



Step Two: Conduct the Economic Opportunities Analysis—Advanced Approach

This chapter describes a level of analysis in addition to the Basic Approach that meets the requirements of Goal 9.

This Advanced approach requires more detailed data and analysis as well as geographic information systems (GIS). Primary research on employment densities, development trends and other factors included a 20-year demand forecast improve the forecast data.

Advanced Approach—Demand

This section describes how to calculate long-term (20 years) and short-term (1-5 years) needs, followed by steps to aggregate and disaggregate demand. For example, an aggregate forecast is an estimate of the total amount of industrial land needed in a jurisdiction during a 20-year planning period. A disaggregated forecast may start with the aggregated, long-term forecast as a baseline or control and divide it further by subarea, industrial sector, parcel size and time period, such as 1-5 years or 5-10 years. Table 7, continued on the next page, shows a sample disaggregation of employment demand.

Table 7 Sample Disaggregation					
Employment Sectors (Non-farm payroll)	Projected Jobs* 2002-2022	Capture Rate	Industrial Jobs	Supportable Gross Fl. Area Req. (sf)**	Supportable Acreage (gross)***
Manufacturing	--	40%	--	--	--
Durable Goods	180	40%	72	72,000	24
Lumber & Wood Products	(60)	40%	(24)	(24,000)	--

Table 7 Sample Disaggregation					
Other Durable Goods	240	40%	96	96,000	31
Non-Durable Goods	(180)	40%	(72)	(72,000)	--
Food & Associated Products	(240)	40%	(96)	(96,000)	--
Other Non-Durable Goods	60	40%	24	24,000	8
Construction & Mining	(480)	--	--	--	--
Transportation & Utilities	(920)	40%	(368)	(368,000)	--
Wholesale Trade	360	40%	144	144,000	47
Government	840	20%	67	67,200	22
TOTAL	5,390		(157)	(156,800)	132

*Does not reflect jobs/land for schools.

** Assumes 1,000 gross square feet of floor area per employee.

*** Assumes 30% of site devoted to public roads, utilities and open space.

As noted previously, many variables can be considered to estimate the growth and kind of industrial and other employment activity that will require developable vacant land.

Long-Term Demand Analysis

Forecasted employment growth can be translated into demand after ascertaining the possible types of companies expected to expand or locate in the planning area and the employees per acre. The resulting estimate can be refined further by applying assumptions about re-use of vacant buildings, redevelopment of built sites and floor-to-area ratios in multi-story buildings. The resulting supportable acreage is the amount of building or land area likely to be needed or supported by the projected job growth.

The analysis of site requirements should consider size, shape, soil, transportation access, services and other characteristics.

This data can be entered into a spreadsheet with worksheets supporting each set of input and, if appropriate, alternative geographies (e.g., neighborhoods within a city, cities within a county, counties within a region). A recommended methodology follows:

Long-Term Demand Task Checklist.

- **Demand Task 1:** Establish baseline employment level and historic growth trends
- **Demand Task 2:** Forecast employment growth
- **Demand Task 3:** Group industries by type of land use
- **Demand Task 4:** Identify employment growth that does not require additional land
- **Demand Task 5:** Apply assumptions to convert employment growth to land demand
- **Demand Task 6:** Adjust net acres to total developable acres
- **Demand Task 7:** Adjust for vacancy rate
- **Demand Task 8:** Disaggregate the total demand

Demand Task 1. Establish baseline employment level and historic growth trends.

The Oregon Employment Department publishes employment data for the state and individual counties by sector and industry, showing the number of reporting units or establishments, monthly employment, average annual employment, quarterly payroll and annual payroll. As this information is derived from unemployment insurance data provided by individual firms, it includes only employees covered by the state’s unemployment insurance program, or “covered employment.” Generally, people not

included are the self-employed, seasonal agricultural workers and some railroad employees. To maintain confidentiality, information about employment sectors or industries with one or a few firms is combined.

Though employment data for cities is not published regularly, municipalities may request confidential data for planning purposes. This information reveals monthly employment and quarterly payroll for individual firms, along with the firm name, street address, state, zip code and industry code.

For research purposes and to establish historic employment trends, it is best to request data for the last five to ten years, as well as the current time period. A jurisdiction may also ask for information for its competitive market region-- a group of counties that provides area-wide land, goods, services and jobs. Converting this raw data to a format that establishes a baseline employment level describes historic employment trends and involves these steps:

Task 1.1. Sort data by geographic identifier, or "geocode" for individual firms.

After obtaining information about the "universe" of firms or establishments in a larger planning area and regional trends, informed decisions about local capture rates can be made that take into account the competitive advantages of the local area.

Correlate employment data to a physical location or subarea. If geocoding individual firms is too time-consuming and costly, the data can be approximated by sorting addresses by zip codes. They also should be divided by accepted industry classifications, such as SIC or NAICS.

