



JOHNSON REID
LAND USE ECONOMICS

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

Prepared For:
CITY OF HILLSBORO, OREGON

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STATEMENT OF PURPOSE

INTRODUCTION

The City of Hillsboro, 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 Hillsboro 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 nature of land need change or growth as a result of recent economic development success with firms in the photovoltaic (PV) solar panel manufacturing, biotech final manufacturing and shipping, and other emergent industry clusters;
- The adequacy of existing, available lands suitable for high-tech industrial uses within the current Urban Growth Boundary;
- The magnitude and type of residential land needs to support growing Hillsboro 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 Hillsboro to accommodate economic growth potential and how sub-regional coordination with the Cities of Cornelius, 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 Hillsboro 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 – HILLSBORO 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 Hillsboro’s 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:* Because Hillsboro already has a much acclaimed City Vision (Hillsboro 2020), the City already has much accomplished with regard to necessary outreach and City visioning required by Planning Goal 9. Outreach for this effort was limited to key Economic Stakeholders identified as being able to provide targeted, existing and emerging high-tech industry cluster perspective since Vision 2020 was last updated, specifically with solar and biotech industry knowledge in mind.
4. *Industry & Job Growth Forecasts:* Detailed forecasts of job growth by industry within Hillsboro 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.

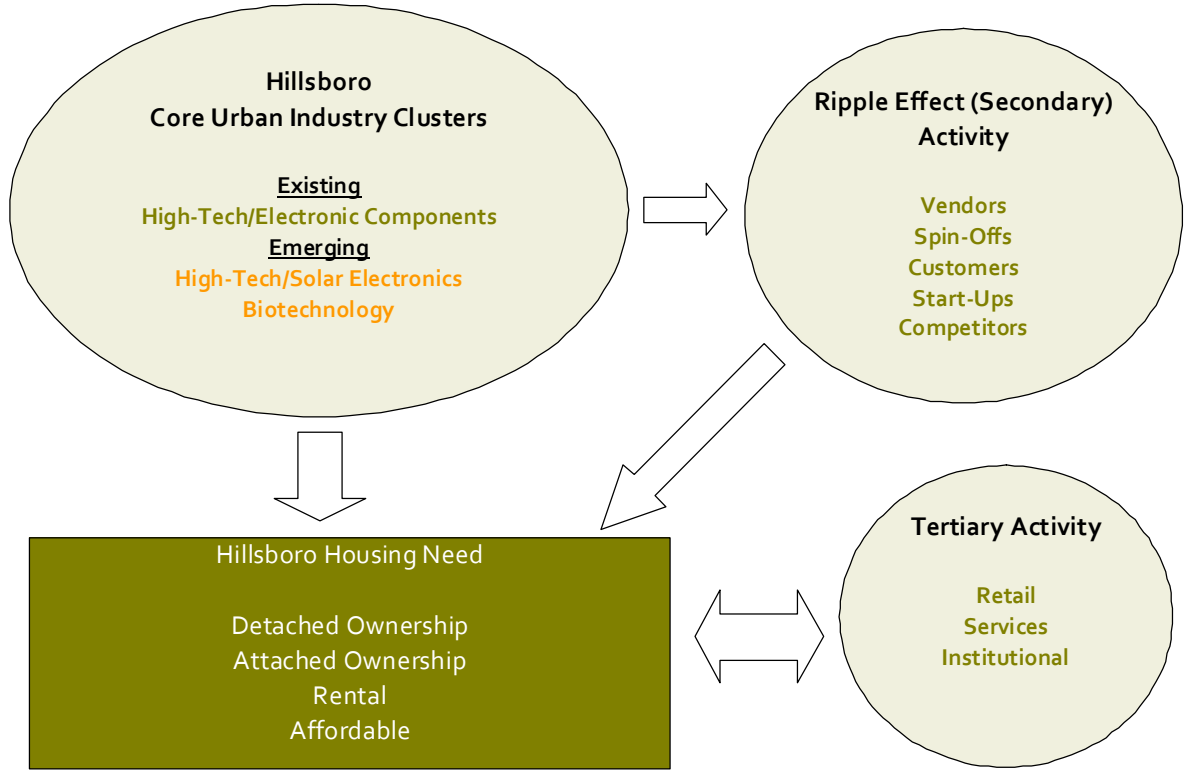
GOAL 10 – HILLSBORO RESIDENTIAL LAND NEED

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. The schematic on the following page provides a flow chart demonstrating the relationship of employment growth forecasts, resulting household growth forecasts, and the tertiary impacts of household growth, namely retail commercial, institutional and services employment demand.

In addition to interest by Hillsboro regarding the demand for housing that would result from potential economic growth scenarios, the City was interested in the implication of a jobs/housing balance policy of 1.5 jobs per housing unit for all new jobs forecasted as part of this analysis. The current Hillsboro jobs/housing balance is presently estimated at 2.2.



HILLSBORO ECONOMIC OPPORTUNITIES ANALYSIS
EMPLOYMENT GROWTH & RESIDENTIAL NEED GROWTH MODEL RELATIONSHIPS





TREND 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 some of the Trend Analysis was researched and completed, 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 consistency 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. Despite the fact that the Federal government's financial bailout plan includes elements to foster liquidity and the LIBOR has since fallen sharply, 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

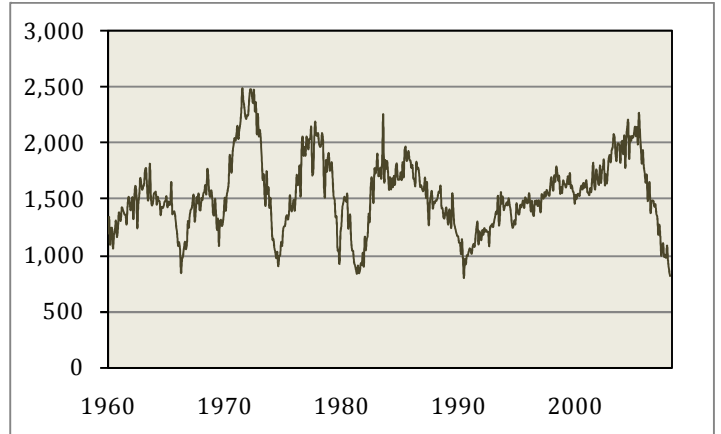
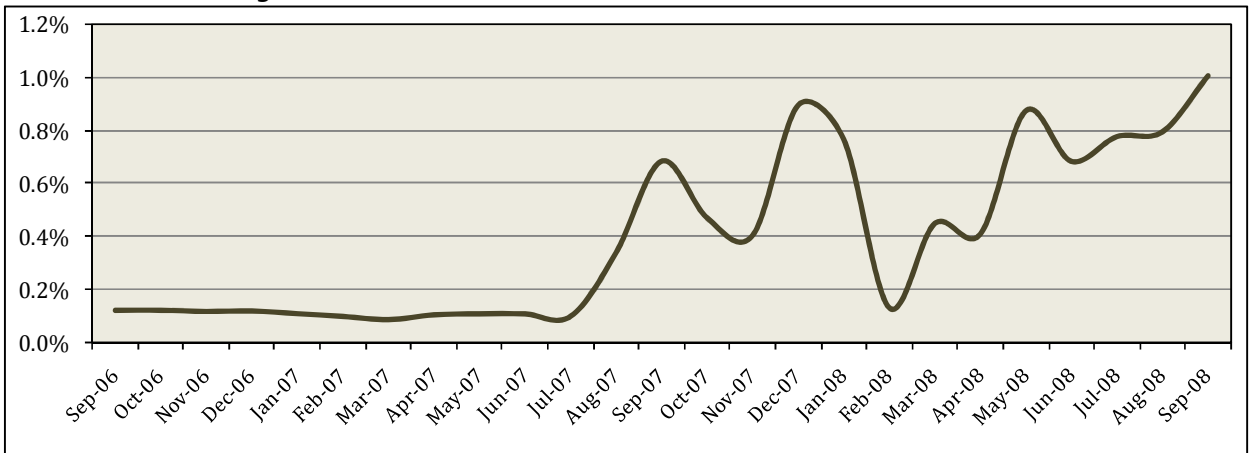


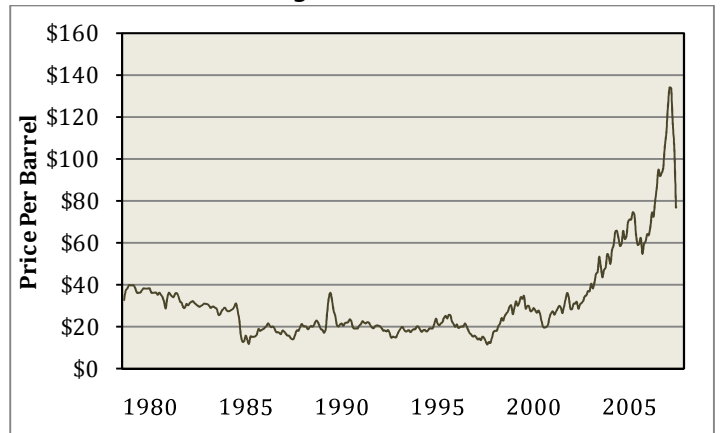
FIGURE 2: SPREAD ON 3-MONTH LIBOR AND FEDERAL FUNDS RATE



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

FIGURE 3: CRUDE OIL PRICE



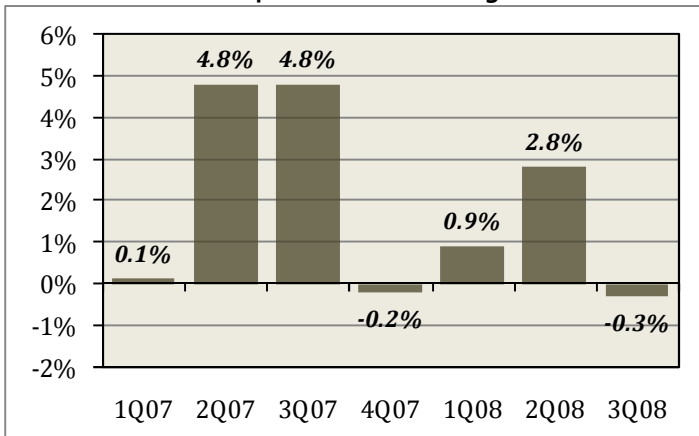


and import goods triggered higher inflation by igniting a wage-price spiral in which an initial price shock set off higher wage growth. However, measures of wages and salaries from the BLS have not yet provided evidence that higher prices are affecting wages. Moreover, unlike the 1970s, the Federal Reserve 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.

Taken together, the United States economy is thought to be roughly halfway through an extended period of slow economic growth. Estimates for the 3rd quarter of 2008 indicate a second of the last four periods posting

FIGURE 4: GDP GROWTH TO 3Q08



negative economic growth. Recent preliminary estimates from the Commerce Department indicate the 4th quarter of 2008 posted a -6.2% dip in GDP, the biggest drop since the 1980-82 recession. The most recent forecast from the Congressional Budget Office indicates that Real GDP growth will average around an annual rate of 1% through the end of 2009 before recovery takes form in 2010, however revised forecasts not yet released will likely indicate no significant economic recovery until into 2010.

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 coming years.

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 now predict the current downturn will more closely resemble the severe 1980-82 recession. Short-term deterioration will be exacerbated 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.

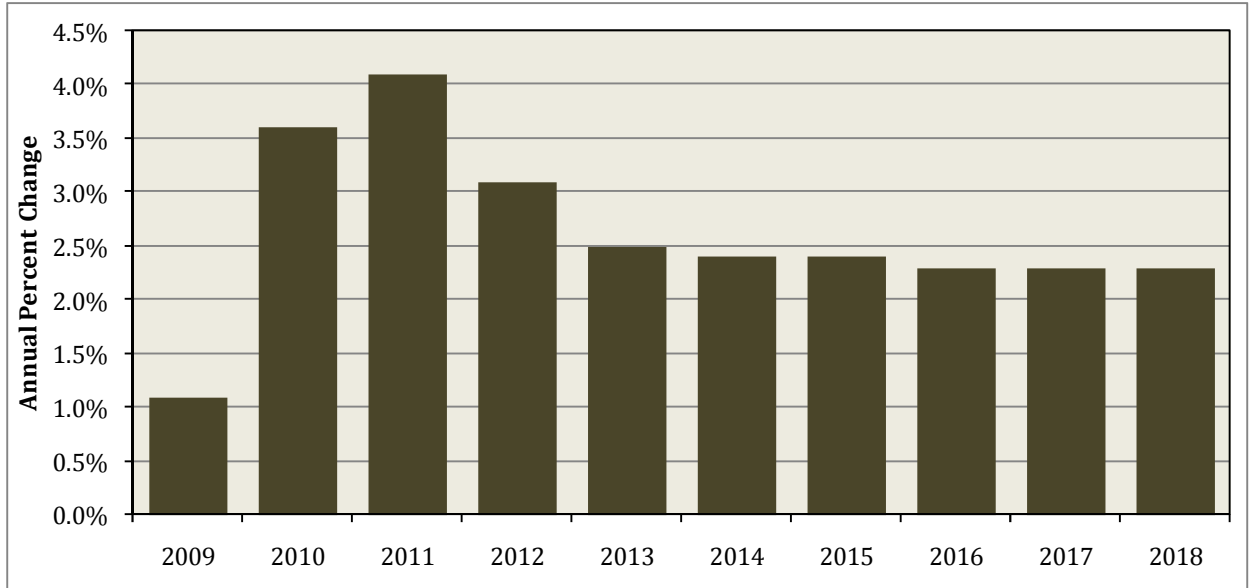
LONG-TERM OUTLOOK

Beyond the near-term, the United States economy is expected to return to a typical growth cycle, averaging 2.7% annual GDP growth sometime in 2010 and beyond 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)

Note: Although this is the most recent CBO forecast, it is generally anticipated that economic recovery will begin in earnest in later 2010.

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, assuming 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

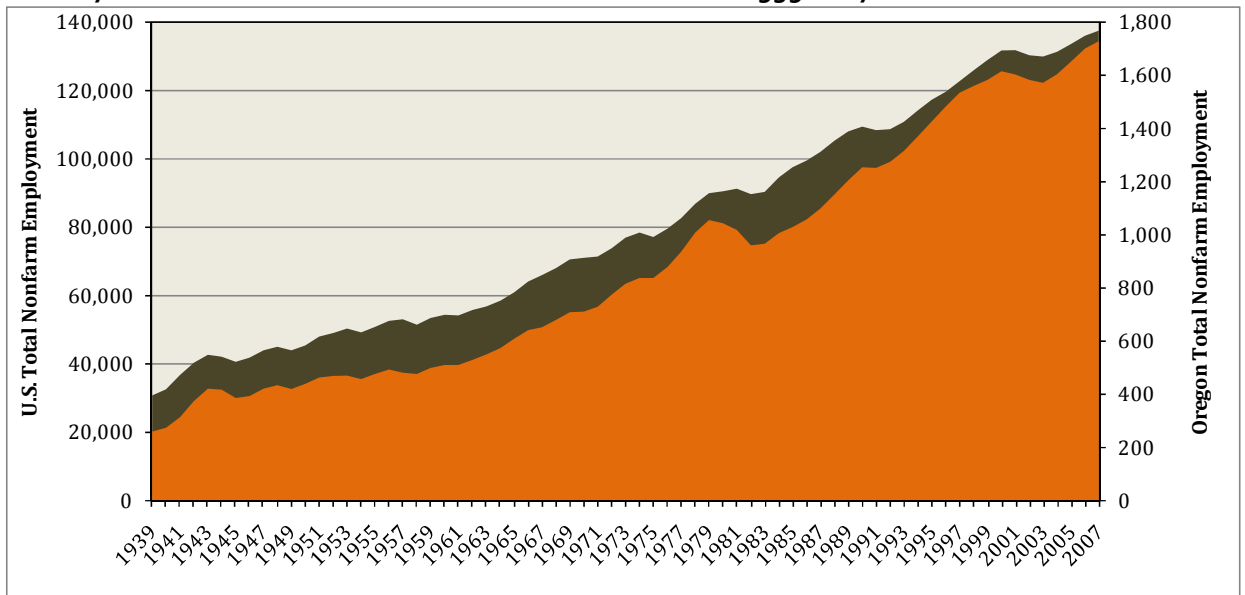
SOURCE: Global Insight

STATE & REGIONAL ECONOMIC TRENDS

GENERAL INDUSTRY TRENDS

Oregon experienced exceptional employment growth between mid-2003 and 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



Source: U.S. Department of Labor

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) now expects the State to see 4.3% economic decline in 2009 with anemic, 0.4% job growth for the calendar year 2010 reflecting a recovery beginning in later 2010.¹

The computer and electronics equipment sector declined by 7.3%, or 750 jobs, during second quarter. OEA's 2008 annual forecast for the sector is slightly less dismal at a 4.7% employment decline with a 1.1% decline 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 second quarter and is expected to experience 4.3% growth for the year.

The Portland Metro area's job growth has been slowing since 2007 and recent estimates for the second half of 2008 show job growth below 0.5%. 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. As later findings suggest, this is likely a temporary correction for the sizeable industry cluster.

Oregon's economic growth since 2005, but prior to the current precipitous slowdown, 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%).

GENERAL INDUSTRY 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
- ◇ State tax incentives, including the Single Sales Factor Tax

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.

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



- **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.

TARGETED 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,

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



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.

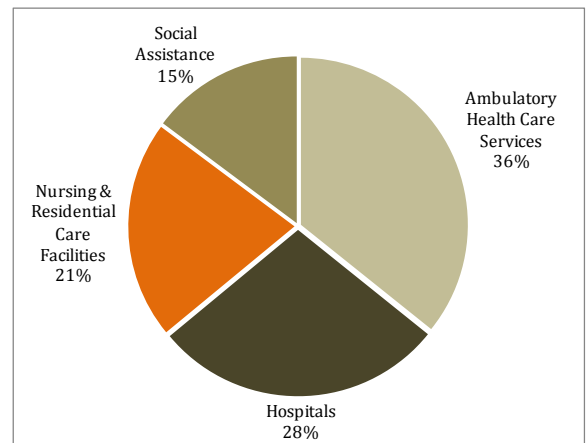
Systems design accounts for 16% of total State high tech employment or 9,200 jobs. Job growth in systems design is down nearly 20% from its 2001 high. Similar to computer and electronics manufacturing, the sector enjoys a relatively high average wage per worker of \$75,838. The third sector in the high 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 to decline by approximately 3% by 2016, systems design and software publishing are expected to growth by 14% and 18%, respectively. JOHNSON REID’s analysis of the outlook for high tech in Washington County and Hillsboro, in particular, departs from OED’s forecasts due in part to the indirect impacts of solar manufacturing as well as the outlook of major employers in the area. Intel, a bellwether for high tech activity in the area has indicated that capacity for additional fabs at their Ronler Acres facility exists, which could be able to come online during the next 20 years as R&D and industry demands change Intel product focus.³

Health Care⁴

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.

FIGURE 8: OREGON’S HEALTH CARE INDUSTRY



Source: Oregon Employment Department, 2007

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

³ Interview with Jonathan Williams, Government Affairs Manager for Intel Oregon, October 2008.

⁴ Unless cited otherwise, data in this section is from the Oregon Employment Department.



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 statewide health care industry presence 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. Hillsboro's health care sector increased by 22.4% (+5.18% AAGR) between 2002-2006. Ambulatory Health Care Services was responsible for an average of 8.8% annual growth, adding 464 employees while Social Assistance grew by an annual average of 6.9%.⁵

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, is in partnership with Hillsboro⁶ in actively working with significantly more,⁷ and is anticipated to be successful following recent "Team Oregon" recruiting efforts confirmed by Greenlight Greater Portland.⁸

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.

Solar companies indicate interest in Oregon due in no small part to its single sales factor corporate tax and proximity to California,⁹ and in particular Hillsboro specifically due to the unique combination of its semiconductor manufacturing cluster, significant electrical power capacity, significant water capacity for its cooling process, and City of Hillsboro's established recording with sizeable, high-technology industrial facility planning and permitting. Perhaps as importantly, the technological similarity of the two industries offer solar

⁵ Oregon Employment Department data related to Hospitals and Nursing & Residential Care Facilities in Hillsboro is confidential.

⁶ Interview with Tim McCabe, Oregon Economic & Community Development Department Director, October 2008.

⁷ Interview with Hillsboro Mayor Tom Hughes and Hillsboro Chamber of Commerce Director Deanna Palm, September 2008.

⁸ Interview with Tim Priest, Director of Greenlight Greater Portland, October 2008.

⁹ Interviews with Larry Pederson, Hillsboro Project Manager, October 2008 and Johnathan Schlueter, Executive Director of the Westside Economic Alliance. The single sales factor corporate tax (Oregon Department of Revenue) comprises a 6.6% corporate income tax based only on product sales within the State of Oregon. The vast consensus based on stakeholder outreach is that solar manufacturers locating in Oregon are largely targeting the sizeable California public energy utilities market as a replacement for coal-fired electrical power generation.



companies choosing to locate in Hillsboro a highly trained workforce with knowledge directly applicable to the Solar PV manufacturing process.

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%.¹⁰

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 2030.¹¹ Oregon is projected to add nearly 15,000 jobs by 2035, with most of the growth occurring in the next ten years.¹²

Bio-Tech¹³

In 2006, Oregon's biotech sector employed roughly 9,500 employees and averaged a 19.4% increase from 2001. While Oregon's share of national employment in biotech is 0.74%, national employment has been increasing at only 3.7%. Employment in Medical Devices & Equipment and Research, Testing & Medical Laboratories account for the bulk of Oregon's biotech industry. Oregon ranks average on the major metrics which determine growth in the biotech sector, such as R&D, high education degrees in the field, venture capital funding and patents.

Until Genentech, which is not yet at full build-out of its first phase, the biotech sector has been small in Washington County and Hillsboro. Prior to Genentech's recent operations in Hillsboro, the industry consisted of small medical laboratories and research companies. As will be discussed more fully later in this document, significant targeted opportunities for this sector exist moving forward.

WASHINGTON COUNTY & HILLSBORO ECONOMIC TRENDS

POPULATION

The City of Hillsboro is one of the predominant demographic hubs and economic drivers of Washington County. Hillsboro's population has grown by 23.6% (3.07% AAGR) since the 2000 Census exceeding 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%.¹⁴

¹⁰ Solar Energy Industries Association and Prometheus Institute, "US Solar Industry Year in Review," 2007.

¹¹ 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.

¹² Climate Solutions and Clean Edge, Inc., "Carbon-Free Prosperity 2025," October, 2008 and Oregon Department of Energy.

¹³ Unless otherwise cited, data in this section is from Battelle Memorial Institute, "State Bioscience Initiatives 2008."

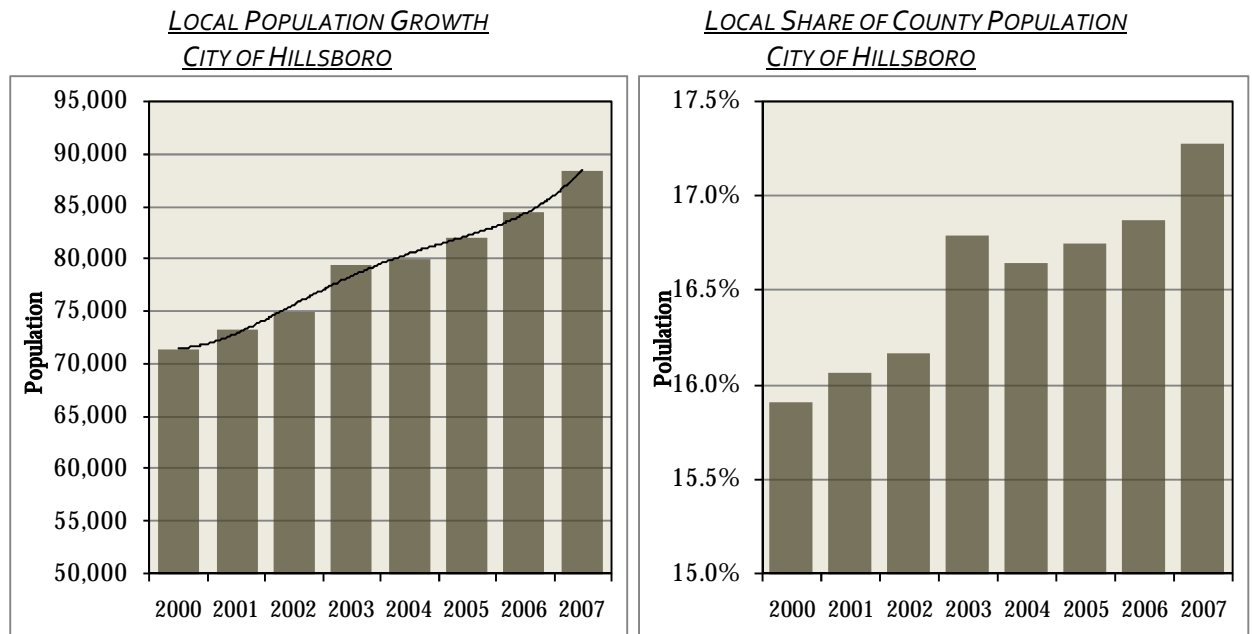
¹⁴ Portland metro area includes Clackamas, Multnomah and Washington Counties.



Unlike many Oregon counties, Washington County has not gained a large share of retirement age population. In 2007, Washington County' share of population age 65 and older was significantly below State levels: 8.8% versus 12.5%. On the other hand, 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. The City of Hillsboro has a 28.7% share of higher educated local residents. While this is substantially less than the regional share, it is not likely to have an impact on Hillsboro's ability to recruit employers. Currently, Hillsboro is a net importer of labor with 80% of its workforce residing outside of the City.

FIGURE 10: LOCAL POPULATION GROWTH TRENDS



SOURCE: Portland State University Population Research Center

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 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 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.

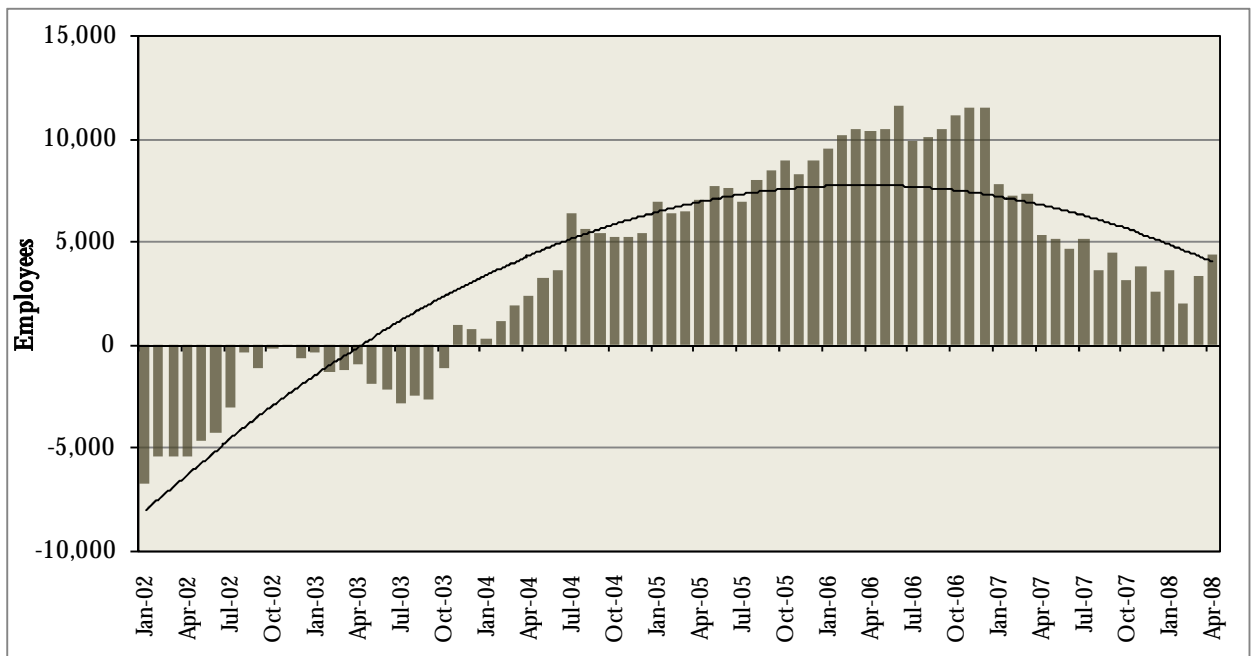


EMPLOYMENT TRENDS

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.

Between 2002 and 2007, total employment growth in Washington County remained strong, gaining 13.1%. The county’s growth cycle, which began in late 2003, maintained momentum until early 2007. While the County is still demonstrating employment growth, it is measurably slower. Moreover, the slowing 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 Hillsboro generally adheres to Washington County’s sector rankings, but is overwhelmingly driven by Manufacturing, which accounts for a 36.1% share of employment. Professional & Business Services follows with a 12.4% share and Education & Health Services with an 11.4% share. The City’s share of the Retail Trade sector (10.5%) is parallel to State (11.6%) and Portland area (10.5%) employment shares.

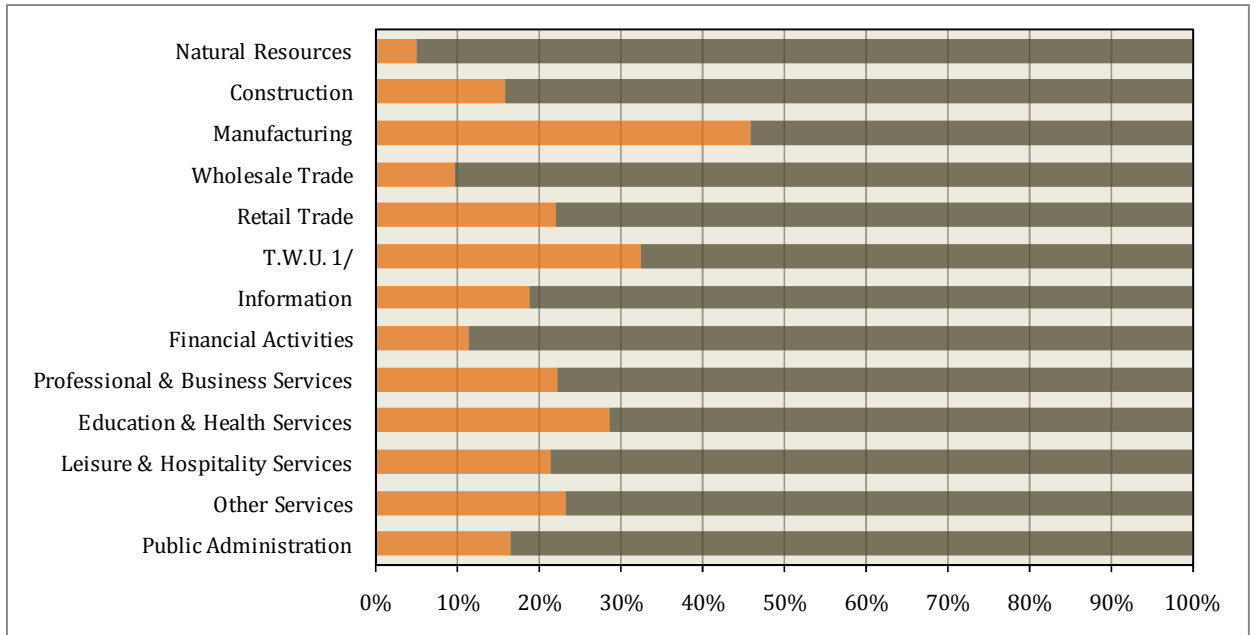
Washington County had numerous strong sectors during the five year period between 2002 and 2007, including Education & Health Services (+5,497 jobs), Public Administration (+3,821 jobs), Leisure & Hospitality Services (+3,606 jobs), Retail Trade (+3,246 jobs), Construction (+3,153 jobs), Professional &



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 2006, the City of Hillsboro’s employment grew by 8.3% and accounted for a quarter of Washington County’s total covered employment. Figure 6 illustrates Hillsboro’s share of Washington County employment by industry sector. The City experienced strong job growth in Professional & Business Services (+1,141 jobs) and Retail Trade (+1,077 jobs). In addition, Leisure & Hospitality Services added 762 jobs, Education & Health Services added 702 jobs and Other Services added 610 jobs. Hillsboro lost over a hundred jobs in Wholesale Trade, Information and Natural Resources.

FIGURE 12: HILLSBORO’S SHARE OF WASHINGTON COUNTY EMPLOYMENT BY INDUSTRY (2006)



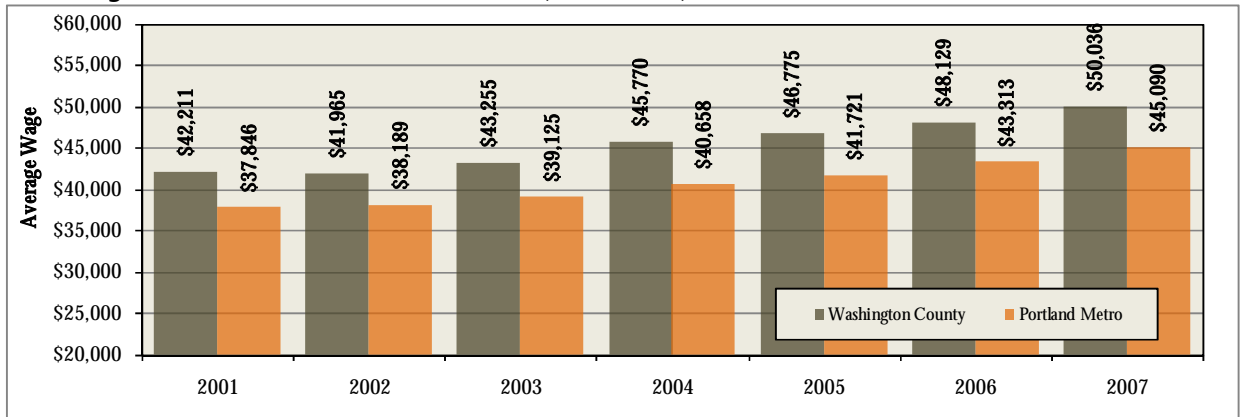
SOURCE: Oregon Employment Department
1/ Transportation, Warehousing, & Utilities

WAGE TRENDS

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 3.1% annual growth at the State level. Conversely, Hillsboro has outpaced State growth with a 3.2% average annual growth rate. In 2006, the average wage in Hillsboro was \$58,421, significantly above the Washington County and Portland area averages.



FIGURE 13: AVERAGE ANNUAL WAGE GROWTH (2002-2006)



In Washington County, the highest paid industry sector is Wholesale Trade (\$90,315 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 Hillsboro’s highest paid industries are Information (\$93,369) and Manufacturing (\$91,377) followed by Wholesale Trade (\$69,639) and Other Services (\$58,973). Its lowest paid industries are also Leisure & Hospitality (\$15,491) and Retail Trade (\$25,592).

OTHER FACTORS FOR LOCAL 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 County¹⁵). 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 Hillsboro and the greater Portland metro area have countless amenities that create potential for economic opportunities.
- Economic Development Support Organizations** – The City of Hillsboro has an array of economic development resources at its disposal. In addition to the City’s own economic development and planning departments are resources at the Portland metro area level, such as Portland Development Commission and the Portland of Portland which both provide economic development resources to the Portland regional area. Similarly, Hillsboro may draw upon private organizations such as the Westside Consortium for Economic Health and Greenlight Greater Portland which both promote economic development in the region. Moreover, the Portland area has the benefit of private industry specific organizations which promote local industry growth, research and technical knowledge spillover. Lastly are multiple State agencies such as the Oregon Innovation Council and the Oregon Economic and Community Development Department.

¹⁵ 2000 Census DP-3 Sample File



- **Educational and Technical Training Programs** – The Portland area offers multiple educational and training institutions which benefit the City of Hillsboro. In particular, Portland State University and Portland Community College both design academic and outreach programs to meet the needs of the local business community.



ECONOMIC OPPORTUNITY STAKEHOLDER OUTREACH

INTRODUCTION & ACKNOWLEDGEMENTS

During the course of assessing short-term and long-term economic development opportunities for the City of Hillsboro and Western Washington County, JOHNSON REID sought input from both public and private economic and industry stakeholders at the State, regional and local level to provide valuable details about transition and outlook for existing and emerging industries in Hillsboro.

We wish to thank the following participants for their willingness to participate, particularly in one-on-one interviews, and the invaluable information they shared.

The Honorable Tom Hughes
Mayor,
City of Hillsboro

Tim McCabe
Director,
Oregon Economic &
Community Development

Barry Starkman
Project Manager,
Genentech Hillsboro

Rep. David Edwards
Oregon House District 30
(Hillsboro)
CEO & Founder,
Zanthus High-Tech Market
Consulting Firm

Jonathan Schlueter
Executive Director,
Westside Economic Alliance

Bob Beisner
Vice President,
SolarWorld Industries
America

John Coulter
President,
Hillsboro Planning
Commission
Hillsboro Vision 2020
Vice President,
Fisher Farms

Jonathan P. Williams
Government Affairs Manager,
Intel Oregon

Manny Berman
Chief Operating Officer,
Tuality Healthcare

Deanna Palm
President,
Hillsboro Chamber of
Commerce

Tim Priest
Director,
Greenlight Greater Portland

Steve Krautscheid
Vice President,
Tuality Healthcare

John Southgate
Director,
City of Hillsboro Economic
Development

Michelle Girts
Chair,
Oregon Innovation Council,
Engineering Technology
Industry Council
EnTranRight, LLC
CH2M Hill

Mike Wells
Government Affairs Chair,
NAIOP
Principal,
Wells Otis Development

Larry Pederson
Manager,
City of Hillsboro Economic
Development

Christopher Dymond
Senior Analyst,
Oregon Department of Energy

Bruce Carswell
President,
Portland & Western Railroad

Patrick Ribellia
Director,
City of Hillsboro Planning

Dennis Yee
Chief Regional Economist,
Metro

Amy Vander Vleet
Regional Economist,
Oregon Employment
Department



STAKEHOLDER OUTREACH PROCESS & FOCUS

In undertaking this Economic Opportunities Analysis process, the City of Hillsboro sought to understand the first-hand perspective of key economic agents, partners, and industry clusters that will drive long-term growth in Washington County and Hillsboro. Given the significant and rapid successes the State has begun to enjoy in the solar manufacturing and biotech industries, the City was also particularly interested in recent, new industries, their economic outlook for the region and the City, as well as their potential economic impact in terms of growth, ripple effects and other indirect economic benefits and resulting land need issues.

To this end, JOHNSON REID interviewed key economic stakeholders in the future economic development potential of Hillsboro. For each participant, questions in the hour-long sessions focused on the following three key areas with emphasis on existing and likely future industry clusters in Hillsboro and Western Washington County:

- *5-year, 20-year and 50-year perspectives and outlook on economic and urbanized land need in the Hillsboro market area;*
- *Hillsboro and Washington County's competitive strengths and opportunities given short and long-term perspectives;*
- *Potential obstacles to short-term and long-term opportunities in Hillsboro and Washington County.*

WHY HILLSBORO? A MIX OF INFRASTRUCTURE, SKILLED LABOR, AND SITE QUALITIES UNIQUE IN NORTH AMERICA

According to interviewees, the question of "Why Hillsboro?" yielded a distinct mix of qualities highly desirable, if not integral, to a specific segment of the nation's high tech industry. The following qualities were frequently cited in a not replicable combination as distinct inputs required by targeted industry:

1. *High-Capacity, Continuous Electrical Power at Competitive Rates*
2. *High-Capacity, High-Quality Water Supply*
3. *Highly-Skilled/Educated Workforce with Existing High-Tech Cluster Investment*
4. *Flat, Seismically Stable Land without Brownfield Costs & Risks*
5. *Proximate, Diverse Transportation Infrastructure (Freeway, Air, Rail)*
6. *Specialized, Existing Industrial Material Supply Infrastructure (Chemicals, Gases)*
7. *Unique Expertise and Experience of the City of Hillsboro*

All of the above factors are individually attracted to a wide swath of industry, including high-tech, but the unique combination of all of the above distinguish Hillsboro from elsewhere in the State of Oregon and uniquely competitive with other markets in North America for high-tech industry that intrinsically depend heavily upon power, water, and highly-skilled labor.

"Perspective to remember is the firm's: 'go where they want to' – workforce, permitting process familiarity, land, infrastructure, water and electricity."

"Hillsboro's advantage in innovation is very strong/highly skilled educated worker base."

"Also a strong and active financial component to innovation." (referring to existing cluster investments and resulting spinoff companies and financing)

"Hillsboro has competitive advantage for solar cell manufacturing utilizing silicon manufactured in Oregon due to water and power."

"Western Oregon is at a clear competitive advantage for solar manufacturing and materials, but Hillsboro is the strongest location based on workforce and existing silicon-based industry expertise and synergy."

"Hillsboro not a likely long-term site for primarily bio-med research activities, but a contract manufacturer for a number



of research-based service firms a definite possibility given water, power, high-tech manufacturing workforce, and City expertise."

"Qualities that played into Genentech's decision (to locate in Hillsboro): property tax abatement for significant capital investment; reasonably close to San Francisco; lower earthquake risk; City/County/State were proactive 'they wanted us here'; nice community with decent schools; significant water and power capacity; reasonably close to PDX airport."

IF NOT HILLSBORO, WHERE?

Strong consensus among interviewees indicates Hillsboro's unique economic assets make it a strong choice compared to other high-tech markets nationwide. Conversely, it was strongly viewed that Hillsboro is desirable for the needs of industries that will only locate in Oregon and the Portland metro area because Hillsboro qualities alone meets firm needs. In other words, industry location choice is Hillsboro vs. Redmond, Austin, etc. not Hillsboro vs. Portland, Gresham, or Tualatin.

"Austin (Texas) & Research Triangle (North Carolina) are competitive but different model of publicly funded research institution and private innovation."

"Hillsboro/Oregon is not going to compete with over fifty years of established experience in state/federal funding programs and private spinoff at universities."

"What's missing in those models? People want to live in Oregon, but not a specific, quantifiable answer."

"U.S. competition is certainly in California, though infrastructure getting in bad shape."

"Seattle, Redmond, Dupont share some of the same quality of life and infrastructure, but Hillsboro still beats on cost of living and some costs of business."

"Massachusetts, New York, Atlanta, Colorado (Arvada and Boulder research), Albuquerque with Los Alamos connection - Intel has invested there."

"Major emergent competitor with Hillsboro is New Mexico with sweeter incentives package not available in Oregon."

Hillsboro was cited as having increased competition from international high-tech centers, but in the majority of cases for the foreseeable future, high-tech firms are "shopping" Hillsboro as the U.S. expansion site in complement to an expansion site overseas. Over the 20-year and 50-year planning periods, this is anticipated to change. Over the long-run, Hillsboro's competitive advantage to overseas tech centers is far stronger protection of intellectual property and the proprietary nature of industrial processes.

"International presence is common for the innovative firms – labor costs are lower and market proximity but the trade-off generally is lesser propriety process/intellectual property protection."

"India, China and South America increasingly competitive (Brazil, Chile, Argentina but with political uncertainty)."

"Central European countries increasingly competitive due to investments in education and established linkages with high tech."

"Vietnam is emerging as a manufacturing recruiter with educated workers and protection of intellectual property."

"Hillsboro's advantage will continue to be innovation with intellectual property rights protection and established high-tech cluster investment."

HILLSBORO IN COMPLEMENT TO THE BROADER PORTLAND METRO AREA

Interviewees felt Hillsboro was an attractive industrial location, but to a specific mix of industries that will generally not locate elsewhere in the Portland metro area. Alternatively, different industries of high priority to the Portland metro area – creative industry, alternative energy, etc. - find Hillsboro less compelling a location than Portland and Gresham, among others. In other words, Hillsboro should be viewed and marketed as a distinct asset to Portland metro area and state economic development goals rather than competition in a "zero sum game."

"As opposed to solar PV (photovoltaic) panel manufacturers, silicon wafer manufacturers can locate anywhere in the



Willamette Valley with anticipated site needs of 50 to 100 acres.”

“Gresham has capacity for silicon manufacturing in support of solar cell manufacturing, though with planning Forest Grove and Cornelius could be candidate locations.”

“Second strongest private recruitment opportunity behind solar is software firms shopping lesser cost locations including Midwest; Portland area lifestyle amenity makes attracting “Young Creatives” and management in this sector among City of Portland’s strongest potential recruitment areas at identified 30% growth potential in ten years.”

“Third strongest private economic development recruitment opportunity is the Design talent cluster comprising apparel to bicycles, green industrial design with identified 14% growth potential over ten years.”

“City of Portland/urban economic development potential strongest for software and design services growth being targeted: ‘Where do you want to live?’ is a legitimate question for where software and design services firms will want to locate – urban amenities are extremely important.”

“Strong manufacturing opportunities (for Multnomah County) regarding other alternative energy component and generation, such as wind turbines and replacement part manufacturing – new component replacement every four years.”

“Other opportunities long-term statewide that may involve Hillsboro in different degrees include cellulose energy technology with wood, though will be seriously rail dependent so not likely a primary fit for Hillsboro – port communities more likely.”

Interviewees distinguished Greenfield land as a specific requirement of targeted high-tech industries due to previously cited qualities, as well as the engineering cost, difficulty, and economic risk of brownfield redevelopment sites, with or without need for remediation. High-tech end users in particular were cited as making extraordinary investment outlays in manufacturing equipment, making brownfield site re-engineering cost-inhibitive for new facility development relative to Greenfield sites.

“Portland is at a serious competitive disadvantage for solar manufacturing as brownfield redevelopment is a serious obstacle and enterprise zones are almost mandatory.”

“Wise infrastructure investment not a settled question with regard to Greenfield vs. brownfield; retrofit of existing antiquated and/ or below-capacity infrastructure is frequently more expensive in total and should not eliminate Greenfield for specific industries that require it.”

“Western Washington County as a distinct economic subregion is an important recognition for land need analysis due to availability of infrastructure extension available on Westside and metro Southend.”

CITY OF HILLSBORO INSTITUTIONAL ASSETS INTEGRAL TO SUCCESS

Outreach participants made it clear that the City of Hillsboro as an economic development institution was a vital, stand-out factor in successful high-tech recruitment, growth, and site permitting and project delivery from an industry and public stakeholder perspective. This factor alone set Hillsboro apart from other high-tech markets nationwide, much less relative to other parts of Oregon or the Portland metro area. Outreach did, however, also indicate that key staff turnover at Hillsboro should be an opportunity for the City make economic development leadership transition clear and seamless.

“Clear understanding of the ‘Hillsboro Way’ is very important for city economic development.”

“It is important to preserve institutional knowledge for large user permitting and site delivery.”

“Part of Hillsboro competitive advantage is all public services experience in-house.”

“Users are seeking secure buildings and specialized infrastructure where Hillsboro experienced.”

“Hillsboro’s local government has been integral to its economic successes due to on-time, on-budget, and flexible development services expertise and experience – Hillsboro competence has been unequaled.”

“Hillsboro’s high tech cluster ‘has not been an accident.’”

