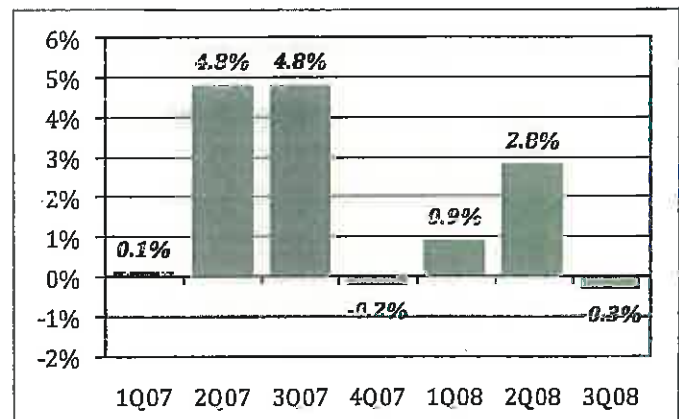
The trade-weighted value of the U.S. dollar has been in decline since 2002. More recently, from July 2007 to March 2008 the U.S. dollar fell at an even more accelerated pace. This rapid fall was primarily a response to easing monetary policy both domestic and foreign, in addition to the Chinese Government's decision to allow the Chinese currency to appreciate more rapidly against the dollar than in the past. All together, Real GDP among the United States' major trading partners will grow more slowly, but still faster, on average, than Real GDP in the United States in the near-term. However, exports, which have been a rare bright spot in the economy in 2008, will likely fall off markedly in 2009 on declining global demand and a strengthening dollar.

FIGURE 3: CRUDE OIL PRICE



Taken together, the United States economy is thought to be roughly halfway through an extended period of slow economic growth. Preliminary estimates for the 3rd quarter of 2008 indicate a second of the last four periods posting negative economic growth. It is widely anticipated that the 4th quarter of 2008 will also be negative, marking two consecutive quarters of negative GDP growth and classifying the current cycle as recessionary under a standard rule of thumb. It is forecasted that Real GDP growth will average around an annual rate of 1% through the end of 2009 before recovery takes form in 2010. Employment growth is expected to remain weak through much of 2009, keeping unemployment measurably above 6% in the near-term. Anticipated near-term weakness in the economy is likely to further dampen spending by households, businesses, and State/Local governments. A sustained fall in the revenues of state and local governments as a result of the weak economy is likely to force spending cutbacks in that sector in coming years.

FIGURE 4: GDP GROWTH



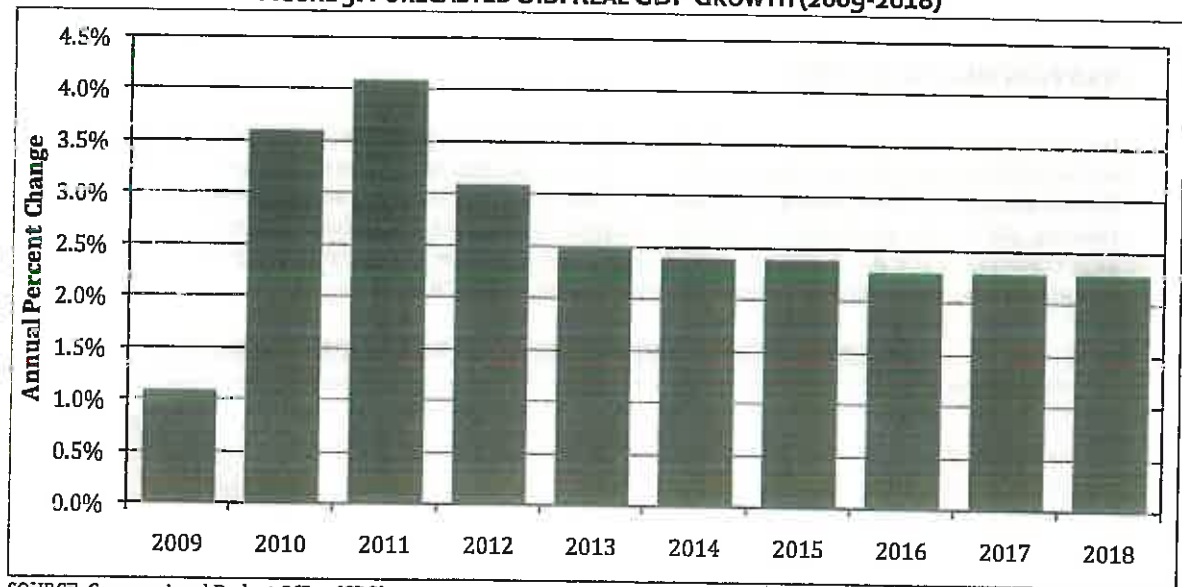
Concerns remain that the economy's current challenges—falling housing prices, problems in financial markets, and high input prices could cause the current downturn to be deeper and more pronounced than recent recessionary periods. Many experts predict the current downturn to resemble that witnessed during 1990-91 recession. The economic outlook could deteriorate even further if many banks become insolvent or if the financial crisis spreads more widely to global financial markets. However, it appears that global coordinated efforts among central bankers and governments to foster stability in the financial sector have successfully abated structural failures of the financial system.



LONG-TERM OUTLOOK

Beyond the near-term, the United States economy is expected to return to a typical growth cycle, averaging 2.7% annual GDP growth from 2010 to 2018—slightly faster than potential GDP, which will average 2.4% over the same interval. The widened gap between real GDP and its potential level created as a result of slow growth in 2008 and 2009 will be narrowed by accelerated growth from 2010 to 2012. Beyond 2012 real output is expected to grow at the same pace, on average, as potential GDP through 2018—keeping the output gap proximate to zero.

FIGURE 5: FORECASTED U.S. REAL GDP GROWTH (2009-2018)



SOURCE: Congressional Budget Office (CBO)

Nationally, employment is expected to grow at an average annual rate of 0.7% from 2010 to 2018, indicating further increase in worker productivity on the horizon. Over the long-term, the inflation rate will largely be determined by monetary policy decisions, specifically, that the Federal Reserve can, on average, maintain core inflation (as measured by the PCE price index) around 2% through 2018. Consumer inflation, as measured by the CPI-U is expected to average 2.2% annually over the same interval.

In the coming growth cycle, the United States' commitment to renewable energy transition is expected to play a major role, a reality that is likely to garner greater political support following the outcome of the 2008 election cycle. In addition to environmental concerns, growth in domestic energy production—through both renewable and non-renewable sources, is being increasingly discussed through the prism of energy independence and energy security—the foundation of which is sufficient, reliable, and affordable energy. The economic advantages of this transition encompass the macroeconomic benefits of investment in new technologies, greater economic productivity, and improvements in the U.S. balance of trade. At a microeconomic level, benefits include lower business costs and reduced household energy expenditures. Taken together, these advantages are manifested in job growth, income growth, and ancillary benefits to the environment.

Over the next ten years, green industries are expected to create over 2.5 million new jobs in the United States across a range of manufacturing and service industries. Over a longer 30-year horizon, forecasted job growth is expected to reach 4.2 million new jobs in the U.S. economy.



FIGURE 6: POTENTIAL NEW GREEN JOBS, (2008-2038)

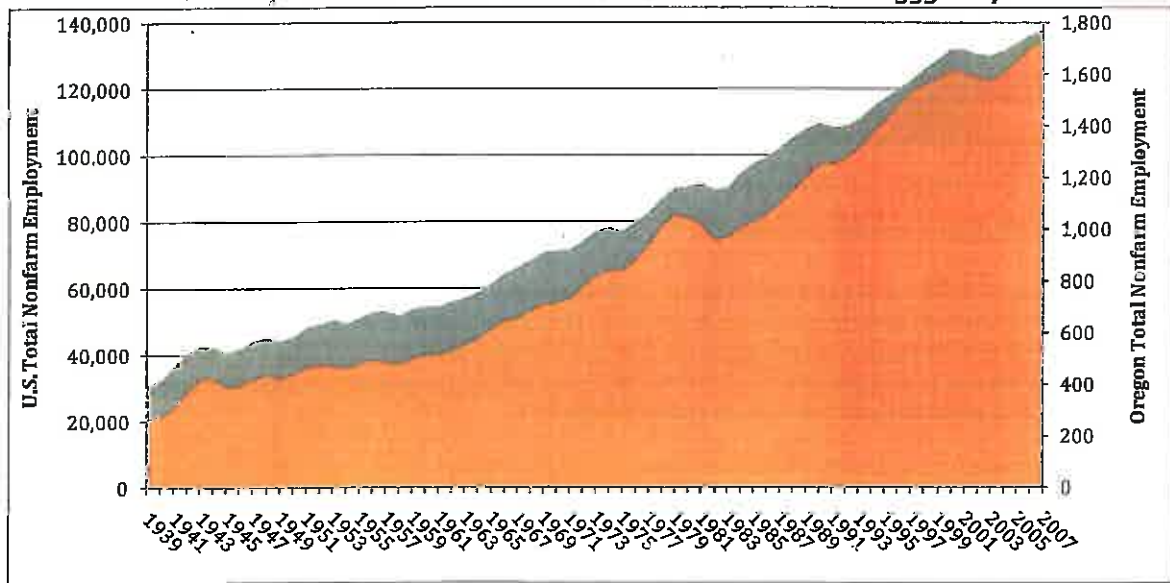
	2018	2028	2038
Renewable Power generation	407,200	802,000	1,236,800
Residential & Commercial Retrofitting	81,000	81,000	81,000
Renewable Transportation Fuels	1,205,700	1,437,700	1,492,000
Engineering, Legal, Research, & Consulting	846,900	1,160,300	1,404,900
TOTAL	2,540,800	3,481,000	4,214,700

SOURCE: Global Insight

STATE & REGIONAL TRENDS

Oregon experienced exceptional employment growth between mid-2003 until 2007. Growth began slowing towards the end of 2006 and continued through 2007. The Oregon Employment Department's employment decline estimates for second quarter 2008 indicate that Oregon is following the U.S. economy into a slowdown. Figure 7 demonstrates how closely tied the Oregon economy is to economic trends at the national level. Since 1939, Oregon has tracked the peaks and valleys of the U.S. economy. Also illustrated is improved diversity in Oregon's economy as evidenced by alleviation of the volatility that plagued Oregon during the 1980's recession.

FIGURE 7: U.S. AND OREGON HISTORICAL EMPLOYMENT TREND: 1939-2007



The sectors contributing to job decline in Oregon are roughly parallel to sectors dragging down the U.S. economy, namely Construction, Manufacturing, Retail Trade, Information, Financial Activities and Leisure & Hospitality. Considering the turmoil and uncertainty in the financial markets at the National level, it is not surprising that employment across all sectors is forecasted to decline through the end of 2009. The Oregon Office of Economic Analysis (OEA) reports a jobs decline of 6.8% (2.5% year-over-year) during the fourth quarter of 2008. OEA projections for 2009 indicate an overall decline of 4.3% for the year with growth of 0.1% expected in 2010 as job losses stabilize. First and second quarters 2009 are expected to see job declines of 7.2% and 3.6%, respectively.¹

The computer and electronics equipment sector declined by 4.5%, or nearly 39,000 jobs during 2008. OEA forecasts further declines of about 10.9% in 2009. The sector is expected to rebound with jobs gains by 2010. Private education and health services, on the other hand, gained jobs at a rate of 3.9% during 2008 and is expected to experience 3.0% growth during 2009.

¹ Oregon Office of Economic Analysis, Economic and Revenue Forecast, Vol. 29, No. 1, March 2009.



The Portland Metro area's job growth has been slowing since second quarter 2006 and estimates for the fourth quarter 2008 show job decline of 1.9%. The current weakness is largely due to the housing slowdown and its impact on construction which has rippled through to finance and other closely related sectors, such as wood products. In addition, high-tech manufacturers have been shedding workers with Washington County leading the decline—the County has lost 5% of its high-tech employment since mid-2007.

Oregon's economic growth since 2005 is due in large part to explosive growth in exports. For example, between first quarter 2007 and first quarter 2008, Oregon exports increased by 23.7%, more than six points higher than the U.S. growth during the same period. Oregon's export growth is primarily due to export growth in agricultural products which grew by 82.2% and computer and electronics products which grew by 24.8%. Computer and electronics account for nearly 40% of total Oregon exports. Several other industries experienced high growth in exports during the same period: Waste and Scrap (+71.6%), Nonmetallic Mineral Products (+54.0%), Chemicals (+47.6%), Primary Metal Manufacturing (+31.0%), Miscellaneous Manufactured Commodities (+26.0%) and Wood Products (+23.8%).

STATE & REGIONAL OUTLOOK

Moving beyond 2010, the assumed year by which the economy pulls out of the current slowdown, Oregon's economic growth is expected to outpace growth at the National level. By 2016, the State's employment is expected to grow by 14%. Oregon's high growth prospects are due to a number of factors:

- Population growth, primarily due to net in-migration
- Relative location near Canada and Asian countries
- High commodity prices
- Export growth
- Affordable housing
- Quality of life
- Some of the lowest business costs in the nation

In addition to the factors listed above are several State initiatives which may continue to change Oregon's economic landscape and drive growth in key sectors. The Oregon Innovation Council designed these initiatives as part of the 2007 Innovation Plan. Listed below, these initiatives are aimed at addressing key issues which have limited Oregon's ability to capture early stage and emerging industries in the past. For example, Oregon has lacked both "angels", investors who provide funding at the earliest stages of development, and venture capital firms. While Oregon has been closing the gap, venture capital funding is available at substantially greater levels in California and Washington. Further, Oregon has not had a strong research university and more importantly has not had strong collaboration between universities and private companies. Lastly, in many emerging industries Oregon has not had a critical mass or cluster of firms by which to attract similar companies or the management and technical workforce with the necessary experience. As mentioned above, the State initiatives below hope to address these critical vulnerabilities.

- **Manufacturing Competitiveness** - In the 2007 Oregon Innovation Plan, the Oregon Innovation Council proposed a State investment of \$5.37 million between 2007-2009 to expand workforce training programs and the Oregon University System's ability to enhance manufacturing industry innovation through equipment, top-notch faculty and partnerships with Oregon companies. As of the 2008 Oregon Business Plan Annual report, \$2.872 million had been invested into this initiative.
- **Innovation Accelerator Fund** - This plan calls for \$5 million to be invested in the "cultivation" of innovative ideas which arise every year from established and emerging firms, entrepreneurs and academic institutions.
- **Oregon Nanoscience and Microtechnology Institute (ONAMI)** - This proposal recommends an additional \$10 million investment between 2007-2009 for the continued support of this public-private partnership between the State's top public universities and leading Oregon high-technology companies. In addition to creating jobs and allowing Oregon to recruit talented researchers, already the State is realizing sizeable returns from ONAMI as technologies are transferred to the marketplace. To date an additional \$9 million has been invested into ONAMI.



- **Oregon Translational Research and Drug Development Institute (OTRADI)** - This public-private partnership seeks to support health care and biomedical research in the State by focusing on drug research and development for the treatment of infectious diseases which will feed into a separate accelerator intended to support commercialization of products by Oregon companies. The State has invested \$5.25 million to date.
- **Bio-Economy and Sustainable Technologies (BEST) Center** - This public-private partnership intends to research and develop innovations related to bio-based technology, green buildings and clean energy. BEST is intended to enhance Oregon's competitive advantage in the growing "green" industry sector. To date, \$2.5 million has been invested.
- **Senate Bill 582** - The first of two Oregon Senate bills intended to promote innovation and emerging industry in the State, Senate Bill 582 increased the amount of allowable contributable funds University's may accept in order to establish the University Venture Development Fund. The Fund supports entrepreneurial training, education, research and startup companies.
- **Senate Bill 579** - Senate Bill 579 expanded the authority of the Oregon Growth Account allowing the Board to investment in emerging firms in early stages of development. In essence, the Senate Bill promotes growth in key target industries by providing early stage funding.
- **Transportation/Infrastructure** - Lastly are initiatives at the State and regional level to improve the State's transportation infrastructure including port districts, rail lines and airports. Included in this are highway expansion plans. Widening of Highway 217 has been approved by Metro and expansion plans are on-going for Highway 26.

STATE & REGIONAL INDUSTRY CLUSTER TRENDS

HIGH TECH²

Oregon's high tech cluster was formed during the 1990s and experienced rapid growth until 2000. The industry employed just under 40,000 people in 1990 and by 2001 employed nearly 70,000 people. Following the dotcom era, the cluster went through a period of steep decline, shedding more than 10,000 jobs. However, since 2003 the cluster has shown moderate growth to reach a total employment of 57,900 people as of mid-2008.

Computer and electronics manufacturing accounts for a 69% share of the State's high tech cluster. Nearly 66% of State employment in the sector is located in Washington County. In addition, the semi-conductor manufacturing sector is a predominant driver—accounting for three-quarters of total sector employment. Moreover, the computer and electronics manufacturing sector is characterized by relatively high wages. In 2007, the average wage per worker in the sector was \$88,222—more than double the \$39,566 Statewide average wage for all workers. The average wage for computer and electronics manufacturing workers in Washington County was \$98,068.

Systems design accounts for 16% of total State high tech employment or 9,200 jobs. Job growth in systems design is down nearly 20% from its 2001 high. Similar to computer and electronics manufacturing, the sector enjoys a relatively high average wage per worker of \$75,838. The third sector in the high tech cluster is software publishing. Unlike the computer and electronics manufacturing and systems design, it grew by 12.3% in 2007 after declining by a relatively negligible 1.1% between 2001 and 2006. It has a State high tech employment share of 15% or 9,100 employees. The sector's average wage per worker is \$89,910.

The OED outlook for high tech is mixed. While computer and electronics manufacturing is expected decline by approximately 3% by 2016, systems design and software publishing are expected to grow by 14% and 18%,

² Unless otherwise cited, data in this section is from the Oregon Employment Department.



respectively. JOHNSON REID's analysis of the outlook for high tech in Washington County departs from OED's forecasts due in part to the indirect impacts of solar manufacturing in the region, as well as the outlook of major employers in the area. Regionally, Intel, a bellwether for high tech activity in the area has indicated that their capacity for two additional fabs at their Ronler Acres facility will most likely come online during the next 20 years.

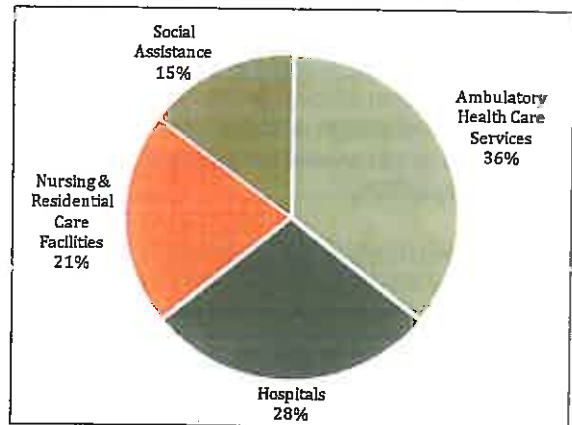
HEALTH CARE³

Oregon's health care industry has shown astounding growth during the last 13 years, adding 61,000 employees or 51.2%. It has grown to be counted among Oregon's largest sectors—capturing an 11.5% share of employment—roughly similar to Manufacturing, Retail Trade and Professional & Business Services. The projected Health Care sector employment gains of 51,300 employees (+29%) through 2016 far exceed statewide projections of 14% or projections for any other occupational group (the next largest group is Other Services, projected to grow by 19%). Of the sector's included within Health Care: Ambulatory Health Care Services is projected to grow by 35%; Nursing and Residential Care Facilities by 30%; Hospitals by 26% and Social Assistance by 19%. Much of the expected growth in Health Care is driven by demographic changes as the U.S. population age 65 and older is expected to grow by 50% by 2020 and close to 125% by 2050.

The current composition of Oregon's health care industry is shown in Figure 8. Ambulatory Health Care Services has an average annual salary of \$53,803 and Hospitals, \$49,942. The second two sectors have significantly lower annual wages: \$22,193 for Nursing and Residential Care Facilities and \$20,658 for Social Assistance.

Washington County has the second largest share of health care in the State as measured by employment. Multnomah County accounts for nearly 26.7% while Washington County accounts for 11.7% or 21,166 employees. Ambulatory and Health Care Services accounts for about 44% of Washington County's health care industry. The Oregon Employment Department projects a gain of 18,500 health care workers by 2016 in Washington and Multnomah Counties. In Cornelius, the industry has remained stable over the past five years, with negligible change or fluctuation of employment since 2002.

FIGURE 8: OREGON'S HEALTH CARE INDUSTRY



Source: Oregon Employment Department, 2007

SOLAR MANUFACTURING

Oregon has witnessed explosive growth over the past couple years in Solar Photovoltaic (PV) manufacturing. This highly competitive industry is growing worldwide, but many European and Asian companies are choosing to locate in the U.S. Oregon has successfully recruited four manufacturers and is actively working with at least a half dozen more. Solar companies indicate interest in Oregon, and in particular, Washington County due to its semiconductor manufacturing cluster.

The technological similarity of the two industries offer solar companies choosing to locate in Washington County a highly trained workforce with knowledge directly applicable to the Solar PV manufacturing process. Within Washington County, Hillsboro is most competitive in attracting Solar PV manufacturing firms interested in the region—offering better proximity to the metro area, suitable land supply, and an existing workforce. That said, considerable ancillary benefits are likely to impact the entire region, as suppliers, vendors, and support services to the process find expanded opportunities in the region—of which jurisdictions like Cornelius are well suited to recruit.

³ Unless cited otherwise, data in this section is from the Oregon Employment Department.



FIGURE 9: OREGON'S RECENT SOLAR PV MANUFACTURING ACTIVITY

Company	Year Est. 1/	Location	Projected Jobs
PV Powered	2001	Bend	60 by 2008
Solaicx	2006	North Portland	100 by 2008
SolarWorld	2007	Hillsboro	2,000 by 2010
Peak Sun Silicon	2007	Millersburg	500 by 2011
XsunX	2008	Wood Village	160 by 2009
SpectraWatt	2008	Hillsboro	135 by 2009 2/
Sanya Electric Co.	2008	Salem	180 by 2009
Total			3,135

Source: Oregon Department of Energy, Oregonian

1/ Year company established operations in Oregon.

2/ SpectraWatt has indicated that their workforce may increase to 1,000 employees with the opening of a second plant in an undecided location.

Over the long-term, the solar industry's success depends on its ability to continue to make cost and efficiency improvements—currently, solar cannot compete with wind power on a cost basis. Moreover, the industry's continued growth is highly dependent on federal investment tax credits, which Congress recently extended for another eight years. The investment tax credit extension allows tax credits for residential and commercial solar installations through 2016. The tax credits are seen as an economic driver, not only for solar manufacturing, but for the construction industry as well. The number of solar installations increased by 119% between 2005 and 2007. Since 2003, annual installed capacity has increased by about 250% sustaining an annual average growth rate of about 36%.⁴

Oregon manufacturers have the added benefit of the Business Energy Tax Credit (BETC), which offers a tax exemption up to 50% (limit \$10 million) of project costs for the construction of an alternative energy manufacturing facility. This tax credit was instrumental in recruiting SolarWorld and Sanyo Electric Co.

The solar industry is projected to add 62,000 jobs nationally by 2015 and about 10 million jobs worldwide by 2030.⁵ Oregon is projected to add nearly 15,000 jobs by 2028, with most of the growth occurring in the next ten years.⁶

AGRICULTURE & FOOD PROCESSING

Over the past year, Oregon has seen significant export growth, increasing to \$15.1 billion, a year-over-year increase of 25.8%. In addition to Computer & Electronics Manufacturing, Agricultural products are a large factor in Oregon's realized export growth. Among all of Oregon's export industries, Agriculture Products second in export value, contributing \$2.3 billion or 15% of total export value. This represented an annual increase of 64.5%, the largest jump among Oregon industries. Food & Kindred Goods provided an additional \$300 million. While Agriculture and Food Products have benefited largely from recent high commodity prices, the last two quarters have seen food prices retreat notably, a trend that is likely to continue in coming periods.

The OED's outlook for Agriculture and Food Manufacturing in Oregon is rather bearish through 2016, with only 600 new jobs (0.25% AAGR) expected in Food Manufacturing. Non-farm agriculture employment is not forecasted by the OED.

⁴ Solar Energy Industries Association and Prometheus Institute, "US Solar Industry Year in Review," 2007.

⁵ Solar Energy Industries Association and Prometheus Institute, "US Solar Industry Year in Review," 2007 and Greenpeace International and European Photovoltaic Industry Association, "Solar Generation V," 2008.

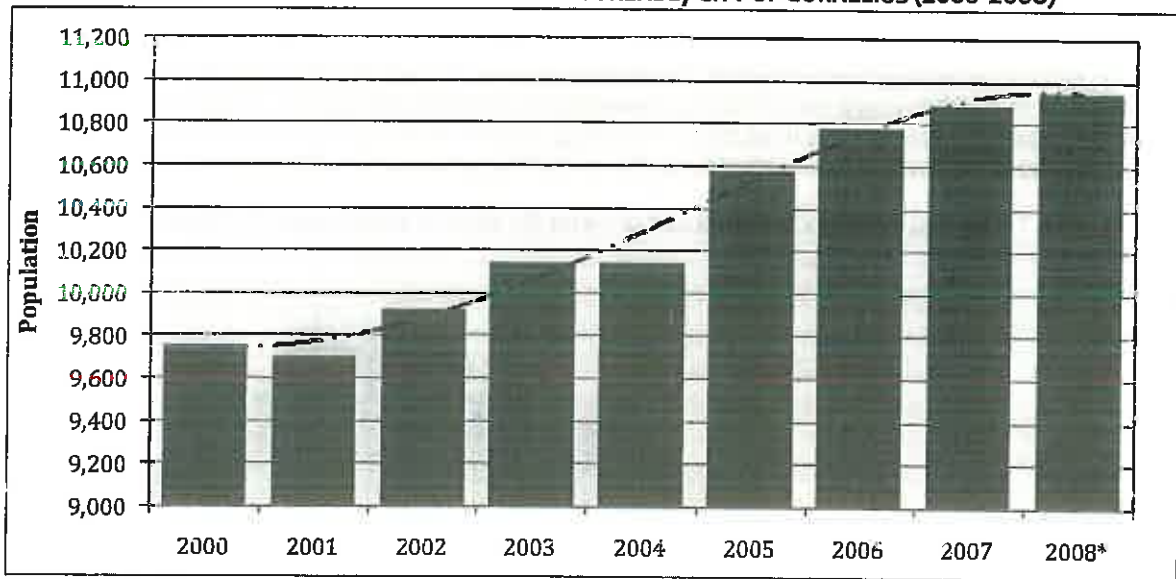
⁶ Climate Solutions and Clean Edge, Inc., "Carbon-Free Prosperity 2025," October, 2008 and Oregon Department of Energy.



DEMOGRAPHICS

The City of Cornelius is among Washington County's more modest jurisdictions in terms of both size and culture. Cornelius' population has grown by 12.2% (1.5% AAGR) since the 2000 Census, roughly consistent with overall County growth of 13.8% (1.86% AAGR). Likewise, Washington County has outpaced the Portland metro area's annual average growth of 1.34%.⁷

FIGURE 10: LOCAL POPULATION GROWTH TRENDS, CITY OF CORNELIUS (2000-2008)



SOURCE: Portland State University Population Research Center

Unlike many Oregon counties, Washington County has not gained a large share of retirement age population. In 2007, Washington County's share of population age 65 and older was significantly below State levels: 8.8% versus 12.5%. Washington County has a greater population age 19 and younger and 25 to 44 relative to the State distribution: 60.6% versus 53.2%.

An area's level of educational attainment is often used as a proxy for the skill level of the population base. From an Economic Development perspective, Washington County is at a slight competitive advantage regionally, with a higher distribution of higher educated persons—36.6% of local residents have a Bachelor's Degree or higher as compared to 34.7% at the Portland metro level. By comparison, the City of Cornelius has only a 9% share of higher educated local residents according to the 2000 census. This is substantially less than the regional share, and that of neighboring job centers, namely Hillsboro and Forest Grove. This highlights concerns locally about the extent to which the local skill base matches the needs of high growth industry opportunities.

Presumably reflecting the Portland metro area's relatively younger demographic, all three metro counties have had a positive natural increase in population since 2000. However, net in-migration appears to be the larger contributor to demographic growth in Multnomah and Clackamas Counties by a share of 75% while natural increase is the larger contributor in Washington County by a share of 63%. Evaluating sources of in-migration is useful in understanding the interconnectedness of Washington County to the Portland metro area as well as to other regions in Oregon or elsewhere. According to the United States Internal Revenue Service (IRS), Washington County is most closely associated with Multnomah and Clackamas Counties, which together account for just over a quarter of net in-migration. This follows anticipated logic given the geographical proximity of these areas. Lane, Benton, Jackson and Marion Counties also account for net in-migration, while Yamhill, Columbia, Deschutes and SW Washington Counties, such as Clark, Cowlitz and Skamania, account for a large portion of out-migration. However, the bulk of net

⁷ Portland metro area includes Clackamas, Multnomah and Washington Counties



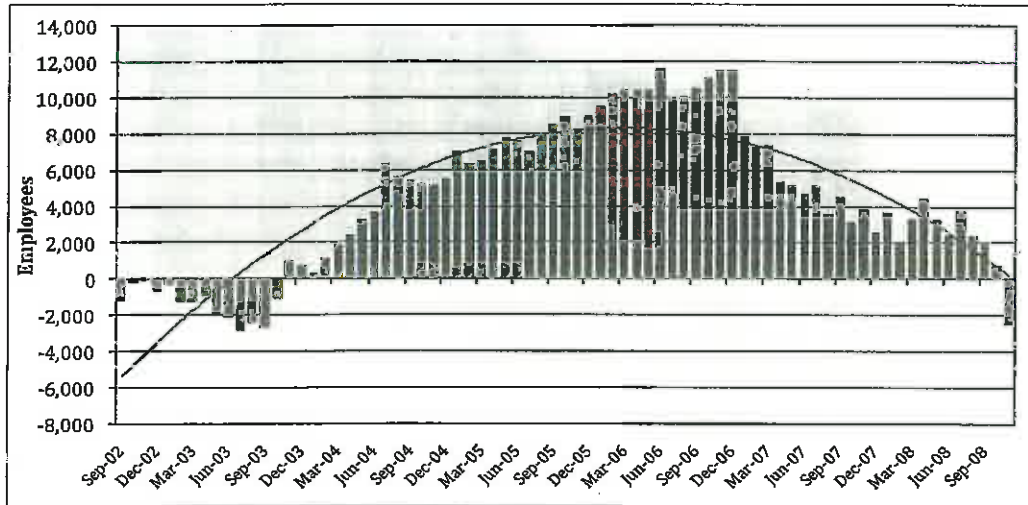
in-migration originates from California, accounting for nearly 70% of net-migration. In aggregate, Washington County gained 10,043 migrants, about 2% of total population, between 2000 and 2006.