These average annual growth rates (AAGR) can be applied to the baseline level of employment established in Task 1 to calculate the employment level and employment growth by industry.

Data sources:

- ✓ Oregon Employment Department ES 202 data and 10-year regional growth forecast by industry and occupation
- ✓ Bureau of Economic Analysis employment by county
- ✓ Local firms

Demand Task 3. Group industries by type of land use.

To forecast demand for non-residential land, employment growth by industry should be combined, based on their employment

densities and development types. Table 8 shows three common land use types and their corresponding typical industries:

➡ **Commercial:** retail, administrative and professional activities such as finance, insurance, real estate, legal, accounting, information technology and medical services. May also include food service, recreation and tourism facilities.

➡ **Industrial:** manufacturing, assembly, fabrication, processing,

Table 8 Sample of Grouping Industries by Land Use Type			
	Warehouse/Distribution	General Industrial	Tech/Flex
Construction and Mining		75%	25%
Manufacturing		75%	25%
TCU			
Trucking and Warehousing	100%		
Water Transportation	100%		
Air Transportation	100%		
Communications		50%	50%
Electricity, Gas, Sanitation		50%	50%
Wholesale	90%	10%	
Services			
Computer, Data Processing			100%
Auto Repair, Services, Parking		100%	
Miscellaneous Repair		75%	25%

Source: Hammer Siler George Associates

storage, logistics, warehousing, distribution, research and development, business headquarters.

- ☛ Institutional: public and private health care facilities, jails, schools and government facilities.

By grouping employment sectors into major categories, the sizes of buildings and land area required to accommodate future job growth can be determined.

Data sources:

- ✓ Local employment forecasts by industry
- ✓ Previous analysis

Demand Task 4. Identify employment growth that does not require additional land.

The next step is to identify employment growth that does not require additional land. Three types of employment growth will not need additional non-residential land:

Expansion by local firms. Anticipated employment growth of firms that own sufficient built space or land to accommodate expansion should be subtracted from the forecasted employment growth by land use type. They also should not be included in the inventory of buildable land, as it is not available to other firms. In many areas, this is a primary source of economic growth.

Growth that can be accommodated in vacant buildings and/or underutilized sites. As there is little empirical data on the share of employment growth that can be accommodated in vacant or redeveloped buildings, a general rule-of-thumb is 10% to 15%. An analysis of improvement-to-land-value ratio can help identify a better estimate of redevelopable land. This can also be validated by visual confirmation or "windshield surveys." It also should not be included in the inventory of buildable land.

Industrial and other employment jobs within residential or mixed-use zones. Planning areas that allow a mixture of employment and residential land uses, such as Mixed-Use Commercial and Mixed-Use Employment Districts tend to require medium- to high-density housing co-existing with retail, office and some light industrial uses. This may entail GIS-based analysis of employment sectors by standard industrial classifications (SIC) for a particular zone district (using ES202 data) or field research to verify the numbers of dwellings, types of employers and number of employees. Table 9 provides a sample mixed-use zoning analysis of jobs and dwellings.

Table 9 Sample Mixed-Use Zoning Analysis of Jobs and Dwellings							
Mixed Use Zone Town Center – Jobs	Range (FAR/Acre)*	Assumed Range (FAR/Acre)*	Assumed Distribution of Land Use	Assumed Distribution of Acres (Net Buildable)	Estimated Floor Area (SF)	Assumed Floor Area SF Per Job	Estimated New Jobs
Retail Use	0.20-0.30	0.25	70%	17.1	186,000	550	338
Office Use	0.35-0.50	0.50	20%	4.9	106,000	350	304
Civic/Other Use	0.20-0.40	0.40	10%	2.4	42,000	750	56
Total	--	--	100%	24.4	334,000	--	698

Mixed-Use Zone Town Center – Dwellings	Estimated Floor Area (SF)**	Assumed Average SF/Dwelling	Estimated Dwelling Units
Retail Floor Area	186,000	--	--
Upper-Level Housing	61,380	950	65

* FAR = ratio of building floor area to total site land area.
 ** Retail floor area estimate derived from above calculation on retail use.
 Source: Otak, Inc.

estimate land demand in acres. Some sampling to confirm the estimate, through interviews, assessment data on building footprints and field checks, is optional.

Measures of employees per acre vary widely, even among firms in the same industry. In all cases, these assumptions should reflect local conditions and expected trends.

Option B. Building square feet per employee and floor-area ratios (FAR's)

Applying assumptions of building square feet per employee (SFE) to the employment forecast results in an estimate of total building space needed to accommodate forecasted employment growth. This estimate can be translated to net acres of land by applying assumptions of building FARs. These assumptions can be based on similar studies elsewhere or local analyses.