“Stability of leadership at the city is key – Who is the go-to person? – and extremely important for transition.”

“City of Hillsboro is unique in its track record of recruiting and shepherding a wide variety of large scale to R&D to first run



technology development to high volume manufacturing facilities"

"City of Hillsboro has been an excellent, flexible and responsive partner to (firm) facility needs"

FUTURE LAND SUPPLY AND INDUSTRIAL FACILITY NEEDS IN HILLSBORO

The topic of short-term and long-term land need for various high-tech industries in Hillsboro was discussed with all participants and perspectives were as varied as the industries themselves. Comments were also frequently pointed. The most oft-repeated observations were as follows:

- 1. Availability of land for targeted high tech industries is currently constrained to the harm of economic diversification;*
- 2. Supply of land must be mindful of the unique needs of high-tech industry seeking a location to take advantage of Hillsboro/Washington County economic assets;*
- 3. Flexibility of land provision is extremely important to targeted industries.*
- 4. A wide variety of site sizes and qualities is appropriate for Hillsboro to diversify, particularly into high-priority, counter-cyclical industries like solar.*
- 5. Hillsboro's long-term industrial expansion is hindered by limitations of the physical suitability of land proximate to the existing urban growth boundary.*

"Flexibility in parcel/site size quality paramount."

"Solar has been seeking sites up to 50 acres or so."

"Significant portion, though uncertain, of industrial supply should be a "community" of 2.5-10 acre lots with transportation/freeway access and proximity to the bigger users."

"In a relatively central location, there should be at least two 75-100 acre + sites."

"20-50 acre need is most challenging as they are sizeable sites for moderate users expanding, but too small for rapidly expanding firms to bank on future growth and no key ownership patterns for this parcel size distribution."

"Some development/industry can occur in UGB, but much of the growth needs/requires suburban industrial form."

"Opportunities do exist for Hillsboro to increase land efficiency with zoning review; MP zone cited specifically with 25 ft. setback and 15% landscaping where greater flexibility can be met by the market."

"Flexibility in land availability, size, and local government partnership is paramount for serious high-tech economic development success in the future."

"Suitable Greenfield parcels of greater than 50 acres in size have hampered significant new targeted industry recruitment including in Hillsboro."

"One of the biggest disadvantages for economic development recruitment package marketing is the lack of larger, suitable industrial parcels for targeted high-tech industries and users."

"Regarding land, wise use of existing infrastructure will be important, with increasing premium on strong transportation access for goods to market and labor to worksite – costs are going to continue to mount."

"There is not enough land in Hillsboro including for another Ronler Acres anchor site – land prices will likely indicate need for users to consider structured parking and higher efficiency."

"Flexibility in site sizes extremely important given changes in product lines, manufacturing process and a variety of other factors that are inherent to tech-dependent manufacturing."

"If Hillsboro and the State hope to land another major high-tech anchor, it must plan for availability of at least one 400-acre site to provide maximum flexibility and long-term investment from a new, sizeable firm."

"From a manufacturing and shipping perspective, it will be crucial for Hillsboro to seek additional land for new firms and industries tightly along Highway 26 – shipping product to PDX airport is extremely important."

"There is no certainty regarding land need, other than flexibility for highly innovative and rapidly changing technology-based manufacturers."



"Evergreen has no more than 10 years worth of supply potential for absorption."

"Helvetia is going to quickly run into topography issues."

"Long-term Hillsboro expansion problematic because of topography."

TARGETED INDUSTRY COMMENTS

During the process of economic stakeholder interviews, questions about the specific, current outlook of Hillsboro's targeted clusters yielded a diversity of response. Below is a summary of interviewee input regarding each targeted high-tech cluster.

Existing High-Tech Comments

As economic data in the Trend Analysis section of this report indicates, Washington County's existing high-tech electronics cluster experienced a slight, net decrease in employment between 2002 and 2006. With eight years since arguably the end of the existing high tech cluster's dramatic expansion cycle, conventional wisdom has held that the Hillsboro-centered high-tech industry cluster can only hope to retain existing employment levels for the foreseeable future.

In September of 2008, the Oregon Employment Department made two starkly different forecasts about high-tech manufacturing and related high-tech services and design. Specifically, the OED forecasted 4% total decline in high tech manufacturing employment through 2016, but 20% expansion in high-tech systems design through 2016.¹⁶

It was within this context that economic stakeholder interviews were asked about the existing Hillsboro high-tech electronics cluster, most notably anchored by Intel. Overall, interviews revealed similar mixed – if not guardedly optimistic – sentiment about growth potential for Hillsboro's existing high-tech agglomeration of firms. Because opinions generally dovetailed with the perception that existing high-tech is maturing, but still capable of growth in the next business cycle and as a result of smaller manufacturing technology, the Oregon Employment Department forecast was adopted by JOHNSON REID as the basis of its conservative job forecast for the City of Hillsboro over long-term planning period.¹⁷

"Existing high tech is in more mature phases, but innovation and investment still strong from larger tech firms – product lines expanding, diversifying for applications and growth potential still strong, though periodic corrections are to be expected"

"Existing high-tech cluster expansion is very probable and currently held land assets by major employers indicate flexibility to expand as such, though "boom" not the best word to characterize growth projections."

Solar Comments

Economic stakeholder outreach, including solar manufacturers and analysts themselves, confirmed the significant interest and likely sizeable investment pattern by solar panel manufacturing firms in Oregon, specifically Hillsboro. To date, solar-related manufacturing firms in Oregon fall into two classes: silicon cell manufacturers of products suitable for photovoltaic (PV) solar panel manufacture; and PV solar panel manufacturers themselves. Solarworld, Hillsboro's recent dramatic solar industry recruitment success, falls into the latter category, which comprises Hillsboro's competitive advantage moving forward as interviews confirmed.

The following general facts were learned about the driving forces behind solar manufacturing growth in Hillsboro for the foreseeable future.

1. *Solar firms plan to manufacture photovoltaic solar panels utilizing silicon cell-based components not unlike*

¹⁶ "Oregon's High Tech Employment Trends – What is High Tech?" September, 2008, Oregon Employment Department. < <http://www.qualityinfo.org/olmisj/ArticleReader?itemid=00004893#seg0010>>

¹⁷ Not long after interviews and forecast methodology were formulated, Intel announced its commitment to reinvest a sizeable portion of \$7 billion in its Oregon facilities for 32 nanometer (nm) manufacturing capability.



silicon wafer-based manufacturing already present in Hillsboro and Washington County.

- 2. Final products are sizeable solar panels to be utilized by electrical utility firms, largely in California, as part of publicly-mandated sustainable energy diversification quotas.*
- 3. California is specifically the largest target market for manufacturers "shopping" Hillsboro for industrial land. Coal-fired electricity in California is specifically the target of solar replacement quotas in that state.*
- 4. Because the solar panel manufacturing process so closely mirrors other, more traditional silicon-based electronic components manufacture, Hillsboro is a natural fit for the largely European firms seeking U.S. market presence.*
- 5. Although Oregon does not have sizeable cash incentives for attracting major manufacturers, the States Single Sales Factor tax – the burden of which firms in Oregon only must pay on product sales inside of the State of Oregon – is a compelling enhancement for firms targeting California and other sunbelt states.*
- 6. Assuming no unpredictable acceleration in solar investment – publicly mandated or more purely market driven – 2015 is currently expected to be the sunset on rapid solar manufacturing growth, though capital market uncertainty may likely extend this deadline up to two years.*

A more detailed discussion of JOHNSON REID industry and employment forecasting methodology for Hillsboro land need is previously found in this document, the following interviewee contributions express more qualitative characteristics of the emerging solar industry in Hillsboro.

"California quotas for coal-fired power replacement by sustainable including solar is the driver for the Oregon boomlet."

"Critical dates/market factors include: new federal bill that extends solar tax credits for 8 years; and in 2009-2010, Chinese manufacturers come online at lower costs so that 'only lean survive.'"

"Baseline Target: Over the next ten years, 10% of U.S. utility energy generation is solar."

"Aggressive Target: over next ten years, 15% to 20% utility is solar."

"2015 is the 'goal' year for industry growth and metric with a target of 3,000 megawatt capacity production statewide."

"2015+ - energy change possibly significant with transportation costs a factor, but the "boomlet" will be over and growth will likely mature."

"State economic development priorities related to solar: manufacturing jobs; workforce development for solar; installation services and process technology; and higher education related to research and innovation."

"Solar manufacturing is the strongest opportunity for private economic development recruitment initiatives along with public – alternative energy including solar is attracting 10% of all venture capital."

"Vendors and suppliers to Solarworld and other potential solar panel manufacturing voice very strong preference for proximity to the major end users."

"Solar manufacturing is the primary, if not sole, industry recruitment by the State with incentives targeted."

"For larger solar components, rail proximity will be increasingly important in addition to freeway access."

"German and Spanish firms are the primary recruitment targets, but suitable land inventory is nearly exhausted."

"Hillsboro/Oregon industry has successfully recruited panel solar vs. thin film, due to Oregon's competitive advantage and significant investments in silicon wafer-based electronics."

"Solar recruits to date have been well-capitalized, foreign firms with established solar business models (lean) and prepared for competition from China."

"Alternative energy may see some variation in development form – anecdotally some firms shopping sites have mentioned multi-story fabrication plant (fab) is a possibility, though no demonstrated record yet."

Bio-Tech Comments

The arrival of the Genentech pack and fill facility at Evergreen & Shute Road in Hillsboro is a major, tangible



recruitment success for the City in the highly prized bio-pharmaceuticals technology industry. Although the facility is primarily a final product shipment facility and will soon be a final manufacturing and shipment (pack & fill) facility with no research or primary manufacturing activity, the investment by Genentech, the largest biotech firm in the U.S., signals viable interest in Hillsboro by the industry and a sizeable initial presence by the firm and potentially the industry.

Biotech industry trends in Oregon, including Genentech, are treated in more detail previously in this document based on interview input. In general, interviews revealed strong optimism but general uncertainty about the potential for biotech expansion in Hillsboro. Genentech has utilized only 15 acres of its total 75-acre site in Hillsboro, indicating strong potential for expansion by the firm if it chooses. Genentech could not comment directly on firm plans for the remainder of the site, but did signal strong enthusiasm for Hillsboro as part of its long-term planning.

Although Genentech's future in Hillsboro is still being decided, it was learned during outreach that Hillsboro can and should be a strong candidate site for biotech diversification in the way of pharmaceutical manufacturers that contract with research-oriented biotech services firms that gradually win production approval from the FDA. As the industry is generally divided into research-oriented firms and manufacturing-oriented firms, Hillsboro's competitive strength given previously mentioned economic assets and Genentech's higher profile make it a potential candidate for manufacturing firms.

More detailed treatment of employment growth potential is discussed previously in this document. The following are interviewee views regarding the status and prospects for biotech in Hillsboro.

"A good case is made for Hillsboro regarding biotech – device manufacturing, OHSU alliance, and infectious disease research lab long-term plans"

"Current budget cycles are difficult for such a prospect from a state funding perspective, but over the planning horizon it should be considered a potentially strong asset."

"Attraction and recruitment of Genentech possibly as profound as Intel – future facilities uncertain but significant capacity on-site will raise the profile of Hillsboro."

"Bio-pharmaceuticals growth should be more robust over the 5-10 year period rather than immediately."

"Hillsboro's biggest opportunity for biotech for the foreseeable future is contract manufacturers. Economics of industry indicate research firms that contract their manufacturing, or pharma companies that find it cost effective to contract research expertise."

Takes at least 25 years to get a new therapy 'out of the blocks' then transition to manufacturing from primarily research is a challenge, thus opportunity for efficiency-based contract manufacturers."

"Tax environment is very important for bio-tech manufacturers – enterprise zone/property tax abatement is vital for such significant investment in high-tech equipment."

"Single sales factor in addition to enterprise zone is highly attractive – cost of labor is not the paramount issue."

"General, not necessarily advanced mechanical skills are highest value for Genentech operations planned – 'mechanical engineering lite.'"

"Genentech does not support a significant number of firms locally so far – limited to raw materials such as glass vials and stoppers, while (their) own biochemical plants supply major products for final distribution."

TRANSPORTATION COMMENTS

Economic stakeholders had comments about transportation infrastructure as asset, as well as burden, for future economic development potential in Hillsboro. Comments were focused on:

1. Roads/Highways
2. Rail
3. Hillsboro & PDX Airport; and
4. Transit.



Sentiment overall indicated a general consensus that Hillsboro will be blessed in the future by its combination of freeway proximity, rail, and Hillsboro airport. All three were viewed as positive assets, if not fully realizing adequate public investment for the foreseeable future. The lack of transit service diversity, including high capacity for workforce in Hillsboro, was the most oft-cited competitive disadvantage faced by Hillsboro for industry recruitment. In fact, European solar firms were cited as expressing significant interest in transit for employees.

The following are economic stakeholder input regarding various transportation issues from an economic opportunities standpoint in Hillsboro over the planning horizon.

Roads

"Still public long-term interest in the Westside Transportation Corridor (Bypass) for commercial traffic relief and will affect the 50-year horizon, if not 20-year; Hwy 47 south to Dundee Bypass more likely."

"Freight is going to be an increasing factor for Shute/Evergreen areas as Genentech and SolarWorld already indicate – widening and expanding capacity of Shute Road is going to be a good, if not crucial investment."

"Shute Road is not on ODOT's improvement certainty list but should be reprioritized given the near-term economic development value to the State."

"Highway 26 and newer high-tech expansion in Hillsboro would significantly benefit from three lanes all the way to Shute Road rather than only to Bethany/Cornell, or at least past 185th."

Rail

"Partnership with rail on potential solar freight and workforce transportation important."

"Hubs of manufacturing need to be carefully sited for convenience and lack of conflicts because of strong risk between industrial/passenger traffic and residential/industrial use conflicts."

"Biggest concern: Incompatible uses and access problems for rail, conflict w/ residential uses particularly."

"Declining land availability and fuel price spikes will drive growth in rail use as well as increasing cost of trucking to California."

"Lots of rail congestion through Portland - Oregon Electric District Line (Washington County including Commuter Rail) over time will be the "Northwest Passage" around Portland (including through Hillsboro, Banks and over Cornelius Pass to river)."

"In twenty years, Oregon Electric District Line traffic likely to double but all bets off over 50 years."

"Some solar discussion and P&W looking for opportunities, though doesn't look like anything serious yet."

Hillsboro/PDX Airport

"Hillsboro Airport an asset, but not necessarily a crucial one at this point due to height limits and restrictions on chemical storage proximate to airport."

"Larger passenger service primarily off the table – security and outbound traffic limited."

"Helicopter service model between SJO and SFO interesting as a model for Hillsboro and PDX."

"Hillsboro airport over long-term is a valuable asset as a feeder to/from PDX for shipping."

Transit

"Transportation and transit very important if Hillsboro or nearby communities unable to accommodate residential growth for workforce – alternatives or complimentary service to Tri-Met like Wilsonville (half the payroll cost)."

"Forest Grove-Hillsboro commuter rail key challenge is attractiveness of line as mass transit; track is going to need improvement anyway, but doesn't pencil without passenger traffic."

"One million more people over 50 years guarantee some passenger traffic on rail."



"Transportation system, particularly transit, is a growing concern but a big opportunity of service for long-term anticipated changes to demographics in Hillsboro."

INFRASTRUCTURE CHALLENGES TO HILLSBORO ECONOMIC DEVELOPMENT

Infrastructure adequacy, as well as workforce adequacy, for long-term economic health in Hillsboro was discussed as a factor for growth and land demand over the planning horizons. The following reflect the general consensus of comments which are more specifically documented below.

1. *High capacity and high-quality water has been a major driver of economic development in Hillsboro.*
2. *Long-term economic development potential will rely on successful expansion of water capacity at Henry Hagg Lake, with current discussions indicating a 45' reservoir height increase.*
3. *Water capacity increase should not be at the expense of Western Washington County's important agricultural industry sectors.*
4. *Hillsboro and Washington County continue to feature an outstandingly skilled, high-tech workforce that is attractive to high-tech firms.*
5. *Intel and other larger firms are talent magnets for Washington County and economic stakeholders generally did not express concern for long-term workforce issues.*
6. *If workforce adequacy is an issue, it may be at manufacturing and technology skill-sets for solar-related firms over the long term, where jobs generally pay no more than \$60,000 annually – compared to frequently higher existing tech wage levels – the implication being that solar firms may not reasonably count on former employees of other tech firms due to the difference/likely reduction in salary.*
7. *Hillsboro's lack of housing diversity, particularly at the higher end for better-paid employees, was viewed as a disadvantage for Hillsboro, but not necessarily a crucial one.*
8. *The first wave of solar firms moving to Hillsboro are far more "clock-in/clock-out" shift manufacturing positions rather than research; accordingly, new cluster employment for the near-term at least will place a premium on greater housing options nearby not subject to distant commutes and delays.*

Water Capacity

"Long-term, Hagg Lake dam height increase to guarantee 50-year water capacity important."

"Electricity and water rates may be of concern in the future for high-tech manufacturing: power rates have been moving in the wrong direction and ensuring long-term water capacity from Henry Hagg Lake should be a top priority for long-term planning."

"Hillsboro has excelled at water-centric processes therefore guarantee of long-term water capacity at Hagg Lake is essential to long-term health of high-tech in Washington County."

"Water system expansion is crucial – senior water rights go to farmers/rural and Hagg Lake expansion is far more integral to urbanized uses need over the long term, but 45' expansion does not guarantee adequate rural/ag provision."

Workforce Issues

"Workforce and training is crucial; workforce training incentives upfront are required with PCC making positive steps."

"Existing high-tech industry, particularly Intel, have been a talent magnet for Washington County with no foreseeable change in the future."

"No problems seen with workforce and recruitment for Genentech – existing high-tech is the talent recruiter to the region and plenty of new employees have had stints at Intel or other firms in the recent or distant past."

"Although no short or medium-term concerns about workforce, long-term is uncertain but no serious concern."



Other Challenges to Hillsboro Economic Development

"Less frequently-mentioned obstacle is Hillsboro dirt 'not cheap' and only a value per foot in larger pieces – recent transaction of seventy acres was \$6 per foot."

"Solar manufacturing a bit of a concern as research not apparent - research may occur with more growth, but a network or association with national affiliation is encouraged to build research critical mass in solar."

"Challenge with any innovation idea is how to get the clusters moving now."

"Schools improving and mentioned as important by German solar firms, though daycare clearly lacking."

"Workforce issues uncertain, but competition for qualified workforce may come up – most solar wages are not comparable to Intel – 'diversifying workforce down the pay scale.'"

"New industry will require new land and new transportation need, but urban/rural mix should be preserved as best as possible."

"Downside for Hillsboro is the lack of mass transit, and diversity of housing including more upscale choices for executives who are important part of location decision for new facilities."

"Hillsboro could do with a broader mix of housing, including for executive-level personnel which would help in attracting new industry."

"High-tech research and development workforce can live anywhere but high capacity manufacturing is clock-in/clock-out employment, specifically the first wave of solar manufacturing, thus nearby housing will be important."

"Greater variety of housing options locally will be highly important for this growing (solar) component of the manufacturing workforce."

"Hillsboro schools are okay and getting better."

OTHER OPPORTUNITIES FOR HILLSBORO ECONOMIC DEVELOPMENT

Over the 50-year planning period, economic stakeholders expressed plenty of optimism given the primary local asset of a highly-skilled, innovative workforce rather than complete dependence upon a potentially scarce or restricted natural resource. With retention of high-tech knowledge and (re)investment by high tech firms over the long-haul, economic opportunities for the City of Hillsboro are preserved. Details, however, are certainly difficult to predict over a 50-year period, much less twenty years. Although details themselves are lacking and the next economic development wave is purely speculative, the following comprises the highlights of economic stakeholder input about factors shaping likely future trends and industries in Hillsboro.

"Key to future growth in Hillsboro is balance between services-research-manufacturing."

"Land and incentives are key, but balance of previous high-tech services, research and manufacturing is crucial."

"Given rapidly changing manufacturing products and technologies, opportunity for a manufacturing technologies center is ripe in Hillsboro – allow various old and new product manufacturers opportunity to experiment with new industrial processes and technologies."

"'Industrial Technologies Center' that would allow proprietary manufacturing processes to be protected is key."

"From State perspective, four key sectors: clean technology, healthcare, manufacturing, and engineering; planning for regional opportunities for cluster development should be high priority."

"Metro area has reached a Puget Sound-like congestion tipping point for subregional business strategy – metro area firms seeking Westside locations specifically rather than servicing from Multnomah County solely or elsewhere due to congestion and critical mass being reached as a distinct Westside residential/industry market."

"More interest in Hillsboro industrial market over last six months than last 4 years, in part due to critical mass issue as well as semiconductor and solar support use."

"Major innovation fields now of attention are solar, wave, transmission-control-monitoring systems (smart grid)."

"Much work to do on wave energy, but it is promising."



"Engineering on transmission-control-monitoring promising for solar-related; basically monitor and feedback system innovation."

"Countercyclical industries should be particular high priority, such as SolarWorld and SpectraWatt, which dovetails with Hillsboro area industry well in addition to smoothing out boom/bust cycle of existing local and statewide industry mix."

"Hillsboro, as much as any jurisdiction, can expect to benefit from State investment in signature research centers and related spin-offs – strategy to attract federal dollars for research commitment of 15-20 years."

"Over the next 20 years, some significant changes in State and local public finance should be anticipated including fiscal structures and tools to provide local jurisdictions more flexibility for revenues and service delivery."

"ONAMI (Oregon Nanotechnology and Microsciences Institute) investment will certainly benefit Hillsboro and nanotech potential long-term with FEI connection and Intel research into nanotech-based microprocessor technology."

"Hydroelectricity will likely be cost competitive over the long haul giving Hillsboro continued competitiveness nationwide."

"Aviation-related drones research and manufacture also on horizon with much flight space over low-pop areas in Oregon – Bend, Hillsboro, Klamath Falls airports named as potential involvement."

"Climate migration to Oregon because of milder climate and less extreme weather is going to be a major factor, even though little information or study produced yet."

HILLSBORO-AREA AGRICULTURE & URBAN BALANCE

In the current urban reserves planning process, it was generally viewed an unfortunate outcome that urban land needs and concerns and rural/agricultural concerns are adversarial in nature, with potential skirmishes over where urban/rural lines will be drawn. Economic stakeholder input recognized the difficulty of the process and indicated the following:

- 1. Agriculture industry clusters should be better understood so that long-term health, land need, workforce issues, and infrastructure need are more fully understood and protected instead of becoming battles over acreage and geography with urbanization interests.*
- 2. An approach of balance between urbanized industry clusters and agriculture clusters would be ideal, particularly so that agriculture water and transportation infrastructure is protected and preserved over the long-term.*

The following are other comments expressed and related to the above discussion themes.

"Predictability of rural preservation extremely important – food security and sustainability are key, particularly since the terrorist attacks of 2001."

"Lands quality is important, but a better process for protecting farmland relative to value of employment land would benefit planning."

"Characterization not only of land quality itself, but clustering of ag products, labor, and transportation of goods to market are highly important but largely being undervalued relative to soil quality issue."

"After rural lands 'best cluster fit,' urban lands designation would make more sense."

"Industry clusters for common water resources, workforce, and roads to market not unlike urban industry."

"Water rights mean everything and without that, land purchase and holdings for agriculture growth mean nothing."

"Housing types and need, particularly higher density residential, is an opportunity to preserve rural land."

"Underestimating urban land need is a greater disservice than overestimating for agricultural interests."



TWENTY-YEAR EMPLOYMENT FORECAST

INTRODUCTION

This analysis outlines a forecast of employment within the City of Hillsboro Urban Growth Boundary. The employment forecasts were generated through 2035. The primary source of data on current employment patterns was derived from the State of Oregon Employment Department’s ES-202 reports.

CREATING A BASE YEAR ESTIMATE

TOTAL CURRENT EMPLOYMENT (2006)

For the year 2006, ES-202 reports estimate employment in Hillsboro to total 60,884 employees. However, our source ES-202 data reports “covered employment” only—employer firms that are 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 in 2006 covered employment accounted for approximately 85% of total employment in Washington County, with individual estimates reported by broad sector. Assuming that the City of Hillsboro roughly tracks the countywide trend, we estimate the *total* employed level in 2006 to be in the area of 71,212 employees.

FIGURE 14: CONVERSION OF COVERED EMPLOYMENT TO TOTAL EMPLOYMENT (2006)

NAICS	2006 Observed 1/	Covered Share of 2/ Total Employment	Estimated Total Employment (2006)
Natural Resources	169	54.6%	309
Construction	2,430	81.9%	2,966
Manufacturing	21,971	97.8%	22,468
Wholesale Trade	1,671	88.9%	1,879
Retail Trade	6,392	85.5%	7,473
T.W.U. 1/	1,357	81.8%	1,660
Information	1,383	90.5%	1,528
Financial Activities	1,659	63.5%	2,613
Professional & Business Services	7,572	79.9%	9,479
Education & Health Services	6,945	73.4%	9,460
Leisure & Hospitality Services	4,158	87.2%	4,767
Other Services	1,826	56.0%	3,261
Public Administration	3,351	100.0%	3,351
TOTAL	60,884	85.5%	71,212

1/ From Oregon Employment Department's ES-202 Data
2/Bureau of Economic Analysis (BEA), Share for Washinton County
Source: Johnson Gardner

TOTAL ESTIMATED EMPLOYMENT (2008)

The second step to creating our base year estimate is updating our 2006 total employment estimate to the current period. This process involves the evaluation of countywide economic trends between 2006 and 2008 in addition to current knowledge about the local economic activity in Hillsboro. Outlined in Figure 15, we assume that between 2006 and 2008 the Hillsboro economy grew at a modest pace, averaging just less than



1% annual growth to 72,529 total employees. This estimate will be utilized as the basis of our long-term employment forecast.

FIGURE 15: UPDATING 2006 TOTAL EMPLOYMENT TO THE CURRENT PERIOD (2008)

NAICS	Total Employment 2006	Assumed Growth Rate 2/	2008 Estimate
Natural Resources	309	0.0%	309
Construction	2,966	-0.6%	2,933
Manufacturing*	22,468	-1.0%	22,016
Wholesale Trade	1,879	0.0%	1,879
Retail Trade	7,473	1.2%	7,656
T.W.U. 1/	1,660	-3.8%	1,536
Information	1,528	6.0%	1,716
Financial Activities	2,613	-0.6%	2,582
Professional & Business Services	9,479	1.3%	9,727
Education & Health Services	9,460	3.7%	10,179
Leisure & Hospitality Services	4,767	3.1%	5,067
Other Services	3,261	0.9%	3,319
Public Administration	3,351	3.8%	3,611
TOTAL	71,212	0.9%	72,529

1/ Transportation, Warehousing & Utilities

2/ Assumes that growth in Hillsboro tracks Washington County trends between 2006 and June 2008

* Augmented to reflect known trends in Hillsboro

SOURCE: Johnson Gardner

ANTICIPATED REGIONAL GROWTH

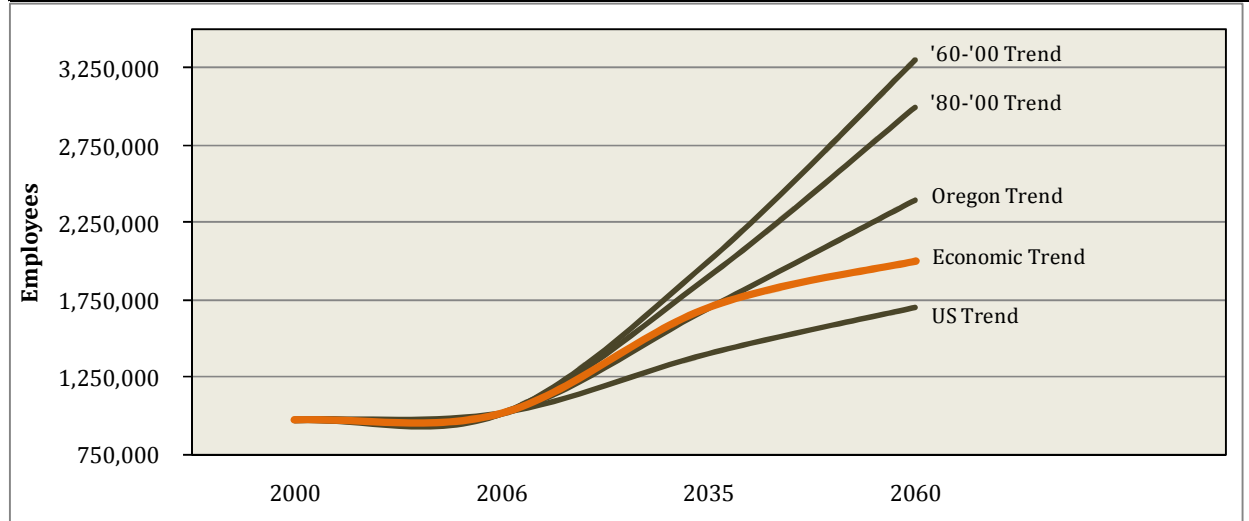
In May 2008, Metro released its preliminary 2060 population and employment forecast for the Portland Metropolitan Area. Based on a range of assumptions and growth rates, Metro’s Data Resource Center produced a series of forecast scenarios, presented in Figure 16. Metro’s preferred option, the *Economic Trend*, relies on national growth factors, migration trends, and birth/death rate from local vital records. Employment is assumed to be correlated with population levels in Metro’s regional econometric model.

- *The forecast does not stratify growth across counties or industries and is presented broadly across the metropolitan area. It presents point estimates to the year 2035 and 2060.*
- *Over the 2035 forecast period, Metro estimates anywhere from 1.4 million to 2.0 million employees in the metro area. Under the preferred Economic Trend the region will have 1.7 million employees by 2035.*
- *The long-range 2060 forecast estimates anywhere from 1.7 to 3.3 million jobs in the region.*



FIGURE 16: ANTICIPATED REGIONAL GROWTH, PORTLAND METRO AREA

Year	METRO CONSOLIDATED EMPLOYMENT FORECAST				
	US Trend (0.9%)	Economic Trend (1.2%)	Oregon Trend (1.4%)	'80-'00 Trend (1.8%)	'60-'00 Trend (2.0%)
1990	730,400	730,400	730,400	730,400	730,400
1995	845,700	845,700	845,700	845,700	845,700
2000	973,200	973,200	973,200	973,200	973,200
2006	1,015,300	1,015,300	1,015,300	1,015,300	1,015,300
2035	1,400,000	1,700,000	1,700,000	1,900,000	2,000,000
2060	1,700,000	2,000,000	2,400,000	3,000,000	3,300,000



SOURCE: Metro

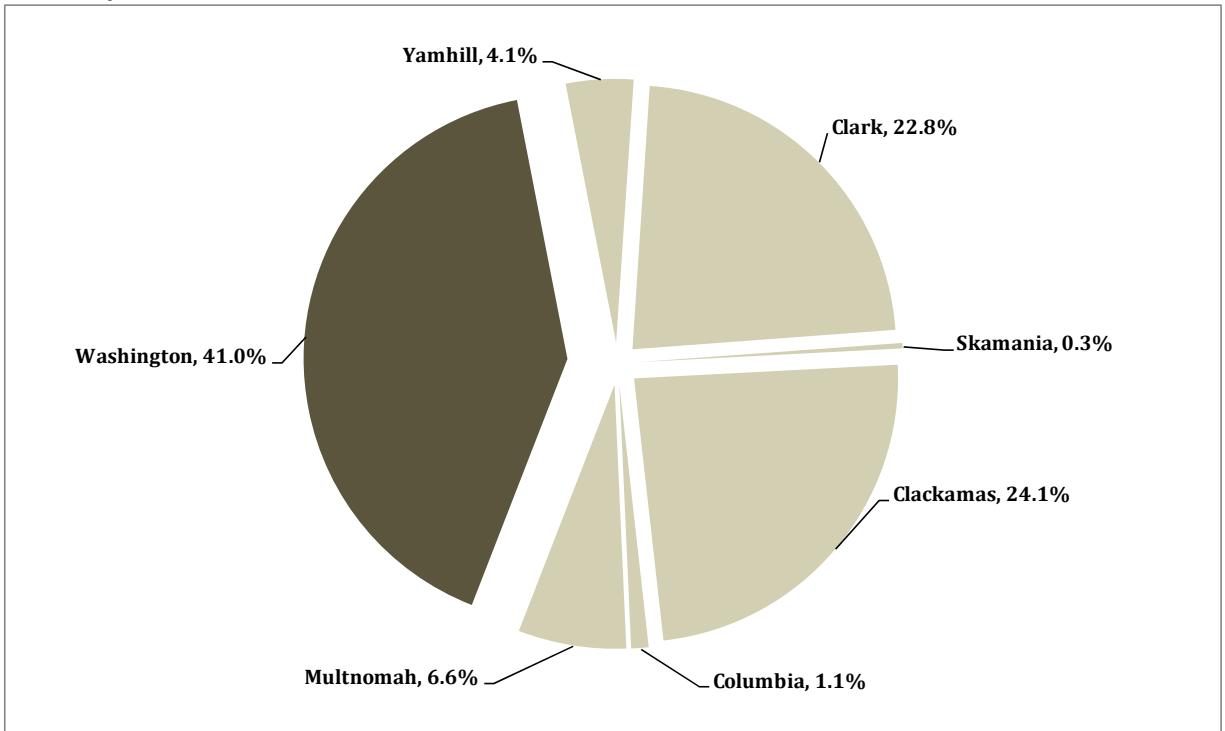
Estimating Washington County Growth

Because Metro’s regional forecast does not allocate employment across subregions, we must make estimates as to what share of regional growth Washington County should conceivably capture. We reviewed historical employment data from the Bureau of Economic Analysis (BEA) and employment departments in Oregon and Washington. 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.

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 reasonably expect this trend to continue into the foreseeable future. When applied to Metro’s regional employment forecast, extrapolated to 2008 and 2035 periods, Washington County can expect to capture better than 162,700 new jobs through 2035.



FIGURE 17: WASHINGTON COUNTY'S HISTORICAL CAPTURE OF REGIONAL GROWTH



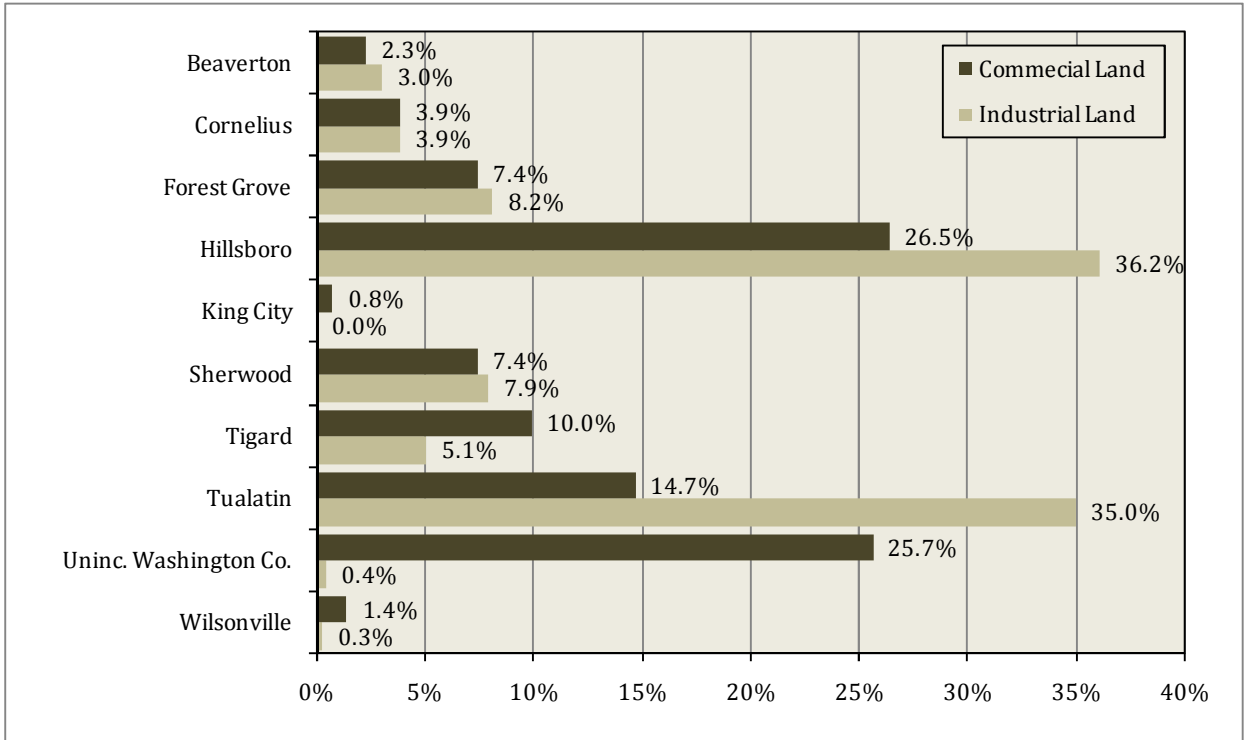
ESTIMATING HILLSBORO'S CAPTURE

With historic capture of regional employment growth by Washington County described above, we attempt to forecast Hillsboro's capture of growth based on a variable measurable across Washington County's jurisdictions: available land. Because future employment growth is a function of net-new economic development, the jurisdictions with capacity to accommodate growth will conceivably capture the greatest share.

Figure 18 highlights the distribution of available vacant industrial and commercial land in Washington County according to Regional Land Information System (RLIS). Taken together, Hillsboro holds a 32.7% share of vacant land, the largest in Washington County, followed by Tualatin with 27.8%. This distribution demonstrates Hillsboro is the biggest player in Washington County for new employment growth, capable of capturing a minimum of 53,000 new jobs over the next 20 years.



FIGURE 18: HILLSBORO’S SHARE OF VACANT EMPLOYMENT LAND IN WASHINGTON COUNTY



EMPLOYMENT FORECAST BY INDUSTRY SECTOR

This section presents three forecasts of total employment in Hillsboro between 2008 and 2035. The Baseline forecast is based on the estimated Washington County share of Metro’s *Economic Trend* projections discussed in Section III. From this starting point, the Baseline forecast incorporates the estimated share of growth allocated to Hillsboro based on available land (from Section IV). Moreover, total employment projections are stratified across industries based on Oregon Employment Department (OED) Region 2 forecasts, historical trends from ES-202 reports, interviews with major employers in the area and State and local officials and lastly, the policy goals and objectives outlined by the City. In the case of Hillsboro, an example of the impact the latter sources have on employment projections will be noticed in the manufacturing sector. The 2006-2016 OED forecast projects manufacturing growth in Region 2 (Multnomah & Washington County) of only 1,500 jobs (0.2% AAGR) over the ten year period. The Baseline forecast herein indicates a 2.7% AAGR demonstrating a relatively strong ES-202 trend, a positive outlook by area business and civic leaders as well as aggressive City policy goals. Although the final reconciliation of need will be based on the baseline projection, two other higher growth scenarios are presented which more fully take into consideration City specific economic development objectives.

The high growth forecast assumes the same methodology using Metro’s *'80-'00 Trend* and the medium growth forecast assumes a midpoint between the baseline and high growth forecasts—similar to Metro’s *Oregon Trend*. In addition, the high and medium growth scenarios have incorporated growth potential in the City of Hillsboro’s targeted industry clusters.

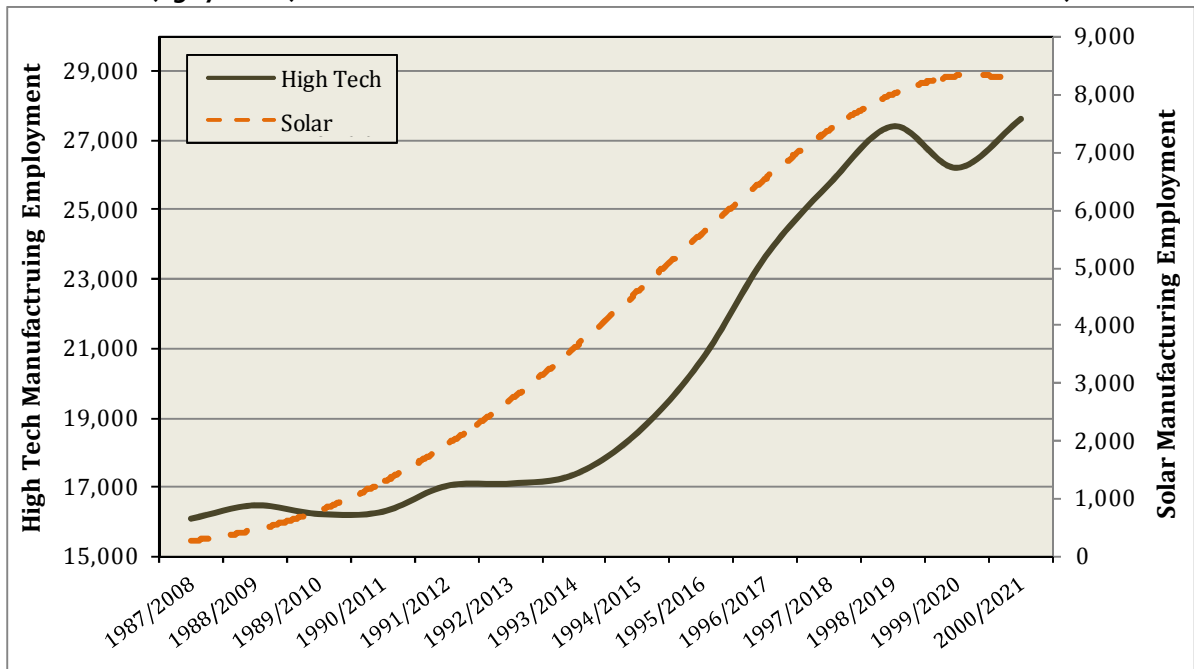
From an economic development standpoint, it is the policy objective of the City of Hillsboro to create a solar energy industry cluster in Hillsboro. Considering the recent activity in Hillsboro with the operations of SolarWorld and SpectraWatt already slated to bring 2,000-2,500 solar manufacturing jobs to Hillsboro in the next two years alone, this objective is increasingly viable. The City’s policy is to plan for local growth similar to the tech boom that hit Hillsboro in the 1990’s. This path could lead to the creation of thousands of manufacturing jobs in the local economy. Between 1987 and 2000 Washington County’s high tech



manufacturing employment nearly doubled, adding close to 15,000 jobs. During that period, the Washington County economy added over 115,000 jobs growing by an annual average rate of 5.7%.

Figure 19 illustrates the change in Washington County’s high-tech microprocessor industry cluster employment during cluster formation from 1987 to 2000 as well as the path of high employment growth projected for solar manufacturing through 2021. In a high growth scenario, solar manufacturing will add nearly 7,000 jobs in Hillsboro by 2035. If including other manufacturing, which arises as a result of solar manufacturing, the number of jobs added is approximately 9,500. In a medium growth scenario the number is nearly 6,000.

FIGURE 19: HIGH-TECH MANUFACTURING EMPLOYMENT GROWTH DURING HILLSBORO’S PREVIOUS CLUSTER FORMATION (1987-2000) AND SOLAR MANUFACTURING PROJECTED EMPLOYMENT GROWTH (2008-2021) 1/



1/ High tech data is for Washington County in SIC codes 36 and 38
SOURCE: Oregon Employment Department and Johnson Reid

The medium and high growth solar employment projections are based on estimated gigawatts of annual installations through 2025 and the industry accepted assumption of 3.5 jobs per megawatt (MW) of solar PV manufactured. (Beyond 2035, an assumed 2 jobs per MW is assumed for the 50-year forecast.) While the medium growth forecast is on a linear growth path, the high growth forecast was adjusted to allow for greater growth during the next 15 years with growth then leveling off to single-digit growth between 2018 and 2023, similar to the business life cycle path.¹⁸

The projections for solar employment in Hillsboro were obtained using employment shares at the State, County and local level in the computer and electronic computer manufacturing. In 2007, Hillsboro’s had a 45% share of Statewide employment in the sector. Extending this assumption was deemed reasonable for the following reasons: 1) the Solar PV manufacturing process is very similar to that of semi-conductor manufacturing. 2) As Hillsboro has a large educated and skilled workforce directly applicable to solar PV manufacturing. 3) Available land. 4) Agglomeration.

¹⁸ The high growth projection path was calculated based on information provided by the Oregon Department of Energy regarding Oregon’s goal to reach 3,000 MW per year of production capacity by 2015.



In addition to the base projection for solar, the indirect and induced employment projections were estimated. In the high growth scenario, solar manufacturing will be responsible for an additional 50,000 indirect and induced jobs in the Portland metro area by 2035. This total impact was allocated to Hillsboro based on its share of each respective industry’s 2006 Portland area employment. For example, of the 4,080 total jobs projected in Financial Activities by 2035, Hillsboro was allocated 124 jobs based on the City’s 3.05% share of that sector’s Portland area employment.¹⁹ Hillsboro’s total employment impact due to solar manufacturing is estimated to be nearly 13,000 by 2035 in the high growth scenario.

The City has also targeted the biotech sector. Oregon’s biotech projections are uncertain. The industry faces challenges at the State level such as a lack of seed and venture capital funding, lack of major biomedical research university and agglomeration. With this said, the potential for Hillsboro to attract biotech companies has been greatly increased by the presence of Genentech. The most viable addition to Hillsboro is biotech contract manufacturing. The high and medium growth forecasts account for potential growth in the sector.

Solar Employment Assumptions	
High	
90	GW of Global Solar PV annual installations
3.5	Jobs per MW
12.5%	Oregon & Washington share of global output
3000	MW of production capacity—Oregon's goal by 2015
Medium	
50	GW of Global Solar PV annual installations
3.5	Jobs per MW
14.5%	Oregon & Washington share of global output
Note: For perspective, as of 2007 total global solar installations was at 3 GW.	

Figure 20 presents a forecast of total employment for Hillsboro between 2008 and 2035. As shown, the baseline employment forecast anticipates an increase of 69,768 jobs, reflecting an average annual growth rate of 2.5%.

- The high growth scenario projects an increase of 128,582 jobs (3.8% AAGR), while the medium growth scenario projects 99,362 new jobs (3.2% AAGR).
- Manufacturing is expected to account for approximately 33% of growth, slightly below its current share of employment.
- Professional Services and Education & Health Services are projected to comprise roughly 37% of new job creation, slightly below the OED forecast for Region 2 as a result of a lower basis in Professional Services in Hillsboro.

¹⁹ Hillsboro’s share of Portland area industry employment is assumed to remain constant except in the case of industries which utilize Tech/Flex industrial land. For those industries, Hillsboro’s share is assumed to increase as a function of the distribution of employment density using Tech/Flex (see Exhibit 1.06) as well as Hillsboro’s historical growth in industry share.