EMPLOYMENT

Unemployment in the Portland metro area has consistently remained lower than the broader State economy. In other words, regional volatility—as measured by unemployment is significantly lower than at the State level. Similarly, unemployment in Washington County has consistently remained lower than that in the Portland metro area.

Since 2002, total employment growth in Washington County had remained strong, gaining 11.3%. The county's growth cycle, which began in late 2003, maintained momentum until early 2007. In November of 2008, the County entered negative territory in terms of year-over-year growth for the first period in five years. Moreover, the slowing and possibly further contraction is expected to extend through early to mid-2009 and impact most industries.

FIGURE 11: YEAR-OVER-YEAR EMPLOYMENT GROWTH IN WASHINGTON COUNTY: 2002-2008



The largest sectors of the Washington County economy diverge somewhat from sector rankings of the State and metro area. For example, Manufacturing accounts for 19% of Washington County's economy whereas the share is nearly 12% at the State and metro area. On the other hand, Public Administration accounts for a correspondingly large share at the State (16.8%) and metro area (12.7%), but only an 8.5% share in Washington County. Portland metro and Washington County both have a relatively greater share of Professional & Business Services employment, 13.6% and 14.0%, respectively while the overall State share is 11.4%. However, in other sectors Washington County's employment share is roughly similar to State and metro levels. The City of Cornelius generally adheres to Washington County's sector rankings, but is overwhelmingly driven by Natural Resources, Manufacturing, Retail Trade and Education & Health Services, which combine to account for over 60% employment in the City.

Washington County had numerous strong sectors during the five year period between 2002 and 2007, including Education & Health Services (+5,497 jobs), Public Administration (+3,821 jobs), Leisure & Hospitality Services (+3,606 jobs), Retail Trade (+3,246 jobs), Construction (+3,153 jobs), Professional & Business Services (+2,901 jobs), Wholesale Trade (+2,713 jobs) and Financial Activities (2,086 jobs) In all, the only industry to lose jobs was Transportation, Warehousing, & Utilities which shed about 827 jobs.

Between 2002 and 2007, the City of Cornelius' employment grew very modestly, roughly 5.2% and accounted for a negligible share of Washington County's total covered employment gains. Over this five-year period, The City experienced its strongest job growth in Professional & Business Services (+126 jobs), Education & Health Services (+73 jobs) and Retail Trade (+52 jobs). Cornelius lost roughly 191 jobs in Natural Resources, Construction and Manufacturing combined.

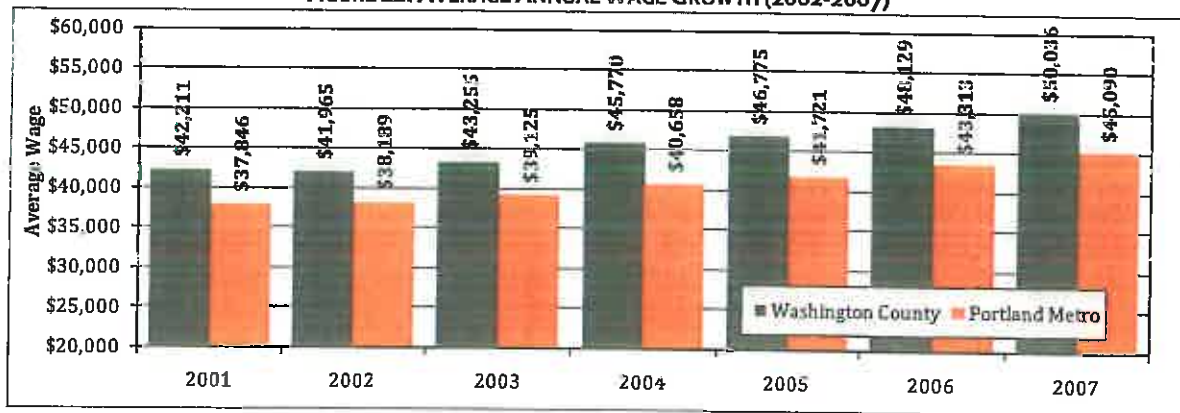


WAGES

With the exception of Public Administration, Leisure & Hospitality Services, Professional & Business Services and Financial Activities, average wage levels by sector in Washington County are at or above wage levels in the Portland metro area. Across all industries, Washington County wages averaged \$50,036, again 11.0% above the Portland metro \$45,090 average and 31.5% above the \$38,057 Oregon average.

Since 2002, wage levels in Washington County have averaged 2.9% annual growth, slightly below the 3.3% annual growth at the State level. Conversely, at 1.1% wage growth, Cornelius has remained well below State wage growth. In 2007, the average wage in Cornelius was \$28,156, also well below the Washington County and Portland area averages.

FIGURE 12: AVERAGE ANNUAL WAGE GROWTH (2002-2007)



In Washington County, the highest paid industry sector is Wholesale Trade (\$90,515 annually), followed by Information (\$77,653) and Manufacturing (\$75,788). The lowest paid industries are Leisure & Hospitality (\$16,363) and Retail Trade (\$27,034). The City of Cornelius' highest paid industries are Public Administration (\$44,807) and Construction (\$43,257) followed by T.W.U. (\$42,562) and Wholesale Trade (\$37,293). Its lowest paid industries are also Leisure & Hospitality (\$16,319) and Retail Trade (\$22,113).

OTHER FACTORS FOR ECONOMIC DEVELOPMENT POTENTIAL

In addition to the demographic and economic trends analyzed above, other factors provide insight into the City's economic development potential. These factors, together with their challenges and opportunities, are discussed briefly below:

- **Amenity Values-** In land use planning parlance, amenity values are encompassed in the concept of livability. The term livability is rarely, if ever, used in economic terms. But amenity values are often characterized in the field of Economics and Economic Geography because amenity values have real economic consequences. For example, Jackson Wyoming is located in a remote area and has few of the typical economic assets required for a vibrant economy. It does, however, have high amenity values that translated into a vibrant economy (Teton County has a median household income of \$54,614 compared to \$52,122 in Washington County⁸). While amenity values are qualitative and subjective in nature which can make them challenging to effectively characterize in quantitative economic terms, their real economic consequences make them worth identifying. The City of Cornelius and the greater Portland metro area have countless amenities that create potential for economic opportunities. Cornelius has a specific assets in the region including, quality public schools, recreational amenities such as Pumpkin Ridge Golf Course, Proximity to North Willamette Valley Wine Country, and a pleasant and diverse community atmosphere.
- **Educational and Technical Training Programs** – The Portland area offers multiple educational and training

⁸ 2000 Census DP-3 Sample File



institutions which benefit the City of Cornelius. In particular, Portland State University and Portland Community College design academic and outreach programs to meet the needs of the regional business community. While not technically in Cornelius, Pacific University in Forest Grove is only 2.5 miles west of central Cornelius and offers 36 undergraduate degrees among 19 different departments. The school is well known for its MFA in writing program and undergraduate programs in health related professions.



TWENTY-YEAR EMPLOYMENT FORECAST

INTRODUCTION

This analysis outlines a forecast of employment within the City of Cornelius Urban Area, referred to hereafter in this section simply as “Cornelius”. The employment forecasts were generated through 2028. The primary source of data on current employment patterns was derived from the State of Oregon Employment Department’s ES-202 reports.

Cornelius’ employment forecast is estimated according to two varying methods. First, Cornelius’ employment forecast is determined in terms of its “organic” growth potential; in other words, growth it may achieve based on its existing and future industries as well as its individual competitive advantage. The methodology used to reach this baseline forecast is expounded in detail below.

Second, two alternative employment forecasts are estimated based on the growth potential of the City of Hillsboro. During the course of completing its own Economic Opportunity Analysis, the City of Hillsboro determined that its growth potential exceeds its ability to provide sufficient land of the sizes and types that its targeted high-tech clusters will require, particularly over the fifty-year horizon. While the City of Hillsboro has decided that it will focus its economic development efforts on targeting “cluster anchor” industrial users, or those that generally require large industrial parcels, the coordination of economic development and employment land provision between the members of the Western Washington County subarea—Hillsboro, Forest Grove, Cornelius, North Plains and Banks—is integral to regional growth prospects. Without the provision of industrial acreage in more moderate parcel and site sizes by the partner cities in Western Washington County, larger high-tech cluster industrial recruitment in general may likely be compromised. Although the impact of Hillsboro’s growth on the region is most important over the fifty-year planning period, the twenty-year horizon will require increasing coordination among the five cities as well as Cornelius’ ability to accommodate spillover industry. These assumptions provide the basis of the alternative medium and high employment forecasts, which both assume Cornelius captures a varying percentage of Hillsboro’s spillover growth. As with the baseline forecast, the methodology used to reach the medium and high forecasts is provided in detail below.

CREATING A BASE YEAR ESTIMATE

TOTAL CURRENT EMPLOYMENT (2007)

For the year 2007, ES-202 reports estimate employment in Cornelius to total 3,431 employees. However, our source ES-202 data reports “covered employment” only—employer firms that tracked through unemployment insurance. Because this data omits a significant portion of the workforce that are not covered (i.e. sole-proprietors, self-employed, commission workers) we must revise our estimates to reflect true employment. Estimates from the Bureau of Economic Analysis (BEA) indicate that covered employment accounts for approximately 95% of total employment in Washington County, with individual estimates reported by broad sector. Assuming that Cornelius industrial sectors roughly track regional trends, we estimate the *total* employed level in 2007 to be in the area 2,546 non-agriculture/natural resource employees within the current UGB.



FIGURE 13: CONVERSION OF COVERED EMPLOYMENT TO TOTAL EMPLOYMENT (2007)

NAICS	2007 Observed 2/	Covered Share of Total Employment 3/	Estimated Total Employment (2007)
Construction	165	81.9%	201
Manufacturing	335	97.8%	343
Wholesale Trade	83	88.9%	93
Retail Trade	416	85.5%	487
T.W.U. 1/	122	81.8%	149
Information	49	90.5%	54
Financial Activities	55	63.5%	86
Professional & Business	152	79.9%	190
Education & Health	444	73.4%	605
Leisure & Hospitality	103	87.2%	118
Other Services	85	56.0%	151
Public Administration	62	100.0%	62
TOTAL	2,070	81.5%	2,540

1/ Transportation, Warehousing, & Utilities

2/ From Oregon Employment Department ES-202 Data

3/ Bureau of Economic Analysis (BEA), Share for Washington County

Source: Johnson Reid, LLC

TOTAL ESTIMATED EMPLOYMENT (2008)

The second step to creating our base year estimate is updating our 2007 total employment estimate to the current period. This process involves the evaluation of countywide economic trends between 2007 and 2008 in addition to current knowledge about the local economic activity in Cornelius. Outlined in Figure 14, we assume that between 2007 and 2008 the Cornelius economy contracted slightly, by a margin of -2.1% to 2,485 employees. This estimate will be utilized as the basis of our long-term employment forecast.

FIGURE 14: UPDATING 2007 TOTAL EMPLOYMENT TO THE CURRENT PERIOD (2008)

NAICS	2007 Total Employment	Short-Term Annual Growth Assumption 2/	2008 Total Employment Estimate
Construction	201	-6.9%	188
Manufacturing	343	-5.5%	324
Wholesale Trade	93	0.0%	93
Retail Trade	487	-1.3%	481
T.W.U. 1/	149	0.0%	149
Information	54	2.5%	55
Financial Activities	86	-5.8%	81
Professional & Business	190	-3.7%	183
Education & Health	605	-0.4%	602
Leisure & Hospitality	118	1.0%	119
Other Services	151	-2.6%	147
Public Administration	62	0.9%	63
TOTAL	2,540	-2.1%	2,485

1/ Transportation, Warehousing, & Utilities

2/ Assumes that growth in Cornelius roughly tracks Washington County between 2007 and 2008

Source: Johnson Reid, LLC



ANTICIPATED EMPLOYMENT GROWTH

In fall 2002, Metro produced 2030 employment and population forecasts for the Portland Metropolitan Area, then defined as the Oregon counties of Clackamas, Multnomah, Washington, and Yamhill in addition to Clark County in Washington State. In accordance standards outlined in DLCD's Goal 9 Handbook, our forecast of employment in Cornelius will be coordinated with regional planning efforts put forth by Metro. Our methodology has three distinct steps:

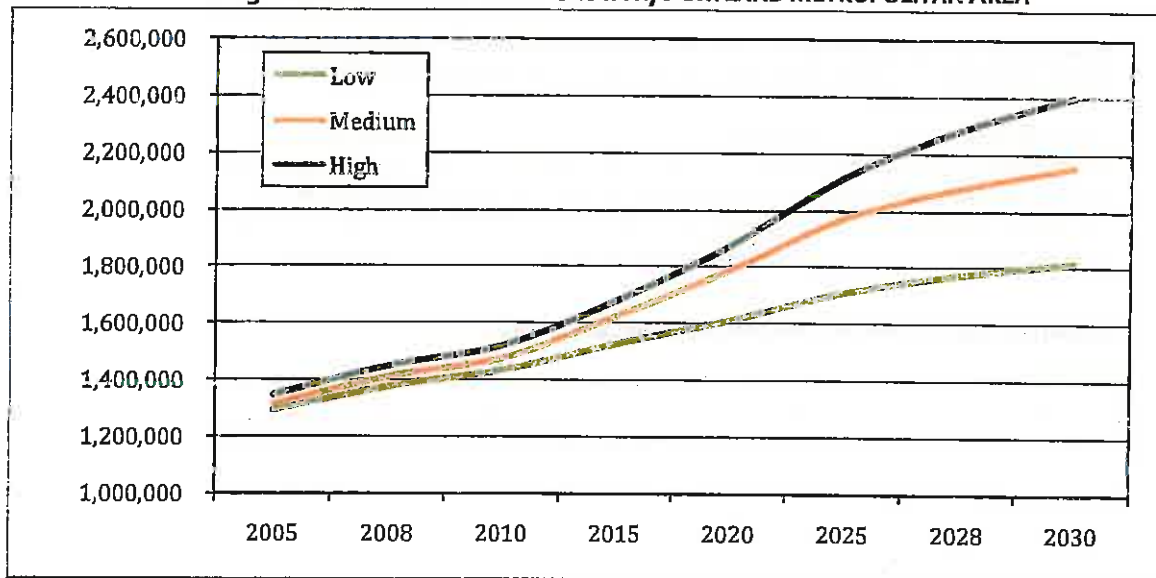
- 1) Present *ADOPTED* regional growth forecasts for the Portland Metropolitan Area as produced by Metro;
- 2) Estimate Washington County's share of anticipated future employment growth;
- 3) Forecast employment growth in Cornelius based on its anticipated share of future economic growth in Washington County.

METRO'S REGIONAL FORECAST

Metro's 2002 regional forecast of employment and population estimated a medium growth scenario of employment along with two alternative "pessimistic" and "optimistic" forecasts. The geographic region is for the then five-county metropolitan area. The methodology employed by Metro can be reviewed in the document available online.⁹

Using extrapolated estimates for 2008 and 2029, Metro's forecast estimates 668,467 new employment positions over the next 20-years (under a medium growth scenario), an increase of 47.4% (1.96% AAGR). Low and high growth scenarios round out a total forecast range of 398,691 to 835,842 new jobs over the 20-year planning period.

FIGURE 15: REGIONAL EMPLOYMENT GROWTH, PORTLAND METROPOLITAN AREA



SOURCE: Metro

WASHINGTON COUNTY EMPLOYMENT GROWTH

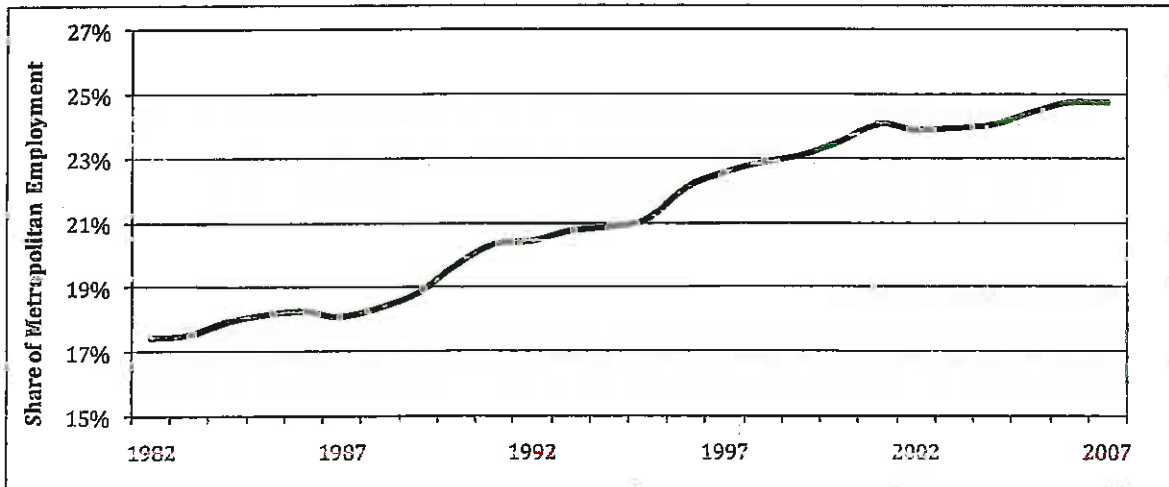
Since 1982, growth in the Washington County economy has exceeded that of any other county in the metropolitan area as measured by employment. Over this interval Washington County's share of regional employment has increased markedly from 17.5% to 24.7% in 25 years, according to estimates from the Oregon Employment Department.

⁹ http://www.oregonmetro.gov/files/maps/2000_2030regionalforecastsept2002.pdf



Over the past quarter century, the Washington County employment base has nearly tripled, adding nearly 160,000 new payroll jobs. Over the last ten years, Washington County has captured 41% of total employment growth across the Portland Metropolitan Area. This interval includes the only period of economic contraction (2001-2002 following the tech bubble) Washington County has seen in the last 25 years.

FIGURE 16: WASHINGTON COUNTY SHARE OF METROPOLITAN AREA EMPLOYMENT



SOURCE: Oregon Employment Department and Johnson Reid

To estimate total employment capture in Washington County over the 20-year planning period, we assume that over the next ten years Washington County will at least continue to capture a similar share of economic activity. Over the broader 20-year planning period, we anticipate Washington County's capture of regional growth to trend toward its exhibited capture over the last 25-years, roughly 32% new employment growth.

Coupled with the fact that Washington County is home to a significant share of the region's employment land suitable for tomorrow's industry, we can conservatively expect this trend to continue into the foreseeable future. When applied to Metro's regional employment forecast, extrapolated to 2008 and 2028 periods, Washington County can expect to capture over 200,000 new jobs through 2028. We forecast annual growth in the range of 1.5% to 2.98% over the planning period with the creation of 116,000 to 252,000 new jobs.

CORNELIUS EMPLOYMENT GROWTH: BASELINE SCENARIO

In 2007 the Cornelius economy comprised roughly 1.4% of the Washington County economy as measured by employment. The Baseline Scenario, or conservative analysis, assumes Cornelius will continue to capture its fair share of employment growth over the planning period. This assumption is also conservative in light of Cornelius' share of developable employment land in Washington County, roughly 4%. This method translates into 1,221 (2.0% AAGR) net new jobs over the twenty-year period.

CORNELIUS EMPLOYMENT GROWTH: MEDIUM SCENARIO

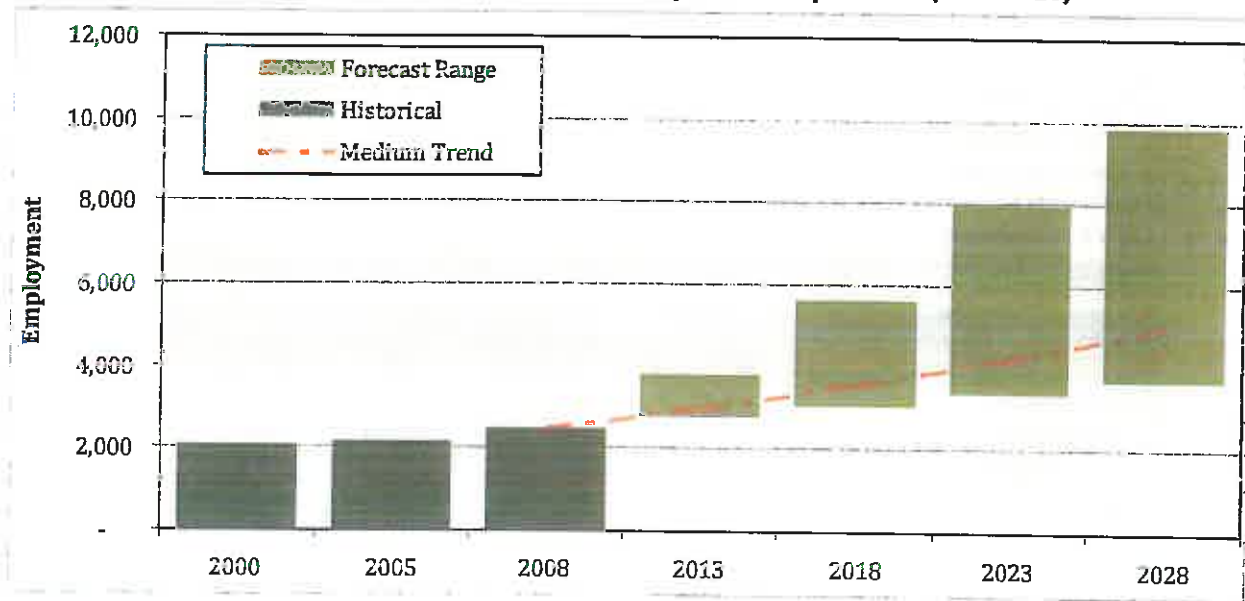
Continuing sub-regional coordination with Hillsboro, Forest Grove, North Plains and Banks indicates a likely future mechanism by which industry attraction by Hillsboro's core existing and emerging clusters may find a formal avenue for economic development co-marketing. To model the possible economic opportunity of co-recruiting and growing industries with Western Washington County partners, JOHNSON REID has created a Medium Growth Scenario by assuming Cornelius captures 15% of all ripple-effect industrial growth and 5% of all ripple-effect office growth created by Hillsboro's recruitment of emerging new clusters such as solar manufacturing, bio-tech, and traditional computer electronics components manufacturing. This scenario translates into 2,501 (3.5% AAGR) net new jobs over the twenty-year period.



CORNELIUS EMPLOYMENT GROWTH: HIGH SCENARIO

A third, High-Growth Scenario was modeled to indicate potential employment land demand should inter-jurisdictional coordination focus on all Western Washington County industry growth and not just emerging industries. For this high-growth scenario, JOHNSON REID assumes Cornelius captures 15% of *all* Hillsboro-generated industrial growth and 5% of *all* Hillsboro office growth over the planning period. This scenario translates into 7,371 (7.1% AAGR) net new jobs over the twenty-year period.

FIGURE 17: EMPLOYMENT FORECAST RANGE, CORNELIUS, OREGON (2008-2028)



CORNELIUS EMPLOYMENT FORECASTS BY INDUSTRY SECTOR

For the purposes of identifying land need, we now stratify total employment growth estimated above across employment sectors in the Cornelius economy. This is an important step in the analysis as different industry sectors require varying types and characteristics of land. In Figure 18, the baseline total employment forecast is stratified across industry sectors based on Oregon Employment Department (OED) Region 2 forecasts, and historical trends from ES-202 reports.

Figure 18 presents a forecast of total employment for Cornelius between 2008 and 2028. Over the course of the planning period, we expect the maturation of the local economy and potential spillover effects from on-going economic growth regionally to produce noteworthy growth in professional services on the margin.



FIGURE 18: EMPLOYMENT FORECAST BY SECTOR, CORNELIUS, OREGON (2008-2028)

Baseline/Low Forecast NAICS	Base Year	Employment Forecast				2008-2028 Growth	
	2008	2013	2018	2023	2028	Jobs	AAGR
Construction	188	208	225	245	264	77	1.7%
Manufacturing	324	360	389	424	459	135	1.8%
Wholesale Trade	93	100	106	113	120	27	1.3%
Retail Trade	481	543	596	657	721	240	2.0%
T.W.U.	149	163	175	189	203	55	1.6%
Information	55	59	62	66	69	14	1.1%
Financial Activities	81	88	93	99	105	24	1.3%
Professional & Business	183	210	233	260	288	105	2.3%
Education & Health	602	707	799	911	1,028	426	2.7%
Leisure & Hospitality	119	136	150	167	185	65	2.2%
Other Services	147	159	168	178	199	41	1.2%
Public Administration	63	66	69	72	75	13	0.9%
TOTAL	2,485	2,799	3,067	3,381	3,707	1,221	2.0%

High Growth Forecast NAICS	Base Year	Employment Forecast				2008-2028 Growth	
	2008	2013	2018	2023	2028	Jobs	AAGR
Construction	188	255	342	452	542	355	5.5%
Manufacturing	324	881	1,801	3,000	3,947	3,623	13.3%
Wholesale Trade	93	124	167	222	267	174	5.4%
Retail Trade	481	652	854	1,112	1,322	841	5.2%
T.W.U.	149	193	248	318	375	226	4.7%
Information	55	66	78	93	105	50	3.2%
Financial Activities	81	98	118	143	163	82	3.6%
Professional & Business	183	294	445	639	795	612	7.6%
Education & Health	602	800	972	1,190	1,369	766	4.2%
Leisure & Hospitality	119	168	227	302	363	244	5.7%
Other Services	147	197	268	358	431	284	5.5%
Public Administration	63	82	111	148	178	116	5.4%
TOTAL	2,485	3,812	5,630	7,977	9,857	7,371	7.1%

Medium Growth Forecast NAICS	Base Year	Employment Forecast				2008-2028 Growth	
	2008	2013	2018	2023	2028	Jobs	AAGR
Construction	188	212	239	267	303	116	2.4%
Manufacturing	324	421	537	681	821	497	4.8%
Wholesale Trade	93	105	118	133	150	57	2.4%
Retail Trade	481	556	639	732	841	360	2.8%
T.W.U.	149	167	188	211	237	89	2.4%
Information	55	63	72	83	94	39	2.7%
Financial Activities	81	91	103	116	130	49	2.4%
Professional & Business	183	257	349	462	577	393	5.9%
Education & Health	602	729	874	1,035	1,236	633	3.7%
Leisure & Hospitality	119	148	187	230	285	165	4.4%
Other Services	147	164	183	204	228	80	2.2%
Public Administration	63	67	72	78	84	22	1.5%
TOTAL	2,485	2,980	3,562	4,231	4,986	2,501	3.5%

SOURCES: Oregon Employment Department Regional Forecasts, Oregon ES-202 reports, Local Interviews, and Johnson Reid.



TWENTY-YEAR EMPLOYMENT LAND NEEDS ANALYSIS

INTRODUCTION

This section summarizes the projected need for commercial and industrial land associated with the employment projections through 2028. Results are followed by a description of the methodology employed by JOHNSON REID to project the need for commercial and industrial space, and subsequently, commercial and industrial land.

Determining the City's required site types involves qualitative and quantitative analysis. The qualitative analysis describes the site characteristics expected to be demanded by firms during the planning period. There are three components to the quantitative analysis. The first describes the types of firms likely to locate in the City of Cornelius during the planning period. This component was completed through the Target Industry Opportunities Analysis above. The second component involves projections of employment. These employment projections were summarized in the previous section. The third component combines these employment projections with the qualitative component of the Site Requirements analysis to project the commercial and industrial land need and the demanded numbers of sites.

SUMMARY OF COMMERCIAL AND INDUSTRIAL LAND NEED FINDINGS

The results summarized in Figure 19 highlight projections of new demand within the Cornelius Urban Area for commercial and industrial land between 2008 and 2028. Detailed findings by use type and growth scenario are included in the technical appendix. Over the next twenty years, net new demand for commercial and industrial land is expected to range from 124 to 453 net buildable acres by growth scenario.

These projections reflect *net* developable land, required only for building and impervious surface space requirements. Roads, right-of-ways, parks and public facilities, among other things necessary to serve projected land development, are not included. While the methodology is not based on a set density per acre assumption, the output reflects the following average jobs per net acre by broad employment land development categories.