For SFE, there is general consensus in empirical studies that a reasonable range for office use is between 300 and 500 square feet; retail can be the same or slightly higher. Industrial and warehousing may reach as high as 600 to 1,000. FARs average around 0.2 to 0.4 for suburban areas, varying by land use and building type.

To develop measures of SFE, a local jurisdiction should match confidential employment data for individual firms to building size available in assessment and taxation data. This information also can be used to calculate a FAR for each firm. The resulting measures can be averaged by industry or land use type.

As noted previously, both estimates can vary widely among firms in the same industry. The assumptions applied to the employment forecast should be adjusted to reflect local conditions and expected trends.

term. There are exceptions, such as, for example, if a few large parcels are held by a single owner who does not plan to sell them in the immediate future can impact available supply.

Vacancy rates also apply to built space. As they tend to be cyclical, the assumption should reflect a long-term average and provide a range of choices. For efficient market operation, a minimum vacancy rate for built space is between 5% and 15%. The estimate of total acres of demand should be increased by this percentage as the market often requires more options than the employment estimates seem to require.

Data sources:

- ✓ Interviews with local realtors

Demand Task 8. Disaggregate the total demand.

The total demand for industrial and other employment land uses that results at the end of Task 7 is for 20 years. Task 8 may be undertaken if further estimates of subcategories, such as heavy industrial/high-tech; short-term/long-term; geographical areas; or parcel size, are needed. Unless the total demand has been developed (steps 1-7) by adding up disaggregated demand estimates, these estimates should subdivide the aggregate (total) land need into components.

As part of their Goal 9 analysis, cities and counties should identify the site requirements of firms that may expand or locate in the planning area. As an important component, parcel size can be determined by using the same employment and land use data as employed to estimate total land demand. An estimate of demand by parcel size can be compared to supply by parcel size to indicate any land deficiencies that should be addressed. A parcel may include more than one tax lot if they are contiguous and/or can be combined under one ownership.

Short-Term Demand Task 3. Analyze supply constraints, adjusting short-term demand potential accordingly.

As noted, short-term supply constraints are important influences on short-term demand. An assessment of ownership and environmental and infrastructure needs should focus on potential sites that may accommodate the short-term demand. For example, if during step two it was determined that four sites of over 70 acres may be needed in the short-term, but the development constraints analysis reveals that only one site is actually available, the jurisdiction may decide to focus on other short-term opportunities such as supply of 5- to 20-acre sites.

Short-Term Demand Task 4. Identify policies to facilitate desired development.

A jurisdiction's ability to realize its short-term development potential can be augmented by supporting land use and funding policies such as:

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- Flexible land use zoning ordinances that appeal to a variety of users
 - Staff assistance to developers in the preparation of site master plans and/or environmental permits; engineering and architectural design drawings and specifications
 - Proactive marketing and promotional efforts
 - Requests for development proposals or expressions of interest from developers for specific sites
 - Public funding or other financing that can provide needed infrastructure or be used to help leverage desired private investment
 - Public assemblage of strategic parcels of land
 - Commercial/industrial business parks or speculative buildings
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Advanced Approach: Determining Supply

Long-Term Land Supply

The steps in this analysis build on the Basic Approach, introducing GIS and other data collection techniques. They will help a jurisdiction calculate:

- Gross vacant acres by plan designation, including fully vacant and partially vacant tax lots
- Gross buildable vacant acres by plan designation, subtracting unbuildable acres from total acres
- Net buildable acres by plan designation, subtracting land for future public facilities from gross buildable vacant acres
- Total net buildable acres by plan designation, adding redevelopable acres to net buildable acres

Supply Task Checklist.

- **Assemble databases.**
- **Categorize land.** Classify land into several mutually exclusive categories.
- **Identify development constraints.** Acknowledgment that not all vacant land is buildable and may be constrained by natural features, zoning, public facilities and other factors.
- **Calculate net buildable land.** Data may be organized by any of the attributes the jurisdiction wishes. GIS provides information that allows classification of each tax lot as either developed, partially developed, or vacant. Tax lots that are considered developed are re-assessed in a subsequent step to determine their redevelopment potential.

☞ **Verify analysis.** This generally includes review through aerial photos, orthophotos and field research to identify potential problems that cannot be ascertained by other means.

☞ **Analyze land by type.**

This Advanced Approach is aided by use of GIS data to develop a summary of land supply that can be cross-referenced. It relies on information such as land use and zoning, parcel boundaries and physical features that can be manipulated at the tax lot level.

There are many ways that “vacant land” and “buildable land” can be defined.

Tax lot boundaries often include developed and vacant land on the same parcel (e.g., one house on a three-acre lot). Thus, on individual tax lots, vacant land that is not constrained (buildable) may be either totally vacant with no significant improvements or partially vacant with some improvements. It also may be described as underutilized and redevelopable.