FIGURE 20: EMPLOYMENT FORECAST BY INDUSTRY SECTOR, HILLSBORO (2008-2035)

Baseline/Low Forecast NAICS	Base Year	Employment Forecast						2008-2035 Growth	
	2008	2013	2018	2023	2028	2033	2035	Jobs	AAGR
Natural Resources	309	317	331	350	365	377	382	74	0.8%
Construction	2,933	3,206	3,713	4,356	4,882	5,308	5,488	2,555	2.3%
Manufacturing	22,016	24,209	28,283	33,453	37,683	41,103	42,556	20,540	2.5%
Wholesale Trade	1,879	2,005	2,240	2,538	2,781	2,979	3,061	1,182	1.8%
Retail Trade	7,656	8,276	9,426	10,886	12,081	13,049	13,457	5,801	2.1%
T.W.U.	1,536	1,702	2,011	2,402	2,723	2,982	3,092	1,557	2.6%
Information	1,716	1,815	2,001	2,236	2,428	2,584	2,650	934	1.6%
Financial Activities	2,582	2,759	3,087	3,503	3,844	4,120	4,237	1,655	1.9%
Professional & Business	9,727	11,018	13,416	16,460	18,950	20,957	21,819	12,092	3.0%
Education & Health	10,179	11,788	14,775	18,567	21,669	24,165	25,243	15,064	3.4%
Leisure & Hospitality	5,067	5,607	6,611	7,885	8,928	9,770	10,129	5,062	2.6%
Other Services	3,319	3,531	3,922	4,420	4,827	5,157	5,296	1,976	1.7%
Public Administration	3,611	3,747	4,000	4,321	4,584	4,798	4,887	1,276	1.1%
TOTAL	72,529	79,979	93,815	111,377	125,745	137,350	142,297	69,768	2.5%

High Growth Forecast 1/ NAICS	Base Year	Employment Forecast						2008-2035 Growth	
	2008	2013	2018	2023	2028	2033	2035	Jobs	AAGR
Natural Resources	309	321	343	368	390	412	422	113	1.2%
Construction	2,934	3,288	3,943	4,764	5,558	6,367	6,748	3,814	3.1%
Manufacturing	22,316	28,172	37,775	45,682	55,458	65,430	70,123	47,807	4.3%
Wholesale Trade	1,883	2,087	2,447	2,844	3,235	3,634	3,822	1,939	2.7%
Retail Trade	7,665	8,536	10,120	12,012	13,843	15,711	16,590	8,925	2.9%
T.W.U.	1,539	1,780	2,216	2,727	3,254	3,792	4,045	2,506	3.6%
Information	1,718	1,898	2,207	2,528	2,850	3,178	3,333	1,615	2.5%
Financial Activities	2,586	2,850	3,325	3,872	4,398	4,935	5,187	2,601	2.6%
Professional & Business	9,757	12,030	15,947	20,078	24,787	29,591	31,851	22,095	4.5%
Education & Health	10,189	12,327	16,260	21,120	26,431	31,848	34,397	24,208	4.6%
Leisure & Hospitality	5,075	5,841	7,232	8,886	10,574	12,296	13,107	8,032	3.6%
Other Services	3,324	3,646	4,220	4,876	5,504	6,144	6,446	3,122	2.5%
Public Administration	3,611	3,792	4,124	4,535	4,887	5,246	5,415	1,804	1.5%
TOTAL	72,905	86,570	110,160	134,291	161,169	188,585	201,487	128,582	3.8%

Medium Growth Forecast 1/ NAICS	Base Year	Employment Forecast						2008-2035 Growth	
	2008	2013	2018	2023	2028	2033	2035	Jobs	AAGR
Natural Resources	309	319	337	359	378	399	409	99	1.0%
Construction	2,934	3,246	3,825	4,561	5,162	5,884	6,201	3,267	2.8%
Manufacturing	22,316	25,795	31,922	39,916	46,230	53,117	56,280	33,965	3.5%
Wholesale Trade	1,883	2,041	2,328	2,696	2,993	3,343	3,496	1,613	2.3%
Retail Trade	7,665	8,395	9,743	11,459	12,857	14,523	15,252	7,587	2.6%
T.W.U.	1,539	1,737	2,102	2,568	2,947	3,395	3,594	2,056	3.2%
Information	1,718	1,850	2,085	2,387	2,631	2,914	3,038	1,320	2.1%
Financial Activities	2,586	2,799	3,191	3,692	4,099	4,581	4,791	2,205	2.3%
Professional & Business	9,757	11,446	14,464	18,337	21,462	25,066	26,697	16,941	3.8%
Education & Health	10,189	12,045	15,484	19,854	23,423	27,665	29,574	19,385	4.0%
Leisure & Hospitality	5,075	5,714	6,893	8,395	9,618	11,068	11,712	6,636	3.1%
Other Services	3,324	3,581	4,052	4,654	5,142	5,721	5,972	2,648	2.2%
Public Administration	3,611	3,768	4,059	4,429	4,731	5,097	5,251	1,640	1.4%
TOTAL	72,905	82,737	100,486	123,308	141,671	162,774	172,267	99,362	3.2%

1/ High growth forecast utilizes Metro's '80-'00 Trend Scenario.



2035 EMPLOYMENT LAND DEMAND ANALYSIS

INTRODUCTION

This section summarizes the projected demand for commercial and industrial land associated with the employment projections through 2035. Results are followed by a description of the methodology employed by JOHNSON REID to project the demand for commercial and industrial space, and subsequently, commercial and industrial land.

Determining the City’s required site types for various, future employers and users 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 Hillsboro 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 demand and the demanded numbers of sites.

SUMMARY OF EMPLOYMENT LAND DEMAND FINDINGS

The results summarized in Figure 21 highlight projections of net new demand within current and potentially future urbanized Hillsboro for commercial and industrial land between 2008 and 2035. Detailed findings by use type and growth scenario are included in the technical appendix.

- Through 2035, net new demand for employment land is expected to range from 3,002 to 6,419 net buildable acres, contingent upon Hillsboro’s realized growth pattern.
- The Medium Growth scenario indicates that Hillsboro can expect employment land demand in the vicinity of 5,058 acres through 2035, 2,067 acres of which would be industrial.

Figure 21 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 across the planning period.

AVERAGE JOBS/NET ACRE	
OFFICE COMMERCIAL	71.9
INDUSTRIAL	19.6
RETAIL COMMERCIAL	11.0
OVERNIGHT LODGING	10.9
SPECIALIZED USES	20.0

The forecast reflects an expectation that future employment space demands will reflect a fairly consistent allocation across commercial office and industrial uses. The targeted creation of a solar manufacturing cluster in Hillsboro will in part facilitate growth in manufacturing at a pace consistent with historical trends. Forecasts do, however, reflect increasing floor area ratios (FARs) for industrial and office uses with concentrations of office, research and services employment. Please refer to the Industrial and Office Land Demand Methodology discussion immediately following Figure 22 for details about FAR increases in Hillsboro across the planning period.



FIGURE 21: HILLSBORO URBAN AREA EMPLOYMENT LAND DEMAND (NET BUILDABLE ACRES 2008-2035)

Use Type	Demand For Land (Acres) By Scenario:		
	Baseline Growth	High Growth	Medium Growth
OFFICE COMMERCIAL	337.6	1,106.8	874.7
INDUSTRIAL	1,281.1	2,846.9	2,067.1
RETAIL COMMERCIAL	936.0	1,837.2	1,572.0
CITY RESIDENTS	829.6	1,628.4	1,393.3
REGION/TOURISTS 1/	106.4	208.8	178.6
OVERNIGHT LODGING	18.1	28.7	23.7
SPECIALIZED USES 2/	429.9	599.3	521.1
TOTAL	3,002.6	6,418.9	5,058.6

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 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 DLCDD 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 Hillsboro for lands outside the UGB and so the below figure converts acreages from Figure 21 to total gross land demand by category. Figure 22 projects the total land demand for the City of Hillsboro.

FIGURE 22: HILLSBORO URBAN AREA EMPLOYMENT LAND DEMAND (GROSS BUILDABLE ACRES 2008-2035)

Use Type	Demand For Land (Acres) By Scenario:		
	Baseline Growth	High Growth	Medium Growth
OFFICE COMMERCIAL	421.9	1,383.6	1,093.4
INDUSTRIAL	1,601.4	3,558.6	2,583.9
RETAIL COMMERCIAL	1,169.9	2,296.5	1,965.0
CITY RESIDENTS	1,037.0	2,035.5	1,741.7
REGION/TOURISTS 1/	132.9	261.0	223.3
OVERNIGHT LODGING	22.6	35.8	29.6
SPECIALIZED USES 2/	537.4	749.1	651.4
TOTAL	3,753.2	8,023.6	6,323.3

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.



INDUSTRIAL AND OFFICE LAND DEMAND 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 Hillsboro. Methodology for forecasting demand 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]

OFFICE STRUCTURE FLOOR AREA RATIO (FAR) TREND

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 15,000 square foot site would be an example of a 0.33 FAR. For projections under each of the three Hillsboro economic scenarios, JOHNSON REID assumed a relatively conservative 0.30 FAR beginning in 2008. Every five years thereafter, JOHNSON REID assumed average office FAR incrementally increases by 0.02, reaching an average office FAR of 0.46 by 2035.

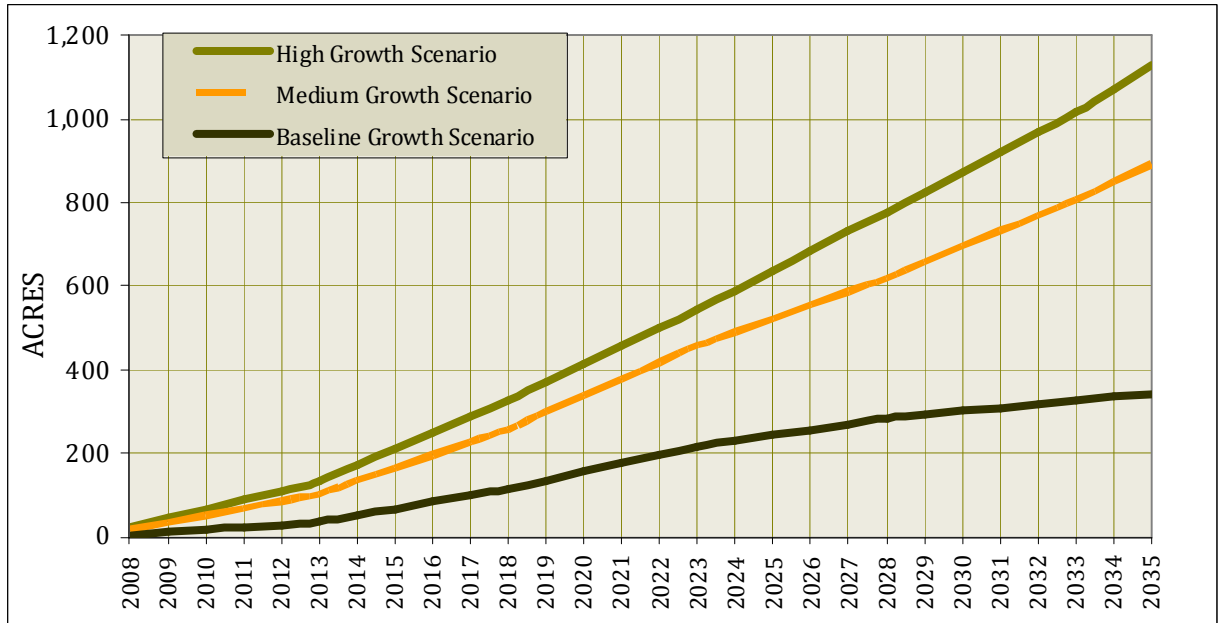
[Exhibits 1.03]

DEMAND FOR OFFICE COMMERCIAL LAND

Demand for office land is a conversion of demand for space by an office floor area ratio (FAR).

[Exhibit 1.04]

FIGURE 23: CUMULATIVE OFFICE LAND DEMAND BY SCENARIO



SOURCE: Johnson Reid, LLC

DEMAND FOR INDUSTRIAL BUILDING SPACE

Hillsboro’s 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 1.06 through 1.08]

INDUSTRIAL STRUCTURE FLOOR AREA RATIO (FAR) TREND

Research during the process of this study gave no indication that industrial structures can be expected to make significant gains in FAR over the planning horizon. Anecdotally, input contradicts this notion: impervious surface for trucks and appropriate access/turning radii will be a significant building footprint determinant over the long run; and manufacturing space utilized by high-tech firms must be flexible in size to allow modifications to manufacturing processes and new product line manufacturing changes over time.

However, it is also noted that high-tech facilities do incorporate significant office space utilization, though structures vary significantly between firms and individual sectors. Intel’s Ronler Acres is an oft-cited example of a high-tech industrial facility over three stories in height with significant office use and structured parking. To model the reality of office-utilizing industrial employment and space increasing in density over the planning period, JOHNSON REID assumed industrial space-utilizing employment growth in Professional & Business Services, and Information, the two primary categories, would see FARs increasing by 0.025 every five years to 0.40 by 2035.

[Exhibit 1.09 through 1.10]

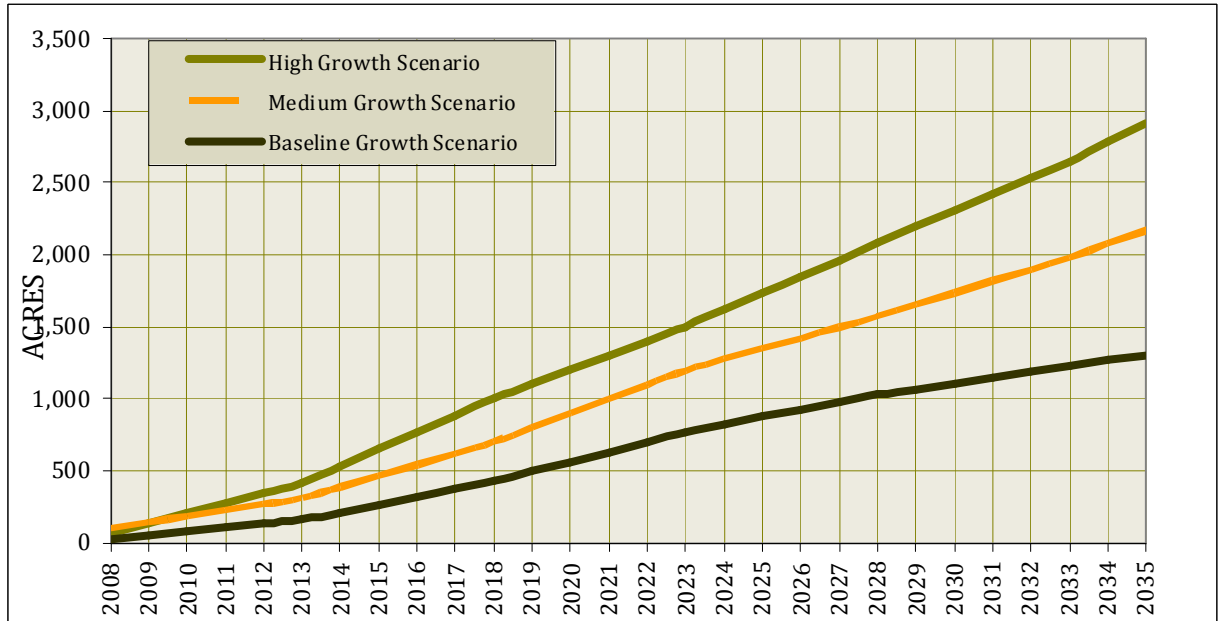


DEMAND FOR INDUSTRIAL LAND

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. Second, a 10% non-industrial use demand for land was assumed for industrial land projections.²⁰ Finally, a stable market vacancy rate of 10% was assumed.

[Exhibits 1.11 and 1.12]

FIGURE 24: CUMULATIVE INDUSTRIAL LAND DEMAND BY SCENARIO



SOURCE: Johnson Reid, LLC

RETAIL COMMERCIAL LAND METHODOLOGY

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

HOUSEHOLD GROWTH PROJECTIONS

For modeling growth in retail commercial land demand driven by residential growth, JOHNSON REID utilized the City’s population growth projections in our residential land demand analysis. Medium, high and low growth scenarios, and resulting household growth projections through 2035, were estimated as follows:

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

²⁰ Non industrial uses in industrial districts include office space as well as support retail.



HILLSBORO 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 25: AVERAGE HOUSEHOLD EXPENDITURES ON RETAIL GOODS, HILLSBORO UGB

NAICS	Category	Per Household Expenditures 1/
441	Automotive Parts, Accessories and Tire Stores	\$9,091
442	Furniture and Home Furnishings Stores	\$1,112
443	Electronics and Appliance Stores	\$1,128
444	Building Materials and Garden Equipment	\$4,481
445	Food and Beverage Stores	\$5,480
446	Health and Personal Care Stores	\$1,833
448	Clothing and Clothing Accessories Stores	\$2,254
451	Sporting Goods, Hobby, Book and Music Stores	\$966
452	General Merchandise Stores	\$5,504
453	Miscellaneous Store Retailers	\$1,166
722	Foodservices and Drinking Places	\$4,435
Totals/Weighted Averages		\$37,450

FUTURE CITY OF HILLSBORO RESIDENT-DRIVEN RETAIL SALES

Future retail sales originating within the City of Hillsboro were simply calculated as the product of future City of Hillsboro household counts under the medium, high, and low growth scenarios through 2035 and annual average retail sales by category.

[Exhibit 1.13]

DEMAND FOR RETAIL COMMERCIAL SPACE

Future retail sales are converted into demand for developed retail space by calculating the product of future City of Hillsboro 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 1.14]

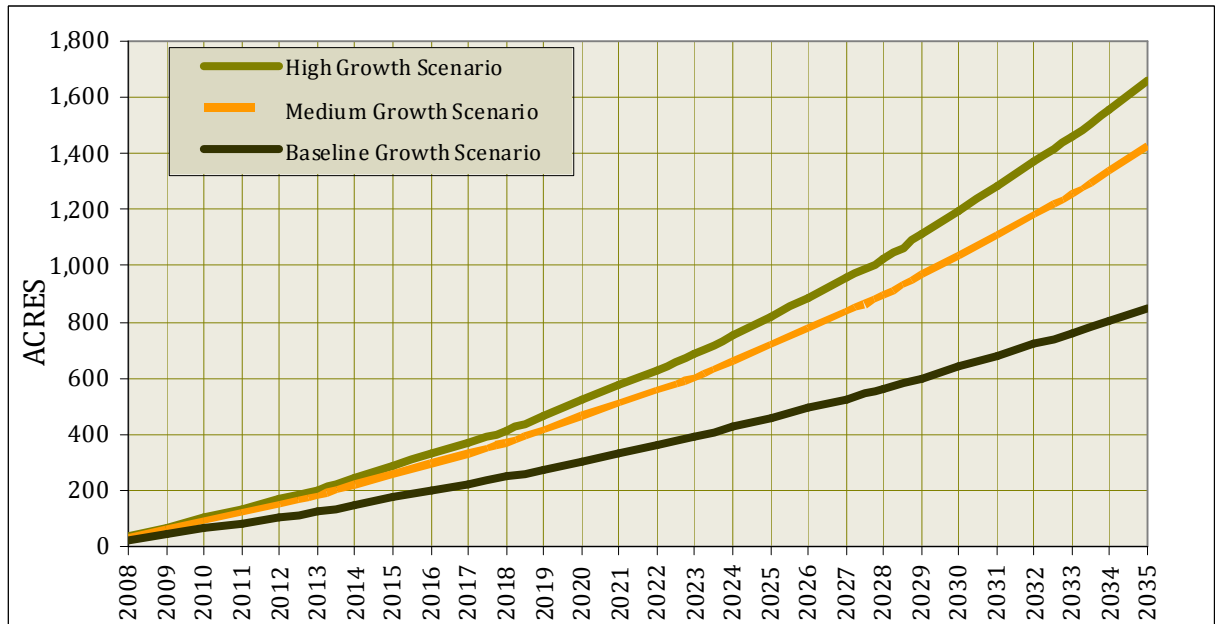
DEMAND FOR RETAIL COMMERCIAL LAND

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. The static, suburban retail assumption was made to reflect the "outer ring" status of Hillsboro and its competitive disadvantage in garnering higher-density retail commercial, as well as its competitive disadvantage relative to the more central Beaverton and Tigard areas.



[Exhibits 1.15 through 1.16]

FIGURE 26: CUMULATIVE RETAIL LAND DEMAND BY SCENARIO



SOURCE: Johnson Reid, LLC

REGION/VISITOR SPENDING PROJECTIONS

The City of Hillsboro’s 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.



20-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 Hillsboro, based on economic opportunities identified, over the planning horizon through 2035. 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 development²¹. 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 future²². However, by identifying and planning for typical patterns, the widest range of development patterns have 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.

²¹ The typical development pattern 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)).

²² 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)
Large Office Users (150-1200+ Employees; 60k-500+k sq. ft. built space)	Main Branch/Headquarters Offices for Banking, Security and Commodity, Real Estate, and Insurance Carriers, Healthcare, Communications, Transportation Services, Back Office Processing	Transportation system that provides access to labor is essential 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.	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.	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.	Typically own or long-term leases from affiliated real estate company. Sometimes independent long-term leases.	Parking must be reasonably adequate and convenient- Often structured. Usually a mix of private and public if structured.
				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.	Typically Own or lease from affiliated real estate company.	Usually uses on-site surface parking.
				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.	Typically discount lease structure, but may own	Usually uses on-site existing surface parking
Medium Office Users (35-175 employees; 12k-70k sq. ft.)	Community Branches for Banking, Security and Commodity, Real Estate, and Insurance Carriers, and Community Healthcare Professional Business Services, Legal Services, Communications, Transportation Services	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.	Water, sewer, and storm drainage must be adequate. Site must be able to be served by modern telecommunications.	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.	Limited ownership opportunities may be a limiting factor. Leases prevalent.	Tends to utilize public supplied parking downtown that may include leases of public spaces.
				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.	Ownership or leases from affiliated companies common and may be deciding factor.	Usually uses on-site surface parking.
				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.	Ownership varies with the user requirements.	Usually on-site, but may be shared parking with adjoining commercial uses.



	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)
Small (1-40 employees; 400 to 13k square feet)	Sole proprietor or small partnership of professional service offices for Banking, Security & Commodity, Real Estate, Insurance Agents and Brokers, Business Services and Legal Services	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.	Water, sewer, and storm drainage must be adequate. Site should have, but may not always, require modern telecommunic ations.	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.	Most are done as leases. Some small ownerships available through condominiums.	Tends to utilize public supplied parking downtown that may include leases of public spaces.
				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.	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.	Usually uses on-site surface parking.
				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.	Most space is leased.	Usually on-site, but may be shared parking with adjoining commercial uses.
				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	These are typically owned by the Company or the Companies' owner(s), often central issue in the decision.	Usually a combination of public on-street and private off-street. Parking can often be limiting factor.
				Home Based Businesses - These offices exist within residences and the use is considered accessory to the residence. Site sizes are dictated by residential standards.	Ownership through home ownership is often central to the decision to operate a home based office business.	Customer parking typically restricted or not allowed per residential standards.



COMMERCIAL RETAIL 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
Large Retail Users (45k-500+k sq. ft./; and/or 15+ acres of outdoor storage)	Retail Trade (Regional Retail);	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.	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.	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 format unanchored specialty retail more common tenant types.	No known definitive ownership/leasing practices.	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
				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.	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	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.
				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. ²³	The large anchors sometimes own their building and portions of the Mall site – Otherwise they are typically done as Triple Net Leases.	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.
				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.	These sites are typically owned by the retail company or an affiliated real estate company.	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.
				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.	These sites are typically owned by the retail company or an affiliated real estate company.	Outdoor storage areas are dominant feature with surface customer parking on-site. Loading is often in designated areas on-site.

²³ 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 Pattern Discussion	Ownership/Leasing Patterns	Parking, Loading, Storage
Medium Retail Users (12k-50k sq. ft.; and/or 3 to 15 acres of outdoor inventory)	Retail Trade (Community Retail)	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	Water, sewer, and storm drainage must be adequate. Site must be able to be served by modern telecom.	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.	Limited ownership opportunities may be a limiting factor. Leases prevalent.	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.
				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.	Ownership or leases from affiliated companies common and may be deciding factor.	Usually use on-site surface parking.
				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.	Ownership or leases from affiliated companies common and may be deciding factor.	Usually use on-site surface parking.
				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.	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	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.
				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.	The medium anchors sometimes own their building and portions of the site – Otherwise they are typically done as Triple Net Leases.	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.
				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	Ownership varies with the user requirements.	Outdoor inventory storage areas are dominant feature with surface customer parking on-site. Loading is often in designated areas on-site.
				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	Ownership varies with the user requirements.	Surface tractor trailer customer parking is usually the dominant feature. Limited outdoor storage. Stacking for fuel stations is important.



	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)	Retail Trade (Neighborhood and Specialty)	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.	Water, sewer, and storm drainage must be adequate. Site must be able to be served by modern telecom.	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.	Most space is leased. Some small ownerships available through condominiums.	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.
				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.	Space is leased and owned. Many uses are corporate and seek sites with ownership.	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.
				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.	Most space is leased from larger building owners – often commercial REITS.	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.
				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.	Space may be leased or owned.	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.
				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 uses along with small scale industrial uses.	Space may be leased or owned. Ownership patterns tend to be fractured.	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.
				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	Space is usually leased, but may be owned.	Outdoor inventory storage areas are dominant feature with surface customer parking on-site.



INDUSTRIAL 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
Large Industrial Users (90k-750+k sq. ft. built space;/ and/or 20+ acres of outdoor inventory/production areas)	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.	Indoor/Outdoor Industrial Processes - Including Manufacturing, Repair, Remanufacturing, Salvage Yards, Micro-Energy, Agri-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.	Typically Corporate Owned (Or Affiliate)	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.
				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.	Usually sites are corporate or gov. owned, but many will include flex space for smaller users.	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.
				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.	Almost always Corporate Owned.	Parking, loading and storage needs are minimal.
				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 require sufficient area to accommodate long-term expansion. Users may seek integration with office developments.	Typically Corporate Owned	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.
				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.	Typically Corporate Owned.	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.
				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. 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.	REIT and Private Equity Ownership	Flex space typically has employee and customer parking and a loading door for each suite. Little outdoor storage is utilized.



	Target Industries	Transportation; Access to Labor and Customers	Public Facilities/ Utilities	Site Sizes and Development Pattern Discussion	Ownership/ Leasing Patterns	Parking, Loading, Storage
Medium Industrial Users (25k- 100k sq. ft. built space/; and/or 4 to 25 acres of outdoor inventory/production areas	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	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 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.	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.	Mix of ownership and leasing	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.
				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 rail yard activities. Site sizes are typically 4 to 20 acres and can cluster with similar uses in freight centers that are 2,000+ acres.	Sites are corporate or developer owned, but may include some leased space for smaller users.	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.
				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.	Almost universally corporate owned.	Parking and loading requirements are minimal. The facilities themselves are kind of outdoor storage.
				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 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.	Usually Corporate owned or affiliate owned.	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.
				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.	Some Corporate and Private Equity Ownership	Employees parking is minimal. Customer parking/loading must be provided for use of each unit
				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.	REIT and and Private Equity Ownership	Flex space typically has employee and customer parking and a loading door for each suite. Little outdoor storage is utilized.



	Target Industries	Transportation; Access to Labor and Customers	Public Facilities/ Utilities	Site Sizes and Development Pattern Discussion	Ownership/ Leasing Patterns	Parking, Loading, Storage
Small (Less than 30k square ft built space and/or less than 5 acres outdoor inventory/production areas)	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	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.	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.	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.	Mix of ownership and leasing	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.
				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.	Usually Corporate owned or affiliate owned.	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.
				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.	Most are Private Equity Ownership	Employee parking is minimal. Customer parking/loading must be provided for use of each unit
				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.	Most are Private Equity Ownership	Flex space typically has employee and customer parking and a loading door for each suite. Little outdoor storage is utilized.



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 telecomm and demands on telecomm 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.	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.
				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	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.
				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.	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.
				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.	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 Hillsboro 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 flexible land supply to accommodate long-term investment decisions by “anchor” cluster firms (SolarWorld, Genentech, Intel). These larger, key industry firms’ commitment to an economic area then attract various ripple effects via spin-offs, joint ventures, competitors, suppliers, and customers typically utilizing more moderate parcel sizes highly proximate to the “anchor” firm. Intel’s Jones Farm and Ronler Acres are examples of employment ripple effect and spin-off well documented by Joe Cortright/Impresa Consulting and the Portland State University Institute of Metropolitan Studies. Input also emphasized flexibility regarding development orientation. Large firms land bank and build larger, more flexible structures to allow for modification of research and manufacturing process, as well as changes in product lines.
- *Industry-Specific Literature Review:* Industry studies and documents were utilized to understand likely parcel sizes required of emerging high technology-dependent firms and clusters based on operations standards and site investments elsewhere.
- *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.
- *City of Hillsboro Planning Documents:* Plans and analysis in support of the Shute Road Industrial Site comprehensive plan amendment, as well findings from the Evergreen Concept Plan and Helvetia Concept Plan were utilized.
- *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 27 provides a detailed assessment of Hillsboro employment land demand through 2035 in terms number of sites demanded by site size, with a comparison to developable employment land supply by site quality within the existing Hillsboro urban growth boundary. Results are expressed for all three employment growth scenarios.



FIGURE 27: RECONCILIATION OF HILLSBORO EMPLOYMENT LAND SITE DEMAND & SUPPLY (2035)

2035 Land Demand Reconciliation - Site Need Count									
Number of Sites by Development Pattern						Planning Horizon			
	Typical Acreage	Demand Projections - Sites				Vacant Supply (Sites)	Balance -Sites Needed		
		Baseline	High	Medium	Baseline		High	Medium	
Office	Business Park	50.0	4	12	9	-	4	12	9
	Medium	25.0	5	16	12	1.0	4	15	11
	Small	5.0	25	80	64	30.0	(5)	50	34
	Sub Total		33	108	86	31.0	7	77	55
Industrial	Cluster Anchor	100.0+	4	10	7	3.0	1	7	4
	Anchor or Large Park	50.0 - 100.0	3	6	4	3.0	(0)	3	1
	Large User or Mid Park	25.0 - 50.0	7	15	11	7.0	(0)	8	4
	Medium User or Smaller Park	10.0 - 25.0	13	29	21	13.0	0	16	8
	Expanding User	5.0 - 10.0	14	31	22	25.0	(11)	6	(3)
	Small Businesses	5.0 or fewer	91	202	146	118.0	(27)	84	28
	Sub Total		132	293	212	169.0	2	124	46
Commercial Retail	Large	25.0	10	20	17	-	10	20	17
	Medium	10.0	55	108	93	1.0	54	107	92
	Small	1.5	243	476	408	73.0	170	403	335
	Sub Total		308	605	517	74.0	234	531	443

Note: Figures may not sum due to rounding.

SOURCE: City of Hillsboro Planning Department and Johnson Reid, LLC

2035 OFFICE EMPLOYMENT SITE DEMAND FINDINGS

- *Sites Demanded:* Hillsboro economic growth is estimated to drive demand for as few as 33 office commercial sites to as many as 108. The majority of sites for office commercial can be expected in the “Small” category, with typical parcel size at 5 acres.
- *Site Supply:* The City of Hillsboro currently has a total of 31 sites suitable for office commercial development, overwhelmingly concentrated in the “Small” category. It should be underscored that Hillsboro presently has no site availability suitable for larger, predominantly office business park development.
- *Sites Needed Reconciliation:* Given documented site demand and existing inventory, Hillsboro will require anywhere from seven new office commercial sites (Baseline Scenario) to 77 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, generally 10 acres or less. Under the Baseline Growth Scenario, Hillsboro currently has five more “Small” sites available (30) than demanded (25). Hillsboro absolutely requires sites in larger size categories given nearly no availability within the current City UGB.

2035 INDUSTRIAL EMPLOYMENT SITE DEMAND FINDINGS

- *Sites Demanded:* Hillsboro economic growth is expected to generate demand for a minimum of 132 industrial sites to as many as 293 over the planning period. The great majority of sites demanded will be five acres or fewer in size (“Small Businesses”), however sizeable shares are attributable to “Expanding Users” (5-10 acres) and “Medium User/Smaller Park” (10-25 acres).



- *Site Supply:* The City of Hillsboro currently has 169 sites suitable for industrial development within its UGB, greatly concentrated in parcels sized five acres or less. Hillsboro currently has some uncommitted, developable industrial sites within its UGB for all categories of site size demand.
- *Sites Needed Reconciliation:* Given documented site demand and existing inventory, Hillsboro will require anywhere from two additional industrial sites (Baseline Scenario) to 124 additional sites (High Growth Scenario) to meet economic opportunities identified in this analysis.
- *Sites Needed Concentration:* Under the conservative Baseline Scenario, Hillsboro will require the addition of land for one site in the “Cluster Anchor” size category, though the sum of site need due to rounding indicates a need for land sufficient for two industrial sites through 2035. Under the two higher growth scenarios, Hillsboro requires the addition of industrial land suitable for nearly all site size categories. It should be underscored that under all growth scenarios, Hillsboro currently has insufficient land for “Cluster Anchor” industrial site demand during the planning period.

2035 RETAIL COMMERCIAL EMPLOYMENT SITE DEMAND FINDINGS

- *Sites Demanded:* Hillsboro population growth, resulting from economic growth opportunity, is expected to create demand for a minimum of 308 commercial sites to as many as 605 over the planning period. The great majority of sites demanded will be three acres or fewer in size (“Small”), though “Medium” site need accounts for up to 20% of future commercial retail site demand through 2035.
- *Site Supply:* The City of Hillsboro currently has 74 sites suitable for retail development within its UGB, overwhelmingly concentrated in parcels sized three acres or less. It should be underscored that Hillsboro presently has nearly no developable sites suitable for commercial center development over the planning period, namely sites greater than three acres in size.
- *Sites Needed Reconciliation:* Given documented site demand and existing inventory, Hillsboro will require anywhere from 234 to 531 retail commercial sites of all suitable retail sizes over the planning period. Hillsboro has absolutely no retail commercial sites suitable for larger centers (“Large” – 20+ acres) and presently has only one, eight-acre site to serve medium-sized need through 2035. Hillsboro has significant undersupply in all retail commercial categories, and is arguably more undersupplied in retail commercial need than the other primary employment land categories.

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 28 provides detailed assessment of Hillsboro employment land demand and reconciled need (gross acres) by site quality through 2035. Results are expressed for all three employment growth scenarios and directly correlate to employment site demand details provided in Figure 27.

2035 OFFICE COMMERCIAL LAND ACREAGE DEMAND FINDINGS

- *Land Demanded:* Hillsboro economic growth can be expected to drive 422 acres of gross land demand under the Baseline growth scenario to as much as 1,384 gross acres under the High Growth scenario. Although the majority of sites demanded are characterized as “Small” in Figure 27, the single-largest share of gross acreage demand is concentrated in “Business Park” site configuration over the planning period.
- *Land Supply:* The City of Hillsboro currently has a total of 110 vacant, buildable acres suitable for office commercial development within the current City UGB. Existing supply is concentrated in “Small” sites (93 gross acres). Again, there is presently no available supply of “Business Park”-



- suitable office commercial land for the single-largest category of office commercial land demand through 2035.
- *Land Needed Reconciliation:* Given documented gross acreage demand and existing UGB inventory, Hillsboro will require anywhere from 312 additional gross acres (Baseline Scenario) to 1,274 additional gross acres (High Growth Scenario) to meet economic opportunities identified in this analysis.
 - *Land Need Concentration:* All categories of gross acreage demand are presently undersupplied within the City of Hillsboro UGB. Office commercial land demand undersupply is most acute in the crucial “Business Park” orientation, historically and in the future supportive of industrial cluster growth.

FIGURE 28: RECONCILIATION OF HILLSBORO EMPLOYMENT LAND ACREAGE DEMAND & SUPPLY (2035)

2035 Land Demand Reconciliation - Gross Acreage Need									
Vacant Acres Reconciliation (Total)						Planning Horizon			
	Typical Acreage	Demand Projections - Gross Acreage			Vacant Supply (Acres)	Balance - Gross Acreage Needed			
		Baseline	High	Medium		Baseline	High	Medium	
Office	Business Park	50.0	176.3	590.5	462.7	0.0	176.3	590.5	462.7
	Medium	25.0	120.7	391.0	310.6	17.0	103.7	374.0	293.6
	Small	5.0	124.9	402.1	320.2	93.0	31.9	309.1	227.2
	Sub Total		421.9	1,383.6	1,093.4	110.0	311.9	1,273.6	983.4
Industrial	Cluster Anchor	100.0+	560.5	1,245.5	904.4	369.0	191.5	876.5	535.4
	Anchor or Large Park	50.0 - 100.0	192.2	427.0	310.1	162.0	30.2	265.0	148.1
	Large User or Mid Park	25.0 - 50.0	256.2	569.4	413.4	196.0	60.2	373.4	217.4
	Medium User or Smaller Park	10.0 - 25.0	224.2	498.2	361.7	184.0	40.2	314.2	177.7
	Expanding User	5.0 - 10.0	96.1	213.5	155.0	180.0	(83.9)	33.5	(25.0)
	Small Businesses	5.0 or fewer	272.2	605.0	439.3	241.0	31.2	364.0	198.3
Sub Total		1,601.4	3,558.6	2,583.9	1,332.0	353.3	2,226.6	1,276.9	
Commercial Retail	Large	25.0	254.5	499.6	427.5	0.0	254.5	499.6	427.5
	Medium	10.0	551.4	1,082.4	926.1	8.0	543.4	1,074.4	918.1
	Small	1.5	364.0	714.5	611.3	61.0	303.0	653.5	550.3
	Sub Total		1,169.9	2,296.5	1,965.0	69.0	1,100.9	2,227.5	1,896.0
Other	Over Night Lodging	Not Estimated	22.6	35.8	29.6	Not Estimated	22.6	35.8	29.6
	Special Uses	Not Estimated	537.4	749.1	651.4	Not Estimated	537.4	749.1	651.4
	Grand Totals		3,753.2	8,023.6	6,323.3		2,326.2	6,512.6	4,837.3

2035 INDUSTRIAL LAND ACREAGE DEMAND FINDINGS

- *Land Demanded:* Hillsboro economic growth is expected to generate demand for a minimum of 1,601 gross acres to as many as 3,559 gross acres through 2035. Although most individual sites demanded will be five acres or fewer in size, “Cluster Anchor” demand (100+ acres) will account for the single-largest share of total land demand through 2035, followed by “Large user/Mid-Size Park” orientation (25-50 acre sites).
- *Land Supply:* The City of Hillsboro currently has 1,332 vacant, developable acres within its UGB, including three potential “Cluster Anchor” sites over 100 acres in size. Remaining acreage supply is somewhat evenly distributed between all other site orientation types, with a larger share in “Small Business” sites under five acres in size.



- *Land Needed Reconciliation:* Given documented site demand and existing inventory, Hillsboro will require anywhere from 353 additional industrial acres (Baseline Scenario) to 2,227 additional acres (High Growth Scenario) to meet economic opportunities identified in this analysis.
- *Land Needed Concentration:* The great majority of unmet land demand, under all growth scenarios, is concentrated in “Cluster Anchor” sites of 100 acres or more, Hillsboro’s traditional competitive advantage and track record of success in high-tech cluster economic development. All other categories of industrial demand will be undersupplied over the planning period, with the exception of the “Expanding User” orientation (5-10 acres) under two of three potential growth scenarios analyzed.

2035 RETAIL COMMERCIAL LAND ACREAGE DEMAND FINDINGS

- *Land Demanded:* Hillsboro economic growth and resulting population growth is expected to create demand for a minimum of 1,170 gross commercial retail acres to as many as 2,297 gross acres over the planning period. The great majority of sites demanded will be three acres or fewer in size (“Small”), though “Medium” site need accounts for up to 20% of future commercial retail site demand through 2035.
- *Land Supply:* The City of Hillsboro currently has 69 vacant, developable acres suitable for retail development within its UGB, overwhelmingly concentrated in parcels sized three acres or less. It should again be underscored that Hillsboro presently has nearly no developable sites suitable for commercial center development over the planning period, namely sites greater than three acres in size.
- *Land Needed Reconciliation:* Given documented land demand and existing inventory, Hillsboro will require anywhere from 1,101 to 2,228 gross acres suitable for retail commercial development over the planning period. Hillsboro has absolutely no retail commercial sites suitable for larger centers (“Large” – 20+ acres) but also has significant undersupply in all retail commercial categories.

HILLSBORO TARGETED INDUSTRY LAND NEED CONSIDERATIONS

HIGH-TECH END USERS

Just as industry in the Portland metro area exhibits a diverse array of products and services, land needs of specific industries and uses vary dramatically as well. In targeting high-tech clusters specifically, however, Hillsboro employment land needs for economic growth potential do share important site need characteristics. Based on established industry standards and industrial site recruitment and planning experience by the City of Hillsboro, the following are key features common to high-tech development sites, particularly end-user employers that seek location proximate to the existing Hillsboro high-tech cluster concentration:

1. *Service by High-Capacity Power and Water*
2. *Seismically Stable, Low or No-Sound/Vibration Interference*
3. *Proximity to Highly-Skilled Labor Force*
4. *Strong Preference for Location Near Existing High-Tech Facilities/Expertise*
5. *Rapid and Flexible Facility Expansion Potential*
6. *Steep Facility Construction and Equipment Costs*
7. *Need for Low-Cost Land Relative to Improvement & Equipment Costs*
8. *Need for Low-Holding Cost Land Relative to Unpredictable Future Expansion/Reinvestment (Land Banking Potential)*
9. *Specialized Infrastructure Frequently Including Hazardous Chemicals*

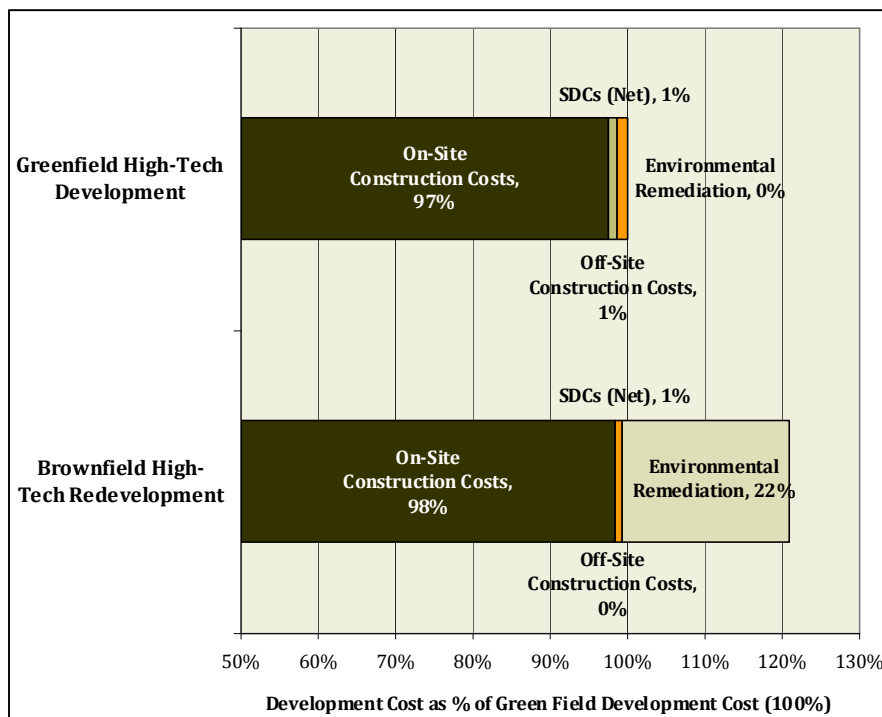


All of the above have important implications for the ability of Hillsboro to satisfy identified site demand via the two primary categories of land quality: Greenfield (raw land) or Infill/Redevelopment (frequently confirmed or suspected brownfield²⁴). Factors 5-8, and to a certain extent Factor 9, indicate development economics that strongly favor Greenfield/undeveloped land to redevelopment sites for high-tech manufacturing facilities, particularly larger end-users.²⁵ Factors 6-8 in particular indicate general Greenfield superiority for high-tech facility construction:

- *High-tech facility construction costs can easily exceed other industrial improvement construction costs by ten-fold.*
- *High facility and equipment costs indicate that low land costs are crucial for facility financial viability, including minimal to no presence of: demolition and removal costs of existing structures; site remediation and risk premiums; and soil stabilization costs among others.*
- *Similar lack of the above land cost issues to minimize land holding costs given the strong potential for uncertain, but frequently rapid site investment decision.*

Figure 29 provides a summary of comparative Brownfield/infill and Greenfield redevelopment economics specifically for the unique, essential needs of high-tech function, particularly manufacturing.²⁶

FIGURE 29: GREENFIELD & BROWNFIELD HIGH-TECH MANUFACTURING DEVELOPMENT ECONOMICS



SOURCE: Brownfield/Greenfield Development Cost Comparison Study (Port of Portland / City of Portland / PDC / Metro, 2004)

²⁴ The EPA defines a brownfield site as “abandoned, idle, or under-used industrial and commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination.”

²⁵ *Brownfield/Greenfield Development Cost Comparison Study*, Port of Portland/City of Portland/PDC/Metro, 2004. For detailed treatment of development economics differences between Greenfield and Brownfield specifically for high-tech uses, the reader is invited to review the study document. Conclusions about the lack of economic viability for brownfield site high-tech, particularly without public resource intervention, were reached via a case study approach to actual candidate industrial sites in both categories identified as best market candidates for (re)development activity, an actual brownfield site in the City of Portland and greenfield site in Hillsboro.

²⁶ *Ibid.*



Figure 29 presents the share of development costs for identical high-tech facilities on the identified Greenfield and Brownfield sites in terms of each general construction cost category as a percentage of total construction cost.

Although information in Figure 29 provides analysis of two specific sites with individual, unique locational cost issues, findings are illustrative of the economic issues facing the viability of industrial infill relative to Greenfield industrial locations. Alternatively, because findings are based on actual case study sites in Portland and Hillsboro, economic issues are material for comparison and industrial site selection purposes.

Findings are summarized as follows:

- On-site construction costs are nearly identical for both site types, and the overwhelming majority of total development costs;
- Off-site costs (infrastructure provision/extension) for Greenfield construction slightly exceeds the comparable Brownfield/infill site; and
- System Development Charges (SDCs) for Greenfield construction, less SDC credits for infrastructure service already in place, slightly exceeds comparable Brownfield/infill site similarly to off-site cost estimates.

Without accounting for site remediation issues, risk premiums of discovery and remediation, holding costs for the remediation process, and political/public resource costs, traditional site cost comparisons indicate that Brownfield/infill costs are slightly less than the comparable Greenfield high-tech development site. However, adding the likely cost constraints of an infill industrial site generally tips the balance in favor of Greenfield site feasibility.

- Although infill sites may have dramatically different Brownfield remediation potential or risk, if any, infill by definition also constrains the key need of high-tech facilities to site on parcel(s) that allow rapid, flexible expansion with low holding cost.
- Infill site assembly may secure a specific site size for a facility and its expansion, but the essential ability to expand beyond site assembly is far from guaranteed given the economic viability of adjacent uses for purchase and redevelopment.
- Infill site assembly well in excess of initial site need to accommodate significant expansion may be physically possible, however significant holding costs and public resources needed for assembly and redevelopment would likely render the site infeasible.