AVERAGE JOBS/NET ACRE	
OFFICE COMMERCIAL	37.9
INDUSTRIAL	11.1
RETAIL COMMERCIAL	3.7
OVERNIGHT LODGING	1.6
SPECIALIZED USES 2/	13.4

The forecast reflects an expectation that future employment space needs will reflect a fairly consistent allocation across commercial office and industrial uses.



FIGURE 19: PROJECTED AGGREGATE NEED FOR COMMERCIAL AND INDUSTRIAL LAND IN THE CORNELIUS URBAN AREA (NET BUILDABLE ACRES) (2008-2028)

Use Type	Need For Land (Acres) By Scenario:		
	Organic Baseline	High Growth	Medium Growth
OFFICE COMMERCIAL	10.0	41.1	22.5
INDUSTRIAL	22.9	272.0	56.2
RETAIL COMMERCIAL	77.5	113.4	101.1
CITY RESIDENTS	62.0	90.7	80.9
REGION/TOURISTS 1/	15.5	22.7	20.2
OVERNIGHT LODGING	1.5	5.6	3.8
SPECIALIZED USES 2/	12.3	21.3	18.3
TOTAL	124.2	453.4	202.0

1/ Assumes regional/tourist demand normalizes at 20% of retail support, given targeted opportunities outlined in the EOA.

2/ Hospitals, Clinics, etc for employment not otherwise categorized. Assumes 20 employees per acre

SOURCE: Johnson Reid, LLC

In addition to the demand for actual sites, the need for public rights of way and infrastructure must be estimated in order to project the total amount of lands that would be required in the event the Urban Growth Boundary were expanded to provide land for needed employment sites. The DLCD Goal 9 guidebook recommends 25% for City's that would largely be extending infrastructure into new areas to serve new development. This would be the predominant pattern for the City of Cornelius for lands outside the UGB and so the below figure converts the acreages from Figure 19 to total gross land demand by category. Figure 20 projects the total land demand for the City of Cornelius.

FIGURE 20: PROJECTED AGGREGATE NEED FOR COMMERCIAL AND INDUSTRIAL LAND IN THE CORNELIUS URBAN AREA (GROSS BUILDABLE ACRES) (2008-2028)

Use Type	Need For Land (Acres) By Scenario:		
	Organic Baseline	High Growth	Medium Growth
OFFICE COMMERCIAL	12.6	51.3	28.2
INDUSTRIAL	28.6	340.0	70.3
RETAIL COMMERCIAL	96.9	141.7	126.4
CITY RESIDENTS	77.5	113.4	101.1
REGION/TOURISTS 1/	19.4	28.3	25.3
OVERNIGHT LODGING	1.9	7.0	4.7
SPECIALIZED USES 2/	15.4	26.6	22.9
TOTAL	155.3	566.7	252.5

1/ Assumes regional/tourist demand normalizes at 20% of retail support, given targeted opportunities outlined in the EOA.

2/ Hospitals, Clinics, etc for employment not otherwise categorized. Assumes 20 employees per acre

SOURCE: Johnson Reid, LLC



INDUSTRIAL AND OFFICE LAND NEED METHODOLOGY

Demand for industrial and office commercial land is a direct function of employment growth in industrial sectors that occupy this type of space. As a result, our projections of industrial and office demand are based on forecasted employment growth by industrial sector within the City of Cornelius. Methodology for forecasting need for industrial and office commercial land follow a standard, multi-step process, summarized below. A number of exhibits are referenced, which are found in the technical appendix to this document.

DEMAND FOR OFFICE BUILDING SPACE

Sector employment growth for each of the three economic scenarios is converted into growth in office employment based on typical percentages of jobs, or capture factors, by sector that will be located in office development rather than industrial development. Employment density ratios, the average space in square feet necessary per office job, were utilized to calculate total office space demand given projected employment growth. Ratios and densities utilized are from the Urban Land Institute.

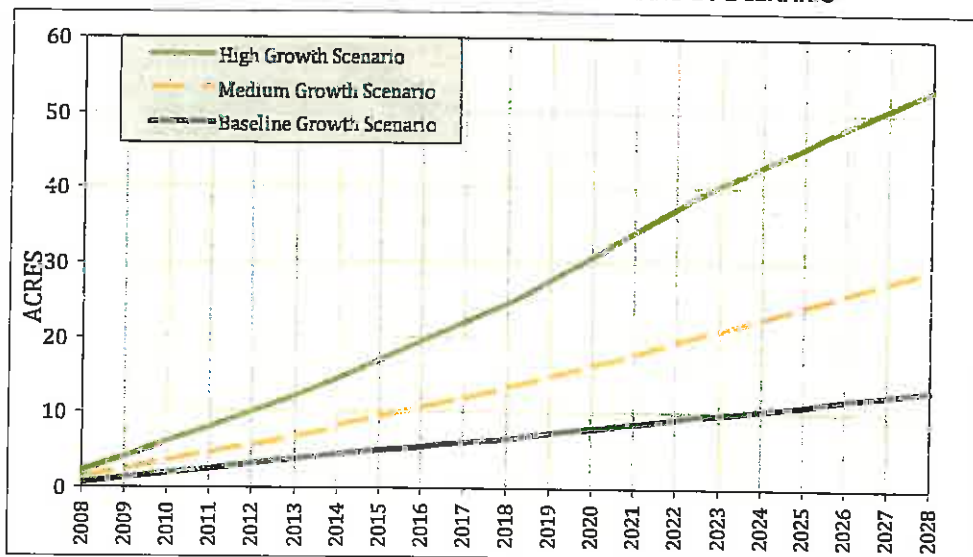
[Exhibits 1.01 and 1.02]

DEMAND FOR OFFICE COMMERCIAL LAND

Demand for office land is a conversion of demand for space by an office floor area ratio (FAR). FAR is defined as the gross leasable building area divided by the buildable land area used. For example, a 5,000 square foot office building on a 10,000 square foot site would be an example of a 0.50 FAR. For projections under each of the three Cornelius economic scenarios, JOHNSON REID assumed a relatively conservative 0.30 FAR. While surface parked office space can be produced at an FAR up to 0.50, the historic pattern in Cornelius has included more single storey structures at a substantially lower ratio.

[Exhibit 1.03]

FIGURE 21: CUMULATIVE OFFICE LAND DEMAND BY SCENARIO



SOURCE: JOHNSON REID



DEMAND FOR INDUSTRIAL BUILDING SPACE

Cornelius' industry employment growth for each of the three economic scenarios is converted into growth in industrial employment based on typical percentages of employment by sector that will be located in industrial space. Employment is then further stratified by type of space, including warehouse/distribution, general industrial and high-tech/flex space. Finally, employment density ratios, calculated as average square feet of space necessary per industrial job, were utilized to calculate total space demand by industrial space type given projected employment growth. These ratios and densities are based on industry standards.

[Exhibits 1.05 through 1.07]

DEMAND FOR INDUSTRIAL LAND

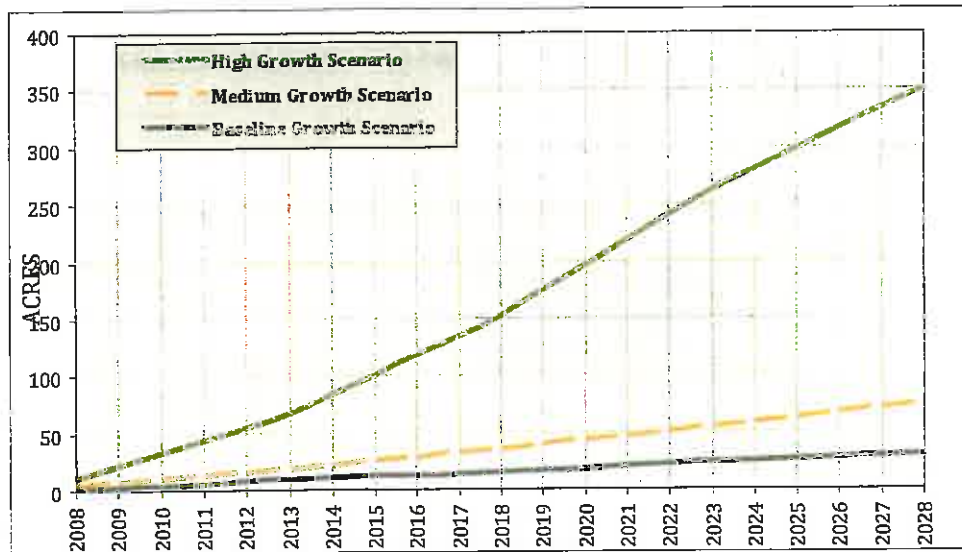
Demand for industrial land is a conversion of demand for space by floor area ratios (FARs) by industrial development type and the addition of non-industrial use demand for industrial land typical of business park space. Projections utilize the following FARs:

- Warehouse/Distribution: 0.31
- General Industrial: 0.30; and
- High-Tech/Flex: 0.26.

Second, a 20% non-industrial use demand for land was assumed for industrial land projections.¹⁰

[Exhibits 1.08 and 1.09]

FIGURE 22: CUMULATIVE INDUSTRIAL LAND DEMAND BY SCENARIO



SOURCE: JOHNSON REID

RETAIL COMMERCIAL LAND METHODOLOGY

Unlike industrial and office commercial land need, retail land need is a direct function of households moving into Cornelius, typical spending patterns by those households and visitor/tourist spending. Methodology for forecasting retail commercial land need is summarized below.

¹⁰ Non industrial uses in industrial districts include office space as well as support retail.



HOUSEHOLD GROWTH PROJECTIONS

For modeling growth in retail commercial land need driven by residential growth, JOHNSON REID utilized the City's population growth projections in our residential land need analysis. Medium, high and low growth scenarios, and resulting household growth projections through 2028, were estimated as follows:

- *Baseline Growth Scenario: Assumes population growth rate of 2.8% annually.¹¹*
- *High Growth Scenario: Assumes population growth rate of 3.83% annually.*
- *Medium Growth Scenario: Assumes population growth rate of 3.38% annually.*

Estimate Cornelius City Per-Household Retail Spending

JOHNSON REID estimated per-household annual spending by retail category utilizing data derived from the US Bureau of Labor Statistics Consumer Expenditure Survey. Categories are as detailed in the following table by the North American Industry Classification System (NAICS).

FIGURE 23: AVERAGE HOUSEHOLD EXPENDITURES ON RETAIL GOODS, CORNELIUS UGB

NAICS Category	Per Household Expenditures \$/yr
441 Motor Vehicles and Parts Dealers	\$8,067
442 Furniture and Home Furnishings Stores	\$943
443 Electronics and Appliance Stores	\$990
444 Building Materials and Garden Equipment	\$4,058
445 Food and Beverage Stores	\$5,334
446 Health and Personal Care Stores	\$1,876
448 Clothing and Clothing Accessories Stores	\$1,914
451 Sporting Goods, Hobby, Book and Music Stores	\$862
452 General Merchandise Stores	\$5,039
453 Miscellaneous Store Retailers	\$1,043
722 Foodservices and Drinking Places	\$3,936
Totals/Weighted Averages	\$34,062

SOURCE: JOHNSON REID

ESTIMATE FUTURE CITY OF CORNELIUS RESIDENT-DRIVEN RETAIL SALES

Future retail sales originating within the City of Cornelius were simply calculated as the product of future City of Cornelius household counts under the medium, high, and low growth scenarios through 2028 and annual average retail sales by category.

[Exhibit 1.12]

DEMAND FOR RETAIL COMMERCIAL SPACE

Future retail sales are converted into need for developed retail space by calculating the product of future City of Cornelius retail sales by category to a category-specific Sales Support Factor. The Sales Support Factor is the national average retail sales per square foot of space for each category of retail. Sales support factors are from the Urban Land Institute publication *Dollars & Cents*.

[Exhibit 1.13]

¹¹ The City of Cornelius has documented residential land inventory constraint since approximately 2000. During the 1990s, contemporaneous with significant high-tech employment growth in Western Washington County and when City residential land capacity was adequate for flexible residential growth, the annual average annual population growth rate was 4.8%. The Baseline population growth rate scenario of 2.8% annually is, therefore, conservative relative to documented precedent.

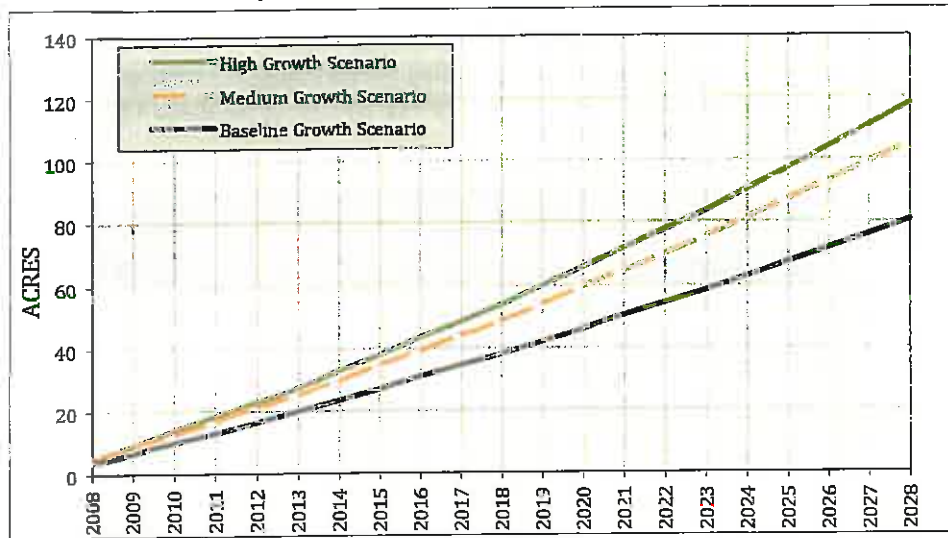


DEMAND FOR RETAIL COMMERCIAL LAND

Demand estimates for developed retail space at different time points was then converted into demand for retail commercial land by applying the industry-standard retail Floor Area Ratio (FAR) of 0.25. The FAR assumes standard suburban retail space requiring one parking space per 1,000 square feet of retail floor area.

[Exhibit 1.13]

FIGURE 24: CUMULATIVE RETAIL LAND DEMAND BY SCENARIO



SOURCE: JOHNSON REID

REGION/VISITOR SPENDING PROJECTIONS

The City of Cornelius' estimated retail sales exceed locally originating sales by a slight margin, reflecting the City's position as an employment center, capturing a certain degree of general retail spending, particularly Food Services. It was assumed within our analysis that this ratio would remain constant, and that regional/visitor spending would grow at an equivalent rate to locally-originating retail sales.



TWENTY-YEAR EMPLOYMENT LAND DEMAND SITE QUALITIES

INTRODUCTION

The previous section of this analysis provided cumulative, net and gross acreage estimates of employment land demand for the City of Cornelius, based on economic opportunities identified, over the planning horizon through 2028. This section of the Economic Opportunities Analysis translates total, cumulative demand for employment land into crucial details of employment site needs by various physical and infrastructure criteria, among other qualities. This section is divided into two employment land need discussions:

- *Qualitative Site Requirements by Use:* Market, industry, and user-specific requirements for employment sites over the planning horizon based on known historical patterns and identified industry trends.
- *Employment Site Demand by Site Quality:* Cumulative land demand is translated into use and orientation demand categories including use type, user type, and site sizes consistent with site requirement findings. A reconciliation with existing City land supply is included, with conclusions of additional land need by use and site type discussed.

QUALITATIVE SITE REQUIREMENTS BY DESIGNATION & USE

The qualitative component of the site requirements analysis identifies factors such as site sizes (acreage), loading, parking, storage, public facilities, utilities, ownership patterns, surrounding development patterns, proximity to labor, proximity to customers, access to transportation infrastructure, and other site amenities unique to the specific industry. The subsequent development matrix tables identify site improvement orientation requirements according to four major land use categories: Office, Commercial Retail, Industrial and Campus/Institutional.

The level of specificity provided in the required site types will inform land demand and supply analyses and land use designation category development.¹² These general development pattern categories are not intended to be exhaustive, but rather are intended to capture the typical patterns observed in the market today and expected for the future.¹³ However, by identifying and planning for typical patterns, the widest range of development patterns has been considered in an effort to analyze demand from these many perspectives.

The subsequent description of site requirements does not include extensive discussions of environmental constraints. This is because employment land development patterns are generally less sensitive to environmental constraints than residential development patterns. Generally, the described acreages assume sites that are largely free from environmental constraints such as slopes, wetlands, and floodplains.

¹² The typical development patterns presented in this section do not equate to land use districts; nor are they intended to function as *Uses with Special Siting Characteristics* (As that term is used in OAR 660-009-0025(8)).

¹³ Site sizes are actually continuous phenomena. The segmentation into size ranges is not statistically defined, but is nonetheless useful for analysis and planning purposes. Hybrid and overlapping development patterns already exist and are common; others hybrids and overlaps may emerge during the planning period including various high-tech uses.



OFFICE DEVELOPMENT PATTERN TYPES MATRIX

Target Industries	Transportation; Access to Labor and Customers	Public Facilities/ Utilities	Site Sizes and Development Pattern Discussion	Ownership/Leasing Patterns	Parking, Loading, Storage (Loading & Storage not major issues for Offices)
<p>Community Branches for Banking, Security and Commodity, Real Estate, and Insurance Carriers, Healthcare, Communications, Transportation Services, Back Office Processing</p>	<p>Transportation system that provides access to labor is important and will require convenient connections to at least a minor collector and may require convenient connections to major arterial roadways and State Highways. Proximity to Government offices may be a factor. Convenient airport access is almost always important. Convenient public transportation may be a consideration, especially for a downtown site.</p>	<p>Water, sewer, and storm drainage must be adequate. Sites must be able to be served by modern telecommunications. Multiple energy suppliers may be a consideration.</p>	<p>Downtown - Large users sometimes occupy high-rise structures in downtown areas. Site sizes are usually 0.75 to 4 acres per user arrayed among traditional downtown development patterns. Large tenants critical in pre-lease requirements for high-rise construction.</p> <p>Business/Office Park- Usually two to three story buildings. Users usually have 3.5 to 15 acre sites clustered within a larger park of 50 to 400 hundred acres. Large users may also prefer a campus siting, and may land bank for potential future expansion.</p> <p>Under-performing Commercial Sites - Usually adaptive reuse of an under-performing commercial site 2 to 20 acres arrayed within a larger commercial node of 20 to 500 acres.</p>	<p>Typically own or long-term leases from affiliated real estate company. Sometimes independent long-term leases.</p> <p>Typically Own or lease from affiliated real estate company.</p> <p>Typically discount lease structure, but may own</p> <p>Limited ownership opportunities may be a limiting factor. Leases prevalent</p> <p>Ownership or leases from affiliated companies common and may be deciding factor.</p> <p>Ownership varies with the user requirements.</p>	<p>Parking must be reasonably adequate and convenient. Usually a mix of private and public if structured.</p> <p>Usually uses on-site surface parking.</p> <p>Usually uses on-site existing surface parking</p> <p>Tends to utilize public supplied parking downtown that may include leases of public spaces.</p> <p>Usually uses on-site surface parking.</p> <p>Usually on-site, but may be shared parking with adjoining commercial uses.</p>
<p>Main Branch/Head-quarters Offices for Banking, Security and Commodity, Real Estate, and Insurance Carriers, Healthcare, Communications, Transportation Services, Back Office Processing</p>	<p>Transportation system that provides access to labor is important and will require convenient connections to at least a minor collector and may require convenient connections to major arterial roadways and State Highways. Proximity to Government offices may be a factor. High visibility access to customers is essential for the consumer oriented users. Airport access is important. Convenient public transportation may be a consideration, especially for a downtown site.</p>	<p>Water, sewer, and storm drainage must be adequate. Sites must be able to be served by modern telecommunications. Multiple energy suppliers may be a consideration.</p>	<p>Downtown- Medium users tend to utilize one or two floors of an existing building. Downtown can be cost-prohibitive for uses that require ground floor customer visibility. Site sizes come from existing configurations. The size of these tenants and their ability to pre-commit on space make building new speculative space difficult at the scale seen in more urban locations.</p> <p>Business/Office Park- Occupy buildings individually or with a group of tenants. Users often seek sites near campus development patterns with which they interact. Sites are typically 0.5 to 3 acres per user within a larger park of 30 to 100 acres.</p> <p>Commercial Centers- These are the preferred development patterns for consumer oriented medium sized office users such as branch banks and real estate offices. Users often seek sites near campus development patterns with which they interact. Sites are typically 0.5 to 3 acres per user within a larger community commercial node of 10 to 200 acres.</p>	<p>Typically own or long-term leases from affiliated real estate company. Sometimes independent long-term leases.</p> <p>Typically Own or lease from affiliated real estate company.</p> <p>Typically discount lease structure, but may own</p> <p>Limited ownership opportunities may be a limiting factor. Leases prevalent</p> <p>Ownership or leases from affiliated companies common and may be deciding factor.</p> <p>Ownership varies with the user requirements.</p>	<p>Parking must be reasonably adequate and convenient. Usually a mix of private and public if structured.</p> <p>Usually uses on-site surface parking.</p> <p>Usually uses on-site existing surface parking</p> <p>Tends to utilize public supplied parking downtown that may include leases of public spaces.</p> <p>Usually uses on-site surface parking.</p> <p>Usually on-site, but may be shared parking with adjoining commercial uses.</p>



Target Industries	Transportation, Access to Labor and Customers	Public Facilities/Utilities	Site Sizes and Development Pattern Discussion	Ownership/Leasing Patterns	Parking, Loading, Storage (Loading & Storage not major issues for Offices)
<p>Sole proprietor or small partnership of professional service offices for Banking, Security & Commodity, Real Estate, Insurance Agents and Brokers, Business Services and Legal Services</p>	<p>Access to customer base very important to consumer oriented users such as insurance agents/brokers and real estate agents/brokers. Transportation system that provides access to labor is important, but these users may have to compromise convenient access to labor as a cost saving measure. Executive housing concentrations are important for many small users, minimizing commute times for executives that don't rely upon specific locations. Proximity to Government offices may be a factor. These office uses can be served by all functional street functional classifications Airport access is important. Convenient public transportation may be a consideration, especially for a downtown site.</p>	<p>Water, sewer, and storm drainage must be adequate. Site should have, but may not always, require modern telecommunication facilities.</p>	<p>Downtown- These small user companies absorb the smaller spaces downtown that are too small or have limitations for larger users. Site sizes downtown are predetermined by existing development patterns and to a lesser extent by redevelopment.</p> <p>Business/Office Park- These small user companies absorb the smaller spaces in larger projects that are too small or have limitations for larger users or occupy expansion areas for medium and large users. Sites sizes are typically driven by larger users except when small companies pool resources to occupy sites. Sites are typically are typically 0.5 to 3 acres within a larger park of 30 to 100 acres.</p> <p>Commercial Centers - These small user companies absorb the smaller spaces in larger projects that are too small or have limitations for larger users or occupy expansion areas for medium and large users. These sites tend to be predetermined by the larger users. These sites are most important to consumer oriented users such as insurance agents.</p> <p>Residential to Office Conversions - These offices tend to be in older transitional areas where commercial and office uses are supplanting residential. Sites tend to be .12 to .75 acres</p> <p>Home Based Businesses - These offices exist within residences and the use is considered accessory to the residence. Site sizes are dictated by residential standards.</p>	<p>Most are done as leases. Some small ownerships available through condominiums. Most space is leased. A collection of small users sometimes pool their resources to jointly own and lease back a 'medium' sized building /site or as a condominium/padlot.</p> <p>Most space is leased.</p> <p>These are typically owned by the Company or the Companies' owner(s), often central issue in the decision.</p> <p>Ownership through home ownership is often central to the decision to operate a home based office business.</p>	<p>Tends to utilize public supplied parking downtown that may include leases of public spaces.</p> <p>Usually uses on-site surface parking.</p> <p>Usually on-site, but may be shared parking with adjoining commercial uses.</p> <p>Usually a combination of public on-street and private off-street. Parking can often be limiting factor.</p> <p>Customer parking typically restricted or not allowed per residential standards.</p>

Small (1-40 employees; 400 to 13k square feet)



COMMERCIAL RETAIL DEVELOPMENT PATTERN TYPES MATRIX

Target Industries	Transportation, Access to Labor and Customers	Public Facilities/Utilities	Site Sizes and Development Patterns Discussion	Ownership/Leasing Patterns	Parking, Loading, Storage
<p>Large Retail Users (45k-500+k sq. Ft.; and/or 15+ acres of outdoor storage)</p> <p>Retail Trade (Regional Retail);</p>	<p>Transportation system that provides convenient connections and very high visibility from major arterial roadways and state highways is essential. Convenient public transportation may be a consideration, especially for a downtown site. Pedestrian traffic on public sidewalks is very important to Downtown Sites and elevated pedestrian connections between buildings can be important as well, Internal pedestrian traffic is essential for Malls, and Lifestyle Centers.</p>	<p>Water, sewer, and storm drainage must be adequate. Site must be able to be served by modern telecommunications. Multiple energy suppliers may be a consideration.</p>	<p>Downtown - Downtown retail sites for large users typically occupy the ground floor and sometimes additional stories. They may occupy existing buildings or the lower floors of new multi-story office buildings. Large Downtown anchors are typically furniture stores and Department stores. Typical site sizes are .5 to 2 acres. Downtown anchors are no longer seen as vital to downtown revitalization, with smaller for-tenants anchored specialty retail more common tenant types. Regional Malls- Regional malls are a well-known development pattern and are large physical structures that contain a cluster of small and medium retailers anchored by three to seven large retail users in one to three stories. Large anchors are often Department stores. Some <i>outlet malls</i> are also configured in a traditional regional mall pattern. Typical site sizes are 3.5 to 10 acres within the larger 50 to 100+ acre mall site.</p> <p>Open-Air Centers - Lifestyle Centers are an example, which are a newer trend in retail development patterns that is a hybrid between an enclosed Mall and a Downtown. It has the concentration of retailers similar to an enclosed mall, but with open air pedestrian connections between stores similar to a Downtown. Some newer <i>outlet malls</i> are configured in a lifestyle center pattern. Typical site sizes are 2.5 to 7 acres within the larger 25 to 60+ acre.¹⁴</p> <p>Large Format Retail - These are large auto-oriented stores that house a collection of goods within a single store. A recent trend has seen smaller vendors co-locate within the larger store (Such as a McDonalds within a Wal-Mart). Individual user site sizes are typically 6 to 14 acres and large format retail tends to seek sites that are clustered with other large format retailers in regional commercial centers that are 55 to 350+ acres.</p> <p>Vehicle/Equipment Salesplex - These are large vehicle and equipment sales yards that serve a wide regional market area. Typical site sizes are 15 to 40+ acres often within a larger cluster of 50 to 200+ acres of similar uses.</p>	<p>No known definitive ownership/leasing practices.</p> <p>The large anchors sometimes own their building and portions of the Mall site - Otherwise they are done as Triple Net Leases from the Mall owner that is often a commercial REIT</p> <p>The large anchors sometimes own their building and portions of the Mall site - Otherwise they are typically done as Triple Net Leases.</p> <p>These sites are typically owned by the retail company or an affiliated real estate company.</p> <p>These sites are typically owned by the retail company or an affiliated real estate company.</p>	<p>Parking is usually a combination of public and private and may be structured. Loading and storage needs can be limiting factor due to existing development patterns. Loading tends to be on-street or in alleys</p> <p>Use on-site shared parking that is sometimes structured. Loading is generally off-hours in designated areas, loading docks and/or vacant parking spaces, storage is almost always indoors.</p> <p>Use on-site center-wide parking that is sometimes structured. Loading is generally off-hours in designated areas. Modern loading bays are one benefit of the lifestyle concept. Storage is almost always indoors.</p> <p>Usually use on-site surface parking that is sometimes structured and may be shared with adjacent properties. Loading is generally non peak-hours in designated areas, storage is mostly indoors, but some out.</p> <p>Outdoor storage areas are dominant feature with surface customer parking on-site. Loading is often in designated areas on-site.</p>

¹⁴ This definition is broader than the typical definition of "Lifestyle Center" in the retail industry.