Redevelopable land is not vacant but can support some of the new demand identified previously. A common guide to determine whether a parcel is redevelopable is if the value of improvement on the land is less than the land value alone. This is also called have a land-to-improvement value ratio. If the ratio is greater than 1:1, the lot may be considered redevelopable. Another way to assess the likelihood of redevelopment is to compare the parcels’ improvement value to surrounding parcels. If the improvement value is significantly lower than similarly designated surrounding parcels, it may be redevelopable.

Infill is not considered a type of vacant land development, but a condition of a tax lot relative it’s to surroundings. If nearby tax lots

Supply Task 4. Estimate total buildable land supply by land classification.

To ensure the accuracy of the conclusions before the final analysis is conducted, jurisdictions should verify buildable land data through aerial photos and field visits. Large jurisdictions may choose standard sampling techniques to test accuracy of the analysis.

Calculate gross buildable acres. Divide the estimated total buildable land supply into classifications. Begin by subtracting constrained acres from total vacant acres—preferably at the tax lot level. This analysis is most easily done by using GIS. It should result in a tabular database that can be summarized by various attributes, such as plan designation and zoning, and facilitates further disaggregated analysis that may be needed.

Jurisdictions have two options when addressing redevelopment potential: either deduct employment from the demand side of the calculation or include redevelopable land on the supply side. To avoid double-counting, only one approach should be used.

A supply-side analysis can help identify tax lots with redevelopment potential—those with developed structures with some probability of being demolished and replaced. Many studies use improvement-to-land-value ratios to estimate this.

Convert gross acres to net acres. A gross acre is a vacant acre of land before it has had a portion of the property dedicated for public rights-of-way, private streets, or public utility easements. For example, a standard assumption is that about 20% of land in a residential subdivision is used for streets and utilities: thus, a gross vacant acre will yield only about 35,000 sq. ft. (80% of a full acre) for lots. At five dwelling units per gross acre, the average lot size is about 7,000 square feet. A jurisdiction can calculate the precise percentage for reducing gross to net residential acres by

analyzing subdivision permits over the last five years. Environmental constraints described in Supply Task 3 can reduce developable acreage even further.

One way to check assumptions is to randomly select developed industrial and other employment parcels and calculate the amount of land available for development that is used for streets, utility easements, and other public purposes.

Table 10 provides a sample calculation of converting gross to net acres.

Table 10 Sample Non-Residential Lands Data Worksheet									
Tax Lot#	Total Acreage	<u>Minus</u> Developed acreage	<u>Equals</u> Gross vacant acreage	<u>Minus</u> Constrained acres	<u>Equals</u> Gross buildable vacant acres	<u>Minus</u> Acres for public facilities (25%)	<u>Equals</u> Net buildable vacant acres	<u>Plus</u> Redevelopable acres ^a	<u>Equals</u> Total net buildable acres
Commercial Plan Designation									
1202	10.0	0.0	10.0	1.1	8.9	2.2	6.7	-	6.7
1400	5.0	1.0	4.0	0.0	4.0	1.0	3.0	-	3.0
1506	8.0	8.0	0.0	0.0	0.0	0.0	0.0	4.0	4.0
Subtotals							9.7	4.0	13.7
Industrial Plan Designation									
2000	20.0	0.0	20.0	2.0	18.0	4.5	13.5	-	13.5
4500	3.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0
Subtotals							13.5	3.0	16.5
Total Net Buildable Acres							23.2	7.0	30.2

Source: Adapted from the HB 2709 Workbook

^a Note: Redevelopment may also be addressed on the demand side of the analysis

Summarize buildable land by classification and plan designation.

At a minimum, jurisdictions should develop buildable lands inventory maps and summary tables displaying this information. Zoning and land classifications may also be shown.

Short-Term Land Supply

Jurisdictions may have a 20-year supply of industrial and other employment land and still not have many sites ready for development. This situation may occur if:

- ➔ Vacant, buildable, and serviceable sites are owned by a few property owners who are not ready to develop
- ➔ There are significant physical, institutional, or cost constraints before necessary public services (primarily roads, water, and sewer) can be supplied

Short-Term Supply Task 1. Identify short-term land supply.

In the buildable lands inventory, identify the number of sites and total acreage by land type ready for immediate development. The local public facilities plan should define the time schedule for providing services to developable sites.

Data sources:

- ✓ Local public facilities plans
- ✓ Interviews with public works director, utility districts
- ✓ Interviews with local landowners, developers and realtors

Advanced Approach—Comparing Land Demand and Supply (Need)

In the Basic approach, the result of the land demand analysis is compared to the total buildable land supply to determine whether the jurisdiction has a 20-year supply of buildable land. An analysis of short-term supply is also required.

Jurisdictions can begin a more detailed comparison of demand and supply by reviewing the site requirements of firms and conducting a detailed comparison of local sites. At a minimum,