OTHER INDUSTRIAL USES IN SUPPORT OF HIGH TECH CLUSTER ANCHORS

The economics of redevelopment for other broad industrial development categories can be expected to display greater viability than for the unique needs of high-tech manufacturing.

- Assuming comparable market values for land, construction costs for general manufacturing and industrial business park are 80% to 90% lower than high-tech manufacturing facilities.
- Most other industrial uses do not require single-user land banking potential.
- Significant or specialized infrastructure or off-site improvements are also generally not on the same scale as larger, single-user high-tech facilities.

All things equal, non-high-tech industrial redevelopment can then afford higher potential costs of remediation, site re-engineering, and other costs without necessarily rendering the development project financially infeasible, at least without public resource investment. It can, therefore, be expected that over the planning horizon Hillsboro may be able to satisfy some non-high-tech industrial site needs with infill. However, given existing and likely future land use patterns, such infill would have to rely on sites proximate to the high-tech end users they serve. Given the economic value of high-tech and related industrial



development (re)investment in Hillsboro, it is uncertain if not outright improbable that significant candidate redevelopment sites of reduced improvement value could serve as economically viable redevelopment/infill potential over the long-term.

HIGH-TECH “CLUSTER ANCHOR” LAND NEED RECOMMENDATIONS

A key, and oft-repeated, finding from the Economic Stakeholder outreach process was Hillsboro’s clear advantage in attracting large high-tech users and ability of Hillsboro to help firms deliver large, complicated sites on-time and on-budget. Another finding was the acknowledgement that over a long planning period, Hillsboro will be constrained in how much well-suited Greenfield industrial land capacity the City can offer within and outside of the current UGB.

Accordingly, Hillsboro may consider a new, two-part economic development strategy of specializing in particular industrial use types as part of strengthening existing and new clusters, as well as potentially attracting new ones, while preserving limited maximum industrial capacity. Specifically, over the longer planning period:

1. Hillsboro can focus on larger, “anchor” users (Intel, Genentech, SolarWorld) that help to crystallize high-tech industry cluster presence in the City and Washington County in general.
2. Hillsboro can coordinate 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.

Following such a strategy would place a premium on Hillsboro’s ability to deliver larger industrial sites and how the distribution of site need may look. To provide some context for potential large lot demand and supply provision for “cluster anchor” users, Figure 30 provides potential site supply profiles under two different approach scenarios. Acreage estimates are from “Cluster Anchor” industrial gross acreage demand estimates from Figure 28.

FIGURE 30: HILLSBORO LARGE “CLUSTER ANCHOR” SITE PROVISION SCENARIOS

100+ Parcel Scenario	Site	Parcel Size Distribution		
		Baseline	Medium	High
"Super Anchor"	1	400	400	400
	2	161	200	200
	3		105	200
	4		100	146
	5		100	100
	6			100
	7			100
"Multi-Anchor"	1	150	200	200
	2	111	155	200
	3	100	150	200
	4	100	100	146
	5	100	100	100
	6		100	100
	7		100	100
	8			100
	9			100
Total 100+ Demand		561	905	1,246



- *“Super Anchor” Scenario:* Economic Stakeholder input indicated the need for Hillsboro to plan for a parcel or assembly of parcels for a site of roughly 400 acres to give the City the ability to recruit a major high-tech industry anchor over the planning horizon. The “Super Anchor” Scenario supposes at least one 400-acre site for each economic growth scenario along with a proposed distribution of remaining “cluster anchor” acreage.
- *“Multi-Anchor” Scenario:* Hillsboro chooses to forego offering 400-acre sites/parcels but rather focuses on a broad provision of sites sized no larger than 200 acres. Flexibility was underscored as an industrial land requirement for high-tech firms, therefore broader provision of site sizes would also be an appropriate supply response to the market.

It should be underscored that recommendations in Figure 30 should not be interpreted as firm parcel size dedications for industry use. “Flexibility” is the prevailing sentiment among Economic Stakeholders, therefore should market conditions dictate, a 100-acre site can be subdivided into smaller, market-responsive sites if necessary. Subdividing larger sites is nearly always an easier, less costly proposition than trying to assemble smaller parcels to provide a larger site as necessary.



FIFTY-YEAR ECONOMIC OPPORTUNITIES ANALYSIS

INTRODUCTION

The City of Hillsboro, 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 (2035) Economic Opportunities Analysis.

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 analytical approach to identifying economic development opportunities for the City of Hillsboro. 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 Hillsboro 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 Hillsboro growth issues over the 2060 planning horizon:

- Growth and land need projections for the City of Hillsboro through 2035;
- Economic Stakeholder/Industry perspectives for long-term growth in Hillsboro; and
- Portland metro area population and employment growth scenario forecasts conducted by Metro (Figure 16 in this document) as discussed previously in this document.

As was confirmed in the Economic Stakeholder Outreach process, the Hillsboro/Washington County high-tech economy has seven distinct features, when combined make Hillsboro a unique location of economic assets for expanding industry. Although three key features (water, power, land quality) are natural resource based, the Hillsboro area high-tech, highly skilled workforce is a force for innovation that cements longer-term economic expansion viability of the area. Unlike areas solely dependent upon natural resources that may become scarce/costly or politically restricted, an innovative workforce signals a far more resilient and flexible economic asset for a variety of industries, not just those that would depend upon the specific natural resources featured locally.

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



1. *Long-term water and power capacity suitable for Hillsboro's 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. *Public research and innovation centers (ONAMI, et al.) will retain if not expand research funding and private/public research and technology spin-off within the State of Oregon.*
6. *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.*

In other words, for 50-year analysis we assume that at worst, no significant changes occur to the status quo for the foreseeable future, if not improve it.

Assuming all of the above remains generally true beyond the next twenty years, allowing Hillsboro to continue its successful path of attracting innovative, expanding technology-related firms, Hillsboro's long-term economic competitive advantage then resembles the Expansion/R&D/Capitalization phase of the Product Life Cycle Theory of International Trade and Industrial Organization.²⁷ Figure 30 on the following page provides a graphic demonstration of Hillsboro's industrial competitive advantage with regard to high-tech product innovation and production in the context of product timeframe, employment needs, and competitive high-tech market areas.

Provided the six basic assumptions about 50-year economic performance stay true, Product Life Cycle Theory would indicate that the Hillsboro area will retain its competitive advantage with:

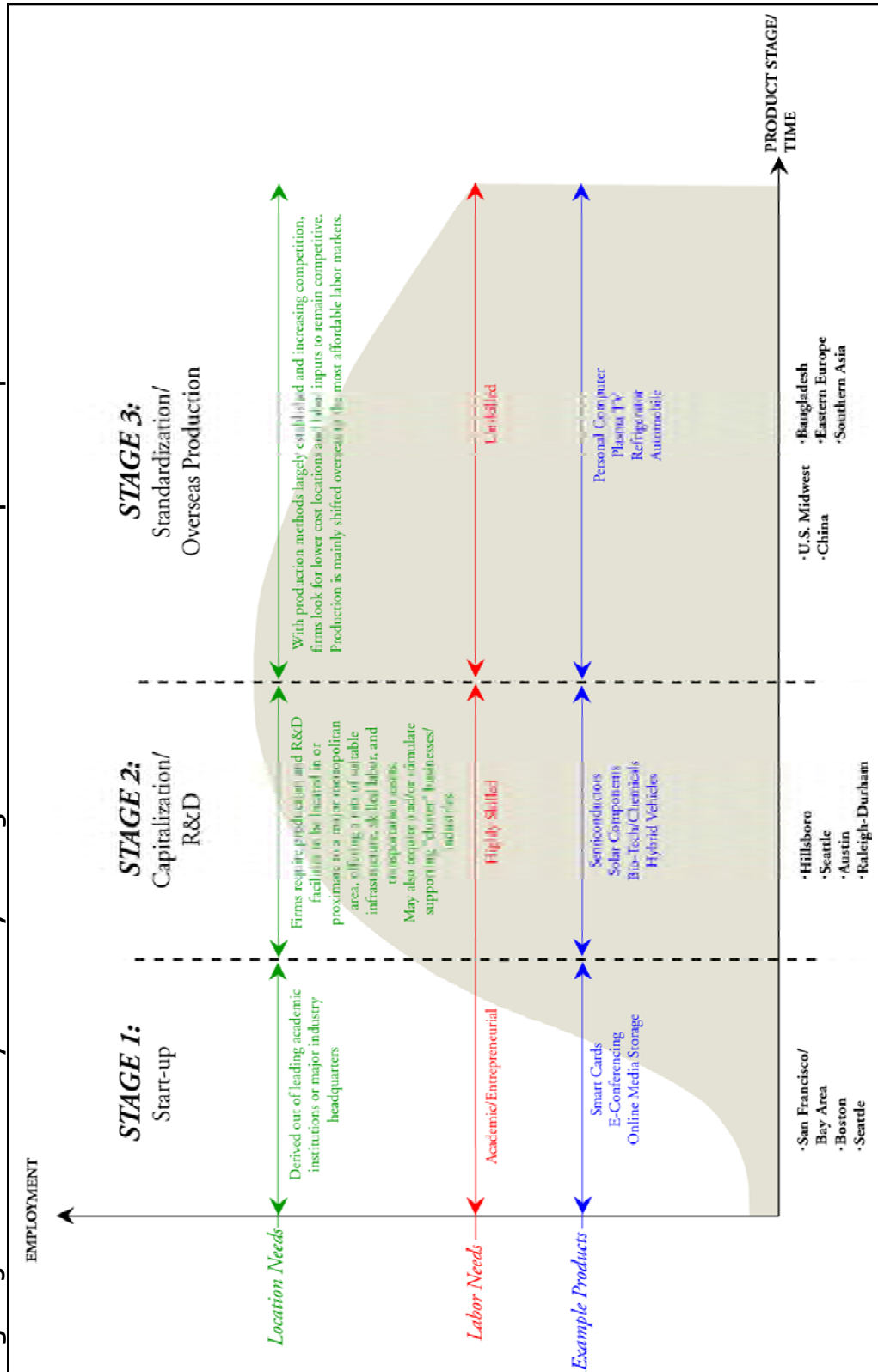
1. *Technology firms in the market capitalization and research and development (R&D) phase where employment growth and business growth can be extremely rapid.*
2. *By definition, Hillsboro will attract firms that have largely already been through the start-up and initial technology innovation stage that frequently begins in markets with world-class technology research universities and institutions (Bay Area, Massachusetts, Puget Sound, etc.).*
3. *Hillsboro will continue to be competitive with other markets with research, innovation and technology commercial application such as Austin, Texas, Puget Sound, Los Alamos/Albuquerque, and the Research Triangle of North Carolina.*
4. *Hillsboro will lose its competitive advantage with firms whose products and production techniques become significantly standardized, do not rely as significantly on new product/or manufacturing technique, and where cost of labor given product commoditization becomes far more of a factor.*

Through this prism of economic development potential and competitive advantage over the long-term, Hillsboro fifty-year economic growth is not dependent upon specific industries that may come and go, i.e. known existing and emerging industries. Instead, Hillsboro economic opportunity can reasonably be focused on retention of local economic assets and advantages that will be attractive to a variety of known and unknown future industries along the Expansion/R&D/Capitalization phase of business growth.

²⁷ First expressed by Raymond Vernon in 1966. "International Investment and International Trade in the Product Cycle," Raymond Vernon, 1966, [The Quarterly Journal of Economics](#), MIT Press, United States.



Figure 30: Product Life Cycle Theory & Long-Term Economic Development Implications



Source: Johnson Reid, LLC



Provided Hillsboro-area economic development emphasis balances specific high-tech industry targeting with retention and expansion of key infrastructure and workforce qualities identified that give the City its competitive advantage over the long-term, we find it reasonable to assume that at worst, Hillsboro 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 Hillsboro 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 2035 in the previous section.

2060 HILLSBORO POTENTIAL EMPLOYMENT FORECAST

Figure 31 on the following page provides an industry employment forecast for the City of Hillsboro through 2060 analogous to the forecast provided for the year 2035 (Figure 20). 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 Hillsboro's innovation-related industry base, workforce, and specialized infrastructure enable the local economy to sustain industry trends established through 2035 by previous analysis.

Accordingly, Baseline, Medium Growth, and High Growth scenario forecasts have been established assuming the three analogous scenarios for the Twenty-Year/2035 analysis perpetuate due to the unique local economic strengths of Hillsboro. This translates into:

- *Baseline Forecast:* Employment growth continues through 2060 at an annual average growth rate of 2.2% (vs. 2.5% from 2008 to 2035);
- *High Growth Forecast:* Job growth through 2060 occurs at a 3.9% annual average pace (vs. 3.8% from 2008 to 2035); and
- *Medium Growth Forecast:* Employment growth continues at an annual average growth rate of 3.0% (vs. 3.2% from 2008 to 2035).

Finally, it should be underscored that the resulting employment forecast should be interpreted as *potential opportunity* for Hillsboro planning purposes rather than supply-constrained, realized demand. As Economic Stakeholder outreach indicates, Hillsboro faces limited possible expansion area suitable for industrial employment over a long planning horizon.

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. We would anticipate that any potential economic opportunity here estimated that the City of Hillsboro chooses to forego may convert to economic opportunity for other jurisdictions provided *adequate economic development planning is conducted by those jurisdictions*.

Total employment levels and changes in employment through 2060 under all three scenarios are very sizeable and should be understood in the context of expected growth throughout the Portland metro region. According to forecasted employment for the Portland metro area by Metro (Figure 16), Hillsboro forecasted growth in Figure 31 represents the following:

- *Baseline Forecast:* Hillsboro employment potential (222,124) represents 11.1% of total, Portland metro employment in 2060 under the Metro Economic Trend Scenario;
- *High Growth Forecast:* Hillsboro employment potential (527,308) represents 26.4% of total, Portland metro employment in 2060 under the Metro Economic Trend Scenario but only 17.6% of 2060 metro area jobs under the '80-'00 Trend forecast upon which the Hillsboro High Growth Scenario forecast is based.



- *Medium Growth Forecast:* Hillsboro employment potential (347,700) represents 17.4% of 2060 metro-wide employment in 2060 under the Metro Economic Trend Scenario.

FIGURE 31: EMPLOYMENT FORECAST BY INDUSTRY SECTOR, HILLSBORO (2008-2060)

Baseline Forecast NAICS	Base Year 2008	Employment Forecast						2008-2060 Growth	
		2038	2043	2048	2053	2058	2060	Jobs	AAGR
Natural Resources	309	390	403	417	431	442	452	143	0.7%
Construction	2,933	5,771	6,274	6,821	7,416	7,876	8,336	5,404	2.0%
Manufacturing	22,016	44,833	48,901	53,339	58,179	61,941	65,703	43,687	2.1%
Wholesale Trade	1,879	3,190	3,417	3,660	3,920	4,117	4,315	2,436	1.6%
Retail Trade	7,656	14,094	15,223	16,442	17,759	18,771	19,782	12,126	1.8%
T.W.U.	1,536	3,266	3,576	3,916	4,289	4,580	4,870	3,335	2.2%
Information	1,716	2,751	2,928	3,116	3,317	3,468	3,619	1,904	1.4%
Financial Activities	2,582	4,417	4,734	5,075	5,440	5,718	5,995	3,414	1.6%
Professional & Business	9,727	23,177	25,633	28,348	31,351	33,724	36,097	26,370	2.6%
Education & Health	10,179	26,949	30,054	33,517	37,378	40,460	43,542	33,363	2.8%
Leisure & Hospitality	5,067	10,692	11,700	12,804	14,012	14,954	15,897	10,830	2.2%
Other Services	3,319	5,511	5,888	6,291	6,722	7,048	7,374	4,055	1.5%
Public Administration	3,611	5,023	5,257	5,503	5,760	5,950	6,141	2,530	1.0%
TOTAL	72,529	150,062	163,989	179,248	195,973	209,049	222,124	149,595	2.2%

High Growth Forecast 1/ NAICS	Base Year 2008	Employment Forecast						2008-2060 Growth	
		2038	2043	2048	2053	2058	2060	Jobs	AAGR
Natural Resources	309	437	464	493	524	547	570	261	1.2%
Construction	2,934	7,401	8,636	10,076	11,756	13,174	14,591	11,658	3.1%
Manufacturing	22,316	78,921	96,715	118,574	145,436	169,833	194,231	171,915	4.2%
Wholesale Trade	1,883	4,132	4,714	5,379	6,137	6,763	7,389	5,506	2.7%
Retail Trade	7,665	18,070	20,850	24,058	27,759	30,846	33,932	26,267	2.9%
T.W.U.	1,539	4,499	5,377	6,427	7,681	8,773	9,864	8,326	3.6%
Information	1,718	3,586	4,060	4,597	5,206	5,706	6,206	4,488	2.5%
Financial Activities	2,586	5,603	6,377	7,259	8,262	9,088	9,913	7,327	2.6%
Professional & Business	9,757	36,178	44,858	55,637	69,022	81,251	93,481	83,724	4.4%
Education & Health	10,189	39,351	49,265	61,679	77,225	91,517	105,809	95,621	4.6%
Leisure & Hospitality	5,075	14,552	17,338	20,658	24,613	28,041	31,469	26,394	3.6%
Other Services	3,324	6,937	7,848	8,879	10,047	11,000	11,954	8,630	2.5%
Public Administration	3,611	5,665	6,109	6,588	7,104	7,501	7,898	4,287	1.5%
TOTAL	72,905	225,333	272,613	330,303	400,773	464,041	527,308	454,403	3.9%

Medium Growth Forecast 1/ NAICS	Base Year 2008	Employment Forecast						2008-2060 Growth	
		2038	2043	2048	2053	2058	2060	Jobs	AAGR
Natural Resources	309	423	447	473	501	522	543	234	1.1%
Construction	2,934	6,707	7,645	8,714	9,933	10,933	11,932	8,999	2.7%
Manufacturing	22,316	61,036	70,140	80,609	92,648	102,762	112,875	90,559	3.2%
Wholesale Trade	1,883	3,734	4,171	4,660	5,207	5,646	6,086	4,203	2.3%
Retail Trade	7,665	16,406	18,533	20,937	23,652	25,859	28,065	20,400	2.5%
T.W.U.	1,539	3,911	4,506	5,192	5,981	6,638	7,296	5,757	3.0%
Information	1,718	3,228	3,576	3,963	4,392	4,735	5,078	3,360	2.1%
Financial Activities	2,586	5,120	5,723	6,397	7,152	7,758	8,364	5,778	2.3%
Professional & Business	9,757	29,276	34,193	39,936	46,644	52,334	58,024	48,268	3.5%
Education & Health	10,189	32,675	38,593	45,582	53,838	60,906	67,974	57,785	3.7%
Leisure & Hospitality	5,075	12,738	14,660	16,871	19,417	21,531	23,646	18,571	3.0%
Other Services	3,324	6,364	7,081	7,880	8,768	9,479	10,190	6,866	2.2%
Public Administration	3,611	5,491	5,916	6,375	6,869	7,247	7,626	4,015	1.4%
TOTAL	72,905	187,110	215,186	247,590	285,003	316,351	347,700	274,795	3.0%

1/ High growth forecast utilizes Metro's '80-'00 Trend Scenario.

Over the 2060 planning horizon, we would certainly view the High Growth Forecast growth rates as aggressive. As economies mature, they certainly see gradually declining growth rates as competing jurisdictions emerge and local economic development policies change in response to real or perceived



environmental damage from economic expansion. However, for planning purposes, employment figures under the High Growth Forecast are useful particularly given interest by Hillsboro in coordinating with neighboring Western Washington County jurisdictions on long-term economic development policy in the face of its own land constraints.

2060 HILLSBORO 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 2035. For a detailed summary of land demand methodology as a function of employment growth, please refer to the section titled 2035 Employment Land Demand. As described for the 2060 employment forecast, employment land demand estimates reflect potential demand unconstrained by physical land limitations proximate to Hillsboro. 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 32 highlight projections of gross, potential new demand within the Hillsboro 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 10,880 to 28,687 gross buildable acres, contingent upon Hillsboro’s realized growth pattern and economic development policy preferences.
- The Medium Growth scenario indicates that Hillsboro can see employment land demand in the vicinity of roughly 18,572 acres through 2035.

FIGURE 32: HILLSBORO URBAN AREA EMPLOYMENT LAND DEMAND (GROSS BUILDABLE ACRES 2008-2060)

Use Type	Need For Land (Acres) By Scenario:		
	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
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

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.

- Total potential demand for industrial land, the most important category from the perspective of Hillsboro competitive advantage, can range from 4,476 gross acres to over 15,000 through 2060.
- Potential office commercial demand is estimated to range between 1,729 acres and nearly 5,000 during the period, but figures generally reflect maximums. Hillsboro will permanently be at a



competitive disadvantage to the more centrally located Beaverton, Tigard and other areas for various office uses, particularly higher-density office uses.

- Potential, gross retail commercial acreage demand is estimated to range from just under 3,000 acres to as much as 6,225 acres through 2060. Retail commercial demand figures reflect a static assumption that for all new jobs in Hillsboro, the City will ensure a 1.5 jobs/housing balance ratio. Accordingly, local retail commercial estimates are on the high side and like office uses, more centrally-located Beaverton, Tigard and other locales will enjoy a competitive advantage for sizeable retail commercial development vis-à-vis Hillsboro.

2060 EMPLOYMENT LAND DEMAND & SUPPLY RECONCILIATION

In the 2035/20-year analysis of employment land demand for the City of Hillsboro, 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 site need counts and gross acreage by site use and size ranges. A more detailed discussion of the underlying methodology is found in the Projected Number of Sites Demanded subsection of the 20-YEAR EMPLOYMENT LAND DEMAND SITE QUALITIES section of this document.

2060 EMPLOYMENT LAND DEMAND & SUPPLY BY SITE QUALITIES

Figure 33 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 32. Estimates reflect *potential*, unconstrained demand for sites in urbanized Hillsboro 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 Hillsboro UGB is also expressed, along with a site need reconciliation for the three growth potential scenarios.

FIGURE 33: RECONCILIATION OF HILLSBORO EMPLOYMENT LAND SITE DEMAND & SUPPLY (2060)

2060 Land Demand Reconciliation - Site Need Count									
Number of Sites by Development Pattern						Planning Horizon			
		Demand Projections - Sites				Vacant Supply (Sites)	Balance - Sites Needed		
		Typical Acreage	Baseline	High	Medium		Baseline	High	Medium
Office	Business Park	50.0	14	42	26	-	14	42	26
	Medium	25.0	20	56	35	1.0	19	55	34
	Small	5.0	102	289	180	30.0	72	259	150
	Sub Total		137	388	241	31.0	106	357	210
Industrial	Cluster Anchor	100.0+	13	42	24	3.0	10	39	21
	Anchor or Large Park	50.0 - 100.0	7	24	14	3.0	4	21	11
	Large User or Mid Park	25.0 - 50.0	19	65	38	7.0	12	58	31
	Medium User or Smaller Park	10.0 - 25.0	37	124	72	13.0	24	111	59
	Expanding User	5.0 - 10.0	38	129	75	25.0	13	104	50
	Small Businesses	5.0 or fewer	254	853	493	118.0	136	735	375
	Sub Total		368	1,237	715	169.0	199	1,068	546
Commercial Retail	Large	25.0	23	54	41	-	23	54	41
	Medium	10.0	124	293	221	1.0	123	292	220
	Small	1.5	546	1,291	974	73.0	473	1,218	901
	Sub Total		693	1,639	1,237	74.0	619	1,565	1,163

Note: Figures may not sum due to rounding.

SOURCE: City of Hillsboro Planning Department and Johnson Reid, LLC



2060 Office Employment Site Demand Findings

- *Sites Demanded:* Hillsboro economic growth potential can drive demand for as few as 137 office commercial sites to as many as 388, the majority of which would be in the “Small” office category.
- *Sites Needed Reconciliation:* Given existing inventory, Hillsboro growth would require anywhere from 106 new office commercial sites (Baseline Scenario) to 357 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 five acres.

2060 Industrial Employment Site Demand Findings

- *Sites Demanded:* Hillsboro economic growth potential can drive demand for a minimum of 368 industrial sites to as many as 1,237 over the planning period. The great majority of sites demanded will be five acres or fewer in size (“Small Businesses”), however sizeable shares are attributable to “Expanding Users” (5-10 acres) and “Medium User/Smaller Park” (10-25 acres).
- *Sites Needed Reconciliation:* Given existing inventory, Hillsboro growth could require anywhere from 199 additional industrial sites (Baseline Scenario) to 1,068 additional sites (High Growth Scenario) to meet economic opportunities through 2060 depending upon the economic growth path chosen and incurred by the City of Hillsboro.
- *Sites Needed Concentration:* Given Hillsboro’s identified competitive advantage with high-tech, particularly “anchor” end users, the most critical concentration of new site need through 2060 would be “Cluster Anchor” site types the new need for which would be ten to 39 sites 100 acres or greater in size. Four to 21 sites sized between 50 and 100 acres would also need to be considered.

2060 Retail Commercial Employment Site Demand Findings

- *Sites Demanded:* Hillsboro population growth, resulting from 50-year economic growth opportunity, is expected to create demand for a minimum of 693 commercial sites to as many as 1,639 over the planning period, the great majority in the “Small” site category.
- *Sites Needed Reconciliation:* Maintenance of a 1.5 jobs/housing balance over the long term is estimated to translate into need for between 619 to 1,565 retail commercial sites of all suitable retail sizes over the planning period depending upon long-term economic opportunities and path engaged by the City.

PROJECTED GROSS ACREAGE NEED BY SITE QUALITY

Figure 34 provides detailed assessment of Hillsboro 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 33.



FIGURE 34: RECONCILIATION OF HILLSBORO EMPLOYMENT LAND ACREAGE DEMAND & SUPPLY (2060)

2060 Land Demand Reconciliation - Gross Acreage Need									
Vacant Acres Reconciliation (Total)					Planning Horizon				
	Typical Acreage	Demand Projections - Gross Acreage			Vacant Supply (Acres)	Balance - Gross Acreage Needed			
		Baseline	High	Medium		Baseline	High	Medium	
Office	Business Park	50.0	722.3	2,125.0	1,302.4	0.0	722.3	2,125.0	1,302.4
	Medium	25.0	494.7	1,407.2	874.2	17.0	477.7	1,390.2	857.2
	Small	5.0	511.6	1,446.9	901.4	93.0	418.6	1,353.9	808.4
	SubTotal		1,728.5	4,979.1	3,077.9	110.0	1,618.5	4,869.1	2,967.9
Industrial	Cluster Anchor	100.0+	1,566.7	5,269.2	3,046.6	369.0	1,197.7	4,900.2	2,677.6
	Anchor or Large Park	50.0 - 100.0	537.2	1,806.6	1,044.5	162.0	375.2	1,644.6	882.5
	Large User or Mid Park	25.0 - 50.0	716.2	2,408.8	1,392.7	196.0	520.2	2,212.8	1,196.7
	Medium User or Smaller Park	10.0 - 25.0	626.7	2,107.7	1,218.6	184.0	442.7	1,923.7	1,034.6
	Expanding User	5.0 - 10.0	268.6	903.3	522.3	180.0	88.6	723.3	342.3
	Small Businesses	5.0 or fewer	761.0	2,559.3	1,479.8	241.0	520.0	2,318.3	1,238.8
	SubTotal		4,476.3	15,054.9	8,704.5	1,332.0	3,144.3	13,722.9	7,372.5
Commercial Retail	Large	25.0	572.8	1,354.4	1,022.1	0.0	572.8	1,354.4	1,022.1
	Medium	10.0	1,241.0	2,934.3	2,214.4	8.0	1,233.0	2,926.3	2,206.4
	Small	1.5	819.1	1,936.8	1,461.7	61.0	758.1	1,875.8	1,400.7
	SubTotal		2,632.9	6,225.4	4,698.2	69.0	2,563.9	6,156.4	4,629.2
Other	Over Night Lodging	Not Estimated	48.3	117.8	82.9	Not Estimated	48.3	117.8	82.9
	Special Uses	Not Estimated	1,657.1	2,309.8	2,008.6	Not Estimated	1,657.1	2,309.8	2,008.6
Grand Totals			10,543.1	28,687.1	18,572.0		9,032.1	27,176.1	17,061.0

Note: Figures may not sum due to rounding.

SOURCE: City of Hillsboro Planning Department and Johnson Reid, LLC



TWENTY-YEAR RESIDENTIAL GROWTH & LAND NEED

TWENTY-YEAR RESIDENTIAL GROWTH ANALYSIS

INTRODUCTION

This analysis outlines a forecast of housing need within the City of Hillsboro/Urban Growth Boundary. While this forecast is referred to as the “20-year Housing Need Forecast”, it extends to 2035 in order to conform to and coordinate with broader regional planning processes currently underway.

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 PROFILE

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 35: PROFILE OF CURRENT HOUSING CONDITIONS (2008)

CURRENT HOUSING CONDITIONS (2008)		SOURCE
Total 2008 Population:	90,165	Claritas ¹
- Estimated group housing population:	-1,020 (1.1% of Total)	Claritas
Estimated 2008 Population:	89,145 (Total - Group)	
Estimated 2008 Households:	32,410	Claritas
Avg. HH Size:	2.75 (Pop/HH)	Claritas
Total Housing Units:	34,820	Claritas
Occupied Housing Units:	32,410	
Vacant Housing Units:	2,410	
Current Vacancy Rate:	6.9%	

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

We estimate a current population of 90,165, living in 32,410 households. Average household size is 2.75 persons (compared to 2.66 in Washington County, and 2.5 statewide). The estimated current vacancy rate of housing units is 6.9%.



CURRENT HOUSING NEED ESTIMATE

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 rent 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 36: ESTIMATE OF CURRENT HOUSING NEED (2008)

Ownership				Rental				
Price Range	# Units	% of Units	Cumulative	Rent Level	# Units	% of Units	Cumulative	
\$0 - 50k	478	2.5%	2.5%	\$0 - 250	932	6.9%	6.9%	
\$50k - 70k	211	1.1%	3.7%	\$250 - 375	694	5.1%	12.0%	
\$70k - 90k	192	1.0%	4.7%	\$375 - 500	1,004	7.4%	19.3%	
\$90k - 120k	563	3.0%	7.7%	\$500 - 625	703	5.2%	24.5%	
\$120k - 160k	1,168	6.2%	13.9%	\$625 - 875	1,659	12.2%	36.7%	
\$160k - 230k	1,807	9.6%	23.5%	\$875 - 1,250	3,192	23.5%	60.2%	
\$230k - 350k	4,948	26.3%	49.8%	\$1,250 - 1,875	2,874	21.1%	81.4%	
\$350k - 460k	3,777	20.1%	69.9%	\$1,875 - 2,500	1,461	10.7%	92.1%	
\$460k - 690k	4,060	21.6%	91.4%	\$2,500 - 3,750	923	6.8%	98.9%	
\$690k +	1,613	8.6%	100.0%	\$3,750 +	151	1.1%	100.0%	
Totals:	18,817	% of All:	58.1%	Totals:	13,593	% of All:	41.9%	All Units
								32,410

Sources: Claritas, Census, Johnson Reid, LLC.

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 Hillsboro 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 55.7% of housing units are ownership units, while an estimated 44.3% of housing units are rental units.
- 97% of ownership units are single family homes, while over 60% of rental units are in structures of 5 units or more.



FIGURE 37: 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	Cummulative %
\$0 - 50k	704	0	0	5	7	10	727	3.7%	3.7%
\$50k - 70k	102	0	0	1	1	1	106	0.5%	4.3%
\$70k - 90k	102	0	0	1	1	1	106	0.5%	4.8%
\$90k - 120k	255	0	0	2	3	4	263	1.4%	6.2%
\$120k - 160k	894	0	0	6	9	13	923	4.8%	10.9%
\$160k - 230k	4,890	0	0	35	51	69	5,044	26.0%	36.9%
\$230k - 350k	7,310	0	0	52	76	103	7,540	38.8%	75.8%
\$350k - 460k	3,067	0	0	22	32	43	3,164	16.3%	92.1%
\$460k - 690k	1,259	0	0	9	13	18	1,299	6.7%	98.8%
\$690k +	234	0	0	2	2	3	242	1.2%	100.0%
Totals:	18,819	0	0	134	195	264	19,412	% of All Units:	55.7%
Percentage:	96.9%	0.0%	0.0%	0.7%	1.0%	1.4%	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	Cummulative %
\$0 - 250	47	88	40	513	4	0	692	4.5%	4.5%
\$250 - 375	19	51	23	305	2	0	400	2.6%	7.1%
\$375 - 500	10	26	12	155	1	0	204	1.3%	8.4%
\$500 - 625	548	402	180	2,005	18	0	3,153	20.5%	28.9%
\$625 - 875	1,053	737	331	3,630	34	0	5,785	37.5%	66.4%
\$875 - 1,250	952	497	223	2,208	23	0	3,903	25.3%	91.7%
\$1,250 - 1,875	364	130	58	459	6	0	1,017	6.6%	98.3%
\$1,875 - 2,500	146	32	15	60	1	0	254	1.7%	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:	3,139	1,963	882	9,335	90	0	15,408	% of All Units:	44.3%
Percentage:	20.4%	12.7%	5.7%	60.6%	0.6%	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:	21,957	1,963	882	9,469	284	264	34,820	100%
Percentage:	63.1%	5.6%	2.5%	27.2%	0.8%	0.8%	100.0%	

Sources: Claritas Inc., Census, Johnson Reid LLC

CURRENT HOUSING NEEDS & CURRENT INVENTORY RECONCILIATION

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 38: COMPARISON OF CURRENT NEED TO CURRENT INVENTORY

Ownership				Rental			
Price Range	Estimated Current	Estimated Current	Unmet Need or (Surplus)	Rent	Estimated Current	Estimated Current	Unmet Need or (Surplus)
\$0 - 50k	478	727	(248)	\$0 - 250	932	692	240
\$50k - 70k	211	106	105	\$250 - 375	694	400	294
\$70k - 90k	192	106	87	\$375 - 500	1,004	204	799
\$90k - 120k	563	263	299	\$500 - 625	703	3,153	(2450)
\$120k - 160k	1,168	923	245	\$625 - 875	1,659	5,785	(4125)
\$160k - 230k	1,807	5,044	(3237)	\$875 - 1,250	3,192	3,903	(711)
\$230k - 350k	4,948	7,540	(2592)	\$1,250 - 1,875	2,874	1,017	1857
\$350k - 460k	3,777	3,164	614	\$1,875 - 2,500	1,461	254	1206
\$460k - 690k	4,060	1,299	2761	\$2,500 - 3,750	923	0	923
\$690k +	1,613	242	1371	\$3,750 +	151	0	151
Totals:	18,817	19,412	(595)	Totals:	13,593	15,408	(1815)

Occupied Units:	32,410
All Housing Units:	34,820
Total Unit Surplus	(2,410)

Sources: Claritas, Census, Johnson Reid LLC

20-YEAR FUTURE HOUSING DEMAND (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 Hillsboro. (Current estimated jobs/housing ratio is 2.2 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 39: PROFILE OF FUTURE HOUSING CONDITIONS (2035)

	Baseline Growth Scenario	Medium Growth Scenario	High Growth Scenario
2008 Population:	90,165	90,165	90,165
Annual Growth Rate:	3.3%	4.2%	4.8%
Estimated 2035 Population:	214,294	267,368	319,770
Estimated 2035 Households:	78,785	98,297	117,563
Total Housing Units:	83,813	104,571	125,067
Occupied Housing Units:	78,785	98,297	117,563
Vacant Housing Units:	5,029	6,274	7,504
New Population ('08-'35):	124,129	177,203	229,605
New Households ('08-'35):	46,375	65,887	85,153

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

PROJECTION OF FUTURE HOUSING NEED (2035)

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 40: PROJECTED TOTAL FUTURE HOUSING NEEDS (2035)

Ownership				Rental				
Price Range	# Units	% of Units	Cumulative	Rent	# Units	% of Units	Cumulative	
\$0 - 50k	1,100	2.0%	2.0%	\$0 - 250	1,720	6.2%	6.2%	
\$50k - 70k	400	0.7%	2.7%	\$250 - 375	1,149	4.1%	10.3%	
\$70k - 90k	392	0.7%	3.4%	\$375 - 500	1,665	6.0%	16.3%	
\$90k - 120k	1,097	2.0%	5.3%	\$500 - 625	1,211	4.3%	20.6%	
\$120k - 160k	2,323	4.2%	9.5%	\$625 - 875	2,899	10.4%	31.0%	
\$160k - 230k	3,831	6.8%	16.3%	\$875 - 1,250	5,905	21.2%	52.2%	
\$230k - 350k	11,645	20.8%	37.2%	\$1,250 - 1,875	5,883	21.1%	73.3%	
\$350k - 460k	10,223	18.3%	55.4%	\$1,875 - 2,500	3,622	13.0%	86.3%	
\$460k - 690k	15,498	27.7%	83.2%	\$2,500 - 3,750	3,034	10.9%	97.2%	
\$690k +	9,422	16.8%	100.0%	\$3,750 +	795	2.8%	100.0%	
Totals:	55,931	% of All:	66.7%	Totals:	27,883	% of All:	33.3%	83,813

Sources: Claritas, Census, Johnson Reid, LLC.

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 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 just fewer than 49,000 new housing units by 2035, with a stronger emphasis on new ownership units (74%) than is reflected in the current housing inventory. Of the new units needed, a similar share (74%) are projected to be single family types, while the remainder will be some form of attached housing.

An estimated 22% 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 less than 2% of the total need each.



FIGURE 41: PROJECTED FUTURE NEED FOR NEW HOUSING UNITS (2035)

OWNERSHIP HOUSING									
Price Range	Single Family	Duplex	3- or 4-plex	5+ Units MFR	Mobile home	Boat, RV, other	Total Units	% of Units	Cummulative %
\$0 - 50k	343	6	4	28	-3	-4	374	1.0%	1.0%
\$50k - 70k	278	2	1	11	1	1	294	0.8%	1.8%
\$70k - 90k	270	2	1	11	1	1	286	0.8%	2.6%
\$90k - 120k	788	6	4	31	2	3	833	2.3%	4.9%
\$120k - 160k	1,316	12	9	63	0	0	1,400	3.8%	8.7%
\$160k - 230k	-1,245	20	14	80	-35	-47	-1,213	-3.3%	5.4%
\$230k - 350k	3,770	61	43	297	-28	-38	4,105	11.2%	16.6%
\$350k - 460k	6,660	54	38	284	10	14	7,059	19.3%	36.0%
\$460k - 690k	13,487	81	57	455	50	68	14,199	38.9%	74.9%
\$690k +	8,731	50	35	280	36	49	9,181	25.1%	100.0%
Totals:	34,397	294	207	1,540	34	47	36,519	% All Units:	74.5%
Percentage:	94.2%	0.8%	0.6%	4.2%	0.1%	0.1%	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	Cummulative %
\$0 - 250	273	72	50	633	0	0	1,028	8.2%	8.2%
\$250 - 375	195	56	37	461	1	0	749	6.0%	14.2%
\$375 - 500	299	129	75	954	3	0	1,461	11.7%	26.0%
\$500 - 625	-323	-289	-118	-1,197	-15	0	-1,942	-15.6%	10.4%
\$625 - 875	-514	-467	-181	-1,698	-26	0	-2,886	-23.1%	-12.7%
\$875 - 1,250	146	53	83	1,728	-8	0	2,002	16.1%	3.3%
\$1,250 - 1,875	730	419	247	3,461	9	0	4,866	39.0%	42.3%
\$1,875 - 2,500	528	305	173	2,354	7	0	3,368	27.0%	69.3%
\$2,500 - 3,750	564	283	157	2,022	7	0	3,034	24.3%	93.6%
\$3,750 +	148	74	41	530	2	0	795	6.4%	100.0%
Totals:	2,047	635	565	9,248	-21	0	12,475	% All Units:	25.5%
Percentage:	16.4%	5.1%	4.5%	74.1%	-0.2%	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:	36,443	929	772	10,788	14	47	48,993	100%
Percentage:	74.4%	1.9%	1.6%	22.0%	0.0%	0.1%	100.0%	

Sources: Claritas Inc., Census, Johnson Reid LLC



TWENTY-YEAR RESIDENTIAL LAND NEED 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 Hillsboro. 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 Hillsboro has five Comprehensive Plan Designations which allow residential uses, ranging from low density to mixed use configurations. The current achieved housing density across these zones is estimated to be 11.9 units per net acre.

FIGURE 42: RESIDENTIAL COMPREHENSIVE PLAN DESIGNATIONS, CITY OF HILLSBORO

Comp Plan Designation		Est. Current Share of Res. Zoned Land	Average Density (Units/ Net Acre)
RL	Residential - Low Density	60.6%	9.2
RM	Residential - Medium D.	17.1%	13.5
RH	Residential - High D.	3.7%	19.1
SCPA	Station Community Plan Area	17.7%	18.3
MU	Mixed Use	1.0%	15.0
Totals/Averages:		100%	11.9

¹ Figures presented for SCPA Designation includes "SC Residential", and excludes "SC Commercial". Sources: City of Hillsboro, Metro RLIS, Johnson Reid LLC

GIS analysis of vacant unconstrained parcels in Hillsboro found 97 parcels of varying sizes across all residential zones. The parcels include 44 net acres (55 gross) of developable land, which will accommodate an estimated 551 housing units, based on the average density allowed in each zone.



FIGURE 43: VACANT RESIDENTIAL PARCELS & ESTIMATED HOUSING DEVELOPMENT CAPACITY

Comp Plan Designatio	Hillsboro Zoning Designation	Density Per Net Acre			Vacant Gross Acres	Vacant Net Acres	Parcel Count	Est. Units Accommodate
		Low	High	Avg.				
RL	R-10	3.5	4.35	3.9	6.7	5.3	17	21
RL	R-7	5	6.25	5.6	23.2	18.6	54	104
RL	R-6	6		6.0	0.2	0.1	1	1
RM/RL	A-1	11	16	13.5	4.8	3.9	7	52
RM/RH	A-2	17	21.25	19.1	0.3	0.2	2	5
RL	A-3	23	28.75	25.9	0.9	0.7	2	19
RH	A-4	17	21.25	19.1	0.9	0.7	2	13
MU	MU - C	17	24	20.5	2.0	1.6	2	32
SCPA	SCR-LD	9	14	11.5	0.6	0.5	2	5
SCPA	SCR-MD	18	23	20.5	5.8	4.6	3	95
SCPA	SCR-V	7	45	26.0	9.7	7.7	4	201
SCPA	SCR-DNC	9	23	16.0	0.2	0.1	1	2
Totals/Averages:				12.5	55.1	44.1	97	551
Summary by Comp Plan Designation								
RL					30.9	24.7	74	145
RM					4.8	3.9	7	52
RH					1.2	0.9	4	18
SCPA					16.3	13.0	10	304
MU					2.0	1.6	2	32

Sources: City of Hillsboro, Metro RLIS, Johnson Reid LLC



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 5,500 gross acres to accommodate 48,400 new households, to the need for 10,000 gross acres to accommodate 89,700 new households.

FIGURE 44: PROJECTED NEW RESIDENTIAL LAND NEED, HILLSBORO (2035)

BASELINE GROWTH SCENARIO						
Comp Plan Designation	Total Future Unit Need - Vacant Lands	Units Per Net Acre	Net Acreage Needed	Gross Acreage Needed	Distribution	
RL Residential - Low Density	28,348	9.2	3,097	3,871	70.6%	
RM Residential - Medium D.	9,660	13.5	716	894	16.3%	
RH Residential - High D.	4,122	19.1	216	269	4.9%	
SCPA Station Community Plan Area ¹	5,263	18.3	287	359	6.5%	
MU Mixed Use	1,049	15.0	70	87	1.6%	
Totals/Averages:		48,442	11.9	4,385	5,481	100%

MEDIUM GROWTH SCENARIO						
Comp Plan Designation	Total Future Unit Need - Vacant Lands	Units Per Net Acre	Net Acreage Needed	Gross Acreage Needed	Distribution	
RL Residential - Low Density	39,427	9.2	4,307	5,384	69.4%	
RM Residential - Medium D.	13,795	13.5	1,022	1,277	16.5%	
RH Residential - High D.	6,249	19.1	327	408	5.3%	
SCPA Station Community Plan Area ¹	8,124	18.3	443	554	7.1%	
MU Mixed Use	1,605	15.0	107	134	1.7%	
Totals/Averages:		69,200	11.9	6,206	7,757	100%

HIGH GROWTH SCENARIO						
Comp Plan Designation	Total Future Unit Need - Vacant Lands	Units Per Net Acre	Net Acreage Needed	Gross Acreage Needed	Distribution	
RL Residential - Low Density	50,365	9.2	5,502	6,877	68.7%	
RM Residential - Medium D.	17,876	13.5	1,324	1,655	16.5%	
RH Residential - High D.	8,350	19.1	437	546	5.5%	
SCPA Station Community Plan Area ¹	10,950	18.3	597	747	7.5%	
MU Mixed Use	2,154	15.0	144	179	1.8%	
Totals/Averages:		89,696	18.3	8,004	10,004	100%

¹ Figures presented for SCPA Designation includes "SC Residential", and excludes "SC Commercial"

Sources: City of Hillsboro, Metro RLIS, Johnson Reid LLC



FIFTY-YEAR RESIDENTIAL GROWTH & LAND NEED

FIFTY-YEAR RESIDENTIAL GROWTH ANALYSIS

INTRODUCTION

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 Hillsboro 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.

FUTURE HOUSING PROFILE (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.

FIGURE 45: PROFILE OF FUTURE HOUSING CONDITIONS (2060)

PROJECTED FUTURE HOUSING CONDITIONS (2008 - 2060)	SOURCE	
2008 Population (Minus Group Pop.)	90,165	Claritas ¹
Projected Annual Growth Rate	2.7%	Johnson Reid, LLC
Total 2060 Population:	354,449	
- Estimated group housing population:	-3,899	Claritas
Estimated 2060 Population:	350,551	
Estimated 2060 Households:	132,283	
Avg. HH Size:	2.65	Claritas
Total Housing Units:	140,727	
Occupied Housing Units:	132,283	
Vacant Housing Units:	8,444	
Projected Vacancy Rate:	6.0%	Johnson Reid, LLC

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



Based on the estimated 50-year employment growth of roughly 150,000 jobs (the baseline employment forecast), divided by the target jobs/housing ratio of 1.5 jobs per household in Hillsboro, we project an annual population growth rate of 2.7%. (Current estimated jobs/housing ratio is 2.2 jobs per household.)

This growth rate represents almost 260,000 new residents living in 106,000 new households over the 52-year period. The future household size is expected to fall somewhat, while still remaining larger than the regional or statewide average.

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.