Target Industries	Transportation; Access to Labor and Customers	Public Facilities/Utilities	Site Sizes and Development Patterns Discussion	Ownership/Leasing Pattern	Parking, Loading, Storage
Medium Retail Users (12k-50k sq. ft./ and/or 3 to 15 acres of outdoor inventory)	<p>Transportation system that provides convenient connections and very high visibility from major arterial roadways and state highways is essential. Convenient public transportation may be a consideration, especially for a downtown site. Pedestrian traffic on public sidewalks is very important to Downtown. Sites and elevated pedestrian connections between buildings can be important as well, internal pedestrian traffic is essential for Malls, and Lifestyle Centers</p>	<p>Water, sewer, and storm drainage must be adequate. Site must be able to be served by modern telecom.</p>	<p>Downtown- Medium users tend to utilize one or two floors of an existing building. Downtown can be cost-prohibitive for some medium sized retail uses. Site sizes are dictated by existing development patterns or as a result of a large user or speculative development project. Second floor retail is typically seen as having limited appeal, unless a multi-floor tenant is found with ground floor presence.</p> <p>Neighborhood Shopping Centers- Typically use 3-10 acres, with leasable area of 30,000 to 100,000. Centers are typically anchored by grocers. These centers serve localized populations, and typically locate near population concentrations.</p> <p>Community Shopping Areas/Centers- Typically use 10 to 30 acres, with leasable area of 100,000 to 450,000. Anchors often include junior department stores, large variety, discount or department stores.</p> <p>Regional Malls- Regional malls are a well-known development pattern and are large physical structures that contain a cluster of small and medium retailers anchored by three to seven large retail users in one to three stories. Large anchors are often Department stores. Some <i>outlet malls</i> are configured in a traditional regional mall pattern. Typical site sizes are 3.5 to 10 acres within the larger 50 to 100+ acre mall site.</p> <p>Open Air-Centers - Lifestyle centers are an example, which are a newer trend in retail development patterns that is a hybrid between an enclosed Mall and a Downtown. It has the concentration of retailers similar to an enclosed mall, but with open air pedestrian connections between stores similar to a Downtown. Some newer <i>outlet malls</i> are configured in a lifestyle center pattern. Typical site sizes are 2.5 to 7 acres within the larger 25 to 60+ acre site.</p> <p>Vehicle/Equipment Dealership- These are medium sized vehicle and equipment sales yards that serve a community market area. Typical site sizes are 4 to 15 acres</p> <p>Truck Center- These are unique uses that serve regional shippers needs for quick services near statewide freight routes. Typical site sizes are 8 to 20 acres</p>	<p>Limited ownership opportunities may be a limiting factor. Leases prevalent.</p> <p>Ownership or leases from affiliated companies common and may be deciding factor.</p> <p>Ownership or leases from affiliated companies common and may be deciding factor.</p> <p>The medium anchors rarely own their building and portions of the Mall site - Otherwise they are done as Triple Net Leases from the Mall owner that is often a REIT</p> <p>The medium anchors sometimes own their building and portions of the site - Otherwise they are typically done as Triple Net Leases.</p> <p>Ownership varies with the user requirements.</p> <p>Ownership varies with the user requirements.</p>	<p>Tends to utilize public and private supplied parking downtown that may include leases of public spaces. Downtown sites rarely have outdoor storage. Loading often done in alleys and may be a limiting factor.</p> <p>Usually use on-site surface parking.</p> <p>Usually use on-site surface parking.</p> <p>Use on-site mall-wide parking that is sometimes structured. Loading is generally off-hours in designated areas or vacant parking spaces, storage is almost always indoors.</p> <p>Use on-site center-wide parking that is sometimes structured. Loading is generally off-hours in designated areas. Modern loading bays are one benefit of the lifestyle concept. Storage is almost always indoors.</p> <p>Outdoor inventory storage areas are dominant feature with surface customer parking on-site. Loading is often in designated areas on-site.</p> <p>Surface tractor trailer customer parking is usually the dominant feature. Limited outdoor storage. Stacking for fuel stations is important.</p>



Target Industries	Transportation, Access to Labor and Customers	Public Facilities/ Utilities	Site Sizes and Development Pattern Discussion	Ownership/ Leasing Patterns	Parking, Loading, Storage
Small Retail and Commercial Services (200 to 15k square feet and/or less than 5 acres outdoor storage)	<p>Transportation system that provides convenient connections and visibility from higher order roadways and state highways is important and essential for some users. Convenient public transportation may be a consideration, especially for a downtown site. Pedestrian traffic on public sidewalks is very important to Downtown Sites and elevated pedestrian connections between buildings can be important as well. Internal pedestrian traffic is essential for Malls, and Lifestyle Centers.</p>	<p>Water, sewer, and storm drainage must be adequate. Site must be able to be served by modern telecom.</p>	<p>Downtown-Small retailers tend to seek ground floor downtown sites. Users tend to be specialty retail, restaurants, bars and similar uses. Site sizes are dictated by existing development patterns or as a result of a large user or speculative development project.</p> <p>Free-Standing Shopping Center Pads- These uses are typically service commercial uses such as restaurants, bars and convenience retail such as convenience marts and fuel stations. Sites are very highest visibility within larger projects. Site sizes are .5 to 2 acres co-located within larger projects such as lifestyle centers, regional malls, clusters of large format retailers and community shopping centers.</p> <p>Attached Boutique/Specialty- These retail sites are co-located within larger buildings that house anchor users in larger projects such as lifestyle centers, regional malls, clusters of large format retailers and community shopping centers. Small sites are the individual lease suites within larger site.</p> <p>Neighborhood Commercial- These are small stand alone users that usually locate along higher order transportation facilities and sometimes cluster with a few other similar sized users. These uses are sometimes occur in residential to commercial conversion areas. These uses tend to be neighborhood service and convenience retail uses such as coffee shops and neighborhood markets. Sites are usually an acre or less within a smaller cluster that is up to three acres.</p> <p>Stand-Alone Legacy Commercial Sites - These are sites in older commercial areas that lack a cohesive development pattern or theme. This development pattern is often linear and arrayed along major transportation corridors. Sites are typically .5 to 4 acres arrayed in within areas containing similar use; along with small scale industrial uses.</p> <p>Vehicle/Equipment Sales Lots- These are medium sized vehicle and equipment sales yards that serve a community market area. Typical site sizes are .5 to 3.5 acres</p>	<p>Most space is leased. Some small ownerships available through condominiums.</p> <p>Space is leased and owned. Many uses are corporate and seek sites with ownership.</p> <p>Most space is leased from larger building owners - often commercial REITs.</p> <p>Space may be leased or owned.</p> <p>Space may be leased or owned. Ownership patterns tend to be fractured.</p> <p>Space is usually leased, but may be owned.</p>	<p>Tends to utilize public supplied parking downtown that may include leases of public spaces. These uses have small amounts of inventory so loading and storage is rarely a limiting factor.</p> <p>Usually uses on-site surface parking, may be shared parking with adjoining commercial uses. These uses have small amounts of inventory so loading and storage is rarely a limiting factor.</p> <p>Usually on-site surface parking shared with adjoining commercial uses. These uses have small amounts of inventory so loading and storage is rarely a limiting factor.</p> <p>Usually on-site surface parking. Pre-existing ratios may be a limiting factor. These uses have small amounts of inventory so loading and storage is rarely a limiting factor.</p> <p>Usually on-site surface parking. Pre-existing ratios may be a limiting factor. These uses have small amounts of inventory so loading and storage is rarely a limiting factor.</p> <p>Outdoor inventory storage areas are dominant feature with surface customer parking on-site.</p>



INDUSTRIAL DEVELOPMENT PATTERN TYPES MATRIX

Target Industries	Transportation, Access to Labor and Customers	Public Facilities/Utilities	Site Sizes and Development Pattern Description	Ownership/Leasing Patterns	Parking, Loading, Storage
Lumber & Wood, Stone, Glass & Concrete, Trucking & Warehousing, Electric, Gas & Sanitation, Food Products, Transportation Equipment, Wholesale Trade, Air Transportation	Transportation system that provides convenient connections to state highways is very important- and especially Interstate 5. Proximity to natural resources can be important for uses that utilize natural resource inputs. Rail access is important to many uses and can be essential for some uses. Convenient access to air freight is important to many uses and may be essential for some. Convenient access to well trained and qualified workforce is essential and industry clustering for access to skilled labor force is common. Convenient access to ocean ports is important to many users and essential for some.	Water, sewer, and storm drainage must be adequate; some of these uses can consume very large quantities of water and produce large quantities of sewage requiring special facilities' plans. Site must be able to be served by modern telecomm. Multiple energy suppliers are important to most users and the ability purchase wholesale energy can be essential for some.	<p>Indoor/Outdoor Industrial Processes - Including Manufacturing, Repair, Remanufacturing, Salvage Yards, Micro-Business, etc. These development patterns typically process raw materials into intermediate industrial input materials and include lumber mills, plywood plants, aggregate processing plants and co-gen power plants. These uses typically have moderate to high levels of airborne emissions, noise production, and waste products. Access to rail can be essential. Site sizes are typically 40 acres to 200+ acres and may cluster with similar uses in areas that are 1000+ acres.</p> <p>Logistics/Warehousing/Transportation Hubs- These development patterns are extremely transportation infrastructure sensitive and require sites with efficient and direct access to the transportation facilities they utilize. Some of these uses may not require proximity to large labor forces. These uses typically produce moderate to high levels of airborne emissions and noise associated with high volumes of truck traffic, rail yard activities, etc. Site sizes are typically 50 to 400+ acres and can cluster with similar uses in freight centers that are 2,000+ acres.</p> <p>Transmission-Regional utility transmission facilities such regional substations and 500kv lines. Noise, emissions and waste levels vary considerably from facility to facility. Site sizes are typically 20+ acres, although some uses can be very large such as solar arrays that cover thousands of acres.</p> <p>Enclosed Manufacturing - These development patterns contain a wide variety of uses from food production to microchip processors and typically process intermediate materials into finished goods and/or parts. Uses are predominantly indoors within enclosed buildings. Convenient access to skilled labor force is essential. These uses typically have low to moderate levels of airborne emissions, noise production, and waste products. Site sizes are typically 20 to 200+ acres and users often seek integration with office developments.</p> <p>Waste Handling - These development patterns include sanitary landfills, regional transfer stations, recycling plants, and sewage treatment plants and large salvage yards. Uses typically have large amounts of outdoor storage/processing. These uses typically have moderate to high levels of airborne emissions and noise production. Site sizes vary considerably from 20 acres to 150+ acres.</p> <p>Spec/Flex Space - Flex space development patterns are enclosed industrial uses where the buildings are developed/investor owned and space is rented to industrial tenants. Often multiple tenants occupy a single building. Low to very low levels of airborne emissions, noise production and waste products. Sites can be 4 to 25 acres.</p>	<p>Typically Corporate Owned (Or Affiliate)</p> <p>Usually sites are corporate or gov. owned, but many will include flex space for smaller users.</p> <p>Almost always Corporate Owned.</p> <p>Typically Corporate Owned</p> <p>Typically Corporate Owned.</p> <p>REIT and Private Equity Ownership</p>	<p>Uses can typically accommodate employee parking easily. These uses typically require large outdoor storage areas for raw materials. Large loading areas are typically needed for trucks and/or railcars.</p> <p>Uses can typically accommodate employee parking easily. These uses are essentially one large storage and loading area with large amounts of land for indoor and outdoor storage and loading areas for trucks, railcars, and sometimes airplanes.</p> <p>Parking, loading and storage needs are minimal.</p> <p>These uses can have a large labor forces requiring large parking areas. Uses typically have large loading areas and some outdoor storage is usually required.</p> <p>Uses can typically accommodate employee parking easily. These uses are essentially usually require large outdoor storage areas. Solid waste disposal facilities typically require large loading areas.</p> <p>Flex space typically has employee and customer parking and a loading door for each suite. Little outdoor storage is utilized.</p>
Large Industrial Users (90k-750+k sq. ft. built space;/ and/or 20+ acres of outdoor inventory/production areas)					



Target Industries	Transportation, Access to Labor and Customers	Public Facilities/Utilities	Site Sizes and Development Pattern Discussion	Ownership/Leasing Patterns	Parking, Loading, Storage
<p>Medium Industrial Users (25k-100k sq. ft. built space); and/or 4 to 25 acres of outdoor inventory/production areas</p> <p>Instruments, Electronic Equipment, Printing & Publishing, Transit Services, Business Services, Communications, Construction, Lumber & Wood, Stone, Glass & Concrete, Trucking & Warehousing, Electric, Gas & Sanitation, Food Products, Transportation Equipment, Wholesale Trade, Air Transportation</p>	<p>Transportation system that provides convenient connections to state highways is very important- and especially Interstate 5. Proximity to natural resources can be important for uses that utilize natural resource inputs. Rail access is important to many uses and can be essential for some uses. Convenient access to air freight is important to many uses and may be essential for some. Convenient access to well trained and qualified workforce is essential and industry clustering for access to skilled labor force is common. Convenient access to ocean ports is important to many users and essential for some.</p>	<p>Water, sewer, and storm drainage must be adequate; some of these uses can consume large quantities of water and produce large quantities of sewage requiring special facilities' plans. Site must be able to be served by modern telecommunications. Multiple energy suppliers are important to most users.</p>	<p>Indoor/Outdoor Industrial Processes - Including Manufacturing, Repair, Remanufacturing, Salvage Yards, Micro-Energy, Agri-business, etc. Uses typically contain indoor activities, but typically more than 25 percent of the site is devoted to outdoor inventory and processes on individual lots. Convenient access to skilled labor force is essential. These uses often have very unique site requirements specific to each industrial processes. These uses typically have moderate levels of airborne emissions, noise production, and waste products. Site sizes are typically 6 to 25 acres and users often require sufficient area to accommodate medium-term expansion planning. Users often seek sites clustered in industrial areas of 100+ acres.</p> <p>Trucking/Warehousing/Distribution/Waste Transfer Substations/Staging- These development patterns are transportation infrastructure sensitive and require sites with efficient and direct access to the transportation facilities they utilize. Some of these uses may not require proximity to large labor forces. These uses typically produce moderate levels of airborne emissions and noise associated with high volumes of truck traffic and mail yard activities. Site sizes are typically 4 to 20 acres and can cluster with similar uses; in freight centers that are 2,000+ acres.</p> <p>Transmission- These are local and small regional substations, natural gas pressure reduction stations for local distribution, and micro power generation uses. These uses typically have low levels of airborne emissions, noise production, and waste products. These uses are typically 4 to 10 acres.</p> <p>Enclosed Industrial Processes - Including Manufacturing, Repair, Remanufacturing, etc. Uses are predominantly indoors within enclosed buildings on individual lots with typically less than 50 percent of the site devoted to outdoor storage. Convenient access to skilled labor force is essential. These uses often have very unique site requirements specific to each industrial processes. These uses typically have low to moderate levels of airborne emissions, noise production, and waste products. Site sizes are typically 4 to 20 acres and users often require sufficient area to accommodate medium-term expansion planning. Users often seek sites clustered in industrial/business parks of 100+ acres and some may seek integrated projects with commercial and office patterns.</p> <p>Personal Storage - Sites should be convenient for access from residential areas. Vehicle storage is typically outdoors while other storage is typically fully enclosed. Low to very low levels of airborne emissions, noise production and waste products. Sites can be 4 to 25 acres.</p> <p>Spec/Flex Space - Flex space development patterns are enclosed industrial uses where the buildings are developer/investor owned and space is rented to industrial tenants within a complex and usually there are multiple tenants occupying a single building. Low to very low levels of airborne emissions, noise production and waste products. Sites can be 4 to 25 acres.</p>	<p>Mix of ownership and leasing</p> <p>Sites are corporate or developer owned, but may include some leased space for smaller users.</p> <p>Almost universally corporate owned.</p> <p>Usually Corporate owned or affiliate owned.</p> <p>Some Corporate and Private Equity Ownership</p> <p>REIT and and Private Equity Ownership</p>	<p>Uses can typically accommodate employee parking easily. These uses include large amounts of land for indoor and outdoor storage and loading areas for trucks, railcars, and sometimes airplanes.</p> <p>Uses can typically accommodate employee parking easily. These uses are essentially one large storage and loading area with large amounts of land for indoor and outdoor storage and loading areas for trucks, railcars, and sometimes airplanes.</p> <p>Parking and loading requirements are minimal. The facilities themselves are kind of outdoor storage.</p> <p>These uses can have moderately sized labor forces requiring large parking areas. Uses typically have large loading areas and some outdoor storage is usually required. Rail and/or air loading areas are sometimes required.</p> <p>Employees parking is minimal. Customer parking/loading must be provided for use of each unit</p> <p>Flex space typically has employee and customer parking and a loading door for each suite. Little outdoor storage is utilized.</p>



Target Industries	Access to Labor and Customers	Public Facilities/Utilities	Site Sizes and Development Pattern Discussion	Ownership/Leasing Patterns	Parking, Loading, Storage
<p>Small (Less than 30k square ft built space and/or less than 5 acres outdoor inventory/production areas)</p> <p>Instruments, Electronic Equipment, Printing & Publishing, Transit, Transportation Services, Business Services, Communications, Construction, Lumber & Wood, Stone, Glass & Concrete, Trucking & Warehousing, Electric, Gas & Sanitation, Food Products, Transportation Equipment, Wholesale Trade, Air Transportation</p>	<p>Transportation system that provides reasonably convenient connections to state highways is important. Rail access is important to some uses and is occasionally essential. Convenient access to air freight is important to many uses and may be essential for some. Convenient access to well trained and qualified workforce is essential and industry clustering for access to skilled labor force is common. Convenient access to ocean ports is important to some and can be essential.</p>	<p>Water, sewer, and storm drainage must be adequate; Site must be able to be served by modern telecommunications. Multiple energy suppliers are important to some users.</p>	<p>Indoor/Outdoor Industrial Uses - Including Manufacturing, Repair, Remanufacturing, Salvage Yards, Micro-Energy etc. Uses typically contain indoor activities, but typically more than 25 percent of the site is devoted to outdoor inventory and processes on individual lots. These uses typically have moderate levels of airborne emissions, noise production, and waste products. Site Sizes are typically 1 to 5 acres.</p> <p>Enclosed Industrial Processes - Including Manufacturing, Repair, Remanufacturing, etc. Uses are predominantly indoors within enclosed buildings on individual lots with typically less than 30 percent of the site devoted to outdoor storage. Convenient access to skilled labor force is essential. These uses typically have low to moderate levels of airborne emissions, noise production, and waste products. Site Sizes are typically .5 to 5 acres and users often require sufficient area to accommodate limited expansion. Users often seek sites clustered in industrial/business parks of 100+ acres and some may seek integrated projects with commercial and office patterns.</p> <p>Personal Storage - Sites should be convenient for access from residential areas. Vehicle storage is typically outdoors while other storage is typically fully enclosed. Low to very low levels of airborne emissions, noise production and waste products. Sites can be .5 to 5 acres.</p> <p>Flex Space - Flex space development patterns are enclosed industrial uses where the buildings are developer/investor owned and space is rented to industrial tenants. Often multiple tenants occupy a single building. Low to very low levels of airborne emissions, noise production and waste products. Sites can be .5 to 5 acres.</p>	<p>Mix of ownership and leasing patterns</p> <p>Usually Corporate owned or affiliate owned.</p> <p>Most are Private Equity Ownership</p> <p>Most are Private Equity Ownership</p>	<p>Uses can typically accommodate employee parking easily. These uses need some land for indoor and outdoor storage and loading areas for trucks rarely railcars and airplanes.</p> <p>These uses can have moderately sized labor forces requiring large parking areas. Uses typically have large loading areas and some outdoor storage is usually required.</p> <p>Employee parking is minimal. Customer parking/loading must be provided for use of each unit</p> <p>Flex space typically has employee and customer parking and a loading door for each suite. Little outdoor storage is utilized.</p>



CAMPUS/INSTITUTIONAL DEVELOPMENT PATTERN TYPES MATRIX

Campus/Institutional development patterns are just that. Campuses are large and medium sized developments usually with a single or very limited set of ownerships. While the many uses within a campus can vary considerably, all the uses within a campus/institutional development are usually aimed at a common purpose or goal. The nature of this common purpose or goal is what shapes the design, site requirements and other characteristics of each individual campus/institutional development. For this reason, the below table describes the site characteristics according to the principal goal of each campus/institution; some uses are merely identified because their requirements will vary too greatly for each particular use.

Type	Target Industries	Transportation; Access to Labor and Customers	Public Facilities/Utilities	Site Sizes and Development Pattern Discussion	Parking, Loading, Storage
Intellectual/Academic	Intellectual and Academic Campuses support the development of intellectual labor capital. Over time, the organic process that is intellectual development tends to intertwine with and support the target industry opportunities in the communities where they exist.	The transportation needs for each campus depends on the type of campus and purpose of the campus. In general, intellectual campuses should have reasonably convenient connections to I-5 and have direct connections to two or more arterials. These uses are often served by public transit and can have high alternative transportation use if facilities are well planned. Good air transportation is essential for some.	Water, sewer, and storm drainage must be adequate; some of these uses can consume large quantities of water and produce large quantities of sewage requiring special facilities' plans. Site must be able to be served by modern telecom and demands on telecom facilities can be immense. Multiple energy suppliers can be important as can the ability purchase wholesale energy can be essential for some.	Major University/National Laboratory- These campuses serve statewide, national and international populations. These campuses are very large and are usually at least 50 acres and can be as large as a 1000+ acres. University campuses usually have on-site dormitories. A wide variety of accessory commercial uses is often necessary to serve the campus population. These uses need excellent connections to regional transportation systems and need convenient air service for passengers and freight. Post-Grad Technology - These can be Private and/or Public and usually involve research and development. These campuses serve statewide, national and international populations. These campuses can vary in size considerably from less than 20 acres to 200+ acres. These uses need excellent connections to regional transportation systems and need convenient air service for passengers and freight. Small College/Community College - These campuses serve regional populations primarily. These may or may not have on-site dormitories. Campuses are typically 20 to 40 acres outside downtown areas. These campuses are sometimes arrayed like a large office user when they are located in a downtown area. Junior High School/High School - These campuses serve local and regional populations and can be public or private. Campuses are typically 15 to 40 acres. Findings Sites that balance the need to be near residential centers that have access to local and regional transportation networks can be challenging.	Loading and storage needs are minimal as a percentage of the overall site sizes for Major Universities. National Labs sometimes require larger storage areas for outdoor scientific equipment. Significant amounts of parking are usually required and may be structured. Loading and storage needs are not extensive, but some storage can be required for outdoor scientific equipment. Amount of parking is proportional to the campus. Some Community Colleges have trade programs that require loading and storage areas. Most do not require significant loading and storage. Significant amounts of parking are usually required and may be structured. Storage needs are not extensive. Student drop-off/pick-up areas are important. High Schools demand more parking than Junior Highs. Parking demands can be reduced by extend of bus services.



PROJECTED NUMBER OF SITES DEMANDED

The final step in establishing the City's land demand projections is to arrive at the number of sites expected to be demanded according to the above described development pattern types during the planning horizon. Because there are subjective components to this analysis, it is important to understand basic assumptions utilized in the analysis. The principal assumptions relate to methodology for identifying and categorizing medium and large sites and these include the following:

- The vast proportion of the employment land base, from the standpoint of total acreage, is consumed by sites larger than half an acre. Some of these are held for speculation and will be divided further, but the vast majority of these parcels are developed and used by going concerns.
- It is much easier to divide employment land into small parcels to meet the needs of smaller users than it is to aggregate small parcels in fractured ownerships to meet the needs of a larger user.

In estimating employment site demand, no single, simple methodology was utilized for estimating Cornelius' need for industrial land by parcel size and quality. Industry-specific and even firm-specific needs indicate an even more diverse range of requirements for known and likely future industries. Accordingly, JOHNSON REID utilized all of the following to identify likely site requirements for parcel size distribution in the context of physical site requirements by general use type summarized in the Development Type Pattern Matrices:

- *Economic Stakeholder Outreach*: Emphasis was put on the City's need for flexible, large industrial sites to capture high-tech spillover from Hillsboro as well City goals to accommodate the agricultural product industry, tourism and commercial services.
- *OECDD Industrial Site/Shovel Ready Guidelines*: Parcel quality and infrastructure need as documented by OECDD for statewide industry recruitment with sector specifics also utilized for pertinent industries.
- *Industrial Development Standards*: NAIOP, among others, indicate design and size standards for industrial development utilized by multiple users instead of "anchor" single users, i.e. business, industrial, and flex park development.
- *U.S. Census of Business*: Washington County zip codes 97123 and 97124 data for distribution of firms by industry and employment were utilized to assist in distribution of need by industry type.
- *Professional Experience*: As a due diligence and feasibility service provider to industrial development throughout the Pacific Northwest, JOHNSON REID experience for private and public interests (Portland Development Commission, et al.) was also utilized.

Figure 25 provides a detailed assessment of Cornelius employment land demand through 2028 in terms of number of sites demanded by site size, with a comparison to developable employment land supply by site quality within the existing Cornelius urban growth boundary. Results are expressed for all three employment growth scenarios.



FIGURE 25: RECONCILIATION OF CORNELIUS EMPLOYMENT LAND SITE DEMAND & SUPPLY (2028)

2028 Land Demand Reconciliation - Site Need Count									
Number of Sites by Development Pattern		Demand Projections				Vacant Supply	Planning Horizon		
		Typical Acreage	Demand Projections				Balance		
			Baseline	High	Medium		Baseline	High	Medium
Commercial (Office)	Business Park	20.00	0	0	0	-	(0)	(0)	(0)
	Medium	7.00	0	1	0	2	2	1	2
	Small	1.00	10	42	23	11	1	(31)	(12)
	Sub Total		10	43	23	13	3	(30)	(10)
Industrial	Cluster Anchor	100.0+	-	1	-	-	-	(1)	-
	Anchor/Large Park	50.0 - 100.0	0	1	0	-	(0)	(1)	(0)
	Large User/Mid Park	25.0 - 50.0	0	3	1	-	(0)	(3)	(1)
	Medium/Smaller Park	10.0 - 25.0	0	5	1	-	(0)	(5)	(1)
	Expanding User	5.0 - 10.0	0	3	1	4	4	1	3
	Small Business	5.0 or fewer	2	19	4	26	24	7	22
Sub Total		3	32	7	30	27	(2)	23	
Commercial (Retail)	Large	25.00	1	1	1	-	(1)	(1)	(1)
	Medium	10.00	5	7	6	1	(4)	(6)	(5)
	Small	1.50	20	29	26	21	1	(8)	(5)
	Sub Total		26	37	33	22	(4)	(15)	(11)

Note: Figures may not sum due to rounding.
SOURCE: City of Cornelius and Johnson Reid, LLC

2028 OFFICE EMPLOYMENT SITE DEMAND FINDINGS

- **Sites Demanded:** Cornelius' economic growth is estimated to drive demand for as few as 10 office commercial sites to as many as 43. The majority of sites for office commercial can be expected in the "Small" category, with typical parcel size of 1 acre.
- **Site Supply:** The City of Cornelius currently has a total of 13 sites suitable for office commercial development, overwhelmingly concentrated in the "Small" category. The City has two medium sites but no site availability suitable for large office development.
- **Sites Needed Reconciliation:** Given documented site demand and existing inventory, Cornelius will require anywhere from no new office commercial site (Baseline Scenario) to 30 new sites (High Growth Scenario) to meet economic opportunities identified in this analysis.
- **Sites Needed Concentration:** Site need is greatly concentrated in the "Small" parcel category, approximately 1 acre. Under the Baseline Growth Scenario, Cornelius currently needs more than two "Small" sites than available (10).

2028 INDUSTRIAL EMPLOYMENT SITE DEMAND FINDINGS

- **Sites Demanded:** Cornelius' economic growth is expected to generate demand for a minimum of 3 industrial sites to as many as 32 over the planning period. The great majority of sites demanded will be five acres or less in size, however lesser shares are attributable to "Expanding Users", "Medium User/Smaller Park", "Large User/Medium Park" and "Anchor/Large Park" users.
- **Site Supply:** The City of Cornelius currently has 30 sites suitable for industrial development within its UGB, greatly concentrated in parcels sized three acres. Cornelius currently has a handful of uncommitted, developable industrial sites within its UGB for medium and small site demand.
- **Sites Needed Reconciliation:** Given documented site demand and existing inventory, Cornelius has a surplus of "Small Business" and "Expanding User" sites (less than 10 acres) under all growth scenarios, however has a deficit of critical industrial park-suitable sites greater than 10 acres under the Medium and High Growth Scenarios.



- *Sites Needed Concentration:* Under the Medium and High Growth Scenarios, Cornelius will require the addition of sites greater than 10 acres to accommodate employment opportunities documented in this analysis.
- *Cluster Anchor Need:* Consistent with City economic development aspirations to diversify its distressed economy, the City of Cornelius seeks a single cluster anchor site of at least 100 acres to catalyze its own potential individual cluster in addition to economic integration with its neighbor cities.

2028 RETAIL COMMERCIAL EMPLOYMENT SITE DEMAND FINDINGS

- *Sites Demanded:* Cornelius population growth, resulting from economic growth opportunity, is expected to create demand for a minimum of 26 commercial sites to as many as 33 over the planning period. The great majority of sites demanded will be one and a half acres in size ("Small"), though "Medium" site need accounts for up to 18% of future commercial retail site demand through 2028.
- *Site Supply:* The City of Cornelius currently has 22 sites suitable for retail development within its UGB, overwhelmingly concentrated in parcels typically sized one and a half acres. The City has 1 site suitable for Medium site need and no sites suitable for large commercial retail development over the planning period.
- *Sites Needed Reconciliation:* Given documented site demand and existing inventory, Cornelius will require anywhere from 4 to 15 retail commercial sites of all suitable retail sizes over the planning period. Cornelius has no retail commercial sites suitable for larger retailers ("Large" – 25+ acres) and presently has only one, ten-acre site to serve medium-sized need through 2028.

PROJECTED GROSS ACREAGE NEED BY SITE QUALITY

Given employment land site demand and need documented in the previous section, resulting estimates of gross demand and need for employment land by site category is possible. Figure 26 provides detailed assessment of Cornelius employment land demand and reconciled need (gross acres) by site quality through 2028. Results are expressed for all three employment growth scenarios and directly correlate to employment site demand details provided in Figure 25.

2028 OFFICE COMMERCIAL LAND ACREAGE DEMAND FINDINGS

- *Land Demanded:* Cornelius economic growth can be expected to drive 13 acres of gross land demand under the Baseline growth scenario to as much as 52 gross acres under the High Growth scenario. The single-largest share of gross acreage demand over the planning period is concentrated in Small site configuration.
- *Land Supply:* The City of Cornelius currently has a total of 28 vacant, buildable acres suitable for office commercial development within the current City UGB. Existing supply is concentrated in "Small" and "Medium" sites. There is presently no available supply of "Large" office commercial land.
- *Land Needed Reconciliation:* Given documented gross acreage demand and existing UGB inventory, Cornelius will have a surplus of gross acres under the Baseline Scenario and marginal sufficiency under the Medium Growth Scenarios, but will require 24 additional gross acres under the High Growth Scenario to meet economic opportunities identified in this analysis.
- *Land Need Concentration:* The City of Cornelius has a surplus of acres in the "Medium" site category under all growth scenarios. Under the Baseline and Medium Growth Scenarios, the surplus acreage may help fill the need in the "Small" site category which has a deficit under the Medium and High Growth Scenarios. Large site orientation gross acreage demand is presently undersupplied within the City of Cornelius UGB, but ultimate demand should be satisfied with medium-sized site supply.

2028 INDUSTRIAL LAND ACREAGE DEMAND FINDINGS

- *Land Demanded:* Cornelius economic growth is expected to generate demand for a minimum of 29 gross acres to as many as 440 gross acres through 2028. The demand for acreage in the "Large User/Medium Park" category dominates industrial demand through 2028, followed by demand for "Medium User/Small Park", "Anchor/Large Park" and "Small Business". Consistent with City aspiration, a 100-acre parcel for a new economic cluster anchor will be required.



FIGURE 26: RECONCILIATION OF CORNELIUS EMPLOYMENT LAND ACREAGE DEMAND & SUPPLY (2028)

2028 Land Demand Reconciliation - Gross Acreage Need									
Vacant Acres Reconciliation (Total)			Demand Projections				Planning Horizon		
	Typical Acreage	Demand Projections			Vacant Supply	Balance			
		Baseline	High	Medium		Baseline	High	Medium	
Commercial Office	Business Park	20.00	1.1	4.6	2.5	-	(1.1)	(4.6)	(2.5)
	Medium	7.00	1.3	5.2	2.9	12.8	11.5	7.5	9.9
	Small	1.00	10.2	41.5	22.8	15.0	4.8	(26.5)	(7.8)
	Sub Total		12.6	54.3	28.2	27.8	15.2	(23.6)	(0.4)
Industrial	Cluster Anchor	100.0+	-	100.0	-	-	(100.0)	-	-
	Anchor/Large Park	50.0 - 100.0	5.7	68.0	14.1	-	(5.7)	(68.0)	(14.1)
	Large User/Mid Park	25.0 - 50.0	9.4	112.2	23.2	-	(9.4)	(112.2)	(23.2)
	Medium/Smaller Park	10.0 - 25.0	6.9	81.6	16.9	-	(6.9)	(81.6)	(16.9)
	Expanding User	5.0 - 10.0	1.7	20.4	4.2	31.0	29.3	10.6	26.8
	Small Business	5.0 or fewer	4.9	57.8	11.9	44.0	39.1	(13.8)	32.1
Sub Total		28.6	440.0	70.3	75.0	46.4	(365.0)	4.7	
Community Retail	Large	25.00	21.1	30.8	27.5	-	(21.1)	(30.8)	(27.5)
	Medium	10.00	45.7	66.8	59.6	10.0	(35.7)	(56.8)	(49.6)
	Small	1.50	30.1	44.1	39.3	14.0	(15.1)	(20.1)	(25.2)
	Sub Total		96.9	141.7	126.4	24.0	(72.9)	(117.7)	(102.4)
Other	Over Night Lodging	Not Estimated	1.9	7.0	4.7	Not Estimated	(1.9)	(7.0)	(4.7)
	Special Uses	Not Estimated	15.4	26.6	22.9	Not Estimated	(15.4)	(26.6)	(22.9)
Grand Totals			155.3	666.7	252.5		(28.5)	(539.9)	(125.7)

- Land Supply: The City of Cornelius currently has 75 vacant, developable acres within its UGB, including 26 acres suitable for "Medium" development and 49 acres suitable for "Small" development. The City currently has zero acres suitable for "Large" user development.
- Land Needed Reconciliation: Given documented site demand and existing inventory, Cornelius will require up to 365 additional acres (High Growth Scenario) to meet economic opportunities identified in this analysis. We would caution, however, that although existing supply is significantly available in smaller parcels, significant industrial business park need with multi-user orientation will not likely be satisfied with the 75 acres of highly parcelized existing supply.
- Land Needed Concentration: The great majority of unmet land demand, under all growth scenarios, is concentrated in sites ten acres or greater. Sites accommodating medium and large industrial users will be undersupplied over the planning period under all three growth scenarios.

2028 RETAIL COMMERCIAL LAND ACREAGE DEMAND FINDINGS

- Land Demanded: Cornelius economic growth and resulting population growth is expected to create demand for a minimum of 97 gross commercial retail acres to as many as 142 gross acres over the planning period. The great majority of acreage demanded will be ten acres in size ("Medium"), though "Small" site need accounts for up to 31% of future commercial retail acreage demand through 2028.
- Land Supply: The City of Cornelius currently has 24 vacant, developable acres suitable for retail development within its UGB, concentrated exclusively in parcels sized ten acres or less. It should be underscored that Cornelius presently has nearly no developable acreage suitable for large commercial retail development over the planning period, namely sites greater than ten acres in size.
- Land Needed Reconciliation: Given documented land demand and existing inventory, Cornelius will require anywhere from 73 to 118 gross acres suitable for retail commercial development over the planning period.



Cornelius has absolutely no retail commercial acreage suitable for large retailers but also has significant undersupply in all retail commercial categories.



FIFTY-YEAR ECONOMIC OPPORTUNITIES ANALYSIS

INTRODUCTION

The City of Cornelius, along with all other jurisdictions within the Portland metropolitan area, has been charged with determining candidate Urban Reserves areas for long-term, 50-year urbanization potential in the context of Portland Metro Urban Growth Boundary planning. This section of the City's Long-Term Economic Opportunities Analysis seeks to address economic development factors that will drive the need for urbanized employment lands through the planning year 2060. Analytical steps for identifying 50-year economic opportunities are analogous to those utilized for the preceding 20-Year (2028) Economic Opportunities Analysis.

Cornelius' long-term employment land is estimated in terms of Cornelius' "organic" growth: growth inherent to the City's economic potential given existing and future industries and its individual competitive advantage. Second, it is estimated in relation to the long-term growth potential of the City of Hillsboro. During the course of completing its own Economic Opportunity Analysis, the City of Hillsboro determined that its long-term growth potential significantly exceeds its ability to provide sufficient land of the sizes and types that its targeted high-tech clusters will require. While the City of Hillsboro has decided that it will focus its economic development efforts on targeting "cluster anchor" industrial users, or those that generally require large industrial parcels, the coordination of economic development and employment land provision between the members of the Western Washington County subarea—Hillsboro, Forest Grove, Cornelius, North Plains and Banks—is integral to regional growth prospects. Without the provision of industrial acreage in more moderate parcel and site sizes by the partner cities in Western Washington County, larger high-tech cluster industrial recruitment in general may likely be compromised. The well-documented multiplier effects and dependent cluster of firms and sectors supporting and supported by new high-tech anchors will not be able to grow within a land-constrained Hillsboro over the long-term and must seek proximate industrial sites in nearby cities.

50-YEAR ECONOMIC FORECASTING ISSUES

Key differences do exist, however, between the 20-year analysis and analysis in support of employment land urbanization over the much longer planning period through 2060. Greater, myriad uncertainties over a fifty-year planning period significantly modify the analytical approach to identifying economic development opportunities for the City of Cornelius. These most notably include, among others:

- *Economic & Financial Uncertainties;*
- *Geopolitical Uncertainties;*
- *Fiscal & Public Financial Unknowns;*
- *Climate Change Risks;* and
- *Possible Demographic & Migration Pattern Changes.*

Detailed speculation regarding all of the above is beyond the scope of this analysis. However, providing "bottom-up" specific forecasts of individual industries in the City of Cornelius over a 50-year period, as conducted for the 20-year analysis, is rendered impractical.

50-YEAR ECONOMIC OPPORTUNITIES ANALYSIS METHODOLOGY

Despite the above outlined uncertainties, the following are available as tools for identifying Cornelius growth issues over the 2060 planning horizon:

- Growth and land need projections for the City of Cornelius through 2028;
- Economic Stakeholder/Industry perspectives for long-term growth in Cornelius;



- Growth and land need projections for the Western Washington County subarea, particularly for the City of Hillsboro through 2060; and
- Portland metro area population and employment growth scenario forecasts conducted by Metro (Figure 15 in this document) as discussed previously in this document.

As discussed throughout this document, Cornelius has distinct features and economic assets attractive for expanding industries. The current diversity of the Cornelius economy, based both on natural resources as well as a strong high-tech presence, offers flexibility along with several opportunities for agglomeration connected to the City's existing industry as well as industry connected to the broader Western Washington County subarea.

Given these findings, JOHNSON REID made the following general assumptions about Cornelius and the Portland metro area economy for fifty-year opportunities consideration:

1. *Long-term water and power capacity suitable for Cornelius' industry competitive advantage will be retained and expanded over the long-term.*
2. *Land use planning regime in the State of Oregon and the Portland metropolitan area will not dramatically change over the 50-year period, ensuring retention and thoughtful planning of future, high-priority industrial lands.*
3. *Natural environment and amenities, urban amenities, and land use planning and policy intended to attract and retain an innovative workforce will be successful over the long-term.*
4. *The above policies and priorities will continue to retain and attract innovative firms in existing and identified emerging industry clusters.*
5. *Future modifications to the State and local fiscal system will not dramatically curb the funding and delivery of key public infrastructure serving both industry and households.*
6. *A coordinated approach to employment land provision and economic development initiatives in Western Washington County based on individual and joint Economic Opportunities Analysis findings.*

Through this concept of economic development and competitive advantage over the long-term, Cornelius fifty-year economic growth is not solely dependent upon the potential of its specific target industries. Instead, Cornelius economic opportunity can reasonably be linked to that of the Western Washington County subarea with the City of Hillsboro driving long-term growth potential.

The City of Hillsboro's long-term growth potential significantly exceeds its ability to provide sufficient land of the sizes and types that targeted high-tech clusters will require over the twenty-year and fifty-year period. The primary implication is that Hillsboro has decided that it will focus its economic development efforts, and resulting industrial land provision, targeting "cluster anchor" industrial users, or those that generally require large industrial parcels, i.e. 90-100 or more acres each. Hillsboro's infrastructure, physical qualities of industrial lands, technical expertise and existing cluster of high-tech firms have provided it with a competitive advantage in recruiting such users vis-à-vis elsewhere across North America.

Although large users may choose to site in Hillsboro, a wide array of industrial site types less than 100 acres in size will be demanded across the planning horizon by the various types of "ripple effect" job growth resulting from the attraction of a cluster anchor. These include vendors, service providers, competitors, and customers who may require anywhere from an individual five-acre facility to a 60-acre flex space business park of various engineering, light manufacturing and research uses.

HIGH-TECH INDUSTRY GROWTH THROUGH 2060

Figure 27 provides a comparison of employment land demand potential in the City of Hillsboro along with the quantity of industrial land the City of Hillsboro seeks for urban reserves over the 2060 planning horizon for high-tech cluster anchors. The City of Hillsboro presently plans to seek up to 3,500 gross acres in urban reserves to strategically target high-tech industrial cluster anchors typically requiring sites 100 acres or greater in size. In contrast, industry growth demand could reach as high as 15,000 gross acres of industrial land by 2060 assuming maximum potential success in growing targeted industries.



FIGURE 27: HILLSBORO URBAN AREA EMPLOYMENT LAND DEMAND (GROSS BUILDABLE ACRES 2008-2060)

Use Type	Need For Land (Acres) By Scenario:			Urb. Reserve Request (Approx.)
	Baseline Growth	High Growth	Medium Growth	
OFFICE COMMERCIAL	1,728.5	4,979.1	3,077.9	
INDUSTRIAL	4,476.3	15,054.9	8,704.5	3,500.0
RETAIL COMMERCIAL	2,970.4	6,225.4	4,698.2	
CITY RESIDENTS	2,632.9	5,518.0	4,164.3	
REGION/TOURISTS 1/	337.5	707.4	533.9	
OVERNIGHT LODGING	48.3	117.8	82.9	
SPECIALIZED USES 2/	1,657.1	2,309.8	2,008.6	
TOTAL	10,880.6	28,687.1	18,572.0	3,500.0

1/ Based on current ratios between locally supported and total sales, CE Survey from the BLS and Census of Retail Trade.

2/ Hospitals, Clinics, etc. for employment not otherwise categorized.

Because Hillsboro’s strategy is to target larger users based on its identified competitive advantage, overall success in fostering economic growth will greatly depend upon the availability of additional industrial land, in a wide array of site sizes, suitable for the various types of “ripple effect” economic growth associated with the presence of larger users and their industrial synergy.

Provided Cornelius-area economic development emphasis balances coordination with the initiatives of the Western Washington County subarea with the goals and targets related to specific target industries in which the City has a competitive advantage over the long-term, we find it reasonable to assume that at worst, Cornelius will retain its projected twenty-year growth path and comprise at least its recent, historical share of Portland metro area employment and economic activity.

This assumption, that Cornelius at least retains its share of growth based upon its innovation competitive advantages, indicates that fifty-year growth (through 2060) will at least materialize as a continuation of trend established over the last ten years and projected through 2028 in the previous section.

2050 CORNELIUS POTENTIAL EMPLOYMENT FORECAST

Figures 28 and 29 below provide industry employment forecasts for the City of Cornelius through 2060 analogous to the forecast provided for the year 2028 (Figure 18). In this case, however, the 2060 industry forecast does not suppose to reasonably predict individual industry or cluster employment growth behavior over the urban reserve planning period. Rather, we depend upon the finding that Cornelius’ industry base and connection to the City of Hillsboro enable the local economy to sustain industry trends established through 2028 by previous analysis.

Accordingly, Baseline, Medium Growth, and High Growth scenario forecasts have been established assuming the three analogous scenarios for the Twenty-Year analysis perpetuate. As in the Twenty-Year analysis, the Baseline forecast represents “organic” growth inherent in Cornelius’ potential given its own existing and future industries and individual competitive advantage. The High and Medium Growth forecasts assume that City of Cornelius captures varying shares of the City of Hillsboro’s growth potential.

Finally, it should be underscored that the resulting employment forecast should be interpreted as *potential opportunity* for Cornelius planning purposes rather than supply-constrained, realized demand. This forecast does not attempt to model the exact timing or nature of such physical constraint, but rather attempts to document total possible demand the City may strategically accommodate based on its own analysis of physical and fiscal constraints to growth over the 2060 planning horizon.



BASELINE LONG-TERM EMPLOYMENT GROWTH

The baseline long-term employment forecast maintains the Twenty-Year analysis assumption that Cornelius will capture approximately 1.4% of Washington County's economic activity. Implicit within this assumption is the success of the City's economic development objectives; namely, the expansion of its target industries, potential transportation network improvements and the resolution of electricity pricing. In other words, it is the City's potential long-term growth assuming it operates in isolation of other cities in the Western Washington County subarea.

Employment growth continues through 2060 at an annual average growth rate of 2.2% (vs. 2.0% from 2008 to 2028) with 5,126 jobs added, inclusive of the 1,221 jobs added through 2028. As in the Twenty-Year analysis, Cornelius' professional services sector is expected to continue significant growth through 2060, due both to maturation in the City's population and economy as well as spillover effects from regional economic growth.

FIGURE 28: EMPLOYMENT FORECAST BY INDUSTRY SECTOR, CORNELIUS (2008-2060)

Baseline/Low Forecast NAICS	Base Year	Employment Forecast							2008-2060 Growth	
	2008	2033	2038	2043	2048	2053	2058	2060	jobs	AAGR
Construction	188	290	314	343	371	406	439	481	293	1.8%
Manufacturing	324	504	546	597	646	709	767	840	517	1.9%
Wholesale Trade	93	128	136	145	154	164	174	186	93	1.3%
Retail Trade	481	905	983	990	1,075	1,197	1,313	1,460	979	2.2%
T.W.U.	149	221	238	258	277	301	323	351	202	1.7%
Information	55	74	78	82	87	92	97	103	48	1.2%
Financial Activities	81	113	120	129	136	146	155	166	85	1.4%
Professional & Business	183	326	361	406	449	507	561	632	448	2.4%
Education & Health	602	1,189	1,344	1,542	1,742	2,007	2,267	2,607	2,004	2.9%
Leisure & Hospitality	119	208	230	257	284	319	352	395	275	2.3%
Other Services	147	201	213	227	240	256	271	289	141	1.3%
Public Administration	63	79	82	86	90	95	99	104	41	1.0%
TOTAL	2,485	4,140	4,544	5,052	5,552	6,198	6,819	7,612	5,126	2.2%

SOURCES: Oregon Employment Department Regional Forecasts, Oregon ES-202 reports, Local Interviews, and Johnson Reid.

ALTERNATIVE LONG-TERM GROWTH SCENARIOS

In determining Cornelius' long-term alternative growth scenarios, the City's baseline "organic" growth is aggregated by expected growth at the regional level. As mentioned previously, the City of Hillsboro has the potential to drive significant regional growth during the next twenty to fifty-year period. To accomplish this, Hillsboro has devised a two-part strategy:

1. A focus on larger, "anchor" users that help to crystallize high-tech industry cluster presence in the City and Washington County in general.
2. Coordination with neighboring western Washington County jurisdictions on industry and cluster growth, specifically provision of various industrial parcels suitable for cluster anchor ripple effects, including vendors, suppliers, spin-offs, and competitors.

Over the fifty-year horizon, Hillsboro intends to seek up to 3,500 gross acres in urban reserves to strategically target high-tech industrial cluster anchors. However, assuming Hillsboro achieves maximum success in growing targeted industries, demand could reach as high as 15,000 gross acres of industrial land by 2060. In keeping with the second part of their strategy, Hillsboro and Cornelius along with Forest Grove, North Plains and Banks have agreed to coordinate economic development efforts and industrial land provision in order to accommodate growth within the region. As expressed in City of Hillsboro 20-Year and 50-Year Economic Opportunities Analysis conducted by JOHNSON REID, Hillsboro is by far the preferred location of high-tech industry in the Portland metropolitan area in the near-term and due to its proximity and knowledge spillovers, western Washington County is by extension Oregon's best prospect for very long-term high-tech economic development.



For Cornelius, Hillsboro's closest neighbor to the west, this translates into the opportunity to provide industrial parcels less than 100 acres in size to allow for growth based on larger and medium-sized users due to the ripple effects of a cluster anchor situating in Hillsboro. Therefore, it is reasonable for Cornelius' alternative growth scenarios to reflect a share of regional growth, which will likely become more important to the City's economy over the 50-year period.

Figure 29 illustrates the high and medium growth scenarios. The high growth forecast assumes Cornelius captures 15% of all Hillsboro-generated industrial growth and 5% of all Hillsboro-generated office growth under its medium growth scenario outlined in JOHNSON REID's Hillsboro analysis. According to the high growth forecast, job growth through 2060 occurs at a 4.9% annual average pace (vs. 7.1% from 2008 to 2028). On the other hand, Cornelius' medium growth forecast assumes the City captures 15% of Hillsboro's growth opportunity created by the emergence of solar and biotechnology clusters alone. According to the medium growth forecast, employment growth continues at an annual average growth rate of 3.2% (vs. 3.5% from 2008 to 2028).

FIGURE 29: ALTERNATIVE GROWTH FORECASTS BY INDUSTRY SECTOR, CORNELIUS (2008-2060)

High Growth Forecast NAICS	Base Year		Employment Forecast						2008-2060 Growth	
	2008	2033	2038	2043	2048	2053	2058	2060	Jobs	AAGR
Construction	189	651	774	915	1,075	1,258	1,408	1,558	1,370	4.2%
Manufacturing	324	4,980	6,168	7,533	9,104	10,909	12,426	13,943	13,620	7.5%
Wholesale Trade	93	319	378	444	517	599	665	731	638	4.0%
Retail Trade	481	1,572	1,954	2,172	2,534	2,941	3,272	3,603	3,122	3.9%
T.W.U.	149	442	519	608	711	830	928	1,027	878	3.8%
Information	55	119	135	152	171	193	210	227	172	2.8%
Financial Activities	81	187	214	245	278	316	346	377	296	3.0%
Professional & Business	183	975	1,186	1,432	1,719	2,054	2,339	2,623	2,440	5.2%
Education & Health	602	1,581	1,832	2,127	2,477	2,890	3,243	3,596	2,994	3.5%
Leisure & Hospitality	119	436	519	615	726	853	959	1,065	945	4.3%
Other Services	147	518	615	722	842	975	1,082	1,189	1,041	4.1%
Public Administration	63	215	254	297	342	392	430	468	405	3.9%
TOTAL	2,485	11,995	14,447	17,263	20,496	24,210	27,308	30,406	27,921	4.9%

Medium Growth Forecast NAICS	Base Year		Employment Forecast						2008-2060 Growth	
	2008	2033	2038	2043	2048	2053	2058	2060	Jobs	AAGR
Construction	188	346	394	448	509	578	655	684	496	2.5%
Manufacturing	324	958	1,120	1,303	1,516	1,755	2,036	2,128	1,804	3.7%
Wholesale Trade	93	168	190	213	241	271	306	314	221	2.4%
Retail Trade	481	972	1,117	1,284	1,470	1,683	1,921	2,040	1,559	2.8%
T.W.U.	149	268	303	342	385	434	489	510	362	2.4%
Information	55	106	119	133	150	169	191	197	141	2.5%
Financial Activities	81	146	164	183	206	230	259	268	187	2.3%
Professional & Business	183	692	832	988	1,174	1,381	1,627	1,703	1,519	4.4%
Education & Health	602	1,482	1,760	2,086	2,453	2,885	3,368	3,651	3,048	3.5%
Leisure & Hospitality	119	346	423	507	608	717	850	871	751	3.9%
Other Services	147	254	284	317	355	396	444	458	310	2.2%
Public Administration	63	91	100	109	119	130	143	146	84	1.6%
TOTAL	2,485	5,830	6,805	7,913	9,186	10,630	12,290	12,969	10,484	3.2%

SOURCES: Oregon Employment Department Regional Forecasts, Oregon ES-202 reports, Local Interviews, and Johnson Reid.



2060 CORNELIUS POTENTIAL EMPLOYMENT LAND DEMAND

INTRODUCTION

An analysis of potential employment land demand through the year 2060 was conducted with methodology analogous to employment land need findings for the year 2028. For a detailed summary of land demand methodology as a function of employment growth, please refer to the section titled Twenty-Year Employment Land Needs Analysis. The resulting total, potential demand estimates will be of use to the City for strategic planning purposes in deciding economic opportunities to engage once policy and physical constraints are introduced.

SUMMARY OF EMPLOYMENT LAND DEMAND FINDINGS

The results summarized in Figure 30 highlight projections of gross, potential new demand within the Cornelius Urban Area for commercial and industrial land through 2060. Detailed findings by use type and growth scenario are included in the technical appendix.

- Through 2060, potential new gross demand for employment land is expected to range from 372 to 2,264 gross buildable acres, contingent upon both Cornelius' realized growth pattern and economic development policy preferences as well as that at the regional level.
- The Organic scenarios indicate that Cornelius can see employment land demand in the vicinity of roughly 372 to 428 acres through 2060.
- Under the Medium Growth scenario in which Cornelius captures 15% of Hillsboro's emerging growth through 2060, the City can realize employment land demand of 782 acres.
- Under the High Growth scenario in which Cornelius captures 15% of Hillsboro's total growth through 2060, the City can see employment land demand as much as 2,264 acres.

FIGURE 30: CORNELIUS URBAN AREA EMPLOYMENT LAND DEMAND (GROSS BUILDABLE ACRES 2008-2060)

Use Type	Need For Land (Acres) By Scenario:			
	Baseline Growth	Organic (Alternative)	High Growth	Medium Growth
OFFICE COMMERCIAL	53.8	61.9	197.1	117.6
INDUSTRIAL	105.3	121.1	1,278.2	268.1
RETAIL COMMERCIAL	149.7	172.1	690.4	312.2
CITY RESIDENTS	119.7	137.7	552.3	249.8
REGION/TOURISTS 1/	29.9	34.4	138.1	62.4
OVERNIGHT LODGING	4.7	5.4	16.3	12.9
SPECIALIZED USES 2/	58.5	67.3	81.5	70.9
TOTAL	372.9	427.8	2,263.6	781.8

1/ Based on current ratios between locally supported and total sales, CE Survey from the BLS and Census of Retail Trade.

2/ Hospitals, Clinics, etc. for employment not otherwise categorized.

SOURCE: Johnson Reid

- Demand for Industrial land represents acreage ranging from 105 under the Organic Baseline scenario to 1,278 under the High Growth scenario.
- Potential Office Commercial demand is estimated to range between 54 and 197 acres during the period, but figures generally reflect maximums. Cornelius will permanently be at a competitive disadvantage to the more centrally located areas for various office uses.
- Potential, gross retail commercial acreage represents the greatest percentage of total demand in each scenario and is estimated to range from 150 to 690 acres through 2060. While some improvement is expected in Cornelius' retail commercial capture due to the development of target industries as well as



regional spill-over growth like office uses, more centrally-located areas will enjoy a competitive advantage for sizeable retail commercial development. As the in the Twenty-Year analysis, retail commercial demand figures reflect a static assumption that Cornelius' regional/visitor driven retail support will normalize at 20% of new demand on the margin.

2060 EMPLOYMENT LAND DEMAND & SUPPLY RECONCILIATION

In the 2028/20-year analysis of employment land demand for the City of Cornelius, gross land demand figures were translated into industry demand by site qualities, namely uses and classes of parcel/site size. Utilizing analogous methodology, a determination of site needs by use and industry size categories was estimated. A more detailed discussion of the underlying methodology is found in the Projected Number of Sites Demanded subsection of the TWENTY-YEAR EMPLOYMENT LAND DEMAND SITE QUALITIES section of this document.

2060 EMPLOYMENT LAND DEMAND & SUPPLY BY SITE QUALITIES

Figure 31 below provides a matrix of fifty-year employment site demand by use and site quality that results from gross acreage demand analysis findings summarized in Figure 30. Estimates reflect *potential*, unconstrained demand for sites in urbanized Cornelius under the three growth path scenarios utilized in this analysis. The inventory of existing, vacant and developable employment land by site type within the current Cornelius UGB is also expressed, along with site need reconciliation for the three growth potential scenarios.

FIGURE 31: RECONCILIATION OF CORNELIUS EMPLOYMENT LAND SITE DEMAND & SUPPLY (2060)

2060 Land Demand Reconciliation - Site Need Count									
Number of Sites by Development Pattern		Demand Projections				Planning Horizon			
		Typical Acreage	Baseline	High	Medium	Vacant Supply	Balance		
							Baseline	High	Medium
Commercial Office	Business Park	20.00	1	2	2	-	(1)	(2)	(2)
	Medium	7.00	1	5	2	2	1	(3)	(0)
	Small	1.00	36	133	66	11	(25)	(122)	(55)
	Sub Total		37	139	70	13	(24)	(126)	(57)
Industrial	Cluster Anchor	100.0+	-	1	-	-	-	(1)	-
	Anchor/Large Park	50.0 - 100.0	0	3	1	-	(0)	(3)	(1)
	Large User/Mid Park	25.0 - 50.0	1	11	2	-	(1)	(11)	(2)
	Medium/Smaller Park	10.0 - 25.0	1	18	4	-	(1)	(18)	(4)
	Expanding User	5.0 - 10.0	1	11	2	4	3	(7)	2
	Small Business	5.0 or fewer	6	72	15	26	20	(46)	11
Sub Total		10	117	24	30	20	(87)	6	
Commercial Retail	Large	25.00	1	6	3	-	(1)	(5)	(3)
	Medium	10.00	7	33	15	1	(6)	(32)	(14)
	Small	1.50	31	143	65	21	(10)	(122)	(44)
	Sub Total		39	182	82	22	(17)	(160)	(60)

Note: Figures may not sum due to rounding.
SOURCE: City of Cornelius and Johnson Reid, LLC

2060 Office Employment Site Demand Findings

- **Sites Demanded:** Cornelius economic growth potential can drive demand for as few as 37 office commercial sites to as many as 139, the majority of which would be in the "Small" office category.
- **Sites Needed Reconciliation:** Given existing inventory, Cornelius growth would require anywhere from 24 new office commercial sites (Baseline Scenario) to 126 new sites (High Growth Scenario) to meet economic opportunities identified in this analysis, the great majority of which would still be "Small" sites typically of one acre.



2060 Industrial Employment Site Demand Findings

- *Sites Demanded:* Cornelius economic growth potential can drive demand for a minimum of 10 industrial sites to as many as 117 sites over the planning period. The great majority of sites demanded will five acres or less in size ("Small Businesses"), however shares are attributable all other categories with exception for Cluster Anchors.
- *Sites Needed Reconciliation:* Given existing inventory, Cornelius growth could require 87 additional industrial sites under the High Growth Scenario to meet economic opportunities through 2060 depending upon the City's economic growth path. However, even under the Baseline and Medium Growth Scenario, the City of Cornelius has a shortage of sites greater than 10 acres in size.

2060 Retail Commercial Employment Site Demand Findings

- *Sites Demanded:* Cornelius population growth, resulting from 50-year economic growth opportunity, is expected to create demand for a minimum of 39 commercial sites to as many as 182 over the planning period, the great majority in the "Small" site category.
- *Sites Needed Reconciliation:* Long term growth is estimated to translate into need for between 17 to 160 retail commercial sites of all suitable retail sizes over the planning period depending upon the City's long-term economic opportunities and path.