FIGURE 46: PROJECTED TOTAL FUTURE HOUSING NEEDS (2060)

Ownership				Rental				
Price Range	# Units	% of Units	Cumulative	Rent	# Units	% of Units	Cumulative	
\$0 - 50k	1,116	1.1%	1.1%	\$0 - 250	1,672	4.0%	4.0%	
\$50k - 70k	240	0.2%	1.4%	\$250 - 375	835	2.0%	6.0%	
\$70k - 90k	312	0.3%	1.7%	\$375 - 500	1,319	3.2%	9.1%	
\$90k - 120k	906	0.9%	2.6%	\$500 - 625	1,299	3.1%	12.2%	
\$120k - 160k	1,862	1.9%	4.5%	\$625 - 875	3,035	7.3%	19.5%	
\$160k - 230k	3,807	3.9%	8.3%	\$875 - 1,250	7,087	16.9%	36.4%	
\$230k - 350k	16,045	16.2%	24.6%	\$1,250 - 1,875	9,409	22.5%	58.9%	
\$350k - 460k	17,504	17.7%	42.3%	\$1,875 - 2,500	7,557	18.1%	77.0%	
\$460k - 690k	32,769	33.1%	75.4%	\$2,500 - 3,750	7,319	17.5%	94.5%	
\$690k +	24,315	24.6%	100.0%	\$3,750 +	2,318	5.5%	100.0%	
Totals:	98,877	% of All:	70.3%	Totals:	41,849	% of All:	29.7%	All Units
								140,727

Sources: Claritas, Census, Johnson Reid, LLC.

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 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 106,000 new housing units by 2060, with a stronger emphasis on new ownership units (75%) than is reflected in the current housing inventory. Of the new units needed, a similar share (75%) are projected to be single family types, while the remainder will be some form of attached housing.

An estimated 22% 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 roughly 2% of the total need each.



FIGURE 47: 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	Cummulative %
\$0 - 50k	352	8	5	36	-5	-6	390	0.5%	0.5%
\$50k - 70k	125	2	1	8	0	-1	134	0.2%	0.7%
\$70k - 90k	193	2	1	11	0	0	207	0.3%	0.9%
\$90k - 120k	603	6	4	31	0	-1	643	0.8%	1.7%
\$120k - 160k	868	13	9	61	-5	-6	940	1.2%	2.9%
\$160k - 230k	-1,286	26	18	104	-41	-56	-1,236	-1.6%	1.4%
\$230k - 350k	7,875	108	76	532	-37	-50	8,505	10.7%	12.1%
\$350k - 460k	13,499	118	83	615	11	15	14,340	18.0%	30.1%
\$460k - 690k	29,754	221	156	1,184	67	90	31,470	39.6%	69.7%
\$690k +	22,777	164	116	883	57	77	24,073	30.3%	100.0%
Totals:	74,758	665	470	3,465	45	61	79,466	% All Units:	75.0%
Percentage:	94.1%	0.8%	0.6%	4.4%	0.1%	0.1%	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	Cummulative %
\$0 - 250	255	51	44	631	-2	0	980	3.7%	3.7%
\$250 - 375	132	18	19	267	-1	0	435	1.6%	5.4%
\$375 - 500	228	83	55	747	1	0	1,114	4.2%	9.6%
\$500 - 625	-313	-294	-115	-1,116	-16	0	-1,855	-7.0%	2.6%
\$625 - 875	-504	-485	-178	-1,553	-29	0	-2,750	-10.4%	-7.8%
\$875 - 1,250	329	91	133	2,643	-12	0	3,184	12.0%	4.2%
\$1,250 - 1,875	1,336	652	415	5,981	8	0	8,392	31.7%	35.9%
\$1,875 - 2,500	1,220	595	366	5,113	10	0	7,303	27.6%	63.6%
\$2,500 - 3,750	1,323	608	368	5,009	11	0	7,319	27.7%	91.2%
\$3,750 +	419	193	117	1,587	3	0	2,318	8.8%	100.0%
Totals:	4,424	1,513	1,223	19,307	-28	0	26,441	% All Units:	25.0%
Percentage:	16.7%	5.7%	4.6%	73.0%	-0.1%	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:	79,183	2,179	1,693	22,773	18	61	105,907	100%
Percentage:	74.8%	2.1%	1.6%	21.5%	0.0%	0.1%	100.0%	

Sources: Claritas Inc., Census, Johnson Reid LLC

FIFTY-YEAR RESIDENTIAL LAND NEED ANALYSIS (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 105,000 new housing units by 2060. This amounts to a total need for almost 11,900 gross acres of new residential lands.



FIGURE 48: PROJECTED NEW RESIDENTIAL LAND NEED, HILLSBORO (2060)

Comp Plan Designation		Total Future Unit Need - Vacant Lands	Units Per Net Acre	Net Acreage Needed	Gross Acreage Needed	Distribution
RL	Residential - Low Density	61,712	9.2	6,741	8,427	70.6%
RM	Residential - Medium D.	21,225	13.5	1,572	1,965	16.5%
RH	Residential - High D.	8,721	19.1	456	570	4.8%
SCPA	Station Community Plan Area ¹	11,448	18.3	624	781	6.5%
MU	Mixed Use	2,250	15.0	150	188	1.6%
Totals/Averages:		105,356	11.9	9,544	11,930	100%

¹ Figures presented for SCPA Designation includes "SC Residential", and excludes "SC Commercial"

Sources: City of Hillsboro, Metro RLIS, Johnson Reid LLC



DRAFT

APPENDIX A: DETAILED ECONOMIC ANALYSIS EXHIBITS

EXHIBIT 1.01
PROJECTIONS OF OFFICE SPACE-UTILIZING EMPLOYMENT BY INDUSTRY SECTOR
HILLSBORO, OREGON
2008-2035

Baseline Growth Scenario		Total Employment 1/						Office		Office Space-Utilizing Employment						
Employment Sector	2008	2013	2018	2023	2028	2033	2035	Share 2/	2008	2013	2018	2023	2028	2033	2035	'08-35
Construction	2,933	3,308	4,004	4,646	5,075	5,518	5,706	2%	59	66	80	93	101	110	114	55
Manufacturing	22,016	25,029	30,624	35,789	39,232	42,795	44,309	5%	1,101	1,251	1,531	1,789	1,962	2,140	2,215	1,115
Wholesale Trade	1,879	2,053	2,375	2,672	2,870	3,076	3,162	5%	94	103	119	134	144	154	158	64
Retail Trade	7,656	8,507	10,087	11,546	12,519	13,527	13,952	5%	383	425	504	577	626	676	698	315
Transportation, Warehousing & Utilities	1,536	1,764	2,188	2,579	2,840	3,110	3,225	30%	461	529	656	774	852	933	968	507
Information	1,716	1,853	2,107	2,342	2,498	2,661	2,729	90%	1,544	1,667	1,896	2,108	2,249	2,395	2,456	912
Financial Activities	2,582	2,825	3,275	3,691	3,969	4,257	4,378	90%	2,324	2,542	2,948	3,322	3,572	3,831	3,940	1,616
Professional & Business Services	9,727	11,501	14,795	17,835	19,862	21,954	22,851	90%	8,754	10,350	13,315	16,052	17,876	19,758	20,566	11,812
Education & Health Services	10,179	12,389	16,492	20,280	22,805	25,407	26,529	40%	4,072	4,955	6,597	8,112	9,122	10,163	10,611	6,540
Leisure & Hospitality	5,067	5,809	7,188	8,461	9,310	10,187	10,561	25%	1,267	1,452	1,797	2,115	2,327	2,547	2,640	1,374
Other Services	3,319	3,609	4,148	4,645	4,976	5,320	5,465	40%	1,328	1,444	1,659	1,858	1,990	2,128	2,186	858
Government	3,611	3,798	4,145	4,466	4,680	4,903	4,996	85%	3,069	3,228	3,524	3,796	3,978	4,168	4,246	1,177
Total	72,220	82,443	101,429	118,954	130,638	142,716	147,864	34%	24,454	28,014	34,627	40,730	44,799	49,004	50,799	26,345
High Growth Scenario		Total Employment 1/						Office		Office Space-Utilizing Employment						
Employment Sector	2008	2013	2018	2023	2028	2033	2035	Share 2/	2008	2013	2018	2023	2028	2033	2035	'08-35
Construction	2,934	3,438	4,371	5,225	5,796	6,763	7,194	2%	59	69	87	105	116	135	144	85
Manufacturing	22,316	29,375	41,211	49,387	55,516	68,009	74,019	5%	1,116	1,469	2,061	2,469	2,776	3,400	3,701	2,585
Wholesale Trade	1,883	2,156	2,645	3,057	3,342	3,812	4,021	5%	94	108	132	153	167	191	201	107
Retail Trade	7,665	8,876	11,090	13,059	14,389	16,603	17,587	5%	383	444	555	653	719	830	879	496
Transportation, Warehousing & Utilities	1,539	1,871	2,476	3,008	3,369	4,026	4,327	30%	462	561	743	902	1,011	1,208	1,298	836
Information	1,718	1,953	2,363	2,696	2,930	3,316	3,489	90%	1,546	1,758	2,127	2,427	2,637	2,984	3,140	1,594
Financial Activities	2,586	2,947	3,602	4,170	4,558	5,187	5,466	90%	2,327	2,653	3,242	3,753	4,102	4,669	4,920	2,592
Professional & Business Services	9,757	12,738	17,970	22,259	25,252	31,305	34,166	90%	8,781	11,464	16,173	20,034	22,727	28,174	30,749	21,968
Education & Health Services	10,189	13,209	18,780	23,838	27,231	34,090	37,303	40%	4,076	5,284	7,512	9,535	10,892	13,636	14,921	10,846
Leisure & Hospitality	5,075	6,138	8,079	9,799	10,964	13,063	14,018	25%	1,269	1,534	2,020	2,450	2,741	3,266	3,504	2,236
Other Services	3,324	3,762	4,551	5,232	5,698	6,446	6,776	40%	1,330	1,505	1,820	2,093	2,279	2,578	2,710	1,381
Government	3,611	3,866	4,337	4,765	5,052	5,447	5,615	85%	3,070	3,287	3,687	4,050	4,294	4,630	4,772	1,703
Total	72,596	90,329	121,475	146,497	164,098	198,067	213,980	33%	24,511	30,134	40,158	48,624	54,462	65,702	70,940	46,429
Medium Growth Scenario		Total Employment 1/						Office		Office Space-Utilizing Employment						
Employment Sector	2008	2013	2018	2023	2028	2033	2035	Share 2/	2008	2013	2018	2023	2028	2033	2035	'08-35
Construction	2,934	3,372	4,185	4,937	5,438	6,245	6,620	2%	59	67	84	99	109	125	132	74
Manufacturing	22,316	26,806	34,811	42,937	48,449	55,201	65,953	5%	1,116	1,340	1,741	2,147	2,422	2,760	3,298	2,182
Wholesale Trade	1,883	2,099	2,494	2,869	3,121	3,501	3,773	5%	94	105	125	143	156	175	189	94
Retail Trade	7,665	8,681	10,558	12,312	13,484	15,324	16,343	5%	383	434	528	616	674	766	817	434
Transportation, Warehousing & Utilities	1,539	1,814	2,321	2,797	3,115	3,606	3,903	30%	462	544	696	839	935	1,082	1,171	709
Information	1,718	1,896	2,217	2,525	2,732	3,035	3,291	90%	1,546	1,707	1,995	2,272	2,459	2,732	2,962	1,416
Financial Activities	2,586	2,881	3,424	3,935	4,277	4,806	5,135	90%	2,327	2,593	3,082	3,542	3,850	4,325	4,622	2,294
Professional & Business Services	9,757	12,041	16,165	20,116	22,769	26,577	29,866	90%	8,781	10,837	14,548	18,104	20,492	23,919	26,879	18,098
Education & Health Services	10,189	12,787	17,602	22,070	25,051	29,764	32,146	40%	4,076	5,115	7,041	8,828	10,021	11,906	12,859	8,783
Leisure & Hospitality	5,075	5,963	7,605	9,139	10,165	11,761	12,676	25%	1,269	1,491	1,901	2,285	2,541	2,940	3,169	1,900
Other Services	3,324	3,679	4,330	4,945	5,356	5,989	6,395	40%	1,330	1,471	1,732	1,978	2,142	2,396	2,558	1,228
Government	3,611	3,831	4,239	4,617	4,869	5,277	5,468	85%	3,070	3,257	3,603	3,924	4,138	4,486	4,647	1,578
Total	72,596	85,849	109,951	133,199	148,826	171,087	191,568	34%	24,511	28,961	37,075	44,777	49,939	57,612	63,303	38,791

1/ Johnson Reid, LLC

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
HILLSBORO, OREGON
2008-2035**

Baseline Growth Scenario Employment Sector	Local Area Jobs in Office Space 1/							'08-35	Avg. Space Per Job 2/	Projected Office Space Need 3/							'08-35
	2008	2013	2018	2023	2028	2033	2035			2008	2013	2018	2023	2028	2033	2035	
Construction	59	66	80	93	101	110	114	55	366	23,616	26,634	32,239	37,413	40,862	44,433	45,948	22,332
Manufacturing	1,101	1,251	1,531	1,789	1,962	2,140	2,215	1,115	366	443,180	503,830	616,465	720,436	789,750	861,468	891,947	448,767
Wholesale Trade	94	103	119	134	144	154	158	64	366	37,827	41,319	47,802	53,787	57,777	61,920	63,660	25,832
Retail Trade	383	425	504	577	626	676	698	315	366	154,123	171,252	203,061	232,424	251,999	272,293	280,861	126,738
Transportation, Warehousing & Utilities	461	529	656	774	852	933	968	507	366	185,461	213,042	264,265	311,547	343,069	375,658	389,544	204,083
Information	1,544	1,667	1,896	2,108	2,249	2,395	2,456	912	366	621,606	671,251	763,449	848,556	905,293	964,287	988,947	367,342
Financial Activities	2,324	2,542	2,948	3,322	3,572	3,831	3,940	1,616	366	935,535	1,023,477	1,186,798	1,337,557	1,438,062	1,542,416	1,586,248	650,713
Professional & Business Services	8,754	10,350	13,315	16,052	17,876	19,758	20,566	11,812	366	3,524,425	4,167,101	5,360,642	6,462,373	7,196,860	7,954,743	8,279,792	4,755,367
Education & Health Services	4,072	4,955	6,597	8,112	9,122	10,163	10,611	6,540	366	1,639,217	1,995,055	2,655,897	3,265,905	3,672,577	4,091,513	4,272,177	2,632,960
Leisure & Hospitality	1,267	1,452	1,797	2,115	2,327	2,547	2,640	1,374	366	509,980	584,715	723,509	851,627	937,038	1,025,355	1,062,970	552,990
Other Services	1,328	1,444	1,659	1,858	1,990	2,128	2,186	858	366	534,567	581,254	667,959	747,994	801,350	856,786	880,020	345,452
Government	3,069	3,228	3,524	3,796	3,978	4,168	4,246	1,177	366	1,235,618	1,299,670	1,418,625	1,528,429	1,601,632	1,678,004	1,709,562	473,945
Total	24,454	28,014	34,627	40,730	44,799	49,004	50,799	26,345	366	9,845,154	11,278,599	13,940,711	16,398,046	18,036,269	19,728,876	20,451,675	10,606,521
High Growth Scenario	Local Area Jobs in Office Space 1/							'08-35	Avg. Space	Projected Office Space Need 3/							'08-35
Employment Sector	2008	2013	2018	2023	2028	2033	2035	'08-35	Per Job 2/	2008	2013	2018	2023	2028	2033	2035	'08-35
Construction	59	69	87	105	116	135	144	85	366	23,621	27,681	35,194	42,073	46,672	54,456	57,926	34,306
Manufacturing	1,116	1,469	2,061	2,469	2,776	3,400	3,701	2,585	366	449,217	591,320	829,572	994,168	1,117,545	1,369,016	1,489,999	1,040,781
Wholesale Trade	94	108	132	153	167	191	201	107	366	37,908	43,402	53,238	61,541	67,268	76,732	80,952	43,044
Retail Trade	383	444	555	653	719	830	879	496	366	154,300	178,671	223,245	262,869	289,660	334,210	354,032	199,732
Transportation, Warehousing & Utilities	462	561	743	902	1,011	1,208	1,298	836	366	185,839	225,990	299,083	363,286	406,894	486,311	522,559	336,720
Information	1,546	1,758	2,127	2,427	2,637	2,984	3,140	1,594	366	622,512	707,579	856,247	976,977	1,061,534	1,201,530	1,264,096	641,583
Financial Activities	2,327	2,653	3,242	3,753	4,102	4,669	4,920	2,592	366	937,039	1,067,907	1,305,092	1,511,051	1,651,558	1,879,600	1,980,597	1,043,558
Professional & Business Services	8,781	11,464	16,173	20,034	22,727	28,174	30,749	21,968	366	3,535,180	4,615,482	6,511,290	8,065,492	9,149,922	11,343,000	12,379,687	8,844,507
Education & Health Services	4,076	5,284	7,512	9,535	10,892	13,636	14,921	10,846	366	1,640,803	2,127,224	3,024,402	3,838,875	4,385,235	5,489,788	6,007,263	4,366,461
Leisure & Hospitality	1,269	1,534	2,020	2,450	2,741	3,266	3,504	2,236	366	510,812	617,757	813,128	986,285	1,103,495	1,314,781	1,410,875	900,063
Other Services	1,330	1,505	1,820	2,093	2,279	2,578	2,710	1,381	366	535,261	605,768	732,902	842,609	917,634	1,038,018	1,091,192	555,931
Government	3,070	3,287	3,687	4,050	4,294	4,630	4,772	1,703	366	1,235,782	1,323,151	1,484,240	1,630,726	1,728,929	1,864,162	1,921,393	685,610
Total	24,511	30,134	40,158	48,624	54,462	65,702	70,940	46,429	366	9,868,275	12,131,933	16,167,633	19,575,951	21,926,347	26,451,605	28,560,570	18,692,295
Medium Growth Scenario	Local Area Jobs in Office Space 1/							'08-35	Avg. Space	Projected Office Space Need 3/							'08-35
Employment Sector	2008	2013	2018	2023	2028	2033	2035	'08-35	Per Job 2/	2008	2013	2018	2023	2028	2033	2035	'08-35
Construction	59	67	84	99	109	125	132	74	366	23,621	27,149	33,694	39,750	43,789	50,281	53,301	29,681
Manufacturing	1,116	1,340	1,741	2,147	2,422	2,760	3,298	2,182	366	449,217	539,609	700,745	864,332	975,288	1,111,194	1,327,628	878,411
Wholesale Trade	94	105	125	143	156	175	189	94	366	37,908	42,249	50,208	57,763	62,826	70,468	75,942	38,034
Retail Trade	383	434	528	616	674	766	817	434	366	154,300	174,742	212,541	247,840	271,425	308,466	328,984	174,684
Transportation, Warehousing & Utilities	462	544	696	839	935	1,082	1,171	709	366	185,839	219,046	280,359	337,832	376,259	435,580	471,372	285,532
Information	1,546	1,707	1,995	2,272	2,459	2,732	2,962	1,416	366	622,512	687,039	803,205	914,863	989,868	1,099,882	1,192,614	570,102
Financial Activities	2,327	2,593	3,082	3,542	3,850	4,325	4,622	2,294	366	937,039	1,043,823	1,240,720	1,425,953	1,549,887	1,741,397	1,860,772	923,733
Professional & Business Services	8,781	10,837	14,548	18,104	20,492	23,919	26,879	18,098	366	3,535,180	4,363,107	5,857,157	7,288,807	8,249,957	9,629,842	10,821,542	7,286,362
Education & Health Services	4,076	5,115	7,041	8,828	10,021	11,906	12,859	8,783	366	1,640,803	2,059,168	2,834,638	3,554,129	4,034,260	4,793,273	5,176,843	3,536,040
Leisure & Hospitality	1,269	1,491	1,901	2,285	2,541	2,940	3,169	1,900	366	510,812	600,202	765,426	919,869	1,023,077	1,183,778	1,275,849	765,036
Other Services	1,330	1,471	1,732	1,978	2,142	2,396	2,558	1,228	366	535,261	592,410	697,352	796,273	862,483	964,444	1,029,770	494,509
Government	3,070	3,257	3,603	3,924	4,138	4,486	4,647	1,578	366	1,235,782	1,311,092	1,450,542	1,579,859	1,666,145	1,805,993	1,871,065	635,282
Total	24,511	28,961	37,075	44,777	49,939	57,612	63,303	38,791	366	9,868,275	11,659,638	14,926,586	18,027,268	20,105,264	23,194,597	25,485,682	15,617,407

1/ From Exhibit 1.01

2/ Average office employment density by industry sector based on Urban Land Institute guidelines.

3/ Assumes a market-clearing 10% office space vacancy rate.

*Estimate

EXHIBIT 1.03
OFFICE FLOOR AREA RATIO WORKSHEET - TRENDING OFFICE SPACE-UTILIZING INDUSTRIAL LAND
HILLSBORO, OREGON
2008-2035

Office-Utilizing Space FAR	Floor Area Ratio Trend							
Employment Sector	2008	2013	2018	2023	2028	2033	2035	<i>08-35</i>
Construction	0.35	0.37	0.39	0.41	0.43	0.45	0.46	0.11
Manufacturing	0.35	0.37	0.39	0.41	0.43	0.45	0.46	0.11
Wholesale Trade	0.35	0.37	0.39	0.41	0.43	0.45	0.46	0.11
Retail Trade	0.35	0.37	0.39	0.41	0.43	0.45	0.46	0.11
Transportation, Warehousing & Utilities	0.35	0.37	0.39	0.41	0.43	0.45	0.46	0.11
Information	0.35	0.37	0.39	0.41	0.43	0.45	0.46	0.11
Financial Activities	0.35	0.37	0.39	0.41	0.43	0.45	0.46	0.11
Professional & Business Services	0.35	0.37	0.39	0.41	0.43	0.45	0.46	0.11
Education & Health Services	0.35	0.37	0.39	0.41	0.43	0.45	0.46	0.11
Leisure & Hospitality	0.35	0.37	0.39	0.41	0.43	0.45	0.46	0.11
Other Services	0.35	0.37	0.39	0.41	0.43	0.45	0.46	0.11
Government	0.35	0.37	0.39	0.41	0.43	0.45	0.46	0.11
Total	0.35	0.37	0.39	0.41	0.43	0.45	0.46	0.11

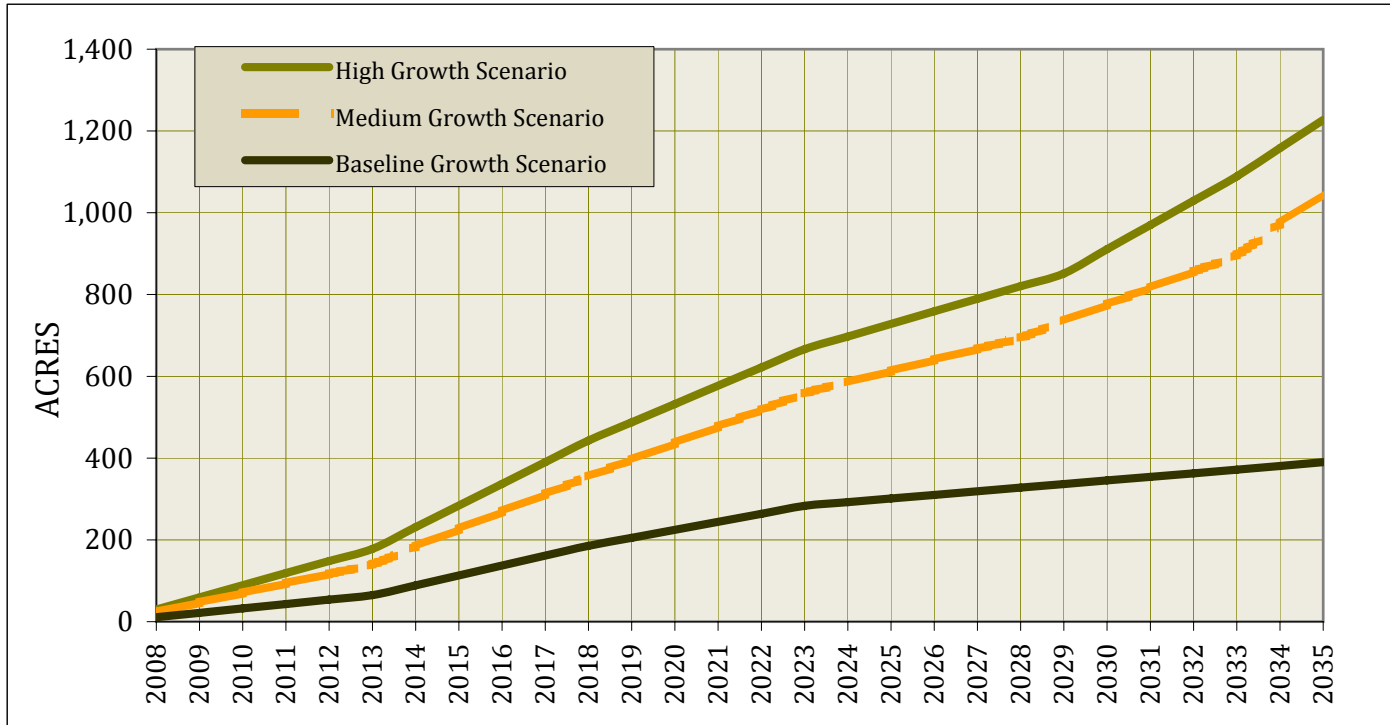
SOURCE: Johnson Reid, LLC

**EXHIBIT 1.04
DEMAND PROJECTIONS FOR COMMERCIAL OFFICE LAND BY INDUSTRY SECTOR
HILLSBORO, OREGON
2008-2035**

Baseline Growth Scenario Employment Sector	Projected Office Space Need 1/							Predicted Land Need (Acres)								
	2008	2013	2018	2023	2028	2033	2035	'08-35	2008	2013	2018	2023	2028	2033	2035	'08-35
Construction	23,616	26,634	32,239	37,413	40,862	44,433	45,948	22,332	1.5	1.7	1.9	2.1	2.2	2.3	2.3	0.8
Manufacturing	443,180	503,830	616,465	720,436	789,750	861,468	891,947	448,767	29.1	31.3	36.3	40.3	42.2	43.9	44.7	15.6
Wholesale Trade	37,827	41,319	47,802	53,787	57,777	61,920	63,660	25,832	2.5	2.6	2.8	3.0	3.1	3.2	3.2	0.7
Retail Trade	154,123	171,252	203,061	232,424	251,999	272,293	280,861	126,738	10.1	10.6	12.0	13.0	13.5	13.9	14.1	4.0
Transportation, Warehousing & Utilities	185,461	213,042	264,265	311,547	343,069	375,658	389,544	204,083	12.2	13.2	15.6	17.4	18.3	19.2	19.5	7.4
Information	621,606	671,251	763,449	848,556	905,293	964,287	988,947	367,342	40.8	41.6	44.9	47.5	48.3	49.2	49.6	8.8
Financial Activities	935,535	1,023,477	1,186,798	1,337,557	1,438,062	1,542,416	1,586,248	650,713	61.4	63.5	69.9	74.9	76.8	78.7	79.5	18.1
Professional & Business Services	3,524,425	4,167,101	5,360,642	6,462,373	7,196,860	7,954,743	8,279,792	4,755,367	231.2	258.5	315.5	361.8	384.2	405.8	415.0	183.8
Education & Health Services	1,639,217	1,995,055	2,655,897	3,265,905	3,672,577	4,091,513	4,272,177	2,632,960	107.5	123.8	156.3	182.9	196.1	208.7	214.1	106.6
Leisure & Hospitality	509,980	584,715	723,509	851,627	937,038	1,025,355	1,062,970	552,990	33.5	36.3	42.6	47.7	50.0	52.3	53.3	19.8
Other Services	534,567	581,254	667,959	747,994	801,350	856,786	880,020	345,452	35.1	36.1	39.3	41.9	42.8	43.7	44.1	9.0
Government	1,235,618	1,299,670	1,418,625	1,528,429	1,601,632	1,678,004	1,709,562	473,945	81.0	80.6	83.5	85.6	85.5	85.6	85.7	4.6
Total	9,845,154	11,278,599	13,940,711	16,398,046	18,036,269	19,728,876	20,451,675	10,606,521	645.8	699.8	820.6	918.2	962.9	1,006.5	1,025.1	379.4
High Growth Scenario	Projected Office Space Need 1/							Predicted Land Need (Acres)								
Employment Sector	2008	2013	2018	2023	2028	2033	2035	'08-35	2008	2013	2018	2023	2028	2033	2035	'08-35
Construction	23,621	27,681	35,194	42,073	46,672	54,456	57,926	34,306	1.5	1.8	2.3	2.8	3.1	3.6	3.8	2.3
Manufacturing	449,217	591,320	829,572	994,168	1,117,545	1,369,016	1,489,999	1,040,781	29.5	38.8	54.4	65.2	73.3	89.8	97.7	68.3
Wholesale Trade	37,908	43,402	53,238	61,541	67,268	76,732	80,952	43,044	2.5	2.8	3.5	4.0	4.4	5.0	5.3	2.8
Retail Trade	154,300	178,671	223,245	262,869	289,660	334,210	354,032	199,732	10.1	11.7	14.6	17.2	19.0	21.9	23.2	13.1
Transportation, Warehousing & Utilities	185,839	225,990	299,083	363,286	406,894	486,311	522,559	336,720	12.2	14.8	19.6	23.8	26.7	31.9	34.3	22.1
Information	622,512	707,579	856,247	976,977	1,061,534	1,201,530	1,264,096	641,583	40.8	46.4	56.2	64.1	69.6	78.8	82.9	42.1
Financial Activities	937,039	1,067,907	1,305,092	1,511,051	1,651,558	1,879,600	1,980,597	1,043,558	61.5	70.0	85.6	99.1	108.3	123.3	129.9	68.4
Professional & Business Services	3,535,180	4,615,482	6,511,290	8,065,492	9,149,922	11,343,000	12,379,687	8,844,507	231.9	302.7	427.1	529.0	600.2	744.0	812.0	580.1
Education & Health Services	1,640,803	2,127,224	3,024,402	3,838,875	4,385,235	5,489,788	6,007,263	4,366,461	107.6	139.5	198.4	251.8	287.6	360.1	394.0	286.4
Leisure & Hospitality	510,812	617,757	813,128	986,285	1,103,495	1,314,781	1,410,875	900,063	33.5	40.5	53.3	64.7	72.4	86.2	92.5	59.0
Other Services	535,261	605,768	732,902	842,609	917,634	1,038,018	1,091,192	555,931	35.1	39.7	48.1	55.3	60.2	68.1	71.6	36.5
Government	1,235,782	1,323,151	1,484,240	1,630,726	1,728,929	1,864,162	1,921,393	685,610	81.1	86.8	97.4	107.0	113.4	122.3	126.0	45.0
Total	9,868,275	12,131,933	16,167,633	19,575,951	21,926,347	26,451,605	28,560,570	18,692,295	647.3	795.7	1,060.5	1,284.0	1,438.2	1,735.0	1,873.3	1,226.0
Medium Growth Scenario	Projected Office Space Need 1/							Predicted Land Need (Acres)								
Employment Sector	2008	2013	2018	2023	2028	2033	2035	'08-35	2008	2013	2018	2023	2028	2033	2035	'08-35
Construction	23,621	27,149	33,694	39,750	43,789	50,281	53,301	29,681	1.5	1.8	2.2	2.6	2.9	3.3	3.5	1.9
Manufacturing	449,217	539,609	700,745	864,332	975,288	1,111,194	1,327,628	878,411	29.5	35.4	46.0	56.7	64.0	72.9	87.1	57.6
Wholesale Trade	37,908	42,249	50,208	57,763	62,826	70,468	75,942	38,034	2.5	2.8	3.3	3.8	4.1	4.6	5.0	2.5
Retail Trade	154,300	174,742	212,541	247,840	271,425	308,466	328,984	174,684	10.1	11.5	13.9	16.3	17.8	20.2	21.6	11.5
Transportation, Warehousing & Utilities	185,839	219,046	280,359	337,832	376,259	435,580	471,372	285,532	12.2	14.4	18.4	22.2	24.7	28.6	30.9	18.7
Information	622,512	687,039	803,205	914,863	989,868	1,099,882	1,192,614	570,102	40.8	45.1	52.7	60.0	64.9	72.1	78.2	37.4
Financial Activities	937,039	1,043,823	1,240,720	1,425,953	1,549,887	1,741,397	1,860,772	923,733	61.5	68.5	81.4	93.5	101.7	114.2	122.0	60.6
Professional & Business Services	3,535,180	4,363,107	5,857,157	7,288,807	8,249,957	9,629,842	10,821,542	7,286,362	231.9	286.2	384.2	478.1	541.1	631.6	709.8	477.9
Education & Health Services	1,640,803	2,059,168	2,834,638	3,554,129	4,034,260	4,793,273	5,176,843	3,536,040	107.6	135.1	185.9	233.1	264.6	314.4	339.6	231.9
Leisure & Hospitality	510,812	600,202	765,426	919,869	1,023,077	1,183,778	1,275,849	765,036	33.5	39.4	50.2	60.3	67.1	77.6	83.7	50.2
Other Services	535,261	592,410	697,352	796,273	862,483	964,444	1,029,770	494,509	35.1	38.9	45.7	52.2	56.6	63.3	67.5	32.4
Government	1,235,782	1,311,092	1,450,542	1,579,859	1,666,145	1,805,993	1,871,065	635,282	81.1	86.0	95.1	103.6	109.3	118.5	122.7	41.7
Total	9,868,275	11,659,638	14,926,586	18,027,268	20,105,264	23,194,597	25,485,682	15,617,407	647.3	764.8	979.0	1,182.4	1,318.7	1,521.4	1,671.6	1,024.4

1/ From Exhibit 1.02
*Estimate

EXHIBIT 1.05
COMPARISON OF CUMULATIVE DEMAND FOR OFFICE LAND
MEDIUM, HIGH AND LOW EMPLOYMENT GROWTH SCENARIOS
2008-2035



SOURCE: Johnson Reid, LLC

EXHIBIT 1.06
PROJECTIONS OF INDUSTRIAL SPACE-UTILIZING EMPLOYMENT BY INDUSTRY SECTOR
HILLSBORO, OREGON
2008-2035

Baseline Growth Scenario		Total Employment 1/							Industrial	Industrial Space-Utilizing Employment							
Employment Sector	2008	2013	2018	2023	2028	2033	2035	Share 2/	2008	2013	2018	2023	2028	2033	2035	08-35	
Construction	2,933	3,308	4,004	4,646	5,075	5,518	5,706	30%	880	992	1,201	1,394	1,522	1,655	1,712	832	
Manufacturing	22,016	25,029	30,624	35,789	39,232	42,795	44,309	95%	20,915	23,777	29,093	34,000	37,271	40,655	42,094	21,179	
Wholesale Trade	1,879	2,053	2,375	2,672	2,870	3,076	3,162	95%	1,785	1,950	2,256	2,538	2,727	2,922	3,004	1,219	
Retail Trade	7,656	8,507	10,087	11,546	12,519	13,527	13,952	0%	0	0	0	0	0	0	0	0	
Transportation, Warehousing & Utilities	1,536	1,764	2,188	2,579	2,840	3,110	3,225	70%	1,075	1,235	1,532	1,806	1,988	2,177	2,258	1,183	
Information	1,716	1,853	2,107	2,342	2,498	2,661	2,729	10%	172	185	211	234	250	266	273	101	
Financial Activities	2,582	2,825	3,275	3,691	3,969	4,257	4,378	0%	0	0	0	0	0	0	0	0	
Professional & Business Services	9,727	11,501	14,795	17,835	19,862	21,954	22,851	10%	973	1,150	1,479	1,784	1,986	2,195	2,285	1,312	
Education & Health Services	10,179	12,389	16,492	20,280	22,805	25,407	26,529	0%	0	0	0	0	0	0	0	0	
Leisure & Hospitality	5,067	5,809	7,188	8,461	9,310	10,187	10,561	0%	0	0	0	0	0	0	0	0	
Other Services	3,319	3,609	4,148	4,645	4,976	5,320	5,465	60%	1,992	2,166	2,489	2,787	2,986	3,192	3,279	1,287	
Government	3,611	3,798	4,145	4,466	4,680	4,903	4,996	15%	542	570	622	670	702	736	749	208	
Total	72,220	82,443	101,429	118,954	130,638	142,716	147,864	38%	28,333	32,025	38,882	45,212	49,432	53,800	55,654	27,321	
High Growth Scenario		Total Employment 1/							Industrial	Industrial Space-Utilizing Employment							
Employment Sector	2008	2013	2018	2023	2028	2033	2035	Share 2/	2008	2013	2018	2023	2028	2033	2035	08-35	
Construction	2,934	3,438	4,371	5,225	5,796	6,763	7,194	30%	880	1,031	1,311	1,568	1,739	2,029	2,158	1,278	
Manufacturing	22,316	29,375	41,211	49,387	55,516	68,009	74,019	95%	21,200	27,906	39,150	46,918	52,741	64,608	70,318	49,118	
Wholesale Trade	1,883	2,156	2,645	3,057	3,342	3,812	4,021	95%	1,789	2,048	2,512	2,904	3,175	3,621	3,820	2,031	
Retail Trade	7,665	8,876	11,090	13,059	14,389	16,603	17,587	0%	0	0	0	0	0	0	0	0	
Transportation, Warehousing & Utilities	1,539	1,871	2,476	3,008	3,369	4,026	4,327	70%	1,077	1,310	1,733	2,105	2,358	2,818	3,029	1,952	
Information	1,718	1,953	2,363	2,696	2,930	3,316	3,489	10%	172	195	236	270	293	332	349	177	
Financial Activities	2,586	2,947	3,602	4,170	4,558	5,187	5,466	0%	0	0	0	0	0	0	0	0	
Professional & Business Services	9,757	12,738	17,970	22,259	25,252	31,305	34,166	10%	976	1,274	1,797	2,226	2,525	3,130	3,417	2,441	
Education & Health Services	10,189	13,209	18,780	23,838	27,231	34,090	37,303	0%	0	0	0	0	0	0	0	0	
Leisure & Hospitality	5,075	6,138	8,079	9,799	10,964	13,063	14,018	0%	0	0	0	0	0	0	0	0	
Other Services	3,324	3,762	4,551	5,232	5,698	6,446	6,776	60%	1,994	2,257	2,731	3,139	3,419	3,867	4,066	2,071	
Government	3,611	3,866	4,337	4,765	5,052	5,447	5,615	15%	542	580	651	715	758	817	842	301	
Total	72,596	90,329	121,475	146,497	164,098	198,067	213,980	41%	28,630	36,602	50,122	59,845	67,007	81,224	87,998	59,369	
Medium Growth Scenario		Total Employment 1/							Industrial	Industrial Space-Utilizing Employment							
Employment Sector	2008	2013	2018	2023	2028	2033	2035	Share 2/	2008	2013	2018	2023	2028	2033	2035	08-35	
Construction	2,934	3,372	4,185	4,937	5,438	6,245	6,620	30%	880	1,012	1,255	1,481	1,631	1,873	1,986	1,106	
Manufacturing	22,316	26,806	34,811	42,937	48,449	55,201	65,953	95%	21,200	25,466	33,070	40,791	46,027	52,441	62,655	41,455	
Wholesale Trade	1,883	2,099	2,494	2,869	3,121	3,501	3,773	95%	1,789	1,994	2,369	2,726	2,965	3,326	3,584	1,795	
Retail Trade	7,665	8,681	10,558	12,312	13,484	15,324	16,343	0%	0	0	0	0	0	0	0	0	
Transportation, Warehousing & Utilities	1,539	1,814	2,321	2,797	3,115	3,606	3,903	70%	1,077	1,270	1,625	1,958	2,181	2,524	2,732	1,655	
Information	1,718	1,896	2,217	2,525	2,732	3,035	3,291	10%	172	190	222	252	273	304	329	157	
Financial Activities	2,586	2,881	3,424	3,935	4,277	4,806	5,135	0%	0	0	0	0	0	0	0	0	
Professional & Business Services	9,757	12,041	16,165	20,116	22,769	26,577	29,866	10%	976	1,204	1,616	2,012	2,277	2,658	2,987	2,011	
Education & Health Services	10,189	12,787	17,602	22,070	25,051	29,764	32,146	0%	0	0	0	0	0	0	0	0	
Leisure & Hospitality	5,075	5,963	7,605	9,139	10,165	11,761	12,676	0%	0	0	0	0	0	0	0	0	
Other Services	3,324	3,679	4,330	4,945	5,356	5,989	6,395	60%	1,994	2,207	2,598	2,967	3,213	3,593	3,837	1,842	
Government	3,611	3,831	4,239	4,617	4,869	5,277	5,468	15%	542	575	636	692	730	792	820	278	
Total	72,596	85,849	109,951	133,199	148,826	171,087	191,568	39%	28,630	33,916	43,392	52,879	59,298	67,510	78,929	50,300	

1/ From Exhibit 1.01

2/ Share of industry employment that utilizes industrial space. Regional Industrial Land Study Phase III (EcoNorthwest and Otak, Inc., 2001) converted to NAICS by Johnson Reid, LLC.

* Estimate

EXHIBIT 1.07
INDUSTRIAL EMPLOYMENT DENSITY WORKSHEET BY INDUSTRY SECTOR
HILLSBORO, OREGON
2008-2035

Industrial Space Density Employment Sector	Distribution by Building Type 1/			Square Feet per Job 2/			Average Space per Job			Weighted Average
	Warehouse, Distrib.	General Industrial	Tech/ Flex	Warehouse, Distrib.	General Industrial	Tech/ Flex	Warehouse Distrib.	General Industrial	Tech/ Flex	
Construction	0%	75%	25%	1,350	533	467	0	400	117	517
Manufacturing	0%	75%	25%	1,350	533	467	0	400	117	517
Wholesale Trade	90%	0%	10%	1,500	533	467	1,350	0	47	1,397
Retail Trade	0%	0%	0%	1,350	533	467	0	0	0	0
Transportation, Warehousing & Utilitie	100%	0%	0%	2,000	533	467	2,000	0	0	2,000
Information	0%	0%	100%	1,350	533	467	0	0	467	467
Financial Activities	0%	0%	0%	1,350	533	467	0	0	0	0
Professional & Business Services	0%	0%	100%	1,350	533	467	0	0	467	467
Education & Health Services	0%	0%	0%	1,350	533	467	0	0	0	0
Leisure & Hospitality	0%	0%	0%	1,350	533	467	0	0	0	0
Other Services	0%	75%	25%	1,350	533	467	0	400	117	517
Government	50%	0%	50%	1,350	533	467	675	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 1.08
DEMAND PROJECTIONS FOR COMMERCIAL INDUSTRIAL SPACE BY INDUSTRY SECTOR
HILLSBORO, OREGON
2008-2035

Baseline Growth Scenario		Local Area Jobs in Industrial Space 1/							Avg. Space		Projected Industrial Space Need 3/						
Employment Sector	2008	2013	2018	2023	2028	2033	2035	08-35	Per Job 2/	2008	2013	2018	2023	2028	2033	2035	08-35
Construction	880	992	1,201	1,394	1,522	1,655	1,712	832	517	499,898	563,785	682,433	791,954	864,969	940,564	972,621	472,723
Manufacturing	20,915	23,777	29,093	34,000	37,271	40,655	42,094	21,179	517	11,882,911	13,509,103	16,529,175	19,316,933	21,175,438	23,098,405	23,915,630	12,032,719
Wholesale Trade	1,785	1,950	2,256	2,538	2,727	2,922	3,004	1,219	1,397	2,742,720	2,995,853	3,465,957	3,899,900	4,189,194	4,489,616	4,615,733	1,873,013
Transportation, Warehousing & Utilities	1,075	1,235	1,532	1,806	1,988	2,177	2,258	1,183	2,000	2,364,711	2,716,386	3,369,495	3,972,366	4,374,280	4,789,805	4,966,864	2,602,153
Information	172	185	211	234	250	266	273	101	467	88,127	95,165	108,236	120,302	128,346	136,710	140,206	52,079
Professional & Business Services	973	1,150	1,479	1,784	1,986	2,195	2,285	1,312	467	499,668	590,782	759,994	916,189	1,020,320	1,127,767	1,173,850	674,182
Other Services	1,992	2,166	2,489	2,787	2,986	3,192	3,279	1,287	517	1,131,574	1,230,401	1,413,938	1,583,356	1,696,301	1,813,648	1,862,829	731,255
Government	542	570	622	670	702	736	749	208	909	541,253	569,311	621,418	669,517	701,583	735,037	748,861	207,608
Total	28,333	32,025	38,882	45,212	49,432	53,800	55,654	27,321	634	19,750,862	22,270,786	26,950,646	31,270,517	34,150,431	37,131,551	38,396,594	18,645,732
High Growth Scenario		Local Area Jobs in Industrial Space 1/							Avg. Space		Projected Industrial Space Need 3/						
Employment Sector	2008	2013	2018	2023	2028	2033	2035	08-35	Per Job 2/	2008	2013	2018	2023	2028	2033	2035	08-35
Construction	880	1,031	1,311	1,568	1,739	2,029	2,158	1,278	517	500,005	585,954	744,982	890,594	987,961	1,152,723	1,226,188	726,183
Manufacturing	21,200	27,906	39,150	46,918	52,741	64,608	70,318	49,118	517	12,044,791	15,854,977	22,243,194	26,656,456	29,964,567	36,707,201	39,951,097	27,906,306
Wholesale Trade	1,789	2,048	2,512	2,904	3,175	3,621	3,820	2,031	1,397	2,748,590	3,146,925	3,860,092	4,462,120	4,877,356	5,563,575	5,869,543	3,120,953
Transportation, Warehousing & Utilities	1,077	1,310	1,733	2,105	2,358	2,818	3,029	1,952	2,000	2,369,537	2,881,481	3,813,444	4,632,065	5,188,087	6,200,690	6,662,868	4,293,331
Information	172	195	236	270	293	332	349	177	467	88,255	100,315	121,393	138,509	150,497	170,344	179,215	90,959
Professional & Business Services	976	1,274	1,797	2,226	2,525	3,130	3,417	2,441	467	501,193	654,350	923,125	1,143,468	1,297,211	1,608,130	1,755,104	1,253,912
Other Services	1,994	2,257	2,731	3,139	3,419	3,867	4,066	2,071	517	1,133,042	1,282,292	1,551,410	1,783,638	1,942,450	2,197,281	2,309,838	1,176,796
Government	542	580	651	715	758	817	842	301	909	541,325	579,596	650,160	714,327	757,344	816,582	841,651	300,326
Total	28,630	36,602	50,122	59,845	67,007	81,224	87,998	59,369	633	19,926,739	25,085,890	33,907,799	40,421,178	45,165,474	54,416,526	58,795,504	38,868,765
Medium Growth Scenario		Local Area Jobs in Industrial Space 1/							Avg. Space		Projected Industrial Space Need 3/						
Employment Sector	2008	2013	2018	2023	2028	2033	2035	08-35	Per Job 2/	2008	2013	2018	2023	2028	2033	2035	08-35
Construction	880	1,012	1,255	1,481	1,631	1,873	1,986	1,106	517	500,005	574,699	713,231	841,425	926,928	1,064,355	1,128,285	628,280
Manufacturing	21,200	25,466	33,070	40,791	46,027	52,441	62,655	41,455	517	12,044,791	14,468,462	18,788,978	23,175,189	26,150,234	29,794,277	35,597,485	23,552,694
Wholesale Trade	1,789	1,994	2,369	2,726	2,965	3,326	3,584	1,795	1,397	2,748,590	3,063,286	3,640,369	4,188,161	4,555,286	5,109,341	5,506,304	2,757,714
Transportation, Warehousing & Utilities	1,077	1,270	1,625	1,958	2,181	2,524	2,732	1,655	2,000	2,369,537	2,792,937	3,574,702	4,307,508	4,797,474	5,553,845	6,010,205	3,640,667
Information	172	190	222	252	273	304	329	157	467	88,255	97,404	113,873	129,703	140,336	155,933	169,080	80,825
Professional & Business Services	976	1,204	1,616	2,012	2,277	2,658	2,987	2,011	467	501,193	618,570	830,386	1,033,355	1,169,621	1,365,251	1,534,202	1,033,009
Other Services	1,994	2,207	2,598	2,967	3,213	3,593	3,837	1,842	517	1,133,042	1,254,016	1,476,157	1,685,554	1,825,707	2,041,538	2,179,821	1,046,779
Government	542	575	636	692	730	792	820	278	909	541,325	574,314	635,399	692,045	729,842	791,102	819,606	278,281
Total	28,630	33,916	43,392	52,879	59,298	67,510	78,929	50,300	633	19,926,739	23,443,688	29,773,095	36,052,939	40,295,428	45,875,642	52,944,988	33,018,249

1/ From EXHIBIT 1.06

2/ From EXHIBIT 1.07

3/ Assumes a market-clearing 10% industrial space vacancy rate.