PROJECTED GROSS ACREAGE NEED BY SITE QUALITY

Figure 32 provides detailed assessment of Cornelius employment land demand and reconciled need (gross acres) by site quality through 2060. Results are expressed for all three employment growth opportunity scenarios and directly correlate to employment site demand details provided in Figure 31.

FIGURE 32: RECONCILIATION OF CORNELIUS EMPLOYMENT LAND ACREAGE DEMAND & SUPPLY (2060)

2060 Land Demand Reconciliation - Gross Acreage Need									
Vacant Acres Reconciliation (Total)		Planning Horizon							
		Typical Acreage	Baseline	High	Medium	Vacant Supply	Baseline	High	Medium
Commercial Office	Business Park	20.00	11.7	32.5	35.7	-	(11.7)	(32.5)	(35.7)
	Medium	7.00	6.3	32.1	16.1	13.0	6.7	(19.1)	(3.1)
	Small	1.00	35.8	132.6	65.8	15.0	(20.8)	(117.6)	(50.8)
	SubTotal		53.8	197.1	117.6	28.0	(25.8)	(169.1)	(89.6)
Industrial	Cluster Anchor	100.0+	-	100.0	-	-	-	(100.0)	-
	Anchor/Large Park	50.0 - 100.0	21.1	255.6	53.6	-	(21.1)	(255.6)	(53.6)
	Large User/Mid Park	25.0 - 50.0	34.7	421.8	88.5	-	(34.7)	(421.8)	(88.5)
	Medium/Smaller Park	10.0 - 25.0	25.3	306.8	64.3	-	(25.3)	(306.8)	(64.3)
	Expanding User	5.0 - 10.0	6.3	76.7	16.1	31.0	24.7	(45.7)	14.9
	SubTotal	5.0 or fewer	17.9	217.3	45.6	44.0	26.1	(173.3)	(1.6)
	SubTotal		105.3	1,378.2	268.1	75.0	(30.3)	(1,303.2)	(193.1)
Commercial Retail	Large	25.00	32.6	150.2	67.9	-	(32.6)	(150.2)	(67.9)
	Medium	10.00	70.6	325.4	147.2	10.0	(60.6)	(315.4)	(137.2)
	Small	1.50	46.6	214.8	97.1	14.0	(32.6)	(200.8)	(83.1)
	SubTotal		149.7	690.4	312.2	24.0	(125.7)	(666.4)	(288.2)
Other	Over Night Lodging	Not Estimated	4.7	16.3	12.9	Not Estimated	(4.7)	(16.3)	(12.9)
	Special Uses	Not Estimated	58.5	81.5	70.9	Not Estimated	(58.5)	(81.5)	(70.9)
Grand Totals			372.0	2,363.6	781.8		(245.0)	(2,236.6)	(654.8)

Note: Figures may not sum due to rounding.
SOURCE: City of Cornelius and Johnson Reid, LLC



TWENTY-YEAR AND FIFTY-YEAR HOUSING NEED FORECAST

INTRODUCTION

This analysis outlines a forecast of housing need within the City of Cornelius/Urban Growth Boundary. Housing need and resulting land need are forecast to 2035 consistent with 20-year need assessment requirements of periodic review.

Housing needs are also forecast to 2060 (the 50-year forecast). The 50-year Housing Need Forecast is based on the 50-year Employment Forecast included in this report. The employment and housing forecasts presented here over a 50-year timeframe project a substantial amount of growth which may eventually be addressed sub-regionally. For the sake of simplicity, this forecast assumes it is accommodated in Cornelius and future City lands.

The primary data sources used in generating this forecast were the U.S. Census, Claritas Inc. (third-party market data source), and the Employment Forecasts included in this report. Other sources are identified as appropriate.

CURRENT HOUSING NEEDS

The profile of current housing conditions in the study area is based on data from Claritas Inc., which derives its data from Nielson market research, and U.S. Census data on the block level. Estimates of current population and households were cross referenced with estimates from the Population Research Center at Portland State University, and the U.S. Census.

FIGURE 33: PROFILE OF CURRENT HOUSING CONDITIONS (2008)

CURRENT HOUSING CONDITIONS (2008)		SOURCE
Total 2008 Population:	11,454	Claritas ¹
- Estimated group housing population:	-121 (1.1% of Total)	Claritas
Estimated 2008 Population:	11,333 (Total - Group)	
Estimated 2008 Households:	3,332	Claritas
Avg. HH Size:	3.40 (Pop/HH)	Claritas
Total Housing Units:	3,450	Claritas
Occupied Housing Units:	3,332	
Vacant Housing Units:	118	
Current Vacancy Rate:	3.4%	

¹ Claritas figures were cross-referenced with figures from the U.S. Census and PSU Population Research Center.

We estimate a current population of 11,454, living in 3,332 households. Average household size is 3.40 persons (compared to 2.66 in Washington County, and 2.5 statewide). The estimated current vacancy rate of housing units is 3.4%.



ESTIMATE OF CURRENT HOUSING NEED

Following the establishment of the current housing profile, the current housing need was determined based upon the age and income characteristics of current households. The analysis considered the propensity of households in specific age and income levels to either rent or own their home, in order to derive the current need for ownership and rental housing units, and the affordable cost level of each. This presents a snapshot of current housing need equal to the number of households in the study area.

FIGURE 34: ESTIMATE OF CURRENT HOUSING NEED (2008)

Ownership				Rental				
Price Range	# Units	% of Units	Cumulative	Rent Level	# Units	% of Units	Cumulative	
\$0 - 50k	83	3.3%	3.3%	\$0 - 250	90	11.2%	11.2%	
\$50k - 70k	48	1.9%	5.2%	\$250 - 375	57	7.0%	18.3%	
\$70k - 90k	71	2.8%	8.0%	\$375 - 500	73	9.1%	27.3%	
\$90k - 120k	90	3.6%	11.6%	\$500 - 625	58	7.2%	34.5%	
\$120k - 160k	242	9.6%	21.1%	\$625 - 875	99	12.3%	46.9%	
\$160k - 230k	397	15.7%	36.8%	\$875 - 1,250	139	17.3%	64.2%	
\$230k - 350k	744	29.4%	66.2%	\$1,250 - 1,875	154	19.2%	83.4%	
\$350k - 460k	435	17.2%	83.4%	\$1,875 - 2,500	100	12.4%	95.8%	
\$460k - 690k	374	14.8%	98.2%	\$2,500 - 3,750	24	3.0%	98.8%	
\$690k +	44	1.8%	100.0%	\$3,750 +	10	1.2%	100.0%	
Totals:	2,528	% of All:	75.9%	Totals:	804	% of All:	24.1%	All Units 3,332

Sources: Claritas, Census, JOHNSON REID

The price levels presented above assumes that an "affordable" housing payment equals 30% of a household's gross income. The affordable price level for ownership housing assumes 30-year amortization, at an interest rate of 6.5%, with 15% down payment.

CURRENT HOUSING INVENTORY

The profile of current housing needs represents the preference and affordability levels of households. In reality, the current housing inventory differs from this profile, meaning that some households find themselves in housing units which are not optimal, either not meeting the household's own/rent preference, or being under- or over-affordable.

A profile of current housing inventory in Cornelius was determined using Census data from the 2006 American Community Survey, which provides a profile of current housing values, current rent levels, and current housing types (single family, attached, mobile home, etc.).

The following figure presents a profile of current housing inventory of ownership and rental housing in the study area.

- An estimated 71.1% of housing units are ownership units, while an estimated 28.9% of housing units are rental units.
- Over 80% of ownership units are single family homes, as well as 40% of rental units.



FIGURE 35: PROFILE OF CURRENT HOUSING INVENTORY (2008)

OWNERSHIP HOUSING									
Price Range	Single Family	Duplex	3- or 4-plex	5+ Units MFR	Mobile home	Boat, RV, other	Total Units	% of Units	Cumulative %
\$0 - 50k	207	1	2	0	42	0	252	10.3%	10.3%
\$50k - 70k	46	0	0	0	9	0	56	2.3%	12.6%
\$70k - 90k	46	0	0	0	9	0	56	2.3%	14.8%
\$90k - 120k	54	0	0	0	11	0	66	2.7%	17.5%
\$120k - 160k	268	2	2	0	54	0	326	13.3%	30.8%
\$160k - 230k	1,009	7	8	0	203	0	1,228	50.1%	80.9%
\$230k - 350k	305	2	2	0	62	0	371	15.1%	96.0%
\$350k - 460k	33	0	0	0	7	0	40	1.6%	97.7%
\$460k - 690k	25	0	0	0	5	0	31	1.3%	98.9%
\$690k+	21	0	0	0	4	0	26	1.1%	100.0%
Totals:	2,016	14	16	0	406	0	2,453	% of All Units:	71.1%
Percentage:	82.2%	0.6%	0.6%	0.0%	16.6%	0.0%	100.0%		

RENTAL HOUSING									
Price Range	Single Family	Duplex	3- or 4-plex	5+ Units MFR	Mobile home	Boat, RV, other	Total Units	% of Units	Cumulative %
\$0 - 250	0	0	0	0	0	0	0	0.0%	0.0%
\$250 - 375	0	1	2	3	0	0	6	0.6%	0.6%
\$375 - 500	0	2	3	6	0	0	10	1.0%	1.6%
\$500 - 625	107	47	73	56	11	0	293	29.4%	31.0%
\$625 - 875	153	67	103	78	15	0	417	41.8%	72.9%
\$875 - 1,250	100	32	49	9	7	0	197	19.8%	92.7%
\$1,250 - 1,875	44	9	15	-12	2	0	59	5.9%	98.5%
\$1,875 - 2,500	18	2	4	-10	1	0	15	1.5%	100.0%
\$2,500 - 3,750	0	0	0	0	0	0	0	0.0%	100.0%
\$3,750 +	0	0	0	0	0	0	0	0.0%	100.0%
Totals:	405	161	247	149	36	0	997	% of All Units:	28.9%
Percentage:	40.6%	16.1%	24.8%	14.9%	3.6%	0.0%	100.0%		

TOTAL HOUSING UNITS								
	Single Family	Duplex	3- or 4-plex	5+ Units MFR	Mobile home	Boat, RV, other	Total Units	% of Units
Totals:	2,421	175	263	149	442	0	3,450	100%
Percentage:	70.2%	5.1%	7.6%	4.3%	12.8%	0.0%	100.0%	

Sources: Claritas Inc., Census, Johnson Reid

RECONCILIATION OF CURRENT HOUSING NEEDS WITH CURRENT INVENTORY

A comparison of estimated current housing needs with current inventory identifies the existing discrepancies between needs and the housing which is currently available. In general, this identifies a current need for units at the lower and upper levels, and a surplus of housing in the middle income bands. This reflects that most housing stock will be found near the median price and rent levels, with lower income households stretching to pay these prices, and upper income households tending to live in homes costing somewhat less than they can afford based on our definition of "affordable."



FIGURE 36: COMPARISON OF CURRENT NEED TO CURRENT INVENTORY

Ownership				Rental			
Price Range	Estimated Current Need	Estimated Current Supply	Unmet Need or (Surplus)	Rent	Estimated Current Need	Estimated Current Supply	Unmet Need or (Surplus)
\$0 - 50k	83	252	(169)	\$0 - 250	90	0	90
\$50k - 70k	48	56	(8)	\$250 - 375	57	6	50
\$70k - 90k	71	56	15	\$375 - 500	73	10	63
\$90k - 120k	90	66	24	\$500 - 625	58	293	(235)
\$120k - 160k	242	326	(84)	\$625 - 875	99	417	(318)
\$160k - 230k	397	1,228	(831)	\$875 - 1,250	139	197	(58)
\$230k - 350k	744	371	372	\$1,250 - 1,875	154	59	96
\$350k - 460k	435	40	395	\$1,875 - 2,500	100	15	85
\$460k - 690k	374	31	343	\$2,500 - 3,750	24	0	24
\$690k +	44	26	18	\$3,750 +	10	0	10
Totals:	2,528	2,453	75	Totals:	804	997	(193)

Occupied Units:	3,332
All Housing Units	3,450
Total Unit Surplu.	(118)

Sources: Claritas Inc., Census, Johnson Reid

FUTURE HOUSING NEEDS (2035)

FUTURE HOUSING PROFILE (2035)

The profile of future (20-year) housing conditions in the study area is based on the current housing profile, multiplied by an assumed projected future population growth rate. The projected population growth rate is based on the 20-year Employment Forecast presented in a previous chapter of this report. This assumes that economic and employment growth will be the primary determinant of the number of households seeking to locate in the study area. While other households will locate in the study area for reasons such as retirement, family, etc. we project these sources of growth to be marginal in comparison to the employment growth impetus.

Future population growth rate was calculated based on the estimated 20-year employment growth under three scenarios (baseline, medium growth, and high growth). New job projections were divided by the target jobs/housing ratio of 1.5 jobs per household in Cornelius. (Current estimated jobs/housing ratio is 0.75 jobs per household.)

The following table presents growth forecasts under baseline, medium growth and high growth scenarios. Each scenario is based upon a corresponding growth scenario in employment.



FIGURE 37: PROFILE OF FUTURE HOUSING CONDITIONS (2035)

	Baseline Organic Scenario	Medium Growth Scenario	High Growth Scenario
2008 Population:	11,454	11,454	11,454
Annual Growth Rate:	1.2%	2.2%	4.9%
Estimated 2035 Population:	15,508	20,229	40,748
Estimated 2035 Households:	5,680	7,410	14,926
Total Housing Units:	6,043	7,883	15,879
Occupied Housing Units:	5,680	7,410	14,926
Vacant Housing Units:	363	473	953
New Population ('08-'35):	4,054	8,775	29,294
New Households ('08-'35):	2,348	4,078	11,594

Assumes average future household size of 2.72, and unit vacancy of 6%.
Sources: Claritas Inc., Census, Johnson Reid

PROJECTION OF FUTURE HOUSING NEED (2035 – BASELINE SCENARIO)

The profile of future housing needs was derived using the same methodology used to produce the estimate of current housing need. It includes current and future households.

FIGURE 38: PROJECTED TOTAL FUTURE HOUSING NEEDS (2035 – BASELINE SCENARIO)

Ownership				Rental				
Price Range	# Units	% of Units	Cumulative	Rent	# Units	% of Units	Cumulative	
\$0 - 50k	121	2.5%	2.5%	\$0 - 250	131	10.9%	10.9%	
\$50k - 70k	61	1.3%	3.8%	\$250 - 375	63	5.2%	16.1%	
\$70k - 90k	62	1.3%	5.0%	\$375 - 500	83	6.8%	22.9%	
\$90k - 120k	132	2.7%	7.8%	\$500 - 625	77	6.4%	29.4%	
\$120k - 160k	302	6.2%	14.0%	\$625 - 875	122	10.1%	39.5%	
\$160k - 230k	413	8.6%	22.6%	\$875 - 1,250	71	5.9%	45.4%	
\$230k - 350k	1,397	28.9%	51.5%	\$1,250 - 1,875	311	25.8%	71.2%	
\$350k - 460k	867	17.9%	69.4%	\$1,875 - 2,500	200	16.6%	87.8%	
\$460k - 690k	1,181	24.4%	93.9%	\$2,500 - 3,750	78	6.5%	94.3%	
\$690k+	297	6.1%	100.0%	\$3,750+	69	5.7%	100.0%	
Totals:	4,837	% of All:	80.0%	Totals:	1,206	% of All:	20.0%	All Units
								6,043

Sources: Claritas, Census, Johnson Reid

The analysis considered the propensity of households at specific age and income levels to either rent or own their home, in order to derive the future need for ownership and rent housing units, and the affordable cost level of each. The projected need is for *all* 2035 households and therefore includes the needs of current households.

The price levels presented above assumes that an "affordable" housing payment equals 30% of a household's gross income. The affordable price level for ownership housing assumes 30-year amortization, at an interest rate of 6.5%, with 15% down payment. Income levels and price levels are presented in 2008 dollars.



RECONCILIATION OF FUTURE HOUSING NEEDS AND CURRENT HOUSING INVENTORY

The profile of total future housing need (baseline growth scenario) was reconciled with the current housing inventory to determine the total future need for *new* housing units by type and price range (next page).

The results find a need for 2,593 new housing units by 2035, with a stronger emphasis on new ownership units (92%) than is reflected in the current housing inventory. Of the new units needed, a similar share (89%) are projected to be single family types, while the remainder will be some form of attached housing.

An estimated 9.3% of all needed units will be multi-family in structures of 5+ attached units, most of these needed being rental units. Duplex through four-plex units are projected to represent a small percentage of needed units.

FIGURE 39: PROJECTED FUTURE NEED FOR NEW HOUSING UNITS (2035 – BASELINE SCENARIO)

OWNERSHIP HOUSING									
Price Range	Single Family	Duplex	3- or 4-plex	5+ Units MFR	Mobile home	Boat, RV, other	Total Units	% of Units	Cumulative %
\$0 - 50k	-100	-1	-1	0	30	0	-131	-5.5%	-5.5%
\$50k - 70k	8	0	0	0	-3	0	5	0.2%	-5.3%
\$70k - 90k	8	0	0	0	-3	0	5	0.2%	-5.0%
\$90k - 120k	62	0	0	0	2	0	65	2.7%	-2.3%
\$120k - 160k	0	0	0	1	-24	0	-24	-1.0%	-3.3%
\$160k - 230k	-639	-5	-5	1	-162	0	-810	-34.0%	-37.3%
\$230k - 350k	933	5	6	3	78	0	1,026	43.0%	5.7%
\$350k - 460k	735	4	5	2	80	0	826	34.7%	40.4%
\$460k - 690k	1,022	6	7	6	113	0	1,151	48.3%	88.6%
\$690k+	242	1	2	1	25	0	271	11.4%	100.0%
Totals:	2,271	11	13	11	78	0	2,385	% All Units:	92.0%
Percentage:	95.2%	0.5%	0.6%	0.5%	3.3%	0.0%	100.0%		

RENTAL HOUSING									
Price Range	Single Family	Duplex	3- or 4-plex	5+ Units MFR	Mobile home	Boat, RV, other	Total Units	% of Units	Cumulative %
\$0 - 250	48	17	25	39	2	0	131	63.1%	63.1%
\$250 - 375	23	7	11	15	1	0	56	27.1%	90.2%
\$375 - 500	30	9	13	19	1	0	72	34.7%	124.9%
\$500 - 625	-79	-37	-58	-33	-9	0	-216	-103.5%	21.4%
\$625 - 875	-109	-52	-80	-42	-13	0	-295	-141.6%	-120.2%
\$875 - 1,250	-75	-23	-35	12	-6	0	-126	-60.5%	-180.7%
\$1,250 - 1,875	69	30	46	104	4	0	252	121.0%	-59.7%
\$1,875 - 2,500	55	23	35	69	3	0	185	88.9%	29.2%
\$2,500 - 3,750	28	10	15	23	1	0	78	37.6%	66.8%
\$3,750 +	25	9	13	21	1	0	69	33.2%	100.0%
Totals:	15	-6	-14	227	-14	0	208	% All Units:	8.0%
Percentage:	7.4%	-3.1%	-6.6%	109.0%	-6.8%	0.0%	100.0%		

TOTAL HOUSING UNITS								
	Single Family	Duplex	3- or 4-plex	5+ Units MFR	Mobile home	Boat, RV, other	Total Units	% of Units
Totals:	2,286	5	0	238	64	0	2,593	100%
Percentage:	88.2%	0.2%	0.0%	9.2%	2.5%	0.0%	100.0%	

Sources: Claritas Inc., Census, Johnson Gardner LLC



FUTURE HOUSING NEEDS (2060)

The profile of future (50-year) housing conditions in the study area is based on the current housing profile, multiplied by an assumed projected future population growth rate. The projected population growth rate is based on the 50-year Employment Forecast presented in a previous chapter of this report. This assumes that economic and employment growth will be the primary determinant of the number of households seeking to locate in the study area. While other households will locate in the study area for reasons such as retirement, family, etc. we project these sources of growth to be marginal in comparison to the employment growth impetus.

As with the 20-year forecast, future population growth rate was calculated based on the estimated 50-year employment growth under three scenarios (baseline, medium growth, and high growth). New job projections were divided by the target jobs/housing ratio of 1.5 jobs per household in Cornelius. (Current estimated jobs/housing ratio is 0.75 jobs per household.)

The following table presents growth forecasts under baseline, medium growth and high growth scenarios. Each scenario is based upon a corresponding growth scenario in employment.

FIGURE 40: PROFILE OF FUTURE HOUSING CONDITIONS (2060)

	Baseline Organic Scenario	Medium Growth Scenario	High Growth Scenario
2008 Population:	11,454	11,454	11,454
Annual Growth Rate:	1.2%	1.9%	3.3%
Estimated 2060 Population:	20,555	30,199	61,585
Estimated 2060 Households:	7,529	11,062	22,559
Total Housing Units:	8,010	11,768	23,999
Occupied Housing Units:	7,529	11,062	22,559
Vacant Housing Units:	481	706	1,440
New Population ('08-'60):	9,101	18,745	50,131
New Households ('08-'60):	4,197	7,730	19,227

Assumes average future household size of 2.73, and unit vacancy of 6%.
Sources: Claritas Inc., Census, Johnson Reid

2060 projections range from 4,200 new households (baseline scenario) to 19,200 new households (high growth scenario). This represents 9,100 to 50,100 new residents.

PROJECTION OF FUTURE HOUSING NEED (2060)

The profile of future housing needs was derived using the same methodology used to produce the estimate of current housing need. It includes current and future households. The following table represents the baseline growth scenario.



FIGURE 41: PROJECTED TOTAL FUTURE HOUSING NEEDS (2060—BASELINE SCENARIO)

Ownership				Rental				All Units	
Price Range	# Units	% of Units	Cumulative	Rent	# Units	% of Units	Cumulative		
\$0 - 50k	113	1.7%	1.7%	\$0 - 250	132	10.2%	10.2%		
\$50k - 70k	40	0.6%	2.3%	\$250 - 375	28	2.2%	12.3%		
\$70k - 90k	-13	-0.2%	2.1%	\$375 - 500	45	3.5%	15.8%		
\$90k - 120k	136	2.0%	4.1%	\$500 - 625	75	5.7%	21.5%		
\$120k - 160k	182	2.7%	6.8%	\$625 - 875	78	6.0%	27.6%		
\$160k - 230k	160	2.4%	9.2%	\$875 - 1,250	-133	-10.2%	17.3%		
\$230k - 350k	1,940	28.5%	35.1%	\$1,250 - 1,875	467	35.9%	53.2%		
\$350k - 460k	1,247	18.6%	56.7%	\$1,875 - 2,500	298	22.9%	76.1%		
\$460k - 690k	2,231	33.2%	90.0%	\$2,500 - 3,750	152	11.7%	87.8%		
\$690k +	673	10.0%	100.0%	\$3,750 +	159	12.2%	100.0%		
Totals:	6,710	% of All:	83.8%	Totals:	1,300	% of All:	16.2%		8,010

Sources: Claritas Inc., Census, Johnson Reid

The analysis considered the propensity of households at *specific age and income levels* to either rent or own their home, in order to derive the future need for ownership and rent housing units, and the affordable cost level of each. The projected need is for *all* 2060 households and therefore includes the needs of current households.

The price levels presented above assumes that an “affordable” housing payment equals 30% of a household’s gross income. The affordable price level for ownership housing assumes 30-year amortization, at an interest rate of 6.5%, with 15% down payment. Income levels and price levels are presented in 2008 dollars.

RECONCILIATION OF FUTURE HOUSING NEEDS AND CURRENT HOUSING INVENTORY

The profile of total future housing need (baseline growth scenario) was reconciled with the current housing inventory to determine the total future need for *new* housing units by type and price range (next page).

The results find a need for 4,560 new housing units by 2060, with a stronger emphasis on new ownership units (94%) than is reflected in the current housing inventory. Of the new units needed, a similar share (90%) are projected to be single family types, while the remainder will be some form of attached housing.

An estimated 7.2% of all needed units will be multi-family in structures of 5+ attached units, most of these being needed rental units. Duplex through four-plex units are projected to represent a small amount of the total need.



FIGURE 42: PROJECTED FUTURE NEED FOR NEW HOUSING UNITS (2060)

OWNERSHIP HOUSING									
Price Range	Single Family	Duplex	3- or 4-plex	5+ Units MFR	Mobile home	Boat, RV, other	Total Units	% of Units	Cumulative %
\$0 - 50k	-104	-1	-1	0	-33	0	-138	-3.2%	-3.2%
\$50k - 70k	-10	0	0	0	-6	0	-16	-0.4%	-3.6%
\$70k - 90k	-58	0	0	0	-10	0	-69	-1.6%	-5.2%
\$90k - 120k	69	0	0	0	-1	0	69	1.5%	-3.6%
\$120k - 160k	-102	-1	-1	1	-40	0	-144	-3.4%	-7.0%
\$160k - 230k	-863	-6	-7	0	-191	0	-1,067	-25.1%	-32.1%
\$230k - 350k	1,458	8	9	6	88	0	1,568	36.8%	4.8%
\$350k - 460k	1,100	6	7	4	39	0	1,206	28.3%	33.1%
\$460k - 690k	2,002	11	13	7	167	0	2,200	51.7%	84.8%
\$690k +	590	3	4	2	48	0	647	15.2%	100.0%
Totals:	4,082	20	24	20	111	0	4,257	% All Units:	93.4%
Percentage:	95.9%	0.5%	0.6%	0.5%	2.6%	0.0%	100.0%		

RENTAL HOUSING									
Price Range	Single Family	Duplex	3- or 4-plex	5+ Units MFR	Mobile home	Boat, RV, other	Total Units	% of Units	Cumulative %
\$0 - 250	46	16	24	45	2	0	132	43.6%	43.6%
\$250 - 375	10	2	4	6	0	0	22	7.3%	50.9%
\$375 - 500	16	4	6	10	0	0	35	11.6%	62.5%
\$500 - 625	-81	-38	-59	-31	-10	0	-218	-72.2%	-9.7%
\$625 - 875	-126	-58	-89	-52	-14	0	-339	-112.1%	-121.8%
\$875 - 1,250	-147	-48	-73	-54	-9	0	-330	-109.1%	-230.9%
\$1,250 - 1,875	120	46	69	169	4	0	408	134.8%	-96.1%
\$1,875 - 2,500	87	33	49	111	3	0	283	93.5%	-2.6%
\$2,500 - 3,750	53	18	27	51	2	0	152	50.2%	47.6%
\$3,750 +	56	19	28	54	2	0	159	52.4%	100.0%
Totals:	34	-6	-15	308	-19	0	303	% All Units:	6.6%
Percentage:	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%		

TOTAL HOUSING UNITS								
	Single Family	Duplex	3- or 4-plex	5+ Units MFR	Mobile home	Boat, RV, other	Total Units	% of Units
Totals:	4,117	14	9	329	92	0	4,560	100%
Percentage:	90.3%	0.3%	0.2%	7.2%	2.0%	0.0%	100.0%	

Sources: Claritas Inc., Census, Johnson Gardner LLC



20-YEAR AND 50-YEAR HOUSING LAND NEEDS ANALYSIS

INTRODUCTION

This section summarizes the projected need for residential land associated with the household growth projections through 2035 and 2060.

Residential land needs were determined by analyzing the area and achieved density of residentially-zoned land in Cornelius. Based on the estimated average housing density of the developed parcels in each zone, the potential development capacity of remaining vacant parcels was determined. The capacity of existing vacant parcels was compared to the overall future housing need presented in the previous section. This determined the amount of additional land which will be needed, assuming that future housing will have the same distribution across residential zones as is currently seen.

CURRENT RESIDENTIAL LANDS

The City of Cornelius has two Comprehensive Plan Designations which allow residential uses, ranging from low density to medium density configurations. The current achieved housing density across these zones is estimated to be 6.5 units per net acre.

FIGURE 43: RESIDENTIAL COMPREHENSIVE PLAN DESIGNATIONS, CITY OF CORNELIUS

Comp Plan Designation	Est. Current Share of Res. Zoned Land	Average Density (Units/ Net Acre)
LDR Residential - Low Density	69.0%	4.5
MDR Residential - Medium D.	31.0%	11.0
Totals/Averages:	100%	6.5

Sources: City of Cornelius, Metro RLIS, Johnson Reid

GIS analysis of vacant unconstrained parcels in Cornelius found 103 parcels of varying sizes across all residential zones. The parcels include 43 net acres (58 gross) of developable land, which will accommodate an estimated 369 housing units, based on the maximum density allowed in each zone.

FIGURE 44: VACANT RESIDENTIAL PARCELS & ESTIMATED HOUSING DEVELOPMENT CAPACITY

Comp Plan Designation	Hillsboro Zoning Designation	Density Per Net Acre			Vacant Gross Acres	Vacant Net Acres	Parcel Count	Est. Units Accommodated
		Low	High	Avg.				
LDR	R-7	4	5	4.5	34.8	26.1	79	130
LDR	R-10	3	5	4.0	-	-	-	-
MDR	A-2	8	14	11.0	22.7	17.1	24	239
Totals/Averages:				8.6	57.5	43.1	103	369

Sources: City of Cornelius, Metro RLIS, Johnson Reid



FUTURE RESIDENTIAL LAND NEED (2035)

The total future housing need presented in the last section, minus the capacity of existing developable parcels, leaves a need for lands to accommodate new housing units by 2035. The following table presents the projected future land need under the three growth scenarios. The scenarios range from the need for 223 gross acres to accommodate 1,789 new units, to the need for 1,893 gross acres to accommodate 15,000 new units.