*Estimate

EXHIBIT 1.09
INDUSTRIAL FLOOR-TO-AREA RATIO (FAR) WORKSHEET BY INDUSTRY SECTOR
HILLSBORO, OREGON
2008-2035

Baseline Growth Scenario Employment Sector	Distribution by Building Type 1/			FAR by industry sector 2/			Average Space per Job			
	Warehouse, Distrib.	General Industrial	Tech/ Flex	Warehouse, Distrib.	General Industrial	Tech/ Flex	Warehouse/ Distrib.	General Industrial	Tech/ Flex	Weighted Average
Construction	0%	75%	25%	0.31	0.30	0.26	0.00	0.23	0.07	0.29
Manufacturing	0%	75%	25%	0.31	0.30	0.26	0.00	0.23	0.07	0.29
Wholesale Trade	90%	0%	10%	0.31	0.30	0.26	0.28	0.00	0.03	0.31
Retail Trade	0%	0%	0%	0.31	0.30	0.26	0.00	0.00	0.00	0.00
Transportation, Warehousing & U	100%	0%	0%	0.31	0.30	0.26	0.31	0.00	0.00	0.31
Information	0%	0%	100%	0.31	0.30	0.26	0.00	0.00	0.26	0.26
Financial Activities	0%	0%	0%	0.31	0.30	0.26	0.00	0.00	0.00	0.00
Professional & Business Services	0%	0%	100%	0.31	0.30	0.26	0.00	0.00	0.26	0.26
Education & Health Services	0%	0%	0%	0.31	0.30	0.26	0.00	0.00	0.00	0.00
Leisure & Hospitality	0%	0%	0%	0.31	0.30	0.26	0.00	0.00	0.00	0.00
Other Services	0%	75%	25%	0.31	0.30	0.26	0.00	0.23	0.07	0.29
Government	0%	0%	0%	0.31	0.30	0.26	0.00	0.00	0.00	0.00

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 1.10
INDUSTRIAL FLOOR AREA RATIO WORKSHEET - TRENDING OFFICE SPACE-UTILIZING INDUSTRIAL LAND
HILLSBORO, OREGON
2008-2035

Employment Sector	Floor Area Ratio Trend							08-35
	2008	2013	2018	2023	2028	2033	2035	
Construction	0.29	0.30	0.30	0.31	0.32	0.32	0.32	0.03
Manufacturing	0.29	0.30	0.30	0.31	0.32	0.32	0.32	0.03
Wholesale Trade	0.31	0.31	0.31	0.31	0.32	0.32	0.32	0.01
Transportation, Warehousing & Utilities	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.00
Information	0.26	0.29	0.31	0.34	0.36	0.39	0.40	0.14
Professional & Business Services	0.26	0.29	0.31	0.34	0.36	0.39	0.40	0.14
Other Services	0.29	0.30	0.30	0.31	0.32	0.32	0.32	0.03
Total	0.29	0.30	0.31	0.32	0.33	0.34	0.34	0.05

**EXHIBIT 1.11
DEMAND PROJECTIONS FOR COMMERCIAL INDUSTRIAL LAND BY INDUSTRY SECTOR
HILLSBORO, OREGON
2008-2035**

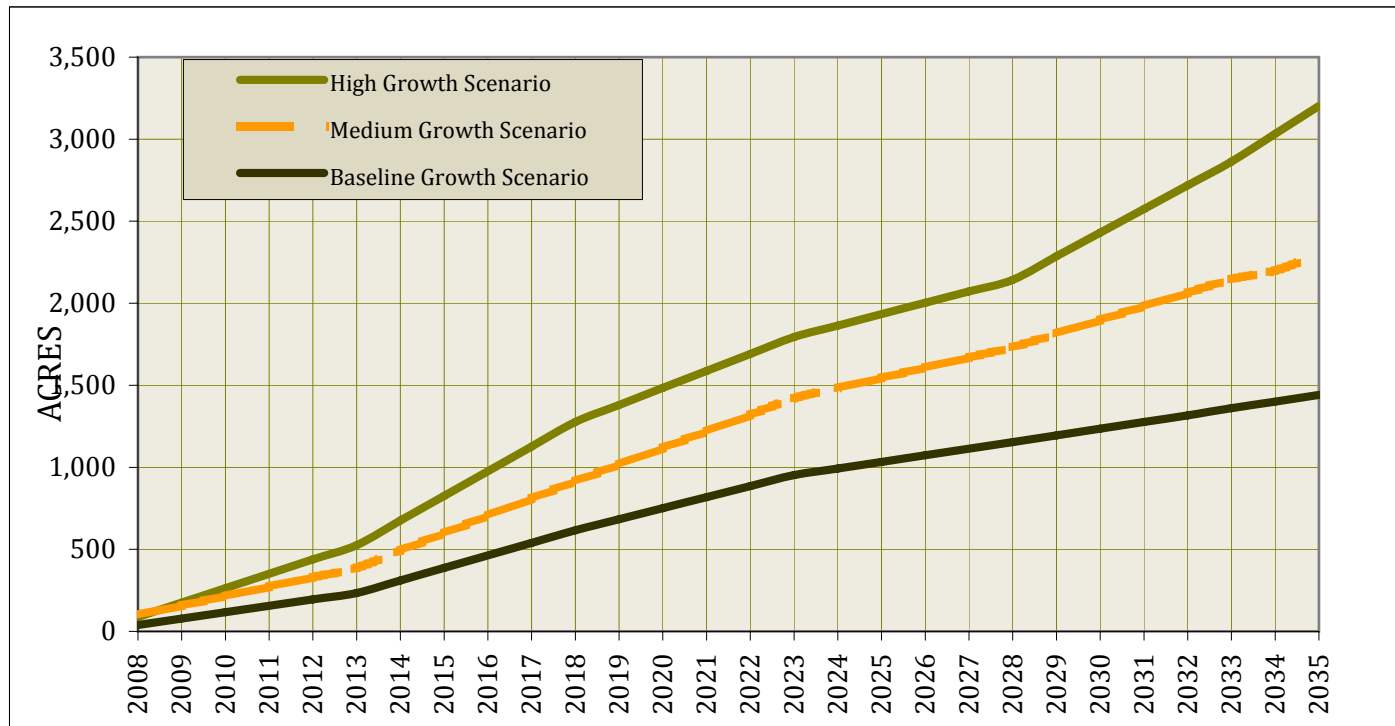
Baseline Growth Scenario		Projected Industrial Space Need 1/							Predicted Land Need (Acres) 2/							
Employment Sector	2008	2013	2018	2023	2028	2033	2035	08-35	2008	2013	2018	2023	2028	2033	2035	08-35
Construction	499,898	563,785	682,433	791,954	864,969	940,564	972,621	472,723	47.5	52.4	62.1	70.7	75.6	80.7	82.8	35.3
Manufacturing	11,882,911	13,509,103	16,529,175	19,316,933	21,175,438	23,098,405	23,915,630	12,032,719	1,128.8	1,256.2	1,505.3	1,723.6	1,851.9	1,980.8	2,035.0	906.2
Wholesale Trade	2,742,720	2,995,853	3,465,957	3,899,900	4,189,194	4,489,616	4,615,733	1,873,013	247.7	268.4	308.0	343.8	366.4	389.5	399.2	151.5
Transportation, Warehousing & Utilities	2,364,711	2,716,386	3,369,495	3,972,366	4,374,280	4,789,805	4,966,864	2,602,153	210.1	241.4	299.4	353.0	388.7	425.6	441.4	231.2
Information	88,127	95,165	108,236	120,302	128,346	136,710	140,206	52,079	9.3	9.2	9.6	9.9	9.8	9.8	9.8	0.4
Professional & Business Services	499,668	590,782	759,994	916,189	1,020,320	1,127,767	1,173,850	674,182	52.9	57.1	67.5	75.3	78.1	80.7	81.9	28.9
Other Services	1,131,574	1,230,401	1,413,938	1,583,356	1,696,301	1,813,648	1,862,829	731,255	107.5	114.4	128.8	141.3	148.3	155.5	158.5	51.0
Total	19,750,862	22,270,786	26,950,646	31,270,517	34,150,431	37,131,551	38,396,594	18,598,454	1,803.9	1,999.1	2,380.8	2,717.5	2,918.9	3,122.6	3,208.5	1,404.6
High Growth Scenario		Projected Industrial Space Need 1/							Predicted Land Need (Acres) 2/							
Employment Sector	2008	2013	2018	2023	2028	2033	2035	08-35	2008	2013	2018	2023	2028	2033	2035	08-35
Construction	500,005	585,954	744,982	890,594	987,961	1,152,723	1,226,188	726,183	47.5	54.5	67.8	79.5	86.4	98.8	104.3	56.8
Manufacturing	12,044,791	15,854,977	22,243,194	26,656,456	29,964,567	36,707,201	39,951,097	27,906,306	1,144.2	1,474.4	2,025.7	2,378.4	2,620.5	3,147.8	3,399.5	2,255.3
Wholesale Trade	2,748,590	3,146,925	3,860,092	4,462,120	4,877,356	5,563,575	5,869,543	3,120,953	248.3	281.9	343.0	393.4	426.5	482.7	507.7	259.4
Transportation, Warehousing & Utilities	2,369,537	2,881,481	3,813,444	4,632,065	5,188,087	6,200,690	6,662,868	4,293,331	210.6	256.1	338.9	411.6	461.0	551.0	592.1	381.5
Information	88,255	100,315	121,393	138,509	150,497	170,344	179,215	90,959	9.4	9.7	10.8	11.4	11.5	12.2	12.5	3.1
Professional & Business Services	501,193	654,350	923,125	1,143,468	1,297,211	1,608,130	1,755,104	1,253,912	53.1	63.2	82.0	94.0	99.3	115.1	122.4	69.3
Other Services	1,133,042	1,282,292	1,551,410	1,783,638	1,942,450	2,197,281	2,309,838	1,176,796	107.6	119.2	141.3	159.1	169.9	188.4	196.5	88.9
Total	19,926,739	25,085,890	33,907,799	40,421,178	45,165,474	54,416,526	58,795,504	38,784,458	1,820.6	2,259.0	3,009.5	3,527.4	3,875.2	4,596.0	4,935.0	3,114.4
Medium Growth Scenario		Projected Industrial Space Need 1/							Predicted Land Need (Acres) 2/							
Employment Sector	2008	2013	2018	2023	2028	2033	2035	08-35	2008	2013	2018	2023	2028	2033	2035	08-35
Construction	500,005	574,699	713,231	841,425	926,928	1,064,355	1,128,285	628,280	47.5	53.4	65.0	75.1	81.1	91.3	96.0	48.5
Manufacturing	12,044,791	14,468,462	18,788,978	23,175,189	26,150,234	29,794,277	35,597,485	23,552,694	1,144.2	1,345.4	1,711.1	2,067.8	2,287.0	2,555.0	3,029.0	1,884.8
Wholesale Trade	2,748,590	3,063,286	3,640,369	4,188,161	4,555,286	5,109,341	5,506,304	2,757,714	248.3	274.4	323.5	369.2	398.4	443.3	476.3	228.0
Transportation, Warehousing & Utilities	2,369,537	2,792,937	3,574,702	4,307,508	4,797,474	5,553,845	6,010,205	3,640,667	210.6	248.2	317.7	382.8	426.3	493.5	534.1	323.5
Information	88,255	97,404	113,873	129,703	140,336	155,933	169,080	80,825	9.4	9.4	10.1	10.7	10.7	11.2	11.8	2.4
Professional & Business Services	501,193	618,570	830,386	1,033,355	1,169,621	1,365,251	1,534,202	1,033,009	53.1	59.8	73.8	85.0	89.5	97.7	107.0	53.9
Other Services	1,133,042	1,254,016	1,476,157	1,685,554	1,825,707	2,041,538	2,179,821	1,046,779	107.6	116.6	134.4	150.4	159.7	175.1	185.5	77.9
Total	19,926,739	23,443,688	29,773,095	36,052,939	40,295,428	45,875,642	52,944,988	32,928,486	1,820.6	2,107.3	2,635.5	3,140.9	3,452.6	3,867.0	4,439.7	2,619.1

1/ From Exhibit 1.09

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

*Estimate

EXHIBIT 1.12
COMPARISON OF CUMULATIVE DEMAND FOR INDUSTRIAL LAND
MEDIUM, HIGH AND LOW EMPLOYMENT GROWTH SCENARIOS
2008-2035



SOURCE: Johnson Reid, LLC

EXHIBIT 1.13
PROJECTIONS OF HOUSEHOLD RETAIL SALES
HILLSBORO, OREGON
2008-2035

NAICS	Category	Per Household Expenditures 1/	Household Retail Spending in Millions (Households)							'08-'35
			2008	2013	2018	2023	2028	2033	2035	
441	Motor Vehicles and Parts Dealers	\$9,091	\$294.6	\$338.7	\$389.4	\$447.6	\$514.5	\$591.5	\$625.4	\$330.8
442	Furniture and Home Furnishings Stores	\$1,112	\$36.0	\$41.4	\$47.6	\$54.7	\$62.9	\$72.3	\$76.5	\$40.5
443	Electronics and Appliance Stores	\$1,128	\$36.6	\$42.0	\$48.3	\$55.6	\$63.9	\$73.4	\$77.6	\$41.1
444	Building Materials and Garden Equipment	\$4,481	\$145.2	\$166.9	\$191.9	\$220.6	\$253.6	\$291.5	\$308.2	\$163.0
445	Food and Beverage Stores	\$5,480	\$177.6	\$204.2	\$234.7	\$269.8	\$310.2	\$356.6	\$377.0	\$199.4
446	Health and Personal Care Stores	\$1,833	\$59.4	\$68.3	\$78.5	\$90.2	\$103.7	\$119.2	\$126.1	\$66.7
448	Clothing and Clothing Accessories Stores	\$2,254	\$73.0	\$84.0	\$96.5	\$111.0	\$127.6	\$146.6	\$155.0	\$82.0
451	Sporting Goods, Hobby, Book and Music Stores	\$966	\$31.3	\$36.0	\$41.4	\$47.6	\$54.7	\$62.8	\$66.4	\$35.1
452	General Merchandise Stores	\$5,504	\$178.4	\$205.1	\$235.7	\$271.0	\$311.5	\$358.1	\$378.6	\$200.3
453	Miscellaneous Store Retailers	\$1,166	\$37.8	\$43.4	\$49.9	\$57.4	\$66.0	\$75.9	\$80.2	\$42.4
722	Foodservices and Drinking Places	\$4,435	\$143.8	\$165.3	\$190.0	\$218.4	\$251.0	\$288.6	\$305.1	\$161.4
Totals/Weighted Averages		\$37,450	\$1,213.7	\$1,395.3	\$1,604.0	\$1,843.8	\$2,119.6	\$2,436.6	\$2,576.3	\$1,362.6

High Growth Scenario		Per Household Expenditures 1/	Household Retail Spending in Millions (Households)							'08-'35
NAICS	Category		2008	2013	2018	2023	2028	2033	2035	
441	Motor Vehicles and Parts Dealers	\$9,091	\$294.6	\$356.4	\$431.2	\$521.6	\$631.1	\$763.4	\$823.9	\$529.2
442	Furniture and Home Furnishings Stores	\$1,112	\$36.0	\$43.6	\$52.7	\$63.8	\$77.2	\$93.4	\$100.8	\$64.7
443	Electronics and Appliance Stores	\$1,128	\$36.6	\$44.2	\$53.5	\$64.8	\$78.3	\$94.8	\$102.3	\$65.7
444	Building Materials and Garden Equipment	\$4,481	\$145.2	\$175.7	\$212.5	\$257.1	\$311.0	\$376.3	\$406.0	\$260.8
445	Food and Beverage Stores	\$5,480	\$177.6	\$214.9	\$259.9	\$314.5	\$380.4	\$460.2	\$496.6	\$319.0
446	Health and Personal Care Stores	\$1,833	\$59.4	\$71.9	\$86.9	\$105.2	\$127.2	\$153.9	\$166.1	\$106.7
448	Clothing and Clothing Accessories Stores	\$2,254	\$73.0	\$88.4	\$106.9	\$129.3	\$156.5	\$189.3	\$204.2	\$131.2
451	Sporting Goods, Hobby, Book and Music Stores	\$966	\$31.3	\$37.9	\$45.8	\$55.4	\$67.1	\$81.1	\$87.5	\$56.2
452	General Merchandise Stores	\$5,504	\$178.4	\$215.8	\$261.1	\$315.8	\$382.1	\$462.2	\$498.8	\$320.4
453	Miscellaneous Store Retailers	\$1,166	\$37.8	\$45.7	\$55.3	\$66.9	\$81.0	\$97.9	\$105.7	\$67.9
722	Foodservices and Drinking Places	\$4,435	\$143.8	\$173.9	\$210.4	\$254.5	\$307.9	\$372.5	\$402.0	\$258.2
Totals/Weighted Averages		\$37,450	\$1,213.7	\$1,468.3	\$1,776.3	\$2,148.9	\$2,599.7	\$3,145.0	\$3,393.9	\$2,180.1

Medium Growth Scenario		Per Household Expenditures 1/	Household Retail Spending in Millions (Households)							'08-'35
NAICS	Category		2008	2013	2018	2023	2028	2033	2035	
441	Motor Vehicles and Parts Dealers	\$9,091	\$294.6	\$348.7	\$412.6	\$488.3	\$577.9	\$683.8	\$731.5	\$436.9
442	Furniture and Home Furnishings Stores	\$1,112	\$36.0	\$42.6	\$50.5	\$59.7	\$70.7	\$83.6	\$89.5	\$53.4
443	Electronics and Appliance Stores	\$1,128	\$36.6	\$43.3	\$51.2	\$60.6	\$71.7	\$84.9	\$90.8	\$54.2
444	Building Materials and Garden Equipment	\$4,481	\$145.2	\$171.8	\$203.4	\$240.7	\$284.8	\$337.0	\$360.5	\$215.3
445	Food and Beverage Stores	\$5,480	\$177.6	\$210.2	\$248.7	\$294.4	\$348.3	\$412.2	\$441.0	\$263.3
446	Health and Personal Care Stores	\$1,833	\$59.4	\$70.3	\$83.2	\$98.4	\$116.5	\$137.9	\$147.5	\$88.1
448	Clothing and Clothing Accessories Stores	\$2,254	\$73.0	\$86.4	\$102.3	\$121.1	\$143.3	\$169.5	\$181.4	\$108.3
451	Sporting Goods, Hobby, Book and Music Stores	\$966	\$31.3	\$37.0	\$43.8	\$51.9	\$61.4	\$72.7	\$77.7	\$46.4
452	General Merchandise Stores	\$5,504	\$178.4	\$211.1	\$249.8	\$295.6	\$349.9	\$414.0	\$442.9	\$264.5
453	Miscellaneous Store Retailers	\$1,166	\$37.8	\$44.7	\$52.9	\$62.6	\$74.1	\$87.7	\$93.8	\$56.0
722	Foodservices and Drinking Places	\$4,435	\$143.8	\$170.1	\$201.3	\$238.2	\$281.9	\$333.7	\$356.9	\$213.1
Totals/Weighted Averages		\$37,450	\$1,213.7	\$1,436.4	\$1,699.8	\$2,011.5	\$2,380.5	\$2,817.1	\$3,013.4	\$1,799.6

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

**EXHIBIT 1.14
PROJECTIONS OF COMMERCIAL RETAIL SPACE NEED
HILLSBORO, OREGON
2008-2035**

Baseline Growth Scenario		Household Retail Spending (millions) 1/							Sales Support		Spending-Supported Retail Demand (SF) 3/							
NAICS	Category	2008	2013	2018	2023	2028	2033	2035	'08-'35	Factor 2/	2008	2013	2018	2023	2028	2033	2035	'08-'35
441	Automotive Parts, Accessories and Tire Stores	\$294.6	\$338.7	\$389.4	\$447.6	\$514.5	\$591.5	\$625.4	\$330.8	\$171	1,895,814	2,179,356	2,505,305	2,880,003	3,310,742	3,805,904	4,024,119	2,128,305
442	Furniture and Home Furnishings Stores	\$36.0	\$41.4	\$47.6	\$54.7	\$62.9	\$72.3	\$76.5	\$40.5	\$213	186,320	214,187	246,221	283,047	325,380	374,044	395,490	209,170
443	Electronics and Appliance Stores	\$36.6	\$42.0	\$48.3	\$55.6	\$63.9	\$73.4	\$77.6	\$41.1	\$246	163,554	188,015	216,135	248,461	285,621	328,339	347,165	183,611
444	Building Materials and Garden Equipment	\$145.2	\$166.9	\$191.9	\$220.6	\$253.6	\$291.5	\$308.2	\$163.0	\$157	1,014,684	1,166,443	1,340,898	1,541,446	1,771,988	2,037,010	2,153,804	1,139,119
445	Food and Beverage Stores	\$177.6	\$204.2	\$234.7	\$269.8	\$310.2	\$356.6	\$377.0	\$199.4	\$384	509,142	585,291	672,828	773,458	889,137	1,022,119	1,080,723	571,581
446	Health and Personal Care Stores	\$59.4	\$68.3	\$78.5	\$90.2	\$103.7	\$119.2	\$126.1	\$66.7	\$283	230,981	265,527	305,240	350,893	403,373	463,702	490,289	259,308
448	Clothing and Clothing Accessories Stores	\$73.0	\$84.0	\$96.5	\$111.0	\$127.6	\$146.6	\$155.0	\$82.0	\$267	301,067	346,095	397,857	457,362	525,766	604,400	639,054	337,988
451	Sporting Goods, Hobby, Book and Music Stores	\$31.3	\$36.0	\$41.4	\$47.6	\$54.7	\$62.8	\$66.4	\$35.1	\$240	143,583	165,058	189,745	218,123	250,746	288,248	304,775	161,192
452	General Merchandise Stores	\$178.4	\$205.1	\$235.7	\$271.0	\$311.5	\$358.1	\$378.6	\$200.3	\$171	1,147,798	1,319,465	1,516,807	1,743,664	2,004,450	2,304,240	2,436,356	1,288,557
453	Miscellaneous Store Retailers	\$37.8	\$43.4	\$49.9	\$57.4	\$66.0	\$75.9	\$80.2	\$42.4	\$236	176,062	202,395	232,665	267,463	307,465	353,450	373,716	197,654
722	Foodservices and Drinking Places	\$143.8	\$165.3	\$190.0	\$218.4	\$251.0	\$288.6	\$305.1	\$161.4	\$290	544,802	626,283	719,951	827,629	951,411	1,093,706	1,156,414	611,613
Totals/Weighted Averages		\$1,213.7	\$1,395.3	\$1,604.0	\$1,843.8	\$2,119.6	\$2,436.6	\$2,576.3	\$1,362.6		6,313,808	7,258,115	8,343,653	9,591,548	11,026,079	12,675,163	13,401,905	7,088,096
High Growth Scenario		Household Retail Spending (millions) 1/							Sales Support		Spending-Supported Retail Demand (SF) 3/							
NAICS	Category	2008	2013	2018	2023	2028	2033	2035	'08-'35	Factor 2/	2008	2013	2018	2023	2028	2033	2035	'08-'35
441	Automotive Parts, Accessories and Tire Stores	\$294.6	\$356.4	\$431.2	\$521.6	\$631.1	\$763.4	\$823.9	\$529.2	\$139	2,331,612	2,820,684	3,412,344	4,128,108	4,994,009	6,041,539	6,519,689	4,188,077
442	Furniture and Home Furnishings Stores	\$36.0	\$43.6	\$52.7	\$63.8	\$77.2	\$93.4	\$100.8	\$64.7	\$213	186,320	225,403	272,682	329,879	399,074	482,783	520,992	334,672
443	Electronics and Appliance Stores	\$36.6	\$44.2	\$53.5	\$64.8	\$78.3	\$94.8	\$102.3	\$65.7	\$246	163,554	197,860	239,363	289,571	350,311	423,791	457,332	293,778
444	Building Materials and Garden Equipment	\$145.2	\$175.7	\$212.5	\$257.1	\$311.0	\$376.3	\$406.0	\$260.8	\$157	1,014,684	1,227,522	1,485,004	1,796,494	2,173,322	2,629,192	2,837,276	1,822,592
445	Food and Beverage Stores	\$177.6	\$214.9	\$259.9	\$314.5	\$380.4	\$460.2	\$496.6	\$319.0	\$384	509,142	615,939	745,136	901,434	1,090,517	1,319,260	1,423,672	914,529
446	Health and Personal Care Stores	\$59.4	\$71.9	\$86.9	\$105.2	\$127.2	\$153.9	\$166.1	\$106.7	\$283	230,981	279,431	338,044	408,952	494,732	598,506	645,874	414,892
448	Clothing and Clothing Accessories Stores	\$73.0	\$88.4	\$106.9	\$129.3	\$156.5	\$189.3	\$204.2	\$131.2	\$267	301,067	364,218	440,615	533,037	644,845	780,107	841,847	540,780
451	Sporting Goods, Hobby, Book and Music Stores	\$31.3	\$37.9	\$45.8	\$55.4	\$67.1	\$81.1	\$87.5	\$56.2	\$240	143,583	173,701	210,136	254,214	307,537	372,045	401,490	257,907
452	General Merchandise Stores	\$178.4	\$215.8	\$261.1	\$315.8	\$382.1	\$462.2	\$498.8	\$320.4	\$171	1,147,798	1,388,557	1,679,817	2,032,172	2,458,434	2,974,109	3,209,491	2,061,693
453	Miscellaneous Store Retailers	\$37.8	\$45.7	\$55.3	\$66.9	\$81.0	\$97.9	\$105.7	\$67.9	\$236	176,062	212,993	257,669	311,717	377,102	456,202	492,308	316,246
722	Foodservices and Drinking Places	\$143.8	\$173.9	\$210.4	\$254.5	\$307.9	\$372.5	\$402.0	\$258.2	\$290	544,802	659,078	797,324	964,569	1,166,894	1,411,659	1,523,383	978,581
Totals/Weighted Averages		\$1,213.7	\$1,468.3	\$1,776.3	\$2,148.9	\$2,599.7	\$3,145.0	\$3,393.9	\$2,180.1		6,749,606	8,165,386	9,878,135	###	14,456,778	17,489,193	18,873,354	12,123,747
Medium Growth Scenario		Household Retail Spending (millions) 1/							Sales Support		Spending-Supported Retail Demand (SF) 3/							
NAICS	Category	2008	2013	2018	2023	2028	2033	2035	'08-'35	Factor 2/	2008	2013	2018	2023	2028	2033	2035	'08-'35
441	Automotive Parts, Accessories and Tire Stores	\$294.6	\$348.7	\$412.6	\$488.3	\$577.9	\$683.8	\$731.5	\$436.9	\$139	2,331,612	2,759,250	3,265,320	3,864,208	4,572,937	5,411,654	5,788,738	3,457,127
442	Furniture and Home Furnishings Stores	\$36.0	\$42.6	\$50.5	\$59.7	\$70.7	\$83.6	\$89.5	\$53.4	\$213	186,320	220,493	260,934	308,791	365,426	432,448	462,581	276,261
443	Electronics and Appliance Stores	\$36.6	\$43.3	\$51.2	\$60.6	\$71.7	\$84.9	\$90.8	\$54.2	\$246	163,554	193,551	229,050	271,060	320,774	379,607	406,058	242,504
444	Building Materials and Garden Equipment	\$145.2	\$171.8	\$203.4	\$240.7	\$284.8	\$337.0	\$360.5	\$215.3	\$157	1,014,684	1,200,786	1,421,021	1,681,648	1,990,077	2,355,075	2,519,177	1,504,492
445	Food and Beverage Stores	\$177.6	\$210.2	\$248.7	\$294.4	\$348.3	\$412.2	\$441.0	\$263.3	\$384	509,142	602,523	713,031	843,808	998,569	1,181,716	1,264,058	754,915
446	Health and Personal Care Stores	\$59.4	\$70.3	\$83.2	\$98.4	\$116.5	\$137.9	\$147.5	\$88.1	\$283	230,981	273,345	323,479	382,808	453,019	536,106	573,462	342,481
448	Clothing and Clothing Accessories Stores	\$73.0	\$86.4	\$102.3	\$121.1	\$143.3	\$169.5	\$181.4	\$108.3	\$267	301,067	356,285	421,631	498,961	590,475	698,773	747,464	446,397
451	Sporting Goods, Hobby, Book and Music Stores	\$31.3	\$37.0	\$43.8	\$51.9	\$61.4	\$72.7	\$77.7	\$46.4	\$240	143,583	169,918	201,082	237,963	281,607	333,256	356,478	212,894
452	General Merchandise Stores	\$178.4	\$211.1	\$249.8	\$295.6	\$349.9	\$414.0	\$442.9	\$264.5	\$171	1,147,798	1,358,314	1,607,441	1,902,260	2,251,151	2,664,031	2,849,661	1,701,863
453	Miscellaneous Store Retailers	\$37.8	\$44.7	\$52.9	\$62.6	\$74.1	\$87.7	\$93.8	\$56.0	\$236	176,062	208,354	246,567	291,790	345,307	408,639	437,113	261,051
722	Foodservices and Drinking Places	\$143.8	\$170.1	\$201.3	\$238.2	\$281.9	\$333.7	\$356.9	\$213.1	\$290	544,802	644,723	762,971	902,906	1,068,507	1,264,480	1,352,590	807,788
Totals/Weighted Averages		\$1,213.7	\$1,436.4	\$1,699.8	\$2,011.5	\$2,380.5	\$2,817.1	\$3,013.4	\$1,799.6		6,749,606	7,987,543	9,452,528	###	13,237,850	15,665,787	16,757,380	10,007,774

1/ From Exhibit 1.13

2/ Based on national averages derived from "Dollars & Cents of Shopping Centers," Urban Land Institute, 2007.

3/ Assumes a market-clearing retail space vacancy rate of 10%.

* Estimate

**EXHIBIT 1.15
PROJECTIONS OF COMMERCIAL RETAIL SPACE NEED
HILLSBORO, OREGON
2008-2035**

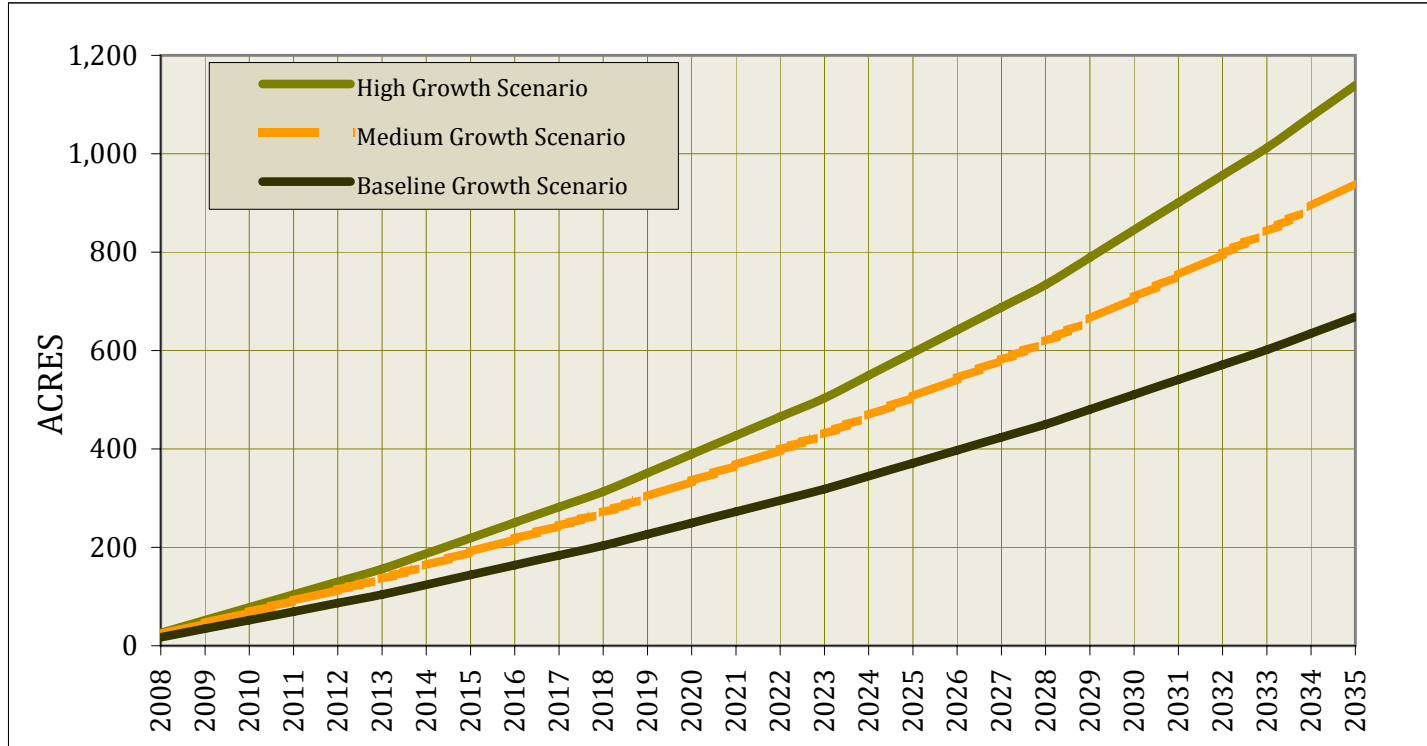
Baseline Growth Scenario		Spending-Supported Retail Demand (SF) 1/							Retail	Commercial Retail Land Need (Acres)								
NAICS	Category	2008	2013	2018	2023	2028	2033	2035	'08-'35	F.A.R. 2/	2008	2013	2018	2023	2028	2033	2035	'08-'35
441	Automotive Parts, Accessories and Tire Stores	1,895,814	2,179,356	2,505,305	2,880,003	3,310,742	3,805,904	4,024,119	2,128,305	0.25	174.1	200.1	230.1	264.5	304.0	349.5	369.5	195.4
442	Furniture and Home Furnishings Stores	186,320	214,187	246,221	283,047	325,380	374,044	395,490	209,170	0.25	17.1	19.7	22.6	26.0	29.9	34.3	36.3	19.2
443	Electronics and Appliance Stores	163,554	188,015	216,135	248,461	285,621	328,339	347,165	183,611	0.25	15.0	17.3	19.8	22.8	26.2	30.2	31.9	16.9
444	Building Materials and Garden Equipment	1,014,684	1,166,443	1,340,898	1,541,446	1,771,988	2,037,010	2,153,804	1,139,119	0.25	93.2	107.1	123.1	141.5	162.7	187.1	197.8	104.6
445	Food and Beverage Stores	509,142	585,291	672,828	773,458	889,137	1,022,119	1,080,723	571,581	0.25	46.8	53.7	61.8	71.0	81.6	93.9	99.2	52.5
446	Health and Personal Care Stores	230,981	265,527	305,240	350,893	403,373	463,702	490,289	259,308	0.25	21.2	24.4	28.0	32.2	37.0	42.6	45.0	23.8
448	Clothing and Clothing Accessories Stores	301,067	346,095	397,857	457,362	525,766	604,400	639,054	337,988	0.25	27.6	31.8	36.5	42.0	48.3	55.5	58.7	31.0
451	Sporting Goods, Hobby, Book and Music Stores	143,583	165,058	189,745	218,123	250,746	288,248	304,775	161,192	0.25	13.2	15.2	17.4	20.0	23.0	26.5	28.0	14.8
452	General Merchandise Stores	1,147,798	1,319,465	1,516,807	1,743,664	2,004,450	2,304,240	2,436,356	1,288,557	0.25	105.4	121.2	139.3	160.1	184.1	211.6	223.7	118.3
453	Miscellaneous Store Retailers	176,062	202,395	232,665	267,463	307,465	353,450	373,716	197,654	0.25	16.2	18.6	21.4	24.6	28.2	32.5	34.3	18.2
722	Foodservices and Drinking Places	544,802	626,283	719,951	827,629	951,411	1,093,706	1,156,414	611,613	0.25	50.0	57.5	66.1	76.0	87.4	100.4	106.2	56.2
Totals/Weighted Averages		6,313,808	7,258,115	8,343,653	9,591,548	11,026,079	12,675,163	13,401,905	7,088,096	0.25	579.8	666.5	766.2	880.8	1,012.5	1,163.9	1,230.7	650.9
High Growth Scenario		Spending-Supported Retail Demand (SF) 1/							Retail	Commercial Retail Land Need (Acres)								
NAICS	Category	2008	2013	2018	2023	2028	2033	2035	'08-'35	F.A.R. 2/	2008	2013	2018	2023	2028	2033	2035	'08-'35
441	Automotive Parts, Accessories and Tire Stores	2,331,612	2,820,684	3,412,344	4,128,108	4,994,009	6,041,539	6,519,689	4,188,077	0.25	214.1	259.0	313.3	379.1	458.6	554.8	598.7	384.6
442	Furniture and Home Furnishings Stores	186,320	225,403	272,682	329,879	399,074	482,783	520,992	334,672	0.25	17.1	20.7	25.0	30.3	36.6	44.3	47.8	30.7
443	Electronics and Appliance Stores	163,554	197,860	239,363	289,571	350,311	423,791	457,332	293,778	0.25	15.0	18.2	22.0	26.6	32.2	38.9	42.0	27.0
444	Building Materials and Garden Equipment	1,014,684	1,227,522	1,485,004	1,796,494	2,173,322	2,629,192	2,837,276	1,822,592	0.25	93.2	112.7	136.4	165.0	199.6	241.4	260.5	167.4
445	Food and Beverage Stores	509,142	615,939	745,136	901,434	1,090,517	1,319,260	1,423,672	914,529	0.25	46.8	56.6	68.4	82.8	100.1	121.1	130.7	84.0
446	Health and Personal Care Stores	230,981	279,431	338,044	408,952	494,732	598,506	645,874	414,892	0.25	21.2	25.7	31.0	37.6	45.4	55.0	59.3	38.1
448	Clothing and Clothing Accessories Stores	301,067	364,218	440,615	533,037	644,845	780,107	841,847	540,780	0.25	27.6	33.4	40.5	48.9	59.2	71.6	77.3	49.7
451	Sporting Goods, Hobby, Book and Music Stores	143,583	173,701	210,136	254,214	307,537	372,045	401,490	257,907	0.25	13.2	16.0	19.3	23.3	28.2	34.2	36.9	23.7
452	General Merchandise Stores	1,147,798	1,388,557	1,679,817	2,032,172	2,458,434	2,974,109	3,209,491	2,061,693	0.25	105.4	127.5	154.3	186.6	225.8	273.1	294.7	189.3
453	Miscellaneous Store Retailers	176,062	212,993	257,669	311,717	377,102	456,202	492,308	316,246	0.25	16.2	19.6	23.7	28.6	34.6	41.9	45.2	29.0
722	Foodservices and Drinking Places	544,802	659,078	797,324	964,569	1,166,894	1,411,659	1,523,383	978,581	0.25	50.0	60.5	73.2	88.6	107.2	129.6	139.9	89.9
Totals/Weighted Averages		6,749,606	8,165,386	9,878,135	11,950,147	14,456,778	17,489,193	18,873,354	12,123,747	0.25	619.8	749.8	907.1	1,097.4	1,327.5	1,606.0	1,733.1	###
Medium Growth Scenario		Spending-Supported Retail Demand (SF) 1/							Retail	Commercial Retail Land Need (Acres)								
NAICS	Category	2008	2013	2018	2023	2028	2033	2035	'08-'35	F.A.R. 2/	2008	2013	2018	2023	2028	2033	2035	'08-'35
441	Automotive Parts, Accessories and Tire Stores	2,331,612	2,759,250	3,265,320	3,864,208	4,572,937	5,411,654	5,788,738	3,457,127	0.25	214.1	253.4	299.8	354.8	419.9	496.9	531.6	317.5
442	Furniture and Home Furnishings Stores	186,320	220,493	260,934	308,791	365,426	432,448	462,581	276,261	0.25	17.1	20.2	24.0	28.4	33.6	39.7	42.5	25.4
443	Electronics and Appliance Stores	163,554	193,551	229,050	271,060	320,774	379,607	406,058	242,504	0.25	15.0	17.8	21.0	24.9	29.5	34.9	37.3	22.3
444	Building Materials and Garden Equipment	1,014,684	1,200,786	1,421,021	1,681,648	1,990,077	2,355,075	2,519,177	1,504,492	0.25	93.2	110.3	130.5	154.4	182.7	216.3	231.3	138.2
445	Food and Beverage Stores	509,142	602,523	713,031	843,808	998,569	1,181,716	1,264,058	754,915	0.25	46.8	55.3	65.5	77.5	91.7	108.5	116.1	69.3
446	Health and Personal Care Stores	230,981	273,345	323,479	382,808	453,019	536,106	573,462	342,481	0.25	21.2	25.1	29.7	35.2	41.6	49.2	52.7	31.4
448	Clothing and Clothing Accessories Stores	301,067	356,285	421,631	498,961	590,475	698,773	747,464	446,397	0.25	27.6	32.7	38.7	45.8	54.2	64.2	68.6	41.0
451	Sporting Goods, Hobby, Book and Music Stores	143,583	169,918	201,082	237,963	281,607	333,256	356,478	212,894	0.25	13.2	15.6	18.5	21.9	25.9	30.6	32.7	19.5
452	General Merchandise Stores	1,147,798	1,358,314	1,607,441	1,902,260	2,251,151	2,664,031	2,849,661	1,701,863	0.25	105.4	124.7	147.6	174.7	206.7	244.6	261.7	156.3
453	Miscellaneous Store Retailers	176,062	208,354	246,567	291,790	345,307	408,639	437,113	261,051	0.25	16.2	19.1	22.6	26.8	31.7	37.5	40.1	24.0
722	Foodservices and Drinking Places	544,802	644,723	762,971	902,906	1,068,507	1,264,480	1,352,590	807,788	0.25	50.0	59.2	70.1	82.9	98.1	116.1	124.2	74.2
Totals/Weighted Averages		6,749,606	7,987,543	9,452,528	11,186,203	13,237,850	15,665,787	16,757,380	10,007,774	0.25	619.8	733.5	868.0	1,027.2	1,215.6	1,438.5	1,538.8	919.0

1/ From Exhibit 1.14

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

*Estimate

EXHIBIT 1.16
COMPARISON OF CUMULATIVE DEMAND FOR COMMERCIAL RETAIL LAND
MEDIUM, HIGH AND LOW GROWTH SCENARIOS
2008-2035



SOURCE: Johnson Reid, LLC

**EXHIBIT 1.17
PROJECTIONS OF OFFICE SPACE-UTILIZING EMPLOYMENT BY INDUSTRY SECTOR
HILLSBORO, OREGON
2008-2060**

Baseline Growth Scenario		Total Employment 1/						Office	Office Space-Utilizing Employment							
Employment Sector	2008	2038	2043	2048	2053	2058	2060	Share 2/	2008	2038	2043	2048	2053	2058	2060	'08-60
Construction	2,933	5,771	6,274	6,821	7,416	7,876	8,336	2%	59	115	125	136	148	158	167	108
Manufacturing	22,016	44,833	48,901	53,339	58,179	61,941	65,703	5%	1,101	2,242	2,445	2,667	2,909	3,097	3,285	2,184
Wholesale Trade	1,879	3,190	3,417	3,660	3,920	4,117	4,315	5%	94	160	171	183	196	206	216	122
Retail Trade	7,656	14,094	15,223	16,442	17,759	18,771	19,782	5%	383	705	761	822	888	939	989	606
Transportation, Warehousing & Utilities	1,536	3,266	3,576	3,916	4,289	4,580	4,870	30%	461	980	1,073	1,175	1,287	1,374	1,461	1,000
Information	1,716	2,751	2,928	3,116	3,317	3,468	3,619	90%	1,544	2,476	2,635	2,805	2,985	3,121	3,258	1,714
Financial Activities	2,582	4,417	4,734	5,075	5,440	5,718	5,995	90%	2,324	3,975	4,261	4,567	4,896	5,146	5,396	3,072
Professional & Business Services	9,727	23,177	25,633	28,348	31,351	33,724	36,097	90%	8,754	20,860	23,069	25,513	28,216	30,351	32,487	23,733
Education & Health Services	10,179	26,949	30,054	33,517	37,378	40,460	43,542	40%	4,072	10,780	12,022	13,407	14,951	16,184	17,417	13,345
Leisure & Hospitality	5,067	10,692	11,700	12,804	14,012	14,954	15,897	25%	1,267	2,673	2,925	3,201	3,503	3,739	3,974	2,707
Other Services	3,319	5,511	5,888	6,291	6,722	7,048	7,374	40%	1,328	2,204	2,355	2,516	2,689	2,819	2,950	1,622
Government	3,611	5,023	5,257	5,503	5,760	5,950	6,141	85%	3,069	4,269	4,469	4,678	4,896	5,058	5,219	2,150
Total	72,220	149,672	163,585	178,831	195,542	208,607	221,673	34%	24,454	51,437	56,311	61,670	67,563	72,191	76,819	52,365
High Growth Scenario		Total Employment 1/						Office	Office Space-Utilizing Employment							
Employment Sector	2008	2038	2043	2048	2053	2058	2060	Share 2/	2008	2038	2043	2048	2053	2058	2060	'08-60
Construction	2,934	7,401	8,636	10,076	11,756	13,174	14,591	2%	59	148	173	202	235	263	292	233
Manufacturing	22,316	78,921	96,715	118,574	145,436	169,833	194,231	5%	1,116	3,946	4,836	5,929	7,272	8,492	9,712	8,596
Wholesale Trade	1,883	4,132	4,714	5,379	6,137	6,763	7,389	5%	94	207	236	269	307	338	369	275
Retail Trade	7,665	18,070	20,850	24,058	27,759	30,846	33,932	5%	383	904	1,043	1,203	1,388	1,542	1,697	1,313
Transportation, Warehousing & Utilities	1,539	4,499	5,377	6,427	7,681	8,773	9,864	30%	462	1,350	1,613	1,928	2,304	2,632	2,959	2,498
Information	1,718	3,586	4,060	4,597	5,206	5,706	6,206	90%	1,546	3,227	3,654	4,138	4,685	5,135	5,585	4,039
Financial Activities	2,586	5,603	6,377	7,259	8,262	9,088	9,913	90%	2,327	5,043	5,739	6,533	7,436	8,179	8,921	6,594
Professional & Business Services	9,757	36,178	44,858	55,637	69,022	81,251	93,481	90%	8,781	32,560	40,373	50,073	62,120	73,126	84,133	75,352
Education & Health Services	10,189	39,351	49,265	61,679	77,225	91,517	105,809	40%	4,076	15,740	19,706	24,672	30,890	36,607	42,324	38,248
Leisure & Hospitality	5,075	14,552	17,338	20,658	24,613	28,041	31,469	25%	1,269	3,638	4,335	5,164	6,153	7,010	7,867	6,599
Other Services	3,324	6,937	7,848	8,879	10,047	11,000	11,954	40%	1,330	2,775	3,139	3,552	4,019	4,400	4,782	3,452
Government	3,611	5,665	6,109	6,588	7,104	7,501	7,898	85%	3,070	4,815	5,193	5,600	6,039	6,376	6,714	3,644
Total	72,596	224,896	272,148	329,810	400,249	463,494	526,738	33%	24,511	74,352	90,038	109,261	132,848	154,101	175,354	150,843
Medium Growth Scenario		Total Employment 1/						Office	Office Space-Utilizing Employment							
Employment Sector	2008	2038	2043	2048	2053	2058	2060	Share 2/	2008	2038	2043	2048	2053	2058	2060	'08-60
Construction	2,934	6,707	7,645	8,714	9,933	10,933	11,932	2%	59	134	153	174	199	219	239	180
Manufacturing	22,316	61,036	70,140	80,609	92,648	102,762	112,875	5%	1,116	3,052	3,507	4,030	4,632	5,138	5,644	4,528
Wholesale Trade	1,883	3,734	4,171	4,660	5,207	5,646	6,086	5%	94	187	209	233	260	282	304	210
Retail Trade	7,665	16,406	18,533	20,937	23,652	25,859	28,065	5%	383	820	927	1,047	1,183	1,293	1,403	1,020
Transportation, Warehousing & Utilities	1,539	3,911	4,506	5,192	5,981	6,638	7,296	30%	462	1,173	1,352	1,558	1,794	1,992	2,189	1,727
Information	1,718	3,228	3,576	3,963	4,392	4,735	5,078	90%	1,546	2,905	3,219	3,567	3,953	4,262	4,571	3,024
Financial Activities	2,586	5,120	5,723	6,397	7,152	7,758	8,364	90%	2,327	4,608	5,151	5,758	6,436	6,982	7,527	5,200
Professional & Business Services	9,757	29,276	34,193	39,936	46,644	52,334	58,024	90%	8,781	26,348	30,774	35,943	41,980	47,101	52,222	43,441
Education & Health Services	10,189	32,675	38,593	45,582	53,838	60,906	67,974	40%	4,076	13,070	15,437	18,233	21,535	24,362	27,190	23,114
Leisure & Hospitality	5,075	12,738	14,660	16,871	19,417	21,531	23,646	25%	1,269	3,185	3,665	4,218	4,854	5,383	5,912	4,643
Other Services	3,324	6,364	7,081	7,880	8,768	9,479	10,190	40%	1,330	2,546	2,833	3,152	3,507	3,792	4,076	2,747
Government	3,611	5,491	5,916	6,375	6,869	7,247	7,626	85%	3,070	4,668	5,029	5,418	5,838	6,160	6,482	3,413
Total	72,596	186,687	214,739	247,117	284,502	315,829	347,157	34%	24,511	62,696	72,254	83,330	96,172	106,965	117,758	93,246

1/ Johnson Reid, LLC

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

* Estimate

**EXHIBIT 1.18
DEMAND PROJECTIONS FOR COMMERCIAL OFFICE SPACE BY INDUSTRY SECTOR
HILLSBORO, OREGON
2008-2060**

Baseline Growth Scenario Employment Sector	Local Area Jobs in Office Space 1/							'08-60	Avg. Space Per Job 2/	Projected Office Space Need 3/							
	2008	2038	2043	2048	2053	2058	2060			2008	2038	2043	2048	2053	2058	2060	'08-60
Construction	59	115	125	136	148	158	167	108	366	23,616	46,465	50,516	54,921	59,711	63,418	67,125	43,510
Manufacturing	1,101	2,242	2,445	2,667	2,909	3,097	3,285	2,184	366	443,180	902,481	984,380	1,073,710	1,171,148	1,246,870	1,322,592	879,412
Wholesale Trade	94	160	171	183	196	206	216	122	366	37,827	64,219	68,782	73,669	78,903	82,882	86,861	49,034
Retail Trade	383	705	761	822	888	939	989	606	366	154,123	283,711	306,437	330,983	357,496	377,858	398,219	244,096
Transportation, Warehousing & Utilities	461	980	1,073	1,175	1,287	1,374	1,461	1,000	366	185,461	394,417	431,929	473,008	517,994	553,124	588,253	402,792
Information	1,544	2,476	2,635	2,805	2,985	3,121	3,258	1,714	366	621,606	996,672	1,060,831	1,129,119	1,201,803	1,256,646	1,311,489	689,883
Financial Activities	2,324	3,975	4,261	4,567	4,896	5,146	5,396	3,072	366	935,535	1,600,388	1,715,489	1,838,869	1,971,122	2,071,765	2,172,408	1,236,873
Professional & Business Services	8,754	20,860	23,069	25,513	28,216	30,351	32,487	23,733	366	3,524,425	8,398,094	9,287,704	10,271,551	11,359,616	12,219,425	13,079,234	9,554,809
Education & Health Services	4,072	10,780	12,022	13,407	14,951	16,184	17,417	13,345	366	1,639,217	4,339,933	4,839,920	5,397,509	6,019,336	6,515,700	7,012,064	5,372,847
Leisure & Hospitality	1,267	2,673	2,925	3,201	3,503	3,739	3,974	2,707	366	509,980	1,076,134	1,177,648	1,288,738	1,410,308	1,505,159	1,600,010	1,090,031
Other Services	1,328	2,204	2,355	2,516	2,689	2,819	2,950	1,622	366	534,567	887,415	948,167	1,013,078	1,082,432	1,135,004	1,187,577	653,009
Government	3,069	4,269	4,469	4,678	4,896	5,058	5,219	2,150	366	1,235,618	1,718,752	1,799,082	1,883,168	1,971,183	2,036,270	2,101,358	865,740
Total	24,454	51,437	56,311	61,670	67,563	72,191	76,819	52,365	366	9,845,154	20,708,681	22,670,885	24,828,323	27,201,051	29,064,120	30,927,190	21,082,036
High Growth Scenario	Local Area Jobs in Office Space 1/							'08-60	Avg. Space Per Job 2/	Projected Office Space Need 3/							
Employment Sector	2008	2038	2043	2048	2053	2058	2060			2008	2038	2043	2048	2053	2058	2060	'08-60
Construction	59	148	173	202	235	263	292	233	366	23,621	59,596	69,535	81,132	94,662	106,076	117,489	93,868
Manufacturing	1,116	3,946	4,836	5,929	7,272	8,492	9,712	8,596	366	449,217	1,588,685	1,946,882	2,386,899	2,927,623	3,418,743	3,909,863	3,460,645
Wholesale Trade	94	207	236	269	307	338	369	275	366	37,908	83,185	94,902	108,275	123,537	136,141	148,746	110,838
Retail Trade	383	904	1,043	1,203	1,388	1,542	1,697	1,313	366	154,300	363,754	419,714	484,284	558,793	620,923	683,053	528,754
Transportation, Warehousing & Utilities	462	1,350	1,613	1,928	2,304	2,632	2,959	2,498	366	185,839	543,393	649,442	776,198	927,707	1,059,563	1,191,419	1,005,579
Information	1,546	3,227	3,654	4,138	4,685	5,135	5,585	4,039	366	622,512	1,299,360	1,471,140	1,665,780	1,886,358	2,067,507	2,248,657	1,626,145
Financial Activities	2,327	5,043	5,739	6,533	7,436	8,179	8,921	6,594	366	937,039	2,030,125	2,310,700	2,630,135	2,993,834	3,292,793	3,591,752	2,654,713
Professional & Business Services	8,781	32,560	40,373	50,073	62,120	73,126	84,133	75,352	366	3,535,180	13,108,614	16,254,007	20,159,388	25,009,437	29,440,632	33,871,826	30,336,646
Education & Health Services	4,076	15,740	19,706	24,672	30,890	36,607	42,324	38,248	366	1,640,803	6,337,090	7,933,595	9,932,781	12,436,307	14,737,930	17,039,552	15,398,749
Leisure & Hospitality	1,269	3,638	4,335	5,164	6,153	7,010	7,867	6,599	366	510,812	1,464,671	1,745,090	2,079,213	2,477,330	2,822,352	3,167,374	2,656,561
Other Services	1,330	2,775	3,139	3,552	4,019	4,400	4,782	3,452	366	535,261	1,117,076	1,263,826	1,429,924	1,617,939	1,771,500	1,925,061	1,389,800
Government	3,070	4,815	5,193	5,600	6,039	6,376	6,714	3,644	366	1,235,782	1,938,677	2,090,521	2,254,363	2,431,169	2,567,043	2,702,916	1,467,133
Total	24,511	74,352	90,038	109,261	132,848	154,101	175,354	150,843	366	9,868,275	29,934,225	36,249,356	43,988,373	53,484,697	62,041,202	70,597,708	60,729,433
Medium Growth Scenario	Local Area Jobs in Office Space 1/							'08-60	Avg. Space Per Job 2/	Projected Office Space Need 3/							
Employment Sector	2008	2038	2043	2048	2053	2058	2060			2008	2038	2043	2048	2053	2058	2060	'08-60
Construction	59	134	153	174	199	219	239	180	366	23,621	54,005	61,559	70,169	79,984	88,032	96,079	72,459
Manufacturing	1,116	3,052	3,507	4,030	4,632	5,138	5,644	4,528	366	449,217	1,228,649	1,411,925	1,622,663	1,865,013	2,068,591	2,272,170	1,822,953
Wholesale Trade	94	187	209	233	260	282	304	210	366	37,908	75,170	83,970	93,810	104,812	113,662	122,513	84,605
Retail Trade	383	820	927	1,047	1,183	1,293	1,403	1,020	366	154,300	330,249	373,070	421,452	476,121	520,535	564,950	410,650
Transportation, Warehousing & Utilities	462	1,173	1,352	1,558	1,794	1,992	2,189	1,727	366	185,839	472,424	544,273	627,054	722,432	801,796	881,160	695,321
Information	1,546	2,905	3,219	3,567	3,953	4,262	4,571	3,024	366	622,512	1,169,606	1,295,831	1,435,915	1,591,430	1,715,758	1,840,086	1,217,574
Financial Activities	2,327	4,608	5,151	5,758	6,436	6,982	7,527	5,200	366	937,039	1,855,177	2,073,657	2,317,996	2,591,287	2,810,889	3,030,491	2,093,452
Professional & Business Services	8,781	26,348	30,774	35,943	41,980	47,101	52,222	43,441	366	3,535,180	10,607,888	12,389,561	14,470,477	16,901,037	18,962,742	21,024,447	17,489,267
Education & Health Services	4,076	13,070	15,437	18,233	21,535	24,362	27,190	23,114	366	1,640,803	5,262,059	6,215,034	7,340,596	8,670,012	9,808,295	10,946,579	9,305,776
Leisure & Hospitality	1,269	3,185	3,665	4,218	4,854	5,383	5,912	4,643	366	510,812	1,282,083	1,475,498	1,698,102	1,954,308	2,167,140	2,379,971	1,869,158
Other Services	1,330	2,546	2,833	3,152	3,507	3,792	4,076	2,747	366	535,261	1,024,931	1,140,380	1,268,925	1,412,073	1,526,541	1,641,008	1,105,747
Government	3,070	4,668	5,029	5,418	5,838	6,160	6,482	3,413	366	1,235,782	1,879,182	2,024,668	2,181,482	2,350,521	2,480,154	2,609,787	1,374,004
Total	24,511	62,696	72,254	83,330	96,172	106,965	117,758	93,246	366	9,868,275	25,241,421	29,089,424	33,548,641	38,719,030	43,064,135	47,409,240	37,540,965

1/ From Exhibit 1.16

2/ Average office employment density by industry sector based on Urban Land Institute guidelines.

3/ Assumes a market-clearing 10% office space vacancy rate.

*Estimate

EXHIBIT 1.19
OFFICE FLOOR AREA RATIO WORKSHEET - TRENDING OFFICE SPACE-UTILIZING INDUSTRIAL LAND
HILLSBORO, OREGON
2008-2060

Office-Utilizing Space FAR	Floor Area Ratio Trend							
	Employment Sector	2008	2028	2035	2058	2060	08-35	08-60
Construction	0.35	0.43	0.46	0.55	0.56	0.56	0.11	0.21
Manufacturing	0.35	0.43	0.46	0.55	0.56	0.56	0.11	0.21
Wholesale Trade	0.35	0.43	0.46	0.55	0.56	0.56	0.11	0.21
Retail Trade	0.35	0.43	0.46	0.55	0.56	0.56	0.11	0.21
Transportation, Warehousing & Utilities	0.35	0.43	0.46	0.55	0.56	0.56	0.11	0.21
Information	0.35	0.43	0.46	0.55	0.56	0.56	0.11	0.21
Financial Activities	0.35	0.43	0.46	0.55	0.56	0.56	0.11	0.21
Professional & Business Services	0.35	0.43	0.46	0.55	0.56	0.56	0.11	0.21
Education & Health Services	0.35	0.43	0.46	0.55	0.56	0.56	0.11	0.21
Leisure & Hospitality	0.35	0.43	0.46	0.55	0.56	0.56	0.11	0.21
Other Services	0.35	0.43	0.46	0.55	0.56	0.56	0.11	0.21
Government	0.35	0.43	0.46	0.55	0.56	0.56	0.11	0.21
Total	0.35	0.43	0.46	0.55	0.56	0.56	0.11	0.21

SOURCE: Johnson Reid, LLC

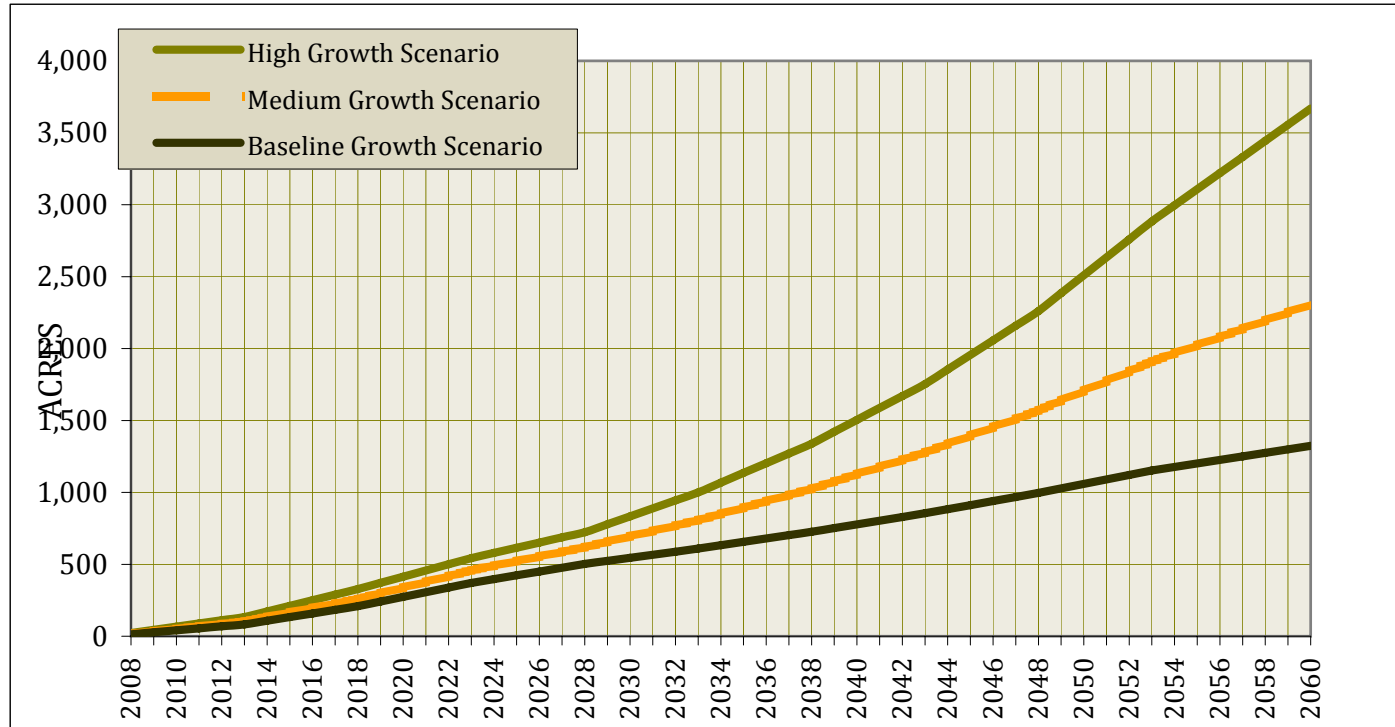
**EXHIBIT 1.20
DEMAND PROJECTIONS FOR COMMERCIAL OFFICE LAND BY INDUSTRY SECTOR
HILLSBORO, OREGON
2008-2060**

Baseline Growth Scenario Employment Sector	Projected Office Space Need 1/							Predicted Land Need (Acres)								
	2008	2038	2043	2048	2053	2058	2060	'08-60	2008	2038	2043	2048	2053	2058	2060	'08-60
Construction	23,616	46,465	50,516	54,921	59,711	63,418	67,125	43,510	1.5	3.0	3.3	3.6	3.9	4.2	4.4	2.9
Manufacturing	443,180	902,481	984,380	1,073,710	1,171,148	1,246,870	1,322,592	879,412	29.1	59.2	64.6	70.4	76.8	81.8	86.8	57.7
Wholesale Trade	37,827	64,219	68,782	73,669	78,903	82,882	86,861	49,034	2.5	4.2	4.5	4.8	5.2	5.4	5.7	3.2
Retail Trade	154,123	283,711	306,437	330,983	357,496	377,858	398,219	244,096	10.1	18.6	20.1	21.7	23.4	24.8	26.1	16.0
Transportation, Warehousing & Utilities	185,461	394,417	431,929	473,008	517,994	553,124	588,253	402,792	12.2	25.9	28.3	31.0	34.0	36.3	38.6	26.4
Information	621,606	996,672	1,060,831	1,129,119	1,201,803	1,256,646	1,311,489	689,883	40.8	65.4	69.6	74.1	78.8	82.4	86.0	45.3
Financial Activities	935,535	1,600,388	1,715,489	1,838,869	1,971,122	2,071,765	2,172,408	1,236,873	61.4	105.0	112.5	120.6	129.3	135.9	142.5	81.1
Professional & Business Services	3,524,425	8,398,094	9,287,704	10,271,551	11,359,616	12,219,425	13,079,234	9,554,809	231.2	550.8	609.2	673.7	745.1	801.5	857.9	626.7
Education & Health Services	1,639,217	4,339,933	4,839,920	5,397,509	6,019,336	6,515,700	7,012,064	5,372,847	107.5	284.7	317.5	354.0	394.8	427.4	459.9	352.4
Leisure & Hospitality	509,980	1,076,134	1,177,648	1,288,738	1,410,308	1,505,159	1,600,010	1,090,031	33.5	70.6	77.2	84.5	92.5	98.7	104.9	71.5
Other Services	534,567	887,415	948,167	1,013,078	1,082,432	1,135,004	1,187,577	653,009	35.1	58.2	62.2	66.4	71.0	74.4	77.9	42.8
Government	1,235,618	1,718,752	1,799,082	1,883,168	1,971,183	2,036,270	2,101,358	865,740	81.0	112.7	118.0	123.5	129.3	133.6	137.8	56.8
Total	9,845,154	20,708,681	22,670,885	24,828,323	27,201,051	29,064,120	30,927,190	21,082,036	645.8	1,358.3	1,487.0	1,628.5	1,784.1	1,906.3	2,028.5	1,382.8
High Growth Scenario	Projected Office Space Need 1/							Predicted Land Need (Acres)								
Employment Sector	2008	2038	2043	2048	2053	2058	2060	'08-60	2008	2038	2043	2048	2053	2058	2060	'08-60
Construction	23,621	59,596	69,535	81,132	94,662	106,076	117,489	93,868	1.5	3.9	4.6	5.3	6.2	7.0	7.7	6.2
Manufacturing	449,217	1,588,685	1,946,882	2,386,899	2,927,623	3,418,743	3,909,863	3,460,645	29.5	104.2	127.7	156.6	192.0	224.2	256.5	227.0
Wholesale Trade	37,908	83,185	94,902	108,275	123,537	136,141	148,746	110,838	2.5	5.5	6.2	7.1	8.1	8.9	9.8	7.3
Retail Trade	154,300	363,754	419,714	484,284	558,793	620,923	683,053	528,754	10.1	23.9	27.5	31.8	36.7	40.7	44.8	34.7
Transportation, Warehousing & Utilities	185,839	543,393	649,442	776,198	927,707	1,059,563	1,191,419	1,005,579	12.2	35.6	42.6	50.9	60.8	69.5	78.1	66.0
Information	622,512	1,299,360	1,471,140	1,665,780	1,886,358	2,067,507	2,248,657	1,626,145	40.8	85.2	96.5	109.3	123.7	135.6	147.5	106.7
Financial Activities	937,039	2,030,125	2,310,700	2,630,135	2,993,834	3,292,793	3,591,752	2,654,713	61.5	133.2	151.6	172.5	196.4	216.0	235.6	174.1
Professional & Business Services	3,535,180	13,108,614	16,254,007	20,159,388	25,009,437	29,440,632	33,871,826	30,336,646	231.9	859.8	1,066.1	1,322.3	1,640.4	1,931.0	2,221.7	1,989.8
Education & Health Services	1,640,803	6,337,090	7,933,595	9,932,781	12,436,307	14,737,930	17,039,552	15,398,749	107.6	415.7	520.4	651.5	815.7	966.7	1,117.6	1,010.0
Leisure & Hospitality	510,812	1,464,671	1,745,090	2,079,213	2,477,330	2,822,352	3,167,374	2,656,561	33.5	96.1	114.5	136.4	162.5	185.1	207.8	174.2
Other Services	535,261	1,117,076	1,263,826	1,429,924	1,617,939	1,771,500	1,925,061	1,389,800	35.1	73.3	82.9	93.8	106.1	116.2	126.3	91.2
Government	1,235,782	1,938,677	2,090,521	2,254,363	2,431,169	2,567,043	2,702,916	1,467,133	81.1	127.2	137.1	147.9	159.5	168.4	177.3	96.2
Total	9,868,275	29,934,225	36,249,356	43,988,373	53,484,697	62,041,202	70,597,708	60,729,433	647.3	1,963.4	2,377.6	2,885.2	3,508.1	4,069.3	4,630.6	3,983.3
Medium Growth Scenario	Projected Office Space Need 1/							Predicted Land Need (Acres)								
Employment Sector	2008	2038	2043	2048	2053	2058	2060	'08-60	2008	2038	2043	2048	2053	2058	2060	'08-60
Construction	23,621	54,005	61,559	70,169	79,984	88,032	96,079	72,459	1.5	3.5	4.0	4.6	5.2	5.8	6.3	4.8
Manufacturing	449,217	1,228,649	1,411,925	1,622,663	1,865,013	2,068,591	2,272,170	1,822,953	29.5	80.6	92.6	106.4	122.3	135.7	149.0	119.6
Wholesale Trade	37,908	75,170	83,970	93,810	104,812	113,662	122,513	84,605	2.5	4.9	5.5	6.2	6.9	7.5	8.0	5.5
Retail Trade	154,300	330,249	373,070	421,452	476,121	520,535	564,950	410,650	10.1	21.7	24.5	27.6	31.2	34.1	37.1	26.9
Transportation, Warehousing & Utilities	185,839	472,424	544,273	627,054	722,432	801,796	881,160	695,321	12.2	31.0	35.7	41.1	47.4	52.6	57.8	45.6
Information	622,512	1,169,606	1,295,831	1,435,915	1,591,430	1,715,758	1,840,086	1,217,574	40.8	76.7	85.0	94.2	104.4	112.5	120.7	79.9
Financial Activities	937,039	1,855,177	2,073,657	2,317,996	2,591,287	2,810,889	3,030,491	2,093,452	61.5	121.7	136.0	152.0	170.0	184.4	198.8	137.3
Professional & Business Services	3,535,180	10,607,888	12,389,561	14,470,477	16,901,037	18,962,742	21,024,447	17,489,267	231.9	695.8	812.6	949.1	1,108.6	1,243.8	1,379.0	1,147.1
Education & Health Services	1,640,803	5,262,059	6,215,034	7,340,596	8,670,012	9,808,295	10,946,579	9,305,776	107.6	345.1	407.7	481.5	568.7	643.3	718.0	610.4
Leisure & Hospitality	510,812	1,282,083	1,475,498	1,698,102	1,954,308	2,167,140	2,379,971	1,869,158	33.5	84.1	96.8	111.4	128.2	142.1	156.1	122.6
Other Services	535,261	1,024,931	1,140,380	1,268,925	1,412,073	1,526,541	1,641,008	1,105,747	35.1	67.2	74.8	83.2	92.6	100.1	107.6	72.5
Government	1,235,782	1,879,182	2,024,668	2,181,482	2,350,521	2,480,154	2,609,787	1,374,004	81.1	123.3	132.8	143.1	154.2	162.7	171.2	90.1
Total	9,868,275	25,241,421	29,089,424	33,548,641	38,719,030	43,064,135	47,409,240	37,540,965	647.3	1,655.6	1,908.0	2,200.5	2,539.6	2,824.6	3,109.6	2,462.3

1/ From Exhibit 1.18

*Estimate

EXHIBIT 1.21
COMPARISON OF CUMULATIVE DEMAND FOR OFFICE LAND
MEDIUM, HIGH AND LOW EMPLOYMENT GROWTH SCENARIOS
2008-2060



SOURCE: Johnson Reid, LLC

EXHIBIT 1.22
PROJECTIONS OF INDUSTRIAL SPACE-UTILIZING EMPLOYMENT BY INDUSTRY SECTOR
HILLSBORO, OREGON
2008-2060

Baseline Growth Scenario Employment Sector	Total Employment 1/						Industrial Share 2/	Industrial Space-Utilizing Employment								08-60
	2008	2038	2043	2048	2053	2058		2060	2008	2038	2043	2048	2053	2058	2060	
Construction	2,933	5,771	6,274	6,821	7,416	7,876	8,336	30%	880	1,731	1,882	2,046	2,225	2,363	2,501	1,621
Manufacturing	22,016	44,833	48,901	53,339	58,179	61,941	65,703	95%	20,915	42,591	46,456	50,672	55,270	58,844	62,417	41,502
Wholesale Trade	1,879	3,190	3,417	3,660	3,920	4,117	4,315	95%	1,785	3,031	3,246	3,477	3,724	3,911	4,099	2,314
Retail Trade	7,656	14,094	15,223	16,442	17,759	18,771	19,782	0%	0	0	0	0	0	0	0	0
Transportation, Warehousing & Utilities	1,536	3,266	3,576	3,916	4,289	4,580	4,870	70%	1,075	2,286	2,503	2,741	3,002	3,206	3,409	2,334
Information	1,716	2,751	2,928	3,116	3,317	3,468	3,619	10%	172	275	293	312	332	347	362	190
Financial Activities	2,582	4,417	4,734	5,075	5,440	5,718	5,995	0%	0	0	0	0	0	0	0	0
Professional & Business Services	9,727	23,177	25,633	28,348	31,351	33,724	36,097	10%	973	2,318	2,563	2,835	3,135	3,372	3,610	2,637
Education & Health Services	10,179	26,949	30,054	33,517	37,378	40,460	43,542	0%	0	0	0	0	0	0	0	0
Leisure & Hospitality	5,067	10,692	11,700	12,804	14,012	14,954	15,897	0%	0	0	0	0	0	0	0	0
Other Services	3,319	5,511	5,888	6,291	6,722	7,048	7,374	60%	1,992	3,306	3,533	3,775	4,033	4,229	4,425	2,433
Government	3,611	5,023	5,257	5,503	5,760	5,950	6,141	15%	542	753	789	825	864	893	921	379
Total	72,220	149,672	163,585	178,831	195,542	208,607	221,673	39%	28,333	56,291	61,265	66,683	72,584	77,164	81,744	53,412
High Growth Scenario	Total Employment 1/						Industrial	Industrial Space-Utilizing Employment								
Employment Sector	2008	2038	2043	2048	2053	2058	2060	Share 2/	2008	2038	2043	2048	2053	2058	2060	08-60
Construction	2,934	7,401	8,636	10,076	11,756	13,174	14,591	30%	880	2,220	2,591	3,023	3,527	3,952	4,377	3,497
Manufacturing	22,316	78,921	96,715	118,574	145,436	169,833	194,231	95%	21,200	74,975	91,880	112,645	138,164	161,342	184,519	163,319
Wholesale Trade	1,883	4,132	4,714	5,379	6,137	6,763	7,389	95%	1,789	3,926	4,479	5,110	5,830	6,425	7,020	5,231
Retail Trade	7,665	18,070	20,850	24,058	27,759	30,846	33,932	0%	0	0	0	0	0	0	0	0
Transportation, Warehousing & Utilities	1,539	4,499	5,377	6,427	7,681	8,773	9,864	70%	1,077	3,149	3,764	4,499	5,377	6,141	6,905	5,828
Information	1,718	3,586	4,060	4,597	5,206	5,706	6,206	10%	172	359	406	460	521	571	621	449
Financial Activities	2,586	5,603	6,377	7,259	8,262	9,088	9,913	0%	0	0	0	0	0	0	0	0
Professional & Business Services	9,757	36,178	44,858	55,637	69,022	81,251	93,481	10%	976	3,618	4,486	5,564	6,902	8,125	9,348	8,372
Education & Health Services	10,189	39,351	49,265	61,679	77,225	91,517	105,809	0%	0	0	0	0	0	0	0	0
Leisure & Hospitality	5,075	14,552	17,338	20,658	24,613	28,041	31,469	0%	0	0	0	0	0	0	0	0
Other Services	3,324	6,937	7,848	8,879	10,047	11,000	11,954	60%	1,994	4,162	4,709	5,328	6,028	6,600	7,172	5,178
Government	3,611	5,665	6,109	6,588	7,104	7,501	7,898	15%	542	850	916	988	1,066	1,125	1,185	643
Total	72,596	224,896	272,148	329,810	400,249	463,494	526,738	42%	28,630	93,259	113,230	137,616	167,414	194,281	221,147	192,518
Medium Growth Scenario	Total Employment 1/						Industrial	Industrial Space-Utilizing Employment								
Employment Sector	2008	2038	2043	2048	2053	2058	2060	Share 2/	2008	2038	2043	2048	2053	2058	2060	08-60
Construction	2,934	6,707	7,645	8,714	9,933	10,933	11,932	30%	880	2,012	2,294	2,614	2,980	3,280	3,580	2,700
Manufacturing	22,316	61,036	70,140	80,609	92,648	102,762	112,875	95%	21,200	57,984	66,633	76,579	88,016	97,624	107,231	86,031
Wholesale Trade	1,883	3,734	4,171	4,660	5,207	5,646	6,086	95%	1,789	3,548	3,963	4,427	4,946	5,364	5,782	3,993
Retail Trade	7,665	16,406	18,533	20,937	23,652	25,859	28,065	0%	0	0	0	0	0	0	0	0
Transportation, Warehousing & Utilities	1,539	3,911	4,506	5,192	5,981	6,638	7,296	70%	1,077	2,738	3,154	3,634	4,187	4,647	5,107	4,030
Information	1,718	3,228	3,576	3,963	4,392	4,735	5,078	10%	172	323	358	396	439	474	508	336
Financial Activities	2,586	5,120	5,723	6,397	7,152	7,758	8,364	0%	0	0	0	0	0	0	0	0
Professional & Business Services	9,757	29,276	34,193	39,936	46,644	52,334	58,024	10%	976	2,928	3,419	3,994	4,664	5,233	5,802	4,827
Education & Health Services	10,189	32,675	38,593	45,582	53,838	60,906	67,974	0%	0	0	0	0	0	0	0	0
Leisure & Hospitality	5,075	12,738	14,660	16,871	19,417	21,531	23,646	0%	0	0	0	0	0	0	0	0
Other Services	3,324	6,364	7,081	7,880	8,768	9,479	10,190	60%	1,994	3,819	4,249	4,728	5,261	5,688	6,114	4,120
Government	3,611	5,491	5,916	6,375	6,869	7,247	7,626	15%	542	824	887	956	1,030	1,087	1,144	602
Total	72,596	186,687	214,739	247,117	284,502	315,829	347,157	40%	28,630	74,174	84,957	97,328	111,524	123,396	135,268	106,638

1/ From Exhibit 1.17

2/ Share of industry employment that utilizes industrial space. Regional Industrial Land Study Phase III (EcoNorthwest and Otak, Inc., 2001) converted to NAICS by Johnson Reid, LLC.

* Estimate

EXHIBIT 1.23
INDUSTRIAL EMPLOYMENT DENSITY WORKSHEET BY INDUSTRY SECTOR
HILLSBORO, OREGON
2008-2060

Industrial Space Density Employment Sector	Distribution by Building Type 1/			Square Feet per Job 2/			Average Space per Job			Weighted Average
	Warehouse/ Distrib.	General Industrial	Tech/ Flex	Warehouse/ Distrib.	General Industrial	Tech/ Flex	Warehouse/ Distrib.	General Industrial	Tech/ Flex	
Construction	0%	75%	25%	1,350	533	467	0	400	117	517
Manufacturing	0%	75%	25%	1,350	533	467	0	400	117	517
Wholesale Trade	90%	0%	10%	2,746	533	467	2,471	0	47	2,518
Retail Trade	0%	0%	0%	1,350	533	467	0	0	0	0
Transportation, Warehousing & Utilitie:	100%	0%	0%	1,707	533	467	1,707	0	0	1,707
Information	0%	0%	100%	1,350	533	467	0	0	467	467
Financial Activities	0%	0%	0%	1,350	533	467	0	0	0	0
Professional & Business Services	0%	0%	100%	1,350	533	467	0	0	467	467
Education & Health Services	0%	0%	0%	1,350	533	467	0	0	0	0
Leisure & Hospitality	0%	0%	0%	1,350	533	467	0	0	0	0
Other Services	0%	75%	25%	1,350	533	467	0	400	117	517
Government	50%	0%	50%	1,350	533	467	675	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 1.24
DEMAND PROJECTIONS FOR COMMERCIAL INDUSTRIAL SPACE BY INDUSTRY SECTOR
HILLSBORO, OREGON
2008-2060**

Baseline Growth Scenario		Local Area Jobs in Industrial Space 1/							Avg. Space		Projected Industrial Space Need 3/							
Employment Sector	2008	2038	2043	2048	2053	2058	2060	08-60	Per Job 2/	2008	2033	2038	2043	2048	2053	2058	2060	08-60
Construction	880	1,731	1,882	2,046	2,225	2,363	2,501	1,621	517	499,898	904,674	983,563	1,069,331	1,162,578	1,263,956	1,342,432	1,420,908	921,011
Manufacturing	20,915	42,591	46,456	50,672	55,270	58,844	62,417	41,502	517	11,882,911	22,184,853	24,198,087	26,394,018	28,789,226	31,401,794	33,432,121	35,462,449	23,579,537
Wholesale Trade	1,785	3,031	3,246	3,477	3,724	3,911	4,099	2,314	2,518	4,944,829	7,837,898	8,394,774	8,991,215	9,630,033	10,314,238	10,834,399	11,354,559	6,409,730
Transportation, Warehousing & Utilities	1,075	2,286	2,503	2,741	3,002	3,206	3,409	2,334	1,707	2,018,281	3,919,479	4,292,249	4,700,471	5,147,518	5,637,082	6,019,377	6,401,672	4,383,391
Information	172	275	293	312	332	347	362	190	467	88,127	132,755	141,301	150,397	160,078	170,383	178,158	185,934	97,807
Professional & Business Services	973	2,318	2,563	2,835	3,135	3,372	3,610	2,637	467	499,668	1,076,580	1,190,622	1,316,745	1,456,228	1,610,486	1,732,384	1,854,281	1,354,613
Other Services	1,992	3,306	3,533	3,775	4,033	4,229	4,425	2,433	517	1,131,574	1,758,124	1,878,483	2,007,083	2,144,486	2,291,295	2,402,581	2,513,866	1,382,292
Government	542	753	789	825	864	893	921	379	909	541,253	719,269	752,886	788,074	824,907	863,462	891,973	920,484	379,231
Total	28,333	56,291	61,265	66,683	72,584	77,164	81,744	53,412	693	21,606,541	38,533,633	41,831,966	45,417,334	49,315,054	53,552,696	56,833,425	60,114,154	38,507,613
High Growth Scenario		Local Area Jobs in Industrial Space 1/							Avg. Space		Projected Industrial Space Need 3/							
Employment Sector	2008	2038	2043	2048	2053	2058	2060	08-60	Per Job 2/	2008	2033	2038	2043	2048	2053	2058	2060	08-60
Construction	880	2,220	2,591	3,023	3,527	3,952	4,377	3,497	517	500,005	1,081,217	1,261,533	1,471,921	1,717,397	2,003,812	2,245,413	2,487,013	1,987,008
Manufacturing	21,200	74,975	91,880	112,645	138,164	161,342	184,519	163,319	517	12,044,791	34,776,386	42,597,151	52,201,434	63,999,532	78,497,893	91,666,211	104,834,529	92,789,738
Wholesale Trade	1,789	3,926	4,479	5,110	5,830	6,425	7,020	5,231	2,518	4,955,412	9,531,782	10,873,974	12,405,716	14,153,776	16,148,864	17,796,535	19,444,206	14,488,794
Transportation, Warehousing & Utilities	1,077	3,149	3,764	4,499	5,377	6,141	6,905	5,828	1,707	2,022,400	4,947,939	5,913,484	7,067,567	8,446,987	10,095,785	11,530,708	12,965,631	10,943,231
Information	172	359	406	460	521	571	621	449	467	88,255	162,720	184,214	208,568	236,163	267,435	293,117	318,799	230,543
Professional & Business Services	976	3,618	4,486	5,564	6,902	8,125	9,348	8,372	467	501,193	1,499,237	1,858,446	2,304,378	2,858,055	3,545,661	4,173,884	4,802,108	4,300,915
Other Services	1,994	4,162	4,709	5,328	6,028	6,600	7,172	5,178	517	1,133,042	2,090,169	2,364,631	2,675,271	3,026,868	3,424,858	3,749,917	4,074,976	2,941,933
Government	542	850	916	988	1,066	1,125	1,185	643	909	541,325	787,574	849,223	915,737	987,507	1,064,955	1,124,474	1,183,992	642,667
Total	28,630	93,259	113,230	137,616	167,414	194,281	221,147	192,518	692	21,786,424	54,877,024	65,902,656	79,250,591	95,426,285	115,049,263	132,580,258	150,111,253	128,324,829
Medium Growth Scenario		Local Area Jobs in Industrial Space 1/							Avg. Space		Projected Industrial Space Need 3/							
Employment Sector	2008	2038	2043	2048	2053	2058	2060	08-60	Per Job 2/	2008	2033	2038	2043	2048	2053	2058	2060	08-60
Construction	880	2,012	2,294	2,614	2,980	3,280	3,580	2,700	517	500,005	1,002,914	1,143,185	1,303,079	1,485,341	1,693,102	1,863,456	2,033,811	1,533,805
Manufacturing	21,200	57,984	66,633	76,579	88,016	97,624	107,231	86,031	517	12,044,791	28,669,445	32,943,573	37,857,711	43,508,218	50,006,289	55,464,811	60,923,333	48,878,542
Wholesale Trade	1,789	3,548	3,963	4,427	4,946	5,364	5,782	3,993	2,518	4,955,412	8,797,151	9,826,261	10,976,696	12,262,876	13,701,071	14,858,076	16,015,082	11,059,670
Transportation, Warehousing & Utilities	1,077	2,738	3,154	3,634	4,187	4,647	5,107	4,030	1,707	2,022,400	4,462,523	5,141,161	5,923,059	6,823,921	7,861,881	8,725,559	9,589,236	7,566,836
Information	172	323	358	396	439	474	508	336	467	88,255	149,690	165,818	183,714	203,574	225,622	243,248	260,874	172,619
Professional & Business Services	976	2,928	3,419	3,994	4,664	5,233	5,802	4,827	467	501,193	1,287,650	1,503,911	1,756,504	2,051,522	2,396,109	2,688,403	2,980,697	2,479,504
Other Services	1,994	3,819	4,249	4,728	5,261	5,688	6,114	4,120	517	1,133,042	1,950,073	2,169,577	2,413,960	2,686,065	2,989,082	3,231,386	3,473,690	2,340,648
Government	542	824	887	956	1,030	1,087	1,144	602	909	541,325	764,033	823,161	886,890	955,582	1,029,628	1,086,413	1,143,197	601,872
Total	28,630	74,174	84,957	97,328	111,524	123,396	135,268	106,638	692	21,786,424	47,083,479	53,716,647	61,301,614	69,977,099	79,902,783	88,161,352	96,419,921	74,633,497

1/ From EXHIBIT 1.22

2/ From EXHIBIT 1.23

3/ Assumes a market-clearing 10% industrial space vacancy rate.