FIGURE 45: PROJECTED NEW RESIDENTIAL LAND NEED, CORNELIUS (2035)

BASELINE ORGANIC SCENARIO					
Comp Plan Designation	Total Future Unit Need - Vacant Lands	Units Per Net Acre	Net Acreage Needed	Gross Acreage Needed	Distribution
LDR R-7	392	5.0	78	98	44.0%
LDR R-10	0	5.0	0	0	0.0%
MDR A-2	1,397	14.0	100	125	56.0%
Totals/Averages:	1,789	10.0	178	223	100%

MEDIUM GROWTH SCENARIO					
Comp Plan Designation	Total Future Unit Need - Vacant Lands	Units Per Net Acre	Net Acreage Needed	Gross Acreage Needed	Distribution
LDR R-7	699	5.0	140	175	44.8%
LDR R-10	0	5.0	0	0	0.0%
MDR A-2	2,416	14.0	173	216	55.2%
Totals/Averages:	3,116	10.0	312	391	100%

HIGH GROWTH SCENARIO					
Comp Plan Designation	Total Future Unit Need - Vacant Lands	Units Per Net Acre	Net Acreage Needed	Gross Acreage Needed	Distribution
LDR R-7	3,403	5.0	681	851	44.9%
LDR R-10	0	5.0	0	0	0.0%
MDR A-2	11,678	14.0	834	1,043	55.1%
Totals/Averages:	15,080	10.0	1,515	1,893	100%

Sources: City of Cornelius, Metro RLIS, Johnson Reid



FUTURE RESIDENTIAL LAND NEED (2060)

The total future housing need presented in the last section, minus the capacity of existing developable parcels, leaves a need for lands to accommodate new housing units by 2060. The following table presents the projected future land need under the three growth scenarios. The scenarios range from the need for 523 gross acres to accommodate 4,182 new housing units, to the need for 2,526 gross acres to accommodate 20,200 new units.

FIGURE 4.6: PROJECTED NEW RESIDENTIAL LAND NEED, CORNELIUS (2060)

BASELINE ORGANIC SCENARIO					
Comp Plan Designation	Total Future Unit Need - Vacant Lands	Units Per Net Acre	Net Acreage Needed	Gross Acreage Needed	Distribution
LDR R-7	929	5.0	186	232	44.4%
LDR R-10	0	5.0	0	0	0.0%
MDR A-2	3,253	14.0	232	290	55.6%
Totals/Averages:	4,182	10.0	418	523	100%

MEDIUM GROWTH SCENARIO					
Comp Plan Designation	Total Future Unit Need - Vacant Lands	Units Per Net Acre	Net Acreage Needed	Gross Acreage Needed	Distribution
LDR R-7	1,747	5.0	349	437	44.1%
LDR R-10	0	5.0	0	0	0.0%
MDR A-2	6,202	14.0	443	554	55.9%
Totals/Averages:	7,949	10.0	792	991	100%

HIGH GROWTH SCENARIO					
Comp Plan Designation	Total Future Unit Need - Vacant Lands	Units Per Net Acre	Net Acreage Needed	Gross Acreage Needed	Distribution
LDR R-7	4,509	5.0	902	1,127	44.6%
LDR R-10	0	5.0	0	0	0.0%
MDR A-2	15,670	14.0	1,119	1,399	55.4%
Totals/Averages:	20,179	10.0	2,021	2,526	100%

Sources: City of Cornelius, Metro RLIS, Johnson Reid

EXHIBIT 1.01

PROJECTIONS OF OFFICE SPACE-UTILIZING EMPLOYMENT BY INDUSTRY SECTOR
CORNELIUS, OREGON
2008-2028

Employment Sector	Total Employment 1/				Office Space-Utilizing Employment			
	2008	2013	2018	2023	2008	2013	2018	2023
Construction	188	208	225	245	4	4	4	5
Manufacturing	324	360	389	424	16	18	19	21
Wholesale Trade	93	100	106	113	5	5	5	6
Retail Trade	481	543	596	657	24	27	30	33
Transportation, Warehousing & Utilities	149	163	175	189	45	49	53	57
Information	55	59	62	66	50	53	56	59
Financial Activities	81	88	93	99	73	79	84	89
Professional & Business Services	183	210	233	260	165	189	210	234
Education & Health Services	602	707	799	911	241	283	320	364
Leisure & Hospitality	119	136	150	167	30	34	38	42
Other Services	147	159	168	178	59	63	67	71
Government	63	66	69	72	53	56	59	61
Total	2,485	2,799	3,067	3,381	764	861	944	1,043
								1,145
								381
Employment Sector	Total Employment 1/				Office Space-Utilizing Employment			
	2008	2013	2018	2023	2008	2013	2018	2023
Construction	188	255	342	452	4	5	7	9
Manufacturing	324	881	1,801	3,600	16	44	90	150
Wholesale Trade	93	124	167	222	5	6	6	11
Retail Trade	481	652	854	1,112	24	33	43	56
Transportation, Warehousing & Utilities	149	193	248	318	45	58	74	95
Information	55	66	78	93	50	59	70	83
Financial Activities	81	98	118	143	73	89	106	129
Professional & Business Services	183	294	445	639	165	265	401	575
Education & Health Services	602	800	972	1,190	241	320	389	476
Leisure & Hospitality	119	168	227	302	30	42	57	76
Other Services	147	197	268	358	59	79	107	143
Government	63	82	111	148	53	70	94	126
Total	2,485	3,812	5,630	7,977	764	1,069	1,446	1,929
								2,319
								1,555
Employment Sector	Total Employment 1/				Office Space-Utilizing Employment			
	2008	2013	2018	2023	2008	2013	2018	2023
Construction	188	212	239	267	4	4	4	5
Manufacturing	324	421	537	681	15	21	27	34
Wholesale Trade	93	105	118	133	5	5	5	7
Retail Trade	481	556	639	732	24	28	32	37
Transportation, Warehousing & Utilities	149	167	188	211	45	50	56	63
Information	55	63	72	83	50	57	65	75
Financial Activities	81	91	103	116	73	82	93	104
Professional & Business Services	183	257	349	462	165	231	314	416
Education & Health Services	602	729	874	1,035	241	292	349	414
Leisure & Hospitality	119	148	187	230	30	37	47	57
Other Services	147	164	183	204	59	66	73	82
Government	63	67	72	78	53	57	61	66
Total	2,485	2,980	3,562	4,231	764	930	1,129	1,360
								1,617
								853

1/ Johnson Reid

2/ Share of industry employment that utilizes office space. From the Urban Land Institute converted to NAICS by Johnson Reid, LLC.

* Estimate

**EXHIBIT 1.02
DEMAND PROJECTIONS FOR COMMERCIAL OFFICE SPACE BY INDUSTRY SECTOR
CORNELIUS, OREGON
2008-2028**

Employment Sector	Local Area Jobs in Office Space 1/					Avg. Space Per Job 2/	Projected Office Space Need 3/					
	2008	2013	2018	2023	2028		2013	2018	2023	2028	2028	
Construction	4	4	4	5	5	366	1,510	1,674	1,811	1,969	2,129	619
Manufacturing	16	18	19	21	23	366	6,521	7,239	7,839	8,532	9,235	2,714
Wholesale Trade	5	5	5	6	6	366	1,872	2,020	2,140	2,276	2,411	539
Retail Trade	24	27	30	33	36	366	9,677	10,928	11,991	13,235	14,514	4,838
Transportation, Warehousing & Utilities	45	49	53	57	61	366	17,952	19,722	21,187	22,867	24,556	6,604
Information	50	53	56	59	62	366	20,040	21,449	22,889	23,969	25,130	6,604
Financial Activities	73	79	84	89	95	366	29,384	31,791	33,757	35,983	38,194	8,810
Professional & Business Services	165	189	210	234	259	366	66,453	76,083	84,373	94,181	104,370	37,917
Education & Health Services	241	283	320	364	411	366	97,024	113,891	128,723	146,630	165,603	68,579
Leisure & Hospitality	30	34	38	42	46	366	12,017	13,698	15,137	16,834	18,592	6,574
Other Services	59	63	67	71	75	366	23,738	25,553	27,029	28,694	30,341	6,603
Government	53	56	59	61	64	366	21,408	22,623	23,595	24,675	25,728	4,320
Total	764	861	944	1,043	1,145	366	307,597	346,674	380,170	419,746	460,803	153,206
Employment Sector	Local Area Jobs in Office Space 1/					Avg. Space Per Job 2/	Projected Office Space Need 3/					
	2008	2013	2018	2023	2028		2013	2018	2023	2028	2028	
Construction	4	5	7	9	11	366	1,510	2,052	2,751	3,640	4,366	2,856
Manufacturing	16	44	90	150	197	366	6,521	17,745	56,245	60,384	79,446	72,925
Wholesale Trade	5	6	8	11	13	366	1,872	2,493	3,362	4,473	5,371	3,500
Retail Trade	24	33	43	56	68	366	9,677	13,132	17,201	22,383	26,604	16,927
Transportation, Warehousing & Utilities	45	58	74	95	112	366	17,952	23,314	29,933	38,372	45,236	27,284
Information	50	59	70	83	94	366	20,040	23,843	28,104	33,578	37,988	17,948
Financial Activities	73	89	106	129	147	366	29,384	35,651	42,759	51,827	59,193	29,809
Professional & Business Services	165	265	401	575	716	366	66,453	106,701	161,377	231,549	288,151	221,698
Education & Health Services	241	320	389	476	548	366	97,024	128,833	156,524	191,717	220,455	123,431
Leisure & Hospitality	30	42	57	76	91	366	12,017	16,913	22,846	30,404	36,558	24,540
Other Services	59	79	107	143	173	366	23,738	31,775	43,152	57,683	69,476	45,738
Government	53	70	94	126	151	366	21,408	28,001	37,958	50,608	60,940	39,532
Total	754	1,069	1,446	1,929	2,319	366	307,597	430,467	582,212	776,616	933,785	626,188
Employment Sector	Local Area Jobs in Office Space 1/					Avg. Space Per Job 2/	Projected Office Space Need 3/					
	2008	2013	2018	2023	2028		2013	2018	2023	2028	2028	
Construction	4	4	5	5	6	366	1,510	1,704	1,921	2,152	2,442	931
Manufacturing	16	21	27	34	41	366	6,521	8,467	10,817	13,708	16,519	9,998
Wholesale Trade	5	5	6	7	8	366	1,872	2,104	2,374	2,677	3,020	1,148
Retail Trade	24	28	32	37	42	366	9,677	11,201	12,872	14,725	16,932	7,255
Transportation, Warehousing & Utilities	45	50	56	63	71	366	17,952	20,214	22,709	25,449	28,673	10,721
Information	50	57	65	75	85	366	20,040	22,899	26,230	30,173	34,186	14,145
Financial Activities	73	82	93	104	117	366	29,384	33,098	37,272	42,026	47,207	17,823
Professional & Business Services	165	231	314	416	519	366	66,453	93,036	126,593	167,350	203,995	142,541
Education & Health Services	241	292	349	414	494	366	97,024	117,382	140,675	166,738	199,029	102,005
Leisure & Hospitality	30	37	47	57	71	366	12,017	14,871	18,856	23,101	28,669	16,652
Other Services	59	66	73	82	91	366	23,738	26,412	29,446	32,831	36,655	12,917
Government	53	57	61	66	72	366	21,408	22,981	24,722	26,586	28,798	7,390
Total	764	930	1,129	1,360	1,617	366	307,597	374,367	454,467	547,517	657,124	343,527

1/ From Exhibit 1.01
 2/ Average office employee at density by industry sector based on Urban Land Institute guidelines.
 3/ Assumes a market-clearing, 10% office space vacancy rate.
 4- Estimate

**EXHIBIT 1.03
DEMAND PROJECTIONS FOR COMMERCIAL OFFICE LAND BY INDUSTRY SECTOR
CORNELIUS, OREGON
2008-2028**

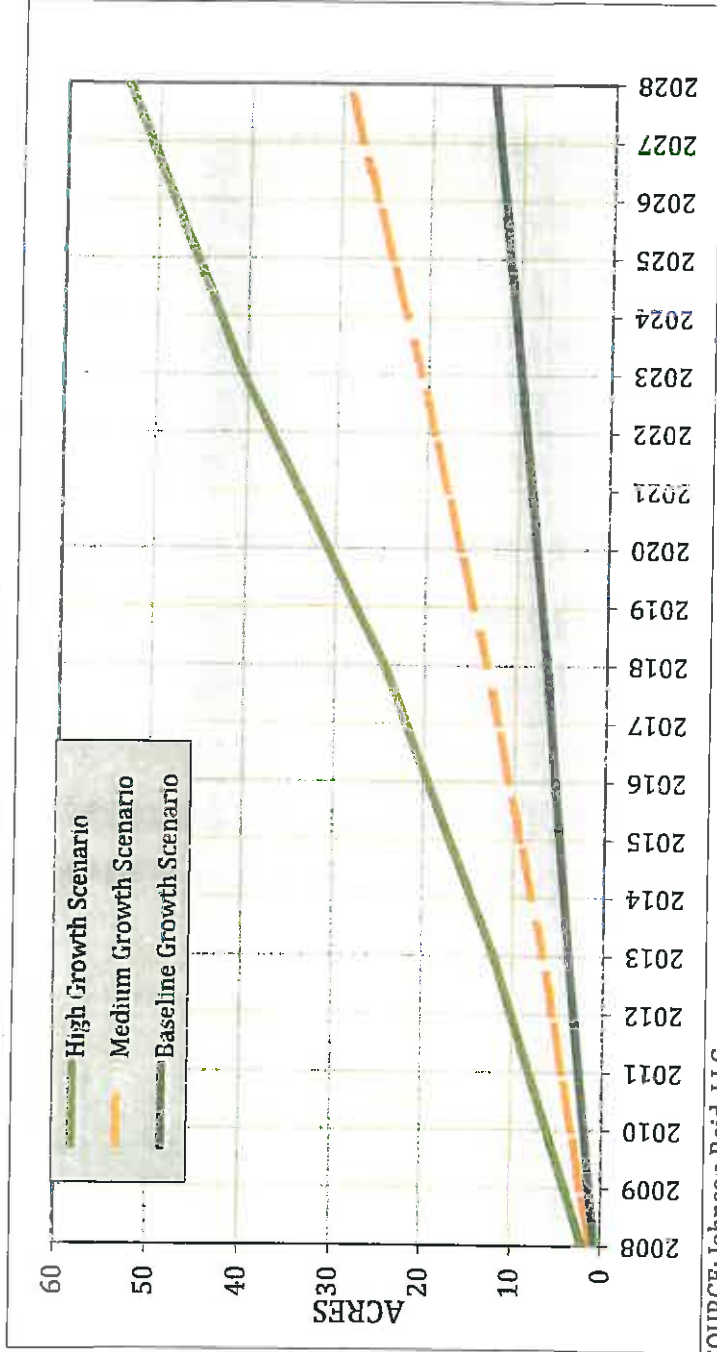
Employment Sector	Projected Office Space Need 1/					Floor to Area Ratio	Predicted Land Need (Acres)					
	2008	2013	2018	2023	2028		2008	2013	2018	2023	2028	
Construction	1,510	1,674	1,811	1,969	2,129	0.35	0.1	0.1	0.1	0.1	0.1	0.0
Manufacturing	6,521	7,239	7,839	8,532	9,235	0.35	0.4	0.5	0.5	0.6	0.6	0.2
Wholesale Trade	1,872	2,020	2,140	2,276	2,411	0.35	0.1	0.1	0.1	0.1	0.2	0.0
Retail Trade	9,677	10,928	11,991	13,235	14,514	0.35	0.6	0.7	0.8	0.9	1.0	0.3
Transportation, Warehousing & Utilities	17,952	19,722	21,187	22,867	24,556	0.35	1.2	1.3	1.4	1.5	1.6	0.4
Information	20,040	21,449	22,589	23,869	25,130	0.35	1.3	1.4	1.5	1.6	1.6	0.3
Financial Activities	29,384	31,791	33,757	35,983	38,194	0.35	1.9	2.1	2.2	2.4	2.5	0.6
Professional & Business Services	66,453	76,088	84,373	94,181	104,370	0.35	4.4	5.0	5.5	6.2	6.8	2.5
Education & Health Services	97,024	113,891	128,723	146,630	165,603	0.35	6.4	7.5	8.4	9.6	10.9	4.5
Leisure & Hospitality	12,017	13,698	15,137	16,834	18,592	0.35	0.8	0.9	1.0	1.1	1.2	0.4
Other Services	23,738	25,553	27,029	28,694	30,341	0.35	1.6	1.7	1.8	1.9	2.0	0.4
Government	21,408	22,623	23,595	24,675	25,728	0.35	1.4	1.5	1.5	1.6	1.7	0.3
Total	307,597	346,674	380,170	419,746	460,803	0.35	20.2	22.7	24.9	27.5	30.2	10.8
Employment Sector												
Construction	1,510	2,052	2,751	3,640	4,366	0.35	0.1	0.1	0.2	0.2	0.2	0.3
Manufacturing	6,521	17,745	36,245	60,384	79,446	0.35	0.4	1.2	2.4	4.0	5.2	4.8
Wholesale Trade	1,872	2,495	3,362	4,473	5,371	0.35	0.1	0.2	0.2	0.3	0.4	0.2
Retail Trade	9,677	13,132	17,201	22,383	26,604	0.35	0.6	0.9	1.1	1.5	1.7	1.1
Transportation, Warehousing & Utilities	17,952	23,314	29,933	36,372	45,236	0.35	1.2	1.5	2.0	2.5	3.0	1.8
Information	20,040	23,843	28,104	33,578	37,988	0.35	1.3	1.6	1.8	2.2	2.5	1.2
Financial Activities	29,384	35,654	42,759	51,827	59,193	0.35	1.9	2.3	2.8	3.4	3.9	2.0
Professional & Business Services	66,453	106,701	161,377	231,549	288,151	0.35	4.4	7.0	10.6	15.2	18.9	14.5
Education & Health Services	97,024	128,839	156,524	191,717	220,455	0.35	6.4	8.5	10.3	12.6	14.5	8.1
Leisure & Hospitality	12,017	16,913	22,846	30,404	36,558	0.35	0.8	1.1	1.5	2.0	2.4	1.6
Other Services	23,738	31,775	43,152	57,683	69,476	0.35	1.6	2.1	2.8	3.8	4.6	3.0
Government	21,408	28,004	37,958	50,608	60,940	0.35	1.4	1.8	2.5	3.3	4.0	2.6
Total	307,597	430,467	582,212	776,616	933,785	0.35	20.2	28.2	38.2	50.9	61.2	41.1
Employment Sector												
Construction	1,510	1,704	1,921	2,152	2,442	0.35	0.1	0.1	0.1	0.1	0.1	0.1
Manufacturing	6,521	8,467	10,817	13,708	16,519	0.35	0.4	0.6	0.7	0.9	1.1	0.7
Wholesale Trade	1,872	2,104	2,374	2,677	3,020	0.35	0.1	0.1	0.2	0.2	0.2	0.1
Retail Trade	9,677	11,201	12,872	14,725	16,932	0.35	0.6	0.7	0.8	1.0	1.1	0.5
Transportation, Warehousing & Utilities	17,952	20,214	22,709	25,449	28,673	0.35	1.2	1.3	1.5	1.7	1.9	0.7
Information	20,040	22,899	26,230	30,173	34,186	0.35	1.3	1.5	1.7	2.0	2.2	0.9
Financial Activities	29,384	33,098	37,272	42,026	47,207	0.35	1.9	2.2	2.4	2.8	3.1	1.2
Professional & Business Services	66,453	93,036	126,593	167,350	208,991	0.35	4.4	6.1	8.3	11.0	13.7	9.3
Education & Health Services	97,024	117,382	140,675	166,738	199,029	0.35	6.4	7.7	9.2	10.9	13.1	6.7
Leisure & Hospitality	12,017	14,871	18,836	23,101	28,669	0.35	0.8	1.0	1.2	1.5	1.9	1.1
Other Services	23,738	26,412	29,446	32,831	36,655	0.35	1.6	1.7	1.9	2.2	2.4	0.8
Government	21,408	22,981	24,722	26,586	28,796	0.35	1.4	1.5	1.6	1.7	1.9	0.5
Total	307,597	374,367	454,467	547,517	651,124	0.35	20.2	26.6	29.8	35.9	42.7	22.5

1/ From Exhibit 1.02

*Estimate

EXHIBIT 1.04

**COMPARISON OF CUMULATIVE DEMAND FOR OFFICE LAND
MEDIUM, HIGH AND LOW EMPLOYMENT GROWTH SCENARIOS
2008-2028**



SOURCE: Johnson Reid, LLC

EXHIBIT 1.05

PROJECTIONS OF INDUSTRIAL SPACE-UTILIZING EMPLOYMENT BY INDUSTRY SECTOR
 CORNELIUS, OREGON
 2008-2028

Employment Sector	Total Employment 1/				Industrial Share 2/				Industrial Space-Utilizing Employment			
	2008	2013	2018	2023	2008	2013	2018	2023	2008	2013	2018	2023
Construction	188	208	225	245	264	30%	30%	30%	56	62	67	73
Manufacturing	324	360	389	424	459	95%	95%	95%	308	342	370	403
Wholesale Trade	93	100	106	113	120	95%	95%	95%	88	95	101	107
Retail Trade	481	543	596	657	721	0%	0%	0%	0	0	0	0
Transportation, Warehousing & Utilities	149	163	175	189	203	70%	70%	70%	104	114	123	133
Information	55	59	62	66	69	10%	10%	10%	6	6	6	7
Financial Activities	81	88	93	99	105	0%	0%	0%	0	0	0	0
Professional & Business Services	183	210	233	260	288	10%	10%	10%	18	21	23	26
Education & Health Services	602	707	799	911	1,028	0%	0%	0%	0	0	0	0
Leisure & Hospitality	119	136	150	167	185	0%	0%	0%	0	0	0	0
Other Services	147	159	168	178	188	60%	60%	60%	88	95	101	107
Government	63	66	69	72	75	15%	15%	15%	9	10	10	11
Total	2,485	2,799	3,067	3,381	3,707	26%	26%	26%	678	746	802	866
Industrial Space-Utilizing Employment												
	Total Employment 1/				Industrial Share 2/				Industrial Space-Utilizing Employment			
	2008	2013	2018	2023	2008	2013	2018	2023	2008	2013	2018	2023
Construction	188	255	342	452	542	30%	30%	30%	56	76	103	136
Manufacturing	324	881	1,801	3,000	3,947	95%	95%	95%	308	837	1,711	2,850
Wholesale Trade	93	124	167	222	257	95%	95%	95%	88	118	159	211
Retail Trade	481	652	854	1,112	1,322	0%	0%	0%	0	0	0	0
Transportation, Warehousing & Utilities	149	193	248	318	375	70%	70%	70%	104	135	173	222
Information	55	66	78	93	105	10%	10%	10%	6	7	8	9
Financial Activities	81	98	118	143	163	0%	0%	0%	0	0	0	0
Professional & Business Services	183	294	445	539	795	10%	10%	10%	18	29	45	64
Education & Health Services	602	800	972	1,190	1,359	0%	0%	0%	0	0	0	0
Leisure & Hospitality	119	168	227	302	353	0%	0%	0%	0	0	0	0
Other Services	147	197	268	358	431	60%	60%	60%	88	118	161	215
Government	63	82	111	148	178	15%	15%	15%	9	12	17	22
Total	2,485	3,812	5,630	7,977	9,857	42%	42%	42%	678	1,333	2,375	3,729
Industrial Space-Utilizing Employment												
	Total Employment 1/				Industrial Share 2/				Industrial Space-Utilizing Employment			
	2008	2013	2018	2023	2008	2013	2018	2023	2008	2013	2018	2023
Construction	188	212	239	267	313	30%	30%	30%	56	63	72	80
Manufacturing	324	421	537	681	821	95%	95%	95%	308	400	510	647
Wholesale Trade	93	105	118	133	150	95%	95%	95%	88	99	112	126
Retail Trade	481	556	539	732	841	0%	0%	0%	0	0	0	0
Transportation, Warehousing & Utilities	149	167	188	211	237	70%	70%	70%	104	117	132	147
Information	55	63	72	83	94	10%	10%	10%	6	6	7	8
Financial Activities	81	91	103	116	130	0%	0%	0%	0	0	0	0
Professional & Business Services	183	257	349	462	577	10%	10%	10%	18	26	35	46
Education & Health Services	602	729	874	1,035	1,236	0%	0%	0%	0	0	0	0
Leisure & Hospitality	119	148	187	230	285	0%	0%	0%	0	0	0	0
Other Services	147	164	183	204	228	60%	60%	60%	88	98	110	122
Government	63	67	72	78	84	15%	15%	15%	9	10	11	12
Total	2,485	2,980	3,562	4,231	4,986	28%	28%	28%	678	820	988	1,189

1/ From Exhibit 1.01
 2/ Share of industry employment that utilizes industrial space. Regional Industrial Land Study Phase III (EconNorthwest and Oak, Inc., 2001) converted to NAIGS by Johnson Reid, LLC.
 * Estimate

EXHIBIT 1.06
INDUSTRIAL EMPLOYMENT DENSITY WORKSHEET BY INDUSTRY SECTOR
CORNELIUS, OREGON
2008-2028

Employment Sector	Distribution by Building Type 1/				Square Feet per Job 2/				Average Space per Job				Weighted Average	
	Warehouse/		General		Warehouse/		General		Warehouse/		General			Tech/ Flex
	Distrib.	Industrial	Distrib.	Industrial	Distrib.	Industrial	Distrib.	Industrial	Distrib.	Industrial				
Construction	0%	75%	25%	533	1,350	467	467	0	400	117	517			
Manufacturing	0%	75%	25%	533	1,350	467	467	0	400	117	517			
Wholesale Trade	90%	0%	10%	533	2,746	467	467	2,471	0	47	2,518			
Retail Trade	0%	0%	0%	533	1,356	467	467	0	0	0	0			
Transportation, Warehousing & Utilities	100%	0%	0%	533	1,707	467	467	1,707	0	0	1,707			
Information	0%	0%	100%	533	1,350	467	467	0	0	467	467			
Financial Activities	0%	0%	0%	533	1,350	467	467	0	0	0	0			
Professional & Business Services	0%	0%	100%	533	1,350	467	467	0	0	467	467			
Education & Health Services	0%	0%	0%	533	1,350	467	467	0	0	0	0			
Leisure & Hospitality	0%	0%	0%	533	1,350	467	467	0	0	0	0			
Other Services	0%	75%	25%	533	1,350	467	467	0	0	0	0			
Government	50%	0%	50%	533	1,350	467	467	675	400	117	517			
				533					0	234	909			

1/ Regional Industrial Land Study Phase II (Otak, Inc. et al, 1999) converted to NAICS by Johnson Reid, LLC.

2/ Regional Industrial Land Study Phase III (EcoNorthwest and Otak, Inc., 2001) converted to NAICS by Johnson Reid, LLC.