*Estimate

EXHIBIT 1.25
INDUSTRIAL FLOOR-TO-AREA RATIO (FAR) WORKSHEET BY INDUSTRY SECTOR
HILLSBORO, OREGON
2008-2060

Baseline Growth Scenario Employment Sector	Distribution by Building Type 1/			FAR by industry sector 2/			Average Space per Job			Weighted Average
	Warehouse/ Distrib.	General Industrial	Tech/ Flex	Warehouse/ Distrib.	General Industrial	Tech/ Flex	Warehouse/ Distrib.	General Industrial	Tech/ Flex	
Construction	0%	75%	25%	0.31	0.30	0.26	0.00	0.23	0.07	0.29
Manufacturing	0%	75%	25%	0.31	0.30	0.26	0.00	0.23	0.07	0.29
Wholesale Trade	90%	0%	10%	0.31	0.30	0.26	0.28	0.00	0.03	0.31
Retail Trade	0%	0%	0%	0.31	0.30	0.26	0.00	0.00	0.00	0.00
Transportation, Warehousing & U	100%	0%	0%	0.31	0.30	0.26	0.31	0.00	0.00	0.31
Information	0%	0%	100%	0.31	0.30	0.26	0.00	0.00	0.26	0.26
Financial Activities	0%	0%	0%	0.31	0.30	0.26	0.00	0.00	0.00	0.00
Professional & Business Services	0%	0%	100%	0.31	0.30	0.26	0.00	0.00	0.26	0.26
Education & Health Services	0%	0%	0%	0.31	0.30	0.26	0.00	0.00	0.00	0.00
Leisure & Hospitality	0%	0%	0%	0.31	0.30	0.26	0.00	0.00	0.00	0.00
Other Services	0%	75%	25%	0.31	0.30	0.26	0.00	0.23	0.07	0.29
Government	0%	0%	0%	0.31	0.30	0.26	0.00	0.00	0.00	0.00

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 1.26
INDUSTRIAL FLOOR AREA RATIO WORKSHEET - TRENDING OFFICE SPACE-UTILIZING INDUSTRIAL LAND
HILLSBORO, OREGON
2008-2060

FAR Trend by Sector	Floor Area Ratio Trend						
Employment Sector	2008	2028	2035	2058	2060	08-35	08-60
Construction	0.29	0.32	0.32	0.35	0.36	0.03	0.07
Manufacturing	0.29	0.32	0.32	0.35	0.36	0.03	0.07
Wholesale Trade	0.31	0.32	0.32	0.33	0.33	0.01	0.03
Transportation, Warehousing & Utilities	0.31	0.31	0.31	0.31	0.31	0.00	0.00
Information	0.26	0.36	0.40	0.51	0.52	0.14	0.26
Professional & Business Services	0.26	0.36	0.40	0.51	0.52	0.14	0.26
Other Services	0.29	0.32	0.32	0.35	0.36	0.03	0.07
Total	0.29	0.33	0.34	0.39	0.39	0.05	0.11

EXHIBIT 1.27
DEMAND PROJECTIONS FOR COMMERCIAL INDUSTRIAL LAND BY INDUSTRY SECTOR
HILLSBORO, OREGON
2008-2060

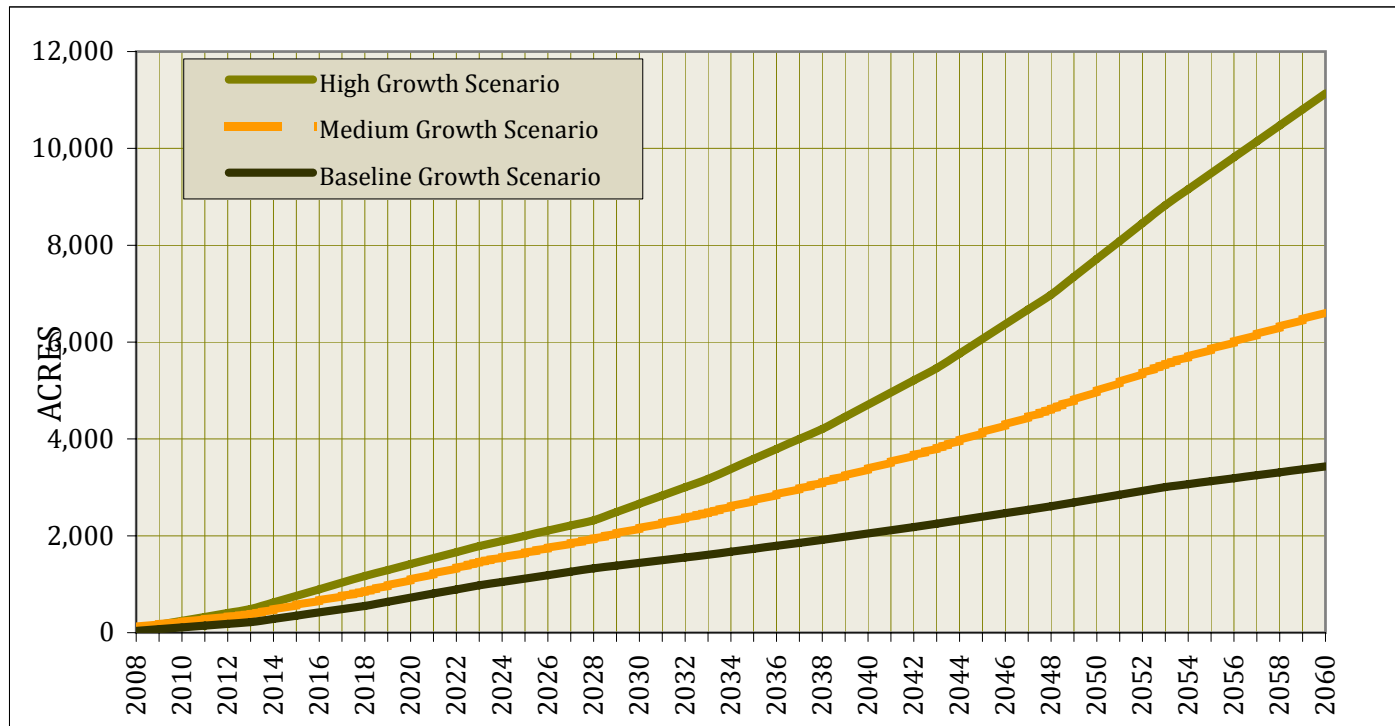
Baseline Growth Scenario		Projected Industrial Space Need 1/							Predicted Land Need (Acres) 2/							
Employment Sector	2008	2038	2043	2048	2053	2058	2060	08-60	2008	2038	2043	2048	2053	2058	2060	08-60
Construction	499,898	983,563	1,069,331	1,162,578	1,263,956	1,342,432	1,420,908	921,011	47.5	93.4	101.6	110.4	120.1	127.5	135.0	87.5
Manufacturing	11,882,911	24,198,087	26,394,018	28,789,226	31,401,794	33,432,121	35,462,449	23,579,537	1,128.8	2,298.7	2,507.3	2,734.8	2,983.0	3,175.8	3,368.7	2,239.9
Wholesale Trade	4,944,829	8,394,774	8,991,215	9,630,033	10,314,238	10,834,399	11,354,559	6,409,730	446.6	758.2	812.1	869.8	931.6	978.6	1,025.6	578.9
Transportation, Warehousing & Utilities	2,018,281	4,292,249	4,700,471	5,147,518	5,637,082	6,019,377	6,401,672	4,383,391	179.4	381.4	417.7	457.4	500.9	534.9	568.9	389.5
Information	88,127	141,301	150,397	160,078	170,383	178,158	185,934	97,807	9.3	15.0	15.9	17.0	18.1	18.9	19.7	10.4
Professional & Business Services	499,668	1,190,622	1,316,745	1,456,228	1,610,486	1,732,384	1,854,281	1,354,613	52.9	126.2	139.5	154.3	170.6	183.6	196.5	143.5
Other Services	1,131,574	1,878,483	2,007,083	2,144,486	2,291,295	2,402,581	2,513,866	1,382,292	107.5	178.4	190.7	203.7	217.7	228.2	238.8	131.3
Government	541,253	752,886	788,074	824,907	863,462	891,973	920,484	379,231	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	21,606,541	41,831,966	45,417,334	49,315,054	53,552,696	56,833,425	60,114,154	38,507,613	1,972.0	3,851.3	4,184.8	4,547.4	4,941.9	5,247.5	5,553.1	3,581.1
High Growth Scenario		Projected Industrial Space Need 1/							Predicted Land Need (Acres) 3/							
Employment Sector	2008	2038	2043	2048	2053	2058	2060	08-60	2008	2038	2043	2048	2053	2058	2060	08-60
Construction	500,005	1,261,533	1,471,921	1,717,397	2,003,812	2,245,413	2,487,013	1,987,008	47.5	119.8	139.8	163.1	190.3	213.3	236.3	188.8
Manufacturing	12,044,791	42,597,151	52,201,434	63,999,532	78,497,893	91,666,211	104,834,529	92,789,738	1,144.2	4,046.5	4,958.8	6,079.6	7,456.8	8,707.7	9,958.6	8,814.5
Wholesale Trade	4,955,412	10,873,974	12,405,716	14,153,776	16,148,864	17,796,535	19,444,206	14,488,794	447.6	982.2	1,120.5	1,278.4	1,458.6	1,607.4	1,756.2	1,308.7
Transportation, Warehousing & Utilities	2,022,400	5,913,484	7,067,567	8,446,987	10,095,785	11,530,708	12,965,631	10,943,231	179.7	525.5	628.1	750.6	897.2	1,024.7	1,152.2	972.5
Information	88,255	184,214	208,568	236,163	267,435	293,117	318,799	230,543	9.4	19.5	22.1	25.0	28.3	31.1	33.8	24.4
Professional & Business Services	501,193	1,858,446	2,304,378	2,858,055	3,545,661	4,173,884	4,802,108	4,300,915	53.1	196.9	244.2	302.8	375.7	442.2	508.8	455.7
Other Services	1,133,042	2,364,631	2,675,271	3,026,868	3,424,858	3,749,917	4,074,976	2,941,933	107.6	224.6	254.1	287.5	325.3	356.2	387.1	279.5
Government	541,325	849,223	915,737	987,507	1,064,955	1,124,474	1,183,992	642,667	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	21,786,424	65,902,656	79,250,591	95,426,285	115,049,263	132,580,258	150,111,253	128,324,829	1,989.1	6,115.0	7,367.6	8,887.1	10,732.3	12,382.6	14,033.0	12,043.9
Medium Growth Scenario		Projected Industrial Space Need 1/							Predicted Land Need (Acres) 3/							
Employment Sector	2008	2038	2043	2048	2053	2058	2060	08-60	2008	2038	2043	2048	2053	2058	2060	08-60
Construction	500,005	1,143,185	1,303,079	1,485,341	1,693,102	1,863,456	2,033,811	1,533,805	47.5	108.6	123.8	141.1	160.8	177.0	193.2	145.7
Manufacturing	12,044,791	32,943,573	37,857,711	43,508,218	50,006,289	55,464,811	60,923,333	48,878,542	1,144.2	3,129.4	3,596.2	4,133.0	4,750.3	5,268.8	5,787.3	4,643.2
Wholesale Trade	4,955,412	9,826,261	10,976,696	12,262,876	13,701,071	14,858,076	16,015,082	11,059,670	447.6	887.5	991.4	1,107.6	1,237.5	1,342.0	1,446.5	998.9
Transportation, Warehousing & Utilities	2,022,400	5,141,161	5,923,059	6,823,921	7,861,881	8,725,559	9,589,236	7,566,836	179.7	456.9	526.4	606.4	698.6	775.4	852.1	672.4
Information	88,255	165,818	183,714	203,574	225,622	243,248	260,874	172,619	9.4	17.6	19.5	21.6	23.9	25.8	27.6	18.3
Professional & Business Services	501,193	1,503,911	1,756,504	2,051,522	2,396,109	2,688,403	2,980,697	2,479,504	53.1	159.3	186.1	217.4	253.9	284.8	315.8	262.7
Other Services	1,133,042	2,169,577	2,413,960	2,686,065	2,989,082	3,231,386	3,473,690	2,340,648	107.6	206.1	229.3	255.2	283.9	307.0	330.0	222.3
Government	541,325	823,161	886,890	955,582	1,029,628	1,086,413	1,143,197	601,872	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	21,786,424	53,716,647	61,301,614	69,977,099	79,902,783	88,161,352	96,419,921	74,633,497	1,989.1	4,965.4	5,672.7	6,482.2	7,409.0	8,180.8	8,952.6	6,963.6

1/ From Exhibit 1.24

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

*Estimate

EXHIBIT 1.28
COMPARISON OF CUMULATIVE DEMAND FOR INDUSTRIAL LAND
MEDIUM, HIGH AND LOW EMPLOYMENT GROWTH SCENARIOS
2008-2060



SOURCE: Johnson Reid, LLC

EXHIBIT 1.29
PROJECTIONS OF HOUSEHOLD RETAIL SALES
HILLSBORO, OREGON
2008-2060

NAICS	Category	Per Household Expenditures 1/	Household Retail Spending in Millions (Households)							'08-'60
			2008	2038	2043	2048	2053	2058	2060	
441	Motor Vehicles and Parts Dealers	\$9,091	\$294.6	\$679.9	\$781.6	\$898.5	\$1,032.9	\$1,187.4	\$1,365.0	\$1,070.4
442	Furniture and Home Furnishings Stores	\$1,112	\$36.0	\$83.2	\$95.6	\$109.9	\$126.3	\$145.2	\$167.0	\$130.9
443	Electronics and Appliance Stores	\$1,128	\$36.6	\$84.4	\$97.0	\$111.5	\$128.2	\$147.4	\$169.4	\$132.9
444	Building Materials and Garden Equipment	\$4,481	\$145.2	\$335.1	\$385.2	\$442.9	\$509.1	\$585.2	\$672.8	\$527.6
445	Food and Beverage Stores	\$5,480	\$177.6	\$409.9	\$471.2	\$541.7	\$622.7	\$715.8	\$822.8	\$645.2
446	Health and Personal Care Stores	\$1,833	\$59.4	\$137.1	\$157.6	\$181.1	\$208.2	\$239.4	\$275.2	\$215.8
448	Clothing and Clothing Accessories Stores	\$2,254	\$73.0	\$168.6	\$193.8	\$222.8	\$256.1	\$294.4	\$338.4	\$265.4
451	Sporting Goods, Hobby, Book and Music Stores	\$966	\$31.3	\$72.2	\$83.0	\$95.5	\$109.7	\$126.2	\$145.0	\$113.7
452	General Merchandise Stores	\$5,504	\$178.4	\$411.7	\$473.2	\$544.0	\$625.4	\$718.9	\$826.4	\$648.0
453	Miscellaneous Store Retailers	\$1,166	\$37.8	\$87.2	\$100.3	\$115.3	\$132.5	\$152.3	\$175.1	\$137.3
722	Foodservices and Drinking Places	\$4,435	\$143.8	\$331.8	\$381.4	\$438.4	\$504.0	\$579.4	\$666.0	\$522.2
Totals/Weighted Averages		\$37,450	\$1,213.7	\$2,801.0	\$3,220.0	\$3,701.6	\$4,255.2	\$4,891.6	\$5,623.2	\$4,409.5

High Growth Scenario		Per Household Expenditures 1/	Household Retail Spending in Millions (Households)							'08-'60
NAICS	Category		2008	2038	2043	2048	2053	2058	2060	
441	Motor Vehicles and Parts Dealers	\$9,091	\$294.6	\$923.6	\$1,117.3	\$1,351.7	\$1,635.2	\$1,978.2	\$2,393.1	\$2,098.5
442	Furniture and Home Furnishings Stores	\$1,112	\$36.0	\$113.0	\$136.7	\$165.3	\$200.0	\$242.0	\$292.7	\$256.7
443	Electronics and Appliance Stores	\$1,128	\$36.6	\$114.6	\$138.7	\$167.8	\$203.0	\$245.6	\$297.1	\$260.5
444	Building Materials and Garden Equipment	\$4,481	\$145.2	\$455.2	\$550.7	\$666.2	\$805.9	\$975.0	\$1,179.5	\$1,034.3
445	Food and Beverage Stores	\$5,480	\$177.6	\$556.7	\$673.5	\$814.8	\$985.7	\$1,192.5	\$1,442.6	\$1,265.0
446	Health and Personal Care Stores	\$1,833	\$59.4	\$186.2	\$225.2	\$272.5	\$329.7	\$398.8	\$482.5	\$423.1
448	Clothing and Clothing Accessories Stores	\$2,254	\$73.0	\$229.0	\$277.0	\$335.1	\$405.4	\$490.4	\$593.3	\$520.3
451	Sporting Goods, Hobby, Book and Music Stores	\$966	\$31.3	\$98.1	\$118.7	\$143.6	\$173.7	\$210.2	\$254.3	\$223.0
452	General Merchandise Stores	\$5,504	\$178.4	\$559.2	\$676.5	\$818.3	\$990.0	\$1,197.7	\$1,448.9	\$1,270.5
453	Miscellaneous Store Retailers	\$1,166	\$37.8	\$118.5	\$143.3	\$173.4	\$209.8	\$253.8	\$307.0	\$269.2
722	Foodservices and Drinking Places	\$4,435	\$143.8	\$450.6	\$545.1	\$659.5	\$797.8	\$965.2	\$1,167.6	\$1,023.9
Totals/Weighted Averages		\$37,450	\$1,213.7	\$3,804.7	\$4,602.7	\$5,568.2	\$6,736.1	\$8,149.1	\$9,858.4	\$8,644.7

Medium Growth Scenario		Per Household Expenditures 1/	Household Retail Spending in Millions (Households)							'08-'60
NAICS	Category		2008	2038	2043	2048	2053	2058	2060	
441	Motor Vehicles and Parts Dealers	\$9,091	\$294.6	\$809.3	\$957.7	\$1,133.3	\$1,341.2	\$1,587.2	\$1,878.3	\$1,583.7
442	Furniture and Home Furnishings Stores	\$1,112	\$36.0	\$99.0	\$117.1	\$138.6	\$164.1	\$194.1	\$229.8	\$193.7
443	Electronics and Appliance Stores	\$1,128	\$36.6	\$100.5	\$118.9	\$140.7	\$166.5	\$197.0	\$233.2	\$196.6
444	Building Materials and Garden Equipment	\$4,481	\$145.2	\$398.9	\$472.0	\$558.6	\$661.0	\$782.3	\$925.7	\$780.5
445	Food and Beverage Stores	\$5,480	\$177.6	\$487.8	\$577.3	\$683.2	\$808.5	\$956.8	\$1,132.3	\$954.6
446	Health and Personal Care Stores	\$1,833	\$59.4	\$163.1	\$193.1	\$228.5	\$270.4	\$320.0	\$378.7	\$319.3
448	Clothing and Clothing Accessories Stores	\$2,254	\$73.0	\$200.6	\$237.4	\$281.0	\$332.5	\$393.5	\$465.7	\$392.6
451	Sporting Goods, Hobby, Book and Music Stores	\$966	\$31.3	\$86.0	\$101.8	\$120.4	\$142.5	\$168.6	\$199.6	\$168.3
452	General Merchandise Stores	\$5,504	\$178.4	\$490.0	\$579.8	\$686.2	\$812.0	\$960.9	\$1,137.2	\$958.8
453	Miscellaneous Store Retailers	\$1,166	\$37.8	\$103.8	\$122.9	\$145.4	\$172.0	\$203.6	\$240.9	\$203.1
722	Foodservices and Drinking Places	\$4,435	\$143.8	\$394.8	\$467.3	\$553.0	\$654.4	\$774.4	\$916.4	\$772.7
Totals/Weighted Averages		\$37,450	\$1,213.7	\$3,333.8	\$3,945.2	\$4,668.8	\$5,525.1	\$6,538.4	\$7,737.6	\$6,523.9

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

**EXHIBIT 1.30
PROJECTIONS OF COMMERCIAL RETAIL SPACE NEED
HILLSBORO, OREGON
2008-2060**

Baseline Growth Scenario		Household Retail Spending (millions) 1/							Sales Support	Spending-Supported Retail Demand (SF) 3/								
NAICS	Category	2008	2038	2043	2048	2053	2058	2060	'08-'60	Factor 2/	2008	2038	2043	2048	2053	2058	2060	'08-'60
441	Automotive Parts, Accessories and Tire Stores	\$294.6	\$679.9	\$781.6	\$898.5	\$1,032.9	\$1,187.4	\$1,365.0	\$1,070.4	\$171	1,895,814	4,375,123	5,029,475	5,781,694	6,646,417	7,640,469	8,783,193	6,887,379
442	Furniture and Home Furnishings Stores	\$36.0	\$83.2	\$95.6	\$109.9	\$126.3	\$145.2	\$167.0	\$130.9	\$213	186,320	429,987	494,296	568,225	653,209	750,905	863,212	676,891
443	Electronics and Appliance Stores	\$36.6	\$84.4	\$97.0	\$111.5	\$128.2	\$147.4	\$169.4	\$132.9	\$246	163,554	377,446	433,898	498,793	573,393	659,151	757,735	594,181
444	Building Materials and Garden Equipment	\$145.2	\$335.1	\$385.2	\$442.9	\$509.1	\$585.2	\$672.8	\$527.6	\$157	1,014,684	2,341,669	2,691,894	3,094,499	3,557,319	4,089,359	4,700,972	3,686,288
445	Food and Beverage Stores	\$177.6	\$409.9	\$471.2	\$541.7	\$622.7	\$715.8	\$822.8	\$645.2	\$384	509,142	1,174,989	1,350,723	1,552,740	1,784,971	2,051,935	2,358,826	1,849,684
446	Health and Personal Care Stores	\$59.4	\$137.1	\$157.6	\$181.1	\$208.2	\$239.4	\$275.2	\$215.8	\$283	230,981	533,054	612,779	704,428	809,783	930,896	1,070,123	839,142
448	Clothing and Clothing Accessories Stores	\$73.0	\$168.6	\$193.8	\$222.8	\$256.1	\$294.4	\$338.4	\$265.4	\$267	301,067	694,796	798,711	918,168	1,055,491	1,213,352	1,394,824	1,093,757
451	Sporting Goods, Hobby, Book and Music Stores	\$31.3	\$72.2	\$83.0	\$95.5	\$109.7	\$126.2	\$145.0	\$113.7	\$240	143,583	331,359	380,918	437,889	503,380	578,667	665,214	521,630
452	General Merchandise Stores	\$178.4	\$411.7	\$473.2	\$544.0	\$625.4	\$718.9	\$826.4	\$648.0	\$171	1,147,798	2,648,867	3,045,037	3,500,459	4,023,995	4,625,832	5,317,681	4,169,883
453	Miscellaneous Store Retailers	\$37.8	\$87.2	\$100.3	\$115.3	\$132.5	\$152.3	\$175.1	\$137.3	\$236	176,062	406,313	467,082	536,940	617,246	709,562	815,686	639,624
722	Foodservices and Drinking Places	\$143.8	\$331.8	\$381.4	\$438.4	\$504.0	\$579.4	\$666.0	\$522.2	\$290	544,802	1,257,283	1,445,325	1,661,490	1,909,986	2,195,648	2,524,033	1,979,232
Totals/Weighted Averages		\$1,213.7	\$2,801.0	\$3,220.0	\$3,701.6	\$4,255.2	\$4,891.6	\$5,623.2	\$4,409.5		6,313,808	14,570,887	16,750,139	19,255,325	22,135,191	25,445,776	29,251,500	22,937,692
High Growth Scenario		Household Retail Spending (millions) 1/							Sales Support	Spending-Supported Retail Demand (SF) 3/								
NAICS	Category	2008	2038	2043	2048	2053	2058	2060	'08-'60	Factor 2/	2008	2038	2043	2048	2053	2058	2060	'08-'60
441	Automotive Parts, Accessories and Tire Stores	\$294.6	\$923.6	\$1,117.3	\$1,351.7	\$1,635.2	\$1,978.2	\$2,393.1	\$2,098.5	\$139	2,331,612	7,308,796	8,841,870	10,696,517	12,940,190	15,654,490	18,938,134	16,606,522
442	Furniture and Home Furnishings Stores	\$36.0	\$113.0	\$136.7	\$165.3	\$200.0	\$242.0	\$292.7	\$256.7	\$213	186,320	584,050	706,559	854,765	1,034,058	1,250,959	1,513,537	1,327,037
443	Electronics and Appliance Stores	\$36.6	\$114.6	\$138.7	\$167.8	\$203.0	\$245.6	\$297.1	\$260.5	\$246	163,554	512,685	620,224	750,321	907,706	1,098,104	1,328,439	1,164,885
444	Building Materials and Garden Equipment	\$145.2	\$455.2	\$550.7	\$666.2	\$805.9	\$975.0	\$1,179.5	\$1,034.3	\$157	1,014,684	3,180,684	3,847,856	4,654,972	5,631,387	6,812,611	8,241,607	7,226,922
445	Food and Beverage Stores	\$177.6	\$556.7	\$673.5	\$814.8	\$985.7	\$1,192.5	\$1,442.6	\$1,265.0	\$384	509,142	1,595,985	1,930,754	2,335,744	2,825,684	3,418,392	4,135,425	3,626,282
446	Health and Personal Care Stores	\$59.4	\$186.2	\$225.2	\$272.5	\$329.7	\$398.8	\$482.5	\$423.1	\$283	230,981	724,047	875,921	1,059,652	1,281,921	1,550,814	1,876,108	1,645,127
448	Clothing and Clothing Accessories Stores	\$73.0	\$229.0	\$277.0	\$335.1	\$405.4	\$490.4	\$593.3	\$520.3	\$267	301,067	943,740	1,141,696	1,381,175	1,670,887	2,021,367	2,445,364	2,144,297
451	Sporting Goods, Hobby, Book and Music Stores	\$31.3	\$98.1	\$118.7	\$143.6	\$173.7	\$210.2	\$254.3	\$223.0	\$240	143,583	450,085	544,493	658,704	796,873	964,022	1,166,233	1,022,650
452	General Merchandise Stores	\$178.4	\$559.2	\$676.5	\$818.3	\$990.0	\$1,197.7	\$1,448.9	\$1,270.5	\$171	1,147,798	3,597,950	4,352,647	5,265,646	6,370,154	7,706,341	9,322,803	8,175,004
453	Miscellaneous Store Retailers	\$37.8	\$118.5	\$143.3	\$173.4	\$209.8	\$253.8	\$307.0	\$269.2	\$236	176,062	551,894	667,658	807,704	977,126	1,182,086	1,430,037	1,253,975
722	Foodservices and Drinking Places	\$143.8	\$450.6	\$545.1	\$659.5	\$797.8	\$965.2	\$1,167.6	\$1,023.9	\$290	544,802	1,707,764	2,065,980	2,499,335	3,023,589	3,657,809	4,425,061	3,880,260
Totals/Weighted Averages		\$1,213.7	\$3,804.7	\$4,602.7	\$5,568.2	\$6,736.1	\$8,149.1	\$9,858.4	\$8,644.7		6,749,606	21,157,680	25,595,658	30,964,536	37,459,574	45,316,995	54,822,568	48,072,961
Medium Growth Scenario		Household Retail Spending (millions) 1/							Sales Support	Spending-Supported Retail Demand (SF) 3/								
NAICS	Category	2008	2038	2043	2048	2053	2058	2060	'08-'60	Factor 2/	2008	2038	2043	2048	2053	2058	2060	'08-'60
441	Automotive Parts, Accessories and Tire Stores	\$294.6	\$809.3	\$957.7	\$1,133.3	\$1,341.2	\$1,587.2	\$1,878.3	\$1,583.7	\$139	2,331,612	6,404,198	7,578,784	8,968,799	10,613,755	12,560,409	14,864,098	12,532,486
442	Furniture and Home Furnishings Stores	\$36.0	\$99.0	\$117.1	\$138.6	\$164.1	\$194.1	\$229.8	\$193.7	\$213	186,320	511,763	605,625	716,702	848,151	1,003,710	1,187,799	1,001,478
443	Electronics and Appliance Stores	\$36.6	\$100.5	\$118.9	\$140.7	\$166.5	\$197.0	\$233.2	\$196.6	\$246	163,554	449,231	531,623	629,128	744,515	881,066	1,042,661	879,107
444	Building Materials and Garden Equipment	\$145.2	\$398.9	\$472.0	\$558.6	\$661.0	\$782.3	\$925.7	\$780.5	\$157	1,014,684	2,787,016	3,298,179	3,903,094	4,618,955	5,466,112	6,468,644	5,453,960
445	Food and Beverage Stores	\$177.6	\$487.8	\$577.3	\$683.2	\$808.5	\$956.8	\$1,132.3	\$954.6	\$384	509,142	1,398,452	1,654,941	1,958,471	2,317,672	2,742,753	3,245,798	2,736,656
446	Health and Personal Care Stores	\$59.4	\$163.1	\$193.1	\$228.5	\$270.4	\$320.0	\$378.7	\$319.3	\$283	230,981	634,433	750,793	888,495	1,051,453	1,244,298	1,472,514	1,241,532
448	Clothing and Clothing Accessories Stores	\$73.0	\$200.6	\$237.4	\$281.0	\$332.5	\$393.5	\$465.7	\$392.6	\$267	301,067	826,934	978,601	1,158,085	1,370,488	1,621,848	1,919,309	1,618,242
451	Sporting Goods, Hobby, Book and Music Stores	\$31.3	\$86.0	\$101.8	\$120.4	\$142.5	\$168.6	\$199.6	\$168.3	\$240	143,583	394,378	466,711	552,309	653,608	773,485	915,349	771,766
452	General Merchandise Stores	\$178.4	\$490.0	\$579.8	\$686.2	\$812.0	\$960.9	\$1,137.2	\$958.8	\$171	1,147,798	3,152,638	3,730,859	4,415,131	5,224,904	6,183,197	7,317,250	6,169,451
453	Miscellaneous Store Retailers	\$37.8	\$103.8	\$122.9	\$145.4	\$172.0	\$203.6	\$240.9	\$203.1	\$236	176,062	483,587	572,281	677,243	801,455	948,449	1,122,402	946,340
722	Foodservices and Drinking Places	\$143.8	\$394.8	\$467.3	\$553.0	\$654.4	\$774.4	\$916.4	\$772.7	\$290	544,802	1,496,397	1,770,849	2,095,639	2,479,997	2,934,850	3,473,127	2,928,325
Totals/Weighted Averages		\$1,213.7	\$3,333.8	\$3,945.2	\$4,668.8	\$5,525.1	\$6,538.4	\$7,737.6	\$6,523.9		6,749,606	18,539,028	21,939,247	25,963,096	30,724,954	36,360,177	43,028,950	36,279,344

1/ From Exhibit 1.29

2/ Based on national averages derived from "Dollars & Cents of Shopping Centers," Urban Land Institute, 2007.

3/ Assumes a market-clearing retail space vacancy rate of 10%.

* Estimate

**EXHIBIT 1.31
PROJECTIONS OF COMMERCIAL RETAIL SPACE NEED
HILLSBORO, OREGON
2008-2060**

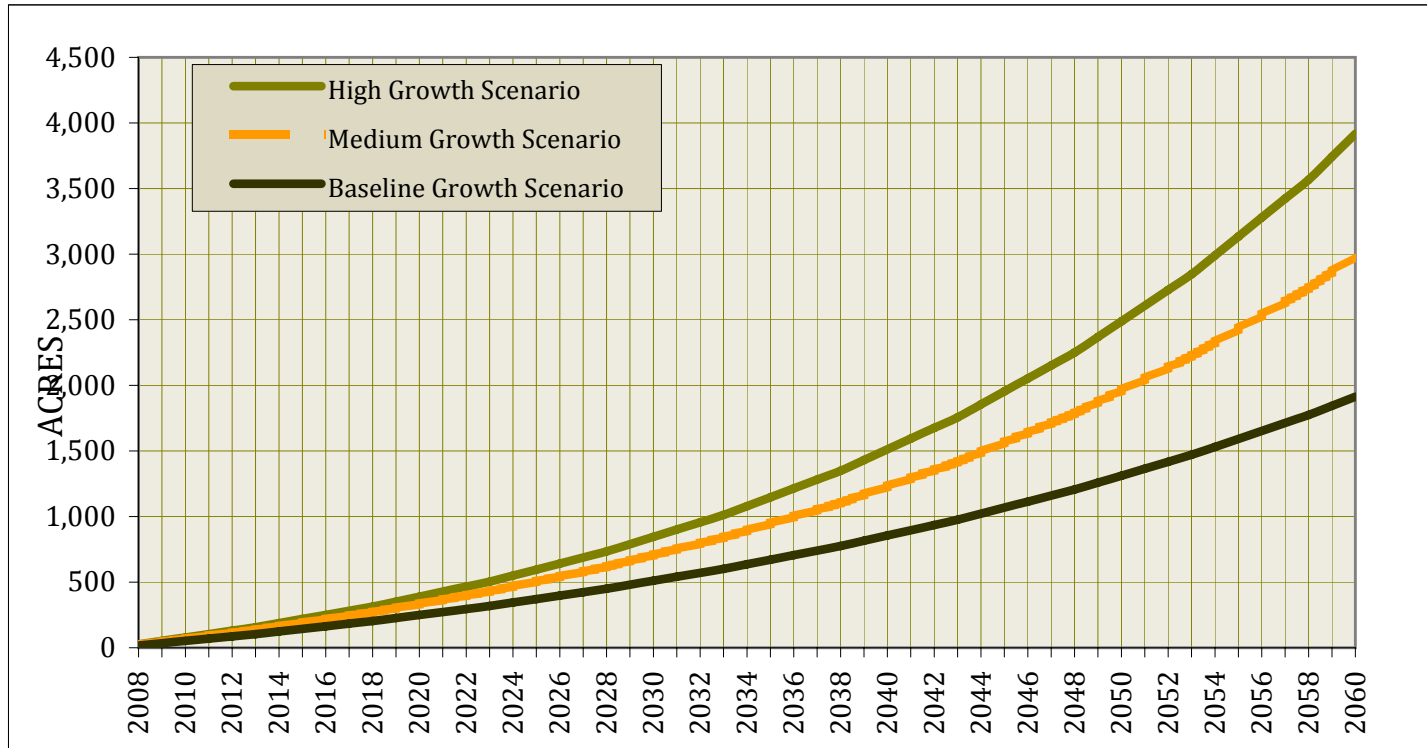
Baseline Growth Scenario		Spending-Supported Retail Demand (SF) 1/							Retail	Commercial Retail Land Need (Acres)								
NAICS	Category	2008	2038	2043	2048	2053	2058	2060	'08-'60	F.A.R. 2/	2008	2038	2043	2048	2053	2058	2060	'08-'60
441	Automotive Parts, Accessories and Tire Stores	1,895,814	4,375,123	5,029,475	5,781,694	6,646,417	7,640,469	8,783,193	6,887,379	0.25	174.1	401.8	461.8	530.9	610.3	701.6	806.5	632.4
442	Furniture and Home Furnishings Stores	186,320	429,987	494,296	568,225	653,209	750,905	863,212	676,891	0.25	17.1	39.5	45.4	52.2	60.0	69.0	79.3	62.2
443	Electronics and Appliance Stores	163,554	377,446	433,898	498,793	573,393	659,151	757,735	594,181	0.25	15.0	34.7	39.8	45.8	52.7	60.5	69.6	54.6
444	Building Materials and Garden Equipment	1,014,684	2,341,669	2,691,894	3,094,499	3,557,319	4,089,359	4,700,972	3,686,288	0.25	93.2	215.0	247.2	284.2	326.7	375.5	431.7	338.5
445	Food and Beverage Stores	509,142	1,174,989	1,350,723	1,552,740	1,784,971	2,051,935	2,358,826	1,849,684	0.25	46.8	107.9	124.0	142.6	163.9	188.4	216.6	169.9
446	Health and Personal Care Stores	230,981	533,054	612,779	704,428	809,783	930,896	1,070,123	839,142	0.25	21.2	48.9	56.3	64.7	74.4	85.5	98.3	77.1
448	Clothing and Clothing Accessories Stores	301,067	694,796	798,711	918,168	1,055,491	1,213,352	1,394,824	1,093,757	0.25	27.6	63.8	73.3	84.3	96.9	111.4	128.1	100.4
451	Sporting Goods, Hobby, Book and Music Stores	143,583	331,359	380,918	437,889	503,380	583,667	665,214	521,630	0.25	13.2	30.4	35.0	40.2	46.2	53.1	61.1	47.9
452	General Merchandise Stores	1,147,798	2,648,867	3,045,037	3,500,459	4,023,995	4,625,832	5,317,681	4,169,883	0.25	105.4	243.2	279.6	321.4	369.5	424.8	488.3	382.9
453	Miscellaneous Store Retailers	176,062	406,313	467,082	536,940	617,246	709,562	815,686	639,624	0.25	16.2	37.3	42.9	49.3	56.7	65.2	74.9	58.7
722	Foodservices and Drinking Places	544,802	1,257,283	1,445,325	1,661,490	1,909,986	2,195,648	2,524,033	1,979,232	0.25	50.0	115.5	132.7	152.6	175.4	201.6	231.8	181.7
Totals/Weighted Averages		6,313,808	14,570,887	16,750,139	19,255,325	22,135,191	25,445,776	29,251,500	22,937,692	0.25	579.8	1,338.0	1,538.1	1,768.2	2,032.6	2,336.6	2,686.1	2,106.3
High Growth Scenario		Spending-Supported Retail Demand (SF) 1/							Retail	Commercial Retail Land Need (Acres)								
NAICS	Category	2008	2038	2043	2048	2053	2058	2060	'08-'60	F.A.R. 2/	2008	2038	2043	2048	2053	2058	2060	'08-'60
441	Automotive Parts, Accessories and Tire Stores	2,331,612	7,308,796	8,841,870	10,696,517	12,940,190	15,654,490	18,938,134	16,606,522	0.25	214.1	671.1	811.9	982.2	1,188.3	1,437.5	1,739.0	1,524.9
442	Furniture and Home Furnishings Stores	186,320	584,050	706,559	854,765	1,034,058	1,250,959	1,513,357	1,327,037	0.25	17.1	53.6	64.9	78.5	95.0	114.9	139.0	121.9
443	Electronics and Appliance Stores	163,554	512,685	620,224	750,321	907,706	1,098,104	1,328,439	1,164,885	0.25	15.0	47.1	57.0	68.9	83.4	100.8	122.0	107.0
444	Building Materials and Garden Equipment	1,014,684	3,180,684	3,847,856	4,654,972	5,631,387	6,812,611	8,241,607	7,226,922	0.25	93.2	292.1	353.3	427.5	517.1	625.6	756.8	663.6
445	Food and Beverage Stores	509,142	1,595,985	1,930,754	2,335,744	2,825,684	3,418,392	4,135,425	3,626,282	0.25	46.8	146.6	177.3	214.5	259.5	313.9	379.7	333.0
446	Health and Personal Care Stores	230,981	724,047	875,921	1,059,652	1,281,921	1,550,814	1,876,108	1,645,127	0.25	21.2	66.5	80.4	97.3	117.7	142.4	172.3	151.1
448	Clothing and Clothing Accessories Stores	301,067	943,740	1,141,696	1,381,175	1,670,887	2,021,367	2,445,364	2,144,297	0.25	27.6	86.7	104.8	126.8	153.4	185.6	224.6	196.9
451	Sporting Goods, Hobby, Book and Music Stores	143,583	450,085	544,493	658,704	796,873	964,022	1,166,233	1,022,650	0.25	13.2	41.3	50.0	60.5	73.2	88.5	107.1	93.9
452	General Merchandise Stores	1,147,798	3,597,950	4,352,647	5,265,646	6,370,154	7,706,341	9,322,803	8,175,004	0.25	105.4	330.4	399.7	483.5	585.0	707.7	856.1	750.7
453	Miscellaneous Store Retailers	176,062	551,894	667,658	807,704	977,126	1,182,086	1,430,037	1,253,975	0.25	16.2	50.7	61.3	74.2	89.7	108.5	131.3	115.1
722	Foodservices and Drinking Places	544,802	1,707,764	2,065,980	2,499,335	3,023,589	3,657,809	4,425,061	3,880,260	0.25	50.0	156.8	189.7	229.5	277.6	335.9	406.3	356.3
Totals/Weighted Averages		6,749,606	21,157,680	25,595,658	30,964,536	37,459,574	45,316,995	54,822,568	48,072,961	0.25	619.8	1,942.9	2,350.4	2,843.4	3,439.8	4,161.3	5,034.2	4,414.4
Medium Growth Scenario		Spending-Supported Retail Demand (SF) 1/							Retail	Commercial Retail Land Need (Acres)								
NAICS	Category	2008	2038	2043	2048	2053	2058	2060	'08-'60	F.A.R. 2/	2008	2038	2043	2048	2053	2058	2060	'08-'60
441	Automotive Parts, Accessories and Tire Stores	2,331,612	6,404,198	7,578,784	8,968,799	10,613,755	12,560,409	14,864,098	12,532,486	0.25	214.1	588.1	695.9	823.6	974.6	1,153.4	1,364.9	1,150.8
442	Furniture and Home Furnishings Stores	186,320	511,763	605,625	716,702	848,151	1,003,710	1,187,799	1,001,478	0.25	17.1	47.0	55.6	65.8	77.9	92.2	109.1	92.0
443	Electronics and Appliance Stores	163,554	449,231	531,623	629,128	744,515	881,066	1,042,661	879,107	0.25	15.0	41.3	48.8	57.8	68.4	80.9	95.7	80.7
444	Building Materials and Garden Equipment	1,014,684	2,787,016	3,298,179	3,903,094	4,618,955	5,466,112	6,468,644	5,453,960	0.25	93.2	255.9	302.9	358.4	424.1	501.9	594.0	500.8
445	Food and Beverage Stores	509,142	1,398,452	1,654,941	1,958,471	2,317,672	2,742,753	3,245,798	2,736,656	0.25	46.8	128.4	152.0	179.8	212.8	251.9	298.1	251.3
446	Health and Personal Care Stores	230,981	634,433	750,793	888,495	1,051,453	1,244,298	1,472,514	1,241,532	0.25	21.2	58.3	68.9	81.6	96.6	114.3	135.2	114.0
448	Clothing and Clothing Accessories Stores	301,067	826,934	978,601	1,158,085	1,370,488	1,621,848	1,919,309	1,618,242	0.25	27.6	75.9	89.9	106.3	125.8	148.9	176.2	148.6
451	Sporting Goods, Hobby, Book and Music Stores	143,583	394,378	466,711	552,309	653,608	773,485	915,349	771,766	0.25	13.2	36.2	42.9	50.7	60.0	71.0	84.1	70.9
452	General Merchandise Stores	1,147,798	3,152,638	3,730,859	4,415,131	5,224,904	6,183,197	7,317,250	6,169,451	0.25	105.4	289.5	342.6	405.4	479.8	567.8	671.9	566.5
453	Miscellaneous Store Retailers	176,062	483,587	572,281	677,243	801,455	948,449	1,122,402	946,340	0.25	16.2	44.4	52.6	62.2	73.6	87.1	103.1	86.9
722	Foodservices and Drinking Places	544,802	1,496,397	1,770,849	2,095,639	2,479,997	2,934,850	3,473,127	2,928,325	0.25	50.0	137.4	162.6	192.4	227.7	269.5	318.9	268.9
Totals/Weighted Averages		6,749,606	18,539,028	21,939,247	25,963,096	30,724,954	36,360,177	43,028,950	36,279,344	0.25	619.8	1,702.4	2,014.6	2,384.1	2,821.4	3,338.9	3,951.2	3,331.4

1/ From Exhibit 1.30

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

*Estimate

EXHIBIT 1.32
COMPARISON OF CUMULATIVE DEMAND FOR COMMERCIAL RETAIL LAND
MEDIUM, HIGH AND LOW GROWTH SCENARIOS
2008-2060



SOURCE: Johnson Reid, LLC



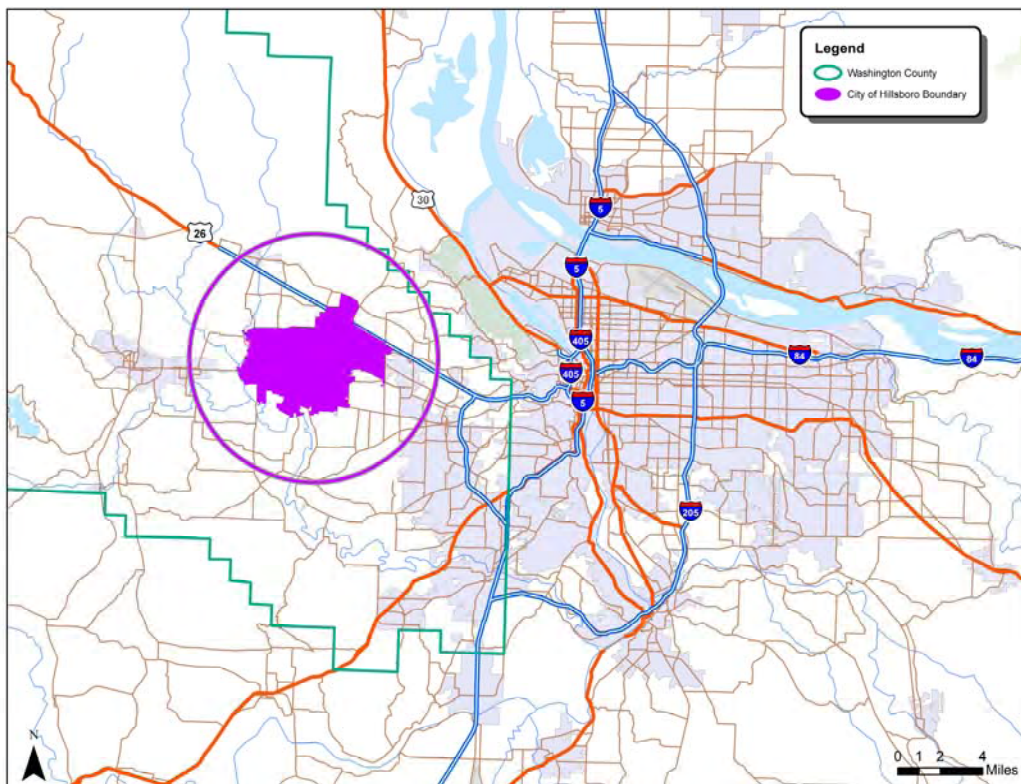
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APPENDIX B: ECONOMIC & PLANNING AREA DEFINED

ECONOMIC & PLANNING AREA DEFINED

In accordance with OAR 660-009-0005 a planning area is defined as: “ The area within an existing or proposed urban growth boundary. Cities and counties with urban growth management agreements must address the urban land governed by their respective plans as specified in the urban growth management agreement for the affected area.” This is particularly true as it relates to the Hillsboro Economic Study Area as the study area should encompass any jurisdictions, which share inter-dependent economic activity. Additionally, the planning area should include the existing Urban Growth Boundary areas as well as potential expansion and urban reserves.

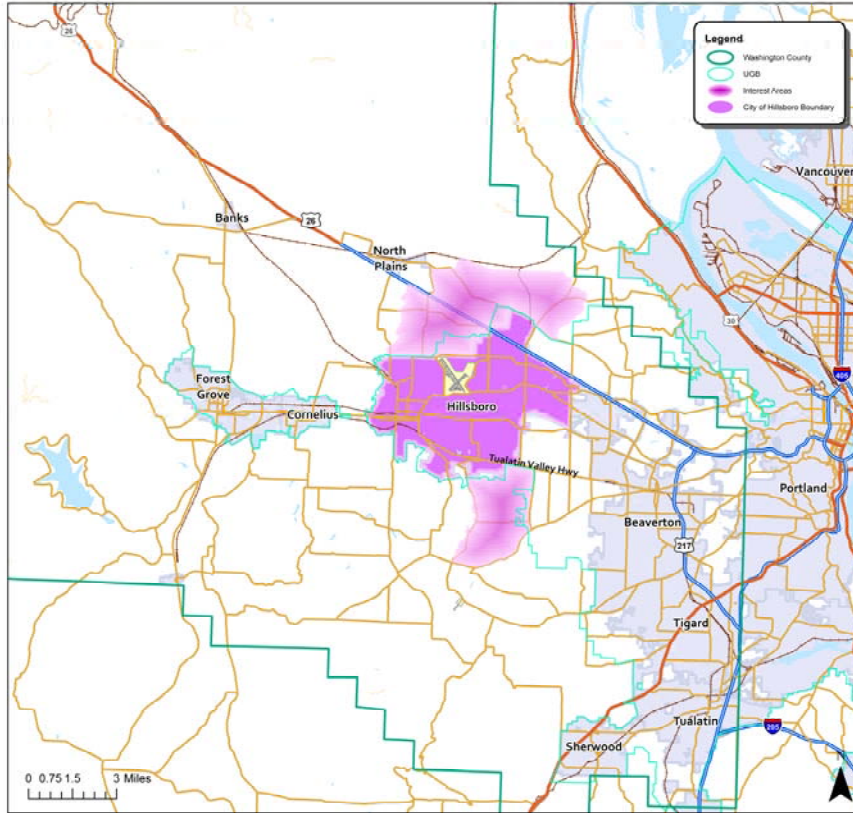
FIGURE B1: CITY OF HILLSBORO ECONOMIC STUDY AREA



Hillsboro is part of the Portland Metro area, located within Washington County on the west side of the metro area. Some of the largest Portland Metro employers are located here, making the economic influence of Hillsboro far reaching in the region. Taking the lead from Metro, the entire region must be considered when studying the implications of growth in Hillsboro. This report encompasses the region as defined by Metro to include the 25 jurisdictions that reside within the three counties of Clackamas, Multnomah and Washington. A regional perspective, particularly in relation to economic development, will aid Hillsboro in their understanding of the City's role in the larger economic field of the entire region. While Hillsboro is a major employment center in the region, it also relies on its relationship to other jurisdictions. For example, Hillsboro is a hub of employment for many of the smaller outlying communities of western Washington County, including North Plains, Banks, Forest Grove and Cornelius. As a result, Washington County has outpaced the other Metro counties in terms

of growth, maintaining its place as a crucial player in regional economic activity. It is clear that Hillsboro has a critical role in the economic prosperity of the Metro region.

FIGURE B2: CITY OF HILLSBORO ECONOMIC PLANNING AREA



Hillsboro must plan for its growth over the next 20 to 50 years. Both population growth and the accompanying physical growth must be addressed. Metro has delineated the parameters for planned growth through urban reserves. Urban reserves are areas established outside of the urban growth boundary that are better suited to accommodate population and job growth over 40 to 50 years. This also includes designating rural reserves, which preserve areas outside of the urban growth boundary as adequate and valuable farm and forestland. Through Johnson Reid’s analysis of future demand and available land supply, an estimate for physical expansion has been established

The planning areas of interest are generalized estimates of potential geographic growth as Hillsboro expands to meet employment and residential needs for housing, services and employment on 20 and 50 year time scales. While there is no definitive size or land uses applied to these planning areas, they serve as an illustrative view of where urban reserves would be best located. They are based on current growth and expansion patterns, land suitability, access to existing infrastructure and geographic constraints. They are not official or adopted areas for reserves, but rather provide a visual concept of future growth. Hillsboro is considering a large area to the north of the existing Urban Growth Boundary, expanding north beyond Highway 26 to just north of West Union Road and Helvetia. Additionally, there is an area to the South of Hillsboro that is under consideration for inclusion in the areas of interest. This encompasses land extending south from Tualatin Valley Highway to Farmington Road, between River Road and 209th. All land under consideration adjoins County land.