EXHIBIT 1.09

DEMAND PROJECTIONS FOR COMMERCIAL INDUSTRIAL LAND BY INDUSTRY SECTOR
CORNELIUS, OREGON

2008-2028

Employment Sector	Projected Industrial Space Need 1/					Floor to Area Ratio 2/	Predicted Land Need (Acres) 3/					
	2008	2013	2018	2023	2028		2008	2013	2018	2023	2028	
Total	718,756	785,990	841,565	905,147	968,969	0.29	65.2	71.3	76.4	82.2	88.1	272.9
Employment Sector												
Construction	31,969	35,441	38,340	41,587	45,076	0.29	3.0	3.4	3.6	4.0	4.3	1.2
Manufacturing	174,843	194,088	210,180	228,773	247,621	0.29	15.6	18.4	20.0	21.7	23.5	6.9
Wholesale Trade	244,691	264,013	279,760	297,554	315,190	0.31	22.1	23.8	25.3	26.9	28.5	6.4
Transportation, Warehousing & Utilities	195,364	214,620	230,570	248,850	267,228	0.31	17.4	19.1	20.5	22.1	23.7	6.4
Information	2,841	3,041	3,203	3,384	3,563	0.26	0.3	0.3	0.3	0.4	0.4	0.1
Professional & Business Services	9,421	10,787	11,962	13,352	14,797	0.26	1.0	1.1	1.3	1.4	1.6	0.6
Other Services	50,249	54,090	57,215	60,739	64,225	0.29	4.8	5.1	5.4	5.8	6.1	1.3
Total	718,756	785,990	841,565	905,147	968,969	0.29	65.2	71.3	76.4	82.2	88.1	272.9
Employment Sector												
Construction	31,969	43,429	58,237	77,045	92,419	0.29	3.0	4.1	5.5	7.3	8.8	5.7
Manufacturing	174,843	475,781	971,839	1,619,058	2,130,181	0.29	16.6	45.2	92.3	153.8	202.4	185.7
Wholesale Trade	244,691	326,145	439,545	584,680	702,168	0.31	22.1	29.5	39.7	52.8	63.4	41.3
Transportation, Warehousing & Utilities	195,364	253,717	325,743	417,583	492,284	0.31	17.4	22.5	28.9	37.1	43.7	26.4
Information	2,841	3,380	3,984	4,760	5,386	0.26	0.3	0.4	0.4	0.5	0.6	0.3
Professional & Business Services	9,421	15,127	22,879	32,827	40,852	0.26	1.0	1.6	2.4	3.5	4.3	3.3
Other Services	50,249	67,262	91,344	122,103	147,068	0.29	4.8	6.4	8.7	11.6	14.0	9.2
Total	718,756	1,197,109	1,930,199	2,680,226	3,637,051	0.29	65.2	109.7	178.0	266.6	337.2	272.0
Employment Sector												
Construction	31,969	36,071	40,655	45,559	51,682	0.29	3.0	3.4	3.9	4.3	4.9	1.9
Manufacturing	174,843	227,013	290,023	367,549	442,928	0.29	16.6	21.6	27.6	34.9	42.1	25.5
Wholesale Trade	244,691	275,031	310,362	350,002	394,714	0.31	22.1	24.8	28.0	31.6	35.7	13.6
Transportation, Warehousing & Utilities	195,364	219,976	247,132	276,954	312,032	0.31	17.4	19.5	22.0	24.6	27.7	10.4
Information	2,841	3,246	3,719	4,278	4,847	0.26	0.3	0.3	0.4	0.5	0.5	0.2
Professional & Business Services	9,421	13,190	17,947	23,726	29,630	0.26	1.0	1.4	1.9	2.5	3.1	2.1
Other Services	50,249	55,908	62,331	69,497	77,592	0.29	4.8	5.3	5.9	6.6	7.4	2.6
Total	718,756	840,503	982,999	1,149,210	1,326,040	0.29	65.2	76.4	89.6	105.0	121.4	56.2

1/ From Exhibit 1.07

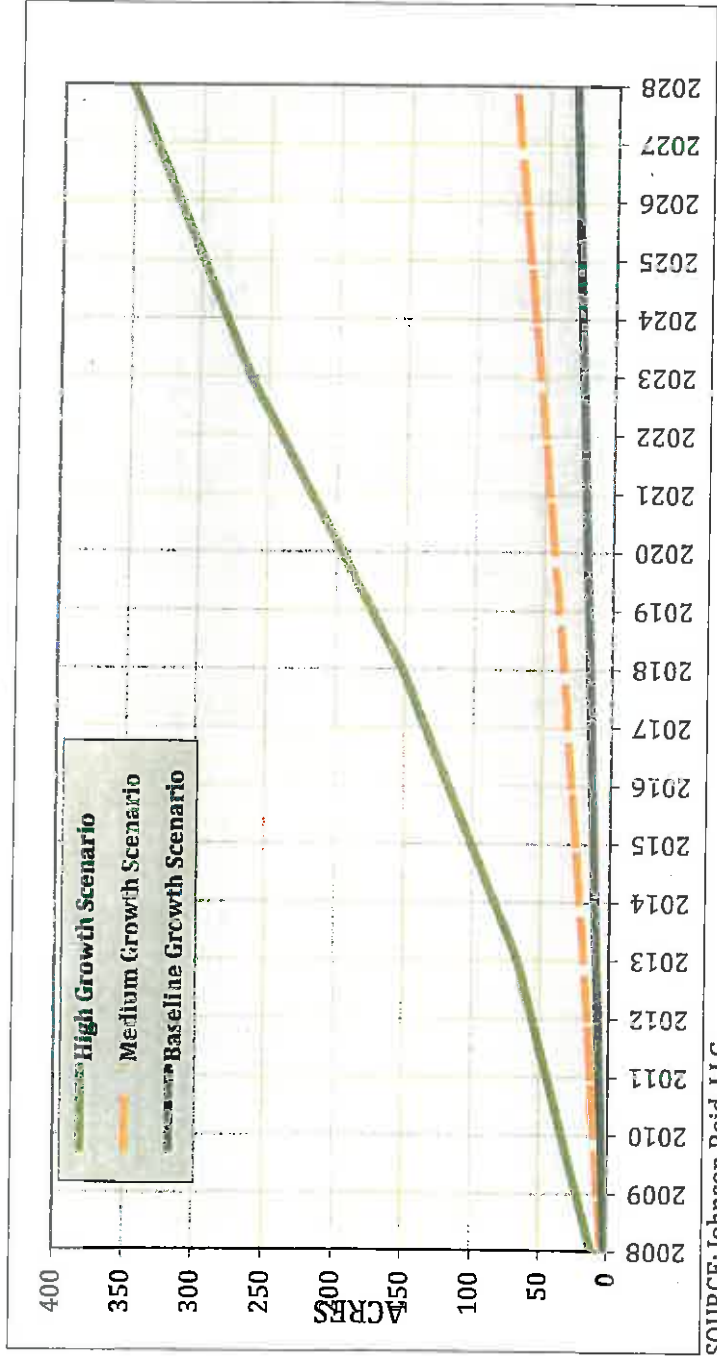
2/ From Exhibit 1.08

3/ Assumes a non-traditional industrial land use factor of 10% from Regional Industrial Land Study Phase II (Orak, Inc., et al., 1999).

*Estimate

EXHIBIT 1.10

**COMPARISON OF CUMULATIVE DEMAND FOR INDUSTRIAL LAND
MEDIUM, HIGH AND LOW EMPLOYMENT GROWTH SCENARIOS
2008-2028**



SOURCE: Johnson Reid, LLC

EXHIBIT 1.11
PROJECTIONS OF HOUSEHOLD RETAIL SALES
CORNELIUS, OREGON
2008-2028

NAICS Category	Per Household Expenditures 1/	Household Retail Spending in Millions (Households)					
		2008	2013	2018	2023	2028	'08-'28
441 Motor Vehicles and Parts Dealers	\$8,067	\$58.6	\$65.2	\$72.4	\$80.5	\$89.5	\$30.9
442 Furniture and Home Furnishings Stores	\$943	\$6.9	\$7.6	\$8.5	\$9.4	\$10.5	\$3.6
443 Electronics and Appliance Stores	\$990	\$7.2	\$8.0	\$8.9	\$9.9	\$11.0	\$3.8
444 Building Materials and Garden Equipment	\$4,058	\$29.5	\$32.8	\$36.4	\$40.5	\$45.0	\$15.5
445 Food and Beverage Stores	\$5,334	\$38.8	\$43.1	\$47.9	\$53.2	\$59.2	\$20.4
446 Health and Personal Care Stores	\$1,876	\$13.6	\$15.2	\$16.8	\$18.7	\$20.8	\$7.2
448 Clothing and Clothing Accessories Stores	\$1,914	\$13.9	\$15.5	\$17.2	\$19.1	\$21.2	\$7.3
451 Sporting Goods, Hobby, Book and Music Stores	\$862	\$6.3	\$7.0	\$7.7	\$8.6	\$9.6	\$3.3
452 General Merchandise Stores	\$5,039	\$36.6	\$40.7	\$45.3	\$50.3	\$55.9	\$19.3
453 Miscellaneous Store Retailers	\$1,043	\$7.6	\$8.4	\$9.4	\$10.4	\$11.6	\$4.0
722 Foodservices and Drinking Places	\$3,936	\$28.6	\$31.8	\$35.3	\$39.3	\$43.7	\$15.1
Totals/Weighted Averages	\$34,062	\$247.5	\$275.1	\$303.9	\$346.0	\$378.0	\$130.5

NAICS Category	Per Household Expenditures 1/	Household Retail Spending in Millions (Households)					
		2008	2013	2015	2023	2028	'08-'28
441 Motor Vehicles and Parts Dealers	\$8,067	\$58.6	\$67.2	\$76.9	\$88.1	\$101.3	\$42.4
442 Furniture and Home Furnishings Stores	\$943	\$6.9	\$7.8	\$9.0	\$10.3	\$11.8	\$5.0
443 Electronics and Appliance Stores	\$990	\$7.2	\$8.2	\$9.4	\$10.8	\$12.4	\$5.2
444 Building Materials and Garden Equipment	\$4,058	\$29.5	\$33.8	\$38.7	\$44.3	\$50.8	\$21.3
445 Food and Beverage Stores	\$5,334	\$38.8	\$44.4	\$50.9	\$58.3	\$66.8	\$28.0
446 Health and Personal Care Stores	\$1,876	\$13.6	\$15.6	\$17.9	\$20.5	\$23.5	\$9.9
448 Clothing and Clothing Accessories Stores	\$1,914	\$13.9	\$15.9	\$18.2	\$20.9	\$24.0	\$10.0
451 Sporting Goods, Hobby, Book and Music Stores	\$862	\$6.3	\$7.2	\$8.2	\$9.4	\$10.8	\$4.5
452 General Merchandise Stores	\$5,039	\$36.6	\$41.9	\$48.1	\$55.1	\$63.1	\$26.5
453 Miscellaneous Store Retailers	\$1,043	\$7.6	\$8.7	\$9.9	\$11.4	\$13.1	\$5.5
722 Foodservices and Drinking Places	\$3,936	\$28.6	\$32.8	\$37.5	\$43.0	\$49.3	\$20.7
Totals/Weighted Averages	\$34,062	\$247.5	\$283.5	\$324.8	\$372.1	\$426.4	\$178.9

NAICS Category	Per Household Expenditures 1/	Household Retail Spending in Millions (Households)					
		2008	2013	2018	2023	2028	'08-'28
441 Motor Vehicles and Parts Dealers	\$8,067	\$58.6	\$66.4	\$75.2	\$85.1	\$96.4	\$37.8
442 Furniture and Home Furnishings Stores	\$943	\$6.9	\$7.8	\$8.8	\$9.9	\$11.3	\$4.4
443 Electronics and Appliance Stores	\$990	\$7.2	\$8.1	\$9.2	\$10.4	\$11.8	\$4.6
444 Building Materials and Garden Equipment	\$4,058	\$29.5	\$33.4	\$37.8	\$42.8	\$48.5	\$19.0
445 Food and Beverage Stores	\$5,334	\$38.8	\$43.9	\$49.7	\$55.3	\$63.7	\$25.0
446 Health and Personal Care Stores	\$1,876	\$13.6	\$15.4	\$17.5	\$19.8	\$22.4	\$8.8
448 Clothing and Clothing Accessories Stores	\$1,914	\$13.9	\$15.7	\$17.8	\$20.2	\$22.9	\$9.0
451 Sporting Goods, Hobby, Book and Music Stores	\$862	\$6.3	\$7.1	\$8.0	\$9.1	\$10.3	\$4.0
452 General Merchandise Stores	\$5,039	\$36.6	\$41.5	\$47.0	\$53.2	\$60.2	\$23.6
453 Miscellaneous Store Retailers	\$1,043	\$7.6	\$8.6	\$9.7	\$11.0	\$12.5	\$4.9
722 Foodservices and Drinking Places	\$3,936	\$28.6	\$32.4	\$36.7	\$41.5	\$47.0	\$18.4
Totals/Weighted Averages	\$34,062	\$247.5	\$280.3	\$317.4	\$359.4	\$407.0	\$159.5

1/ Claritas, Inc. average retail sales figures for Cornelius, Oregon in 2007 dollars.

**EXHIBIT 1.12
PROJECTIONS OF COMMERCIAL RETAIL SPACE NEED
CORNELLIUS, OREGON
2008-2028**

NAICS Category	Household Retail Spending (millions) 1/					Sales Support Factor 2/	Spending-Supported Retail Demand (SF) 3/					
	2008	2013	2018	2023	2028		2008	2013	2018	2023	2028	
441 Automotive Parts, Accessories and Tire Stores	\$58.6	\$65.2	\$72.4	\$80.5	\$89.5	176.9	377,179	419,310	466,147	518,215	576,009	198,920
442 Furniture and Home Furnishings Stores	\$6.9	\$7.6	\$8.5	\$9.4	\$10.5	33.6	35,422	39,378	43,777	48,667	54,103	19,681
443 Electronics and Appliance Stores	\$7.2	\$8.0	\$8.9	\$9.9	\$11.0	33.6	32,454	35,745	39,738	44,177	49,111	16,958
444 Building Materials and Garden Equipment	\$29.5	\$32.8	\$36.4	\$40.5	\$45.0	315.5	206,011	229,022	254,604	283,043	314,658	108,648
445 Food and Beverage Stores	\$38.8	\$43.1	\$47.9	\$53.2	\$59.2	302.4	\$384	111,100	137,310	152,643	169,694	58,593
446 Health and Personal Care Stores	\$13.6	\$15.2	\$16.8	\$18.7	\$20.8	77.2	\$283	58,015	65,519	72,838	80,974	27,959
448 Clothing and Clothing Accessories Stores	\$13.9	\$15.5	\$17.2	\$19.1	\$21.2	77.3	\$77	57,310	63,712	70,828	78,740	27,959
451 Sporting Goods, Hobby, Book and Music Stores	\$6.3	\$7.0	\$7.7	\$8.6	\$9.5	33.3	\$240	28,721	31,929	35,495	39,460	30,225
452 General Merchandise Stores	\$36.6	\$40.7	\$45.3	\$50.3	\$55.9	319.3	\$171	233,602	251,919	291,175	323,699	15,147
453 Miscellaneous Store Retailers	\$7.6	\$8.4	\$9.4	\$10.4	\$11.6	44.9	\$236	33,301	39,244	43,628	48,501	35,919
722 Foodservices and Drinking Places	\$28.6	\$31.8	\$35.3	\$39.3	\$43.7	151.5	\$290	120,395	133,963	148,926	165,561	57,166
Totals/Weighted Averages	\$247.5	\$275.1	\$305.9	\$340.0	\$376.0	\$130.5	1,286,210	1,423,209	1,582,180	1,758,908	1,955,977	875,167
NAICS Category	Household Retail Spending (millions) 1/					Sales Support Factor 2/	Spending-Supported Retail Demand (SF) 3/					
	2008	2013	2018	2023	2028		2008	2013	2018	2023	2028	
441 Automotive Parts, Accessories and Tire Stores	\$58.6	\$67.2	\$76.9	\$88.1	\$101.0	182.6	465,883	511,447	608,851	697,529	799,122	335,239
442 Furniture and Home Furnishings Stores	\$6.9	\$7.8	\$9.0	\$10.3	\$11.8	35.0	35,422	40,581	46,491	53,263	61,020	25,599
443 Electronics and Appliance Stores	\$7.2	\$8.2	\$9.4	\$10.8	\$12.4	35.2	32,454	36,937	42,202	48,349	55,391	23,237
444 Building Materials and Garden Equipment	\$29.5	\$33.8	\$38.7	\$44.3	\$50.8	127.3	206,011	236,015	270,391	309,773	354,891	148,680
445 Food and Beverage Stores	\$38.8	\$44.4	\$50.9	\$58.3	\$66.8	178.6	111,100	137,282	145,820	167,059	191,391	80,290
446 Health and Personal Care Stores	\$13.6	\$15.6	\$17.9	\$20.5	\$23.5	79.9	53,015	60,736	69,582	79,717	91,327	38,313
448 Clothing and Clothing Accessories Stores	\$13.9	\$15.9	\$18.2	\$20.9	\$24.0	110.6	57,310	65,657	75,220	86,176	98,727	41,417
451 Sporting Goods, Hobby, Book and Music Stores	\$6.3	\$7.2	\$8.2	\$9.4	\$10.8	44.5	\$240	28,721	32,904	37,696	43,187	49,477
452 General Merchandise Stores	\$36.6	\$41.9	\$48.1	\$55.1	\$63.1	319.3	\$171	233,602	269,917	309,230	354,269	405,867
453 Miscellaneous Store Retailers	\$7.6	\$8.7	\$9.9	\$11.4	\$13.1	55.5	\$236	33,301	40,443	46,333	53,082	60,813
722 Foodservices and Drinking Places	\$28.6	\$32.8	\$37.5	\$43.0	\$49.3	170.7	108,395	124,183	142,270	162,991	186,730	78,335
Totals/Weighted Averages	\$247.5	\$283.5	\$324.8	\$372.1	\$426.4	\$178.9	1,366,914	1,566,002	1,794,087	2,055,392	2,354,756	987,843
NAICS Category	Household Retail Spending (millions) 1/					Sales Support Factor 2/	Spending-Supported Retail Demand (SF) 3/					
	2008	2013	2018	2023	2028		2008	2013	2018	2023	2028	
441 Automotive Parts, Accessories and Tire Stores	\$58.6	\$66.4	\$75.2	\$85.1	\$96.4	177.8	463,883	525,301	594,851	673,610	762,796	298,913
442 Furniture and Home Furnishings Stores	\$6.9	\$7.8	\$9.0	\$10.4	\$11.8	34.4	35,422	40,111	45,422	51,436	58,246	22,825
443 Electronics and Appliance Stores	\$7.2	\$8.1	\$9.2	\$10.4	\$11.8	34.6	32,454	36,411	41,232	46,691	52,873	20,719
444 Building Materials and Garden Equipment	\$29.5	\$33.4	\$37.8	\$42.8	\$48.5	119.9	206,011	233,287	264,174	299,151	338,758	132,747
445 Food and Beverage Stores	\$38.8	\$43.9	\$49.7	\$56.3	\$63.7	125.7	111,100	125,810	142,467	161,330	182,690	71,590
446 Health and Personal Care Stores	\$13.6	\$15.4	\$17.5	\$19.8	\$22.4	82.0	53,015	60,034	67,982	76,983	87,176	34,161
448 Clothing and Clothing Accessories Stores	\$13.9	\$15.7	\$17.8	\$20.2	\$22.9	93.6	57,310	64,896	73,491	83,221	94,239	36,929
451 Sporting Goods, Hobby, Book and Music Stores	\$6.3	\$7.1	\$8.0	\$9.1	\$10.3	44.6	28,721	32,523	36,830	41,706	47,228	18,507
452 General Merchandise Stores	\$36.6	\$41.5	\$47.6	\$53.2	\$60.2	319.3	\$171	235,602	266,796	302,120	342,120	387,417
453 Miscellaneous Store Retailers	\$7.6	\$8.6	\$9.7	\$11.0	\$12.5	54.9	\$236	35,301	39,975	45,268	51,261	58,048
722 Foodservices and Drinking Places	\$28.6	\$32.4	\$36.7	\$41.5	\$47.0	170.4	108,395	122,747	138,998	157,402	178,242	69,847
Totals/Weighted Averages	\$247.5	\$280.3	\$317.4	\$359.4	\$407.0	\$159.5	1,366,914	1,547,893	1,752,835	1,984,911	2,247,713	888,800

1/ From Exhibit 1.11
2/ Based on national averages derived from "Dollars & Cents of Shopping Centers," Urban Land Institute, 2000.
3/ Assumes a market-clearing retail space vacancy rate of 10%.
* Estimate

**EXHIBIT 1.13
PROJECTIONS OF COMMERCIAL RETAIL SPACE NEED
CORNELIUS, OREGON
2008-2028**

NAICS Category	Spending-Supported Retail Demand (SF) 1/					Commercial Retail Land Need (Acres)							
	2008	2013	2018	2023	2028	'08-'28	F.A.R. 2/	2008	2013	2018	2023	2028	'08-'28
441 Automotive Parts, Accessories and Tire Stores	377,179	419,310	466,147	518,215	576,099	198,920	0.25	34.6	38.5	42.8	47.6	52.9	18.3
442 Furniture and Home Furnishings Stores	35,422	39,378	43,777	48,667	54,103	19,681	0.25	3.3	3.6	4.0	4.5	5.0	1.7
443 Electronics and Appliance Stores	32,154	35,745	39,738	44,177	49,111	16,958	0.25	3.0	3.3	3.6	4.1	4.5	1.6
444 Building Materials and Garden Equipment	206,011	229,022	254,604	283,043	314,658	108,648	0.25	18.9	21.0	23.4	26.0	28.9	10.0
445 Food and Beverage Stores	111,100	123,510	137,306	152,643	169,694	58,593	0.25	10.2	11.3	12.6	14.0	15.6	5.4
446 Health and Personal Care Stores	53,015	58,936	65,519	72,838	80,974	27,959	0.25	4.9	5.4	6.0	6.7	7.4	2.6
448 Clothing and Clothing Accessories Stores	57,310	63,712	70,828	78,740	87,535	30,225	0.25	5.3	5.9	6.5	7.2	8.0	2.8
451 Sporting Goods, Hobby, Book and Music Stores	28,721	31,929	35,495	39,460	43,868	15,147	0.25	2.6	2.9	3.3	3.6	4.0	1.4
452 General Merchandise Stores	235,602	261,919	291,175	323,699	359,856	124,254	0.25	21.6	24.1	26.7	29.7	33.0	11.4
453 Miscellaneous Store Retailers	35,301	39,244	43,628	48,501	53,919	18,617	0.25	3.2	3.6	4.0	4.5	5.0	1.7
722 Foodservices and Drinking Places	109,395	120,503	133,963	148,926	165,561	57,166	0.25	10.0	11.1	12.3	13.7	15.2	5.2
Totals/Weighted Averages	1,280,210	1,423,209	1,582,180	1,758,908	1,955,377	675,167	0.25	117.6	130.7	145.3	161.5	179.6	62.0

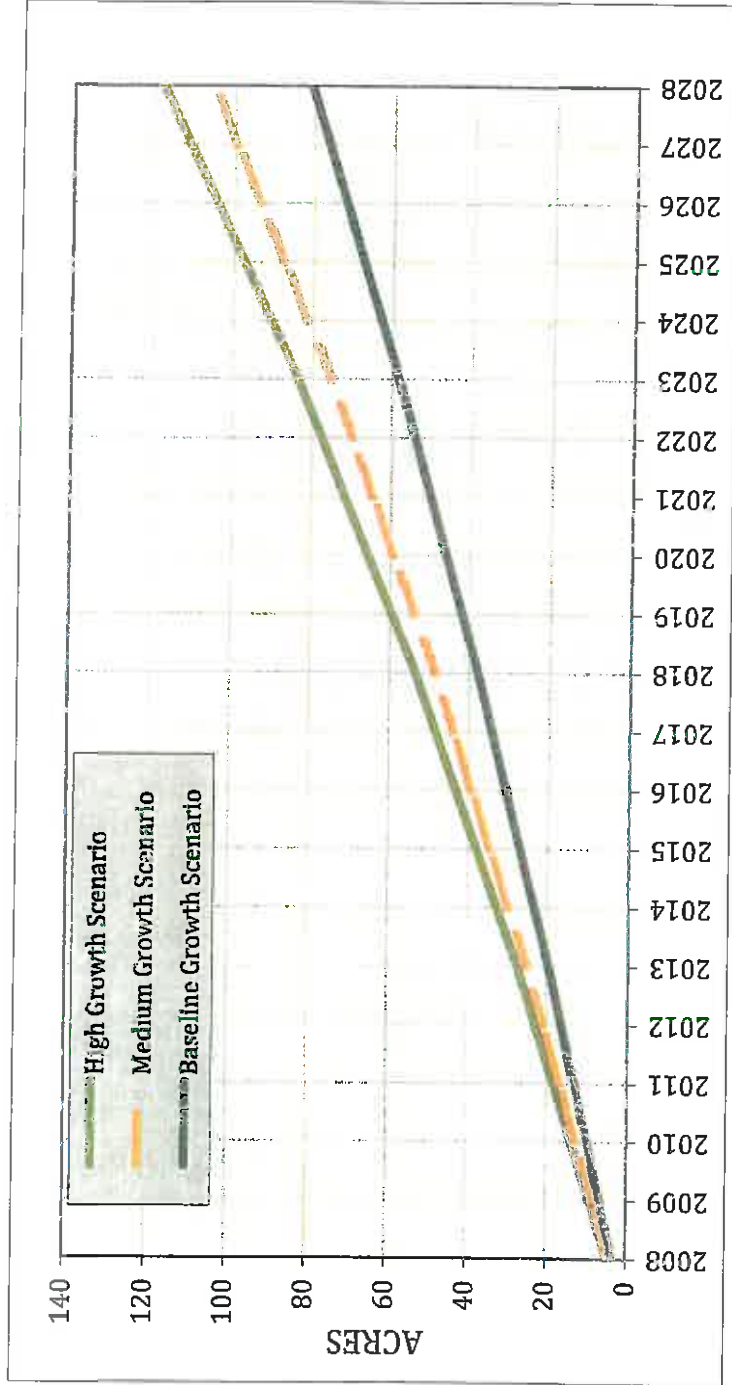
NAICS Category	Spending-Supported Retail Demand (SF) 1/					Commercial Retail Land Need (Acres)							
	2008	2013	2018	2023	2028	'08-'28	F.A.R. 2/	2008	2013	2018	2023	2028	'08-'28
441 Automotive Parts, Accessories and Tire Stores	463,883	531,447	608,851	697,529	799,122	335,239	0.25	42.6	48.8	55.9	64.1	73.4	30.8
442 Furniture and Home Furnishings Stores	35,422	40,581	46,491	53,263	61,020	25,599	0.25	3.3	3.7	4.3	4.9	5.6	2.4
443 Electronics and Appliance Stores	32,154	36,837	42,202	48,349	55,391	23,237	0.25	3.0	3.4	3.9	4.4	5.1	2.1
444 Building Materials and Garden Equipment	206,011	236,016	270,391	309,773	354,891	148,880	0.25	18.9	21.7	24.8	28.4	32.6	13.7
445 Food and Beverage Stores	111,100	127,282	145,820	167,059	191,391	80,290	0.25	10.2	11.7	13.4	15.3	17.6	7.4
446 Health and Personal Care Stores	53,015	60,736	69,582	79,717	91,327	36,313	0.25	4.9	5.6	6.4	7.3	8.4	3.5
448 Clothing and Clothing Accessories Stores	57,310	65,657	75,220	86,176	98,727	41,417	0.25	5.3	6.0	6.9	7.9	9.1	3.8
451 Sporting Goods, Hobby, Book and Music Stores	28,721	32,904	37,696	43,187	49,477	20,758	0.25	2.6	3.0	3.5	4.0	4.5	1.9
452 General Merchandise Stores	235,602	269,917	309,230	354,269	405,867	170,263	0.25	21.6	24.8	28.4	32.5	37.3	15.6
453 Miscellaneous Store Retailers	35,301	40,443	46,333	53,082	60,813	25,512	0.25	3.2	3.7	4.3	4.9	5.6	2.3
722 Foodservices and Drinking Places	109,395	124,183	142,270	162,991	186,730	78,335	0.25	10.0	11.4	13.1	15.0	17.1	7.2
Totals/Weighted Averages	1,366,914	1,566,002	1,794,087	2,055,392	2,354,756	987,843	0.25	125.5	143.8	164.7	188.7	216.2	90.7

NAICS Category	Spending-Supported Retail Demand (SF) 1/					Commercial Retail Land Need (Acres)							
	2008	2013	2018	2023	2028	'08-'28	F.A.R. 2/	2008	2013	2018	2023	2028	'08-'28
441 Automotive Parts, Accessories and Tire Stores	463,883	525,301	594,851	675,610	762,796	298,913	0.25	42.6	48.2	54.6	61.9	70.0	27.4
442 Furniture and Home Furnishings Stores	35,422	40,111	45,422	51,436	58,246	22,823	0.25	3.3	3.7	4.2	4.7	5.3	2.1
443 Electronics and Appliance Stores	32,154	36,411	41,232	46,691	52,873	20,719	0.25	3.0	3.3	3.8	4.3	4.9	1.9
444 Building Materials and Garden Equipment	206,011	233,287	264,174	299,151	338,758	132,747	0.25	18.9	21.4	24.3	27.5	31.1	12.2
445 Food and Beverage Stores	111,100	125,810	142,467	161,336	182,690	71,590	0.25	10.2	11.6	13.1	14.8	16.8	6.6
446 Health and Personal Care Stores	53,015	60,034	67,982	76,985	87,176	34,161	0.25	4.9	5.5	6.2	7.1	8.0	3.1
448 Clothing and Clothing Accessories Stores	57,310	64,898	73,491	83,221	94,239	36,929	0.25	5.3	6.0	6.7	7.6	8.7	3.4
451 Sporting Goods, Hobby, Book and Music Stores	28,721	32,523	36,830	41,706	47,228	18,507	0.25	2.6	3.0	3.4	3.8	4.3	1.7
452 General Merchandise Stores	235,602	266,796	302,120	342,120	387,417	151,815	0.25	21.6	24.5	27.7	31.4	35.6	13.9
453 Miscellaneous Store Retailers	35,301	39,975	45,268	51,261	58,048	22,747	0.25	3.2	3.7	4.2	4.7	5.3	2.1
722 Foodservices and Drinking Places	109,395	122,747	138,998	157,402	178,242	69,847	0.25	10.0	11.3	12.8	14.5	16.4	6.4
Totals/Weighted Averages	1,366,914	1,547,893	1,752,835	1,984,011	2,247,713	880,800	0.25	125.5	142.1	161.0	182.3	206.4	80.9

1/ From Exhibit 1.12
2/ Assumes typical suburban retail profile: single-story with four parking spaces per 1,000 square feet of developed space.
* Estimate

EXHIBIT 1.1.4

**COMPARISON OF CUMULATIVE DEMAND FOR COMMERCIAL RETAIL LAND
MEDIUM, HIGH AND LOW GROWTH SCENARIOS
2008-2028**



SOURCE: Johnson Reid, LLC

**EXHIBIT 1.16
GROSS NEED FOR COMMERCIAL AND INDUSTRIAL LAND
CORNELIUS, OREGON
2008-2028**

Use Type	Need For Land (Acres) By Scenario:		
	Organic Baseline	High Growth	Medium Growth
OFFICE COMMERCIAL	10.0	41.1	22.5
INDUSTRIAL	22.9	272.0	56.2
RETAIL COMMERCIAL	77.5	113.4	101.1
CITY RESIDENTS	62.0	90.7	80.9
REGION/TOURISTS 1/	15.5	22.7	20.2
OVERNIGHT LODGING	1.5	5.6	3.8
SPECIALIZED USES 2/	12.3	21.3	18.3
TOTAL	124.2	453.4	202.0

1/ Assumes regional/tourist demand normalizes at 20% of retail support, given targeted opportunities outlined in the EOA.

2/ Hospitals, Clinics, etc. for employment not otherwise categorized. Assumes 20 employees per acre

SOURCE: Johnson Reid, LLC