Regional Industrial Lands Study: Economic Trends

Employment Growth and Development Density

Presentation by ECONorthwest
August 2001
Background
Why study industrial lands?

- It’s not only the law—it’s a good idea
  - State requirements
    - Implications for Regional Urban Growth Boundary
  - Economic development
    - Land a key factor
      - Location
      - Services
      - Cost
What kind of study?

- How much buildable land is there?
  - What characteristics?
    - Location, size, services
  - How readily available?

- How much will growth require?
  - Density of development
  - By location and characteristics
What’s been done so far?

- Phase I (July 98)
  - Interviews to define the problem

- Phase II (December 99) (1)
  - Demand: 6,300 net buildable acres of industrially-zoned land (20 years)
  - Supply: 9,200 acres of industrially-zoned land, but:
    - 2,400 acres are readily developable
    - Unevenly distributed; Few large parcels

(1) Six county Portland-Vancouver PMSA. Supply is all types (Tier A - D), which includes non-vacant land assumed potentially redevelopable land.
What does this study do?

- Phase III: Policy Alternatives *(now)*
  - Check estimates
    - More research on potential change in type, operation, and land needs of businesses
    - Estimate costs of making more land available
  - Compare alternative strategies and policies
What does this part of Phase III cover?

- Demand analysis and emerging industrial trends: a check on Phase II demand analysis
  - Population and employment: trends and forecasts
  - Emerging trends affecting industrial land
    - Location, parcel size, employment density, building type, infill, redevelopment
  - Alternative land demand forecasts
How is this presentation organized?

- Definitions
- Expected employment growth
- Land demand
- Site requirements
- Conclusions
Definitions
Definitions: What is an “industrial” job?

- Typically includes following sectors:
  - Manufacturing
  - Transportation, Communication and Utilities
  - Wholesale Trade
  - Mining and Construction

- Similar to “traded” or “basic” sectors
  - Usually excludes Services, even if they are export-oriented
What is “industrial” land?

- Land designated to allow (not necessarily require) industrial uses
- Not all jobs in “industrial” sectors use industrially-designated land
  - E.g., head office in downtown commercial
- Not all industrially-designated land is used by “industrial” sectors
  - Some services NEED industrial land (e.g., auto repair)
  - Some office/retail/residential developments USE industrial land
Land and employment

LAND

- Industrial
  - Vacant
  - Developed

- Non-Industrial

EMPLOYMENT

- Industrial SICs
  - Need Industrial Land
  - Does Not Need Industrial Land
    - Will Use Industrial Land
    - Will Not Use Industrial Land

- Non-Industrial SIC
### Industrial jobs by land designation, 2000

<table>
<thead>
<tr>
<th></th>
<th>Gross Acres</th>
<th>Industrial Jobs as % of All Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Industrial Areas</td>
<td>44,198</td>
<td>73%</td>
</tr>
<tr>
<td>Industrial Area</td>
<td>4,17</td>
<td>77%</td>
</tr>
<tr>
<td>Heavy Industrial</td>
<td>15,891</td>
<td>85%</td>
</tr>
<tr>
<td>Light Industrial</td>
<td>6,326</td>
<td>68%</td>
</tr>
<tr>
<td>Mixed Use Industrial</td>
<td>21,564</td>
<td>69%</td>
</tr>
<tr>
<td>All Commercial Areas</td>
<td>13,704</td>
<td>17%</td>
</tr>
</tbody>
</table>


Note: In this table, "industrial" includes construction, mining, manufacturing, TCU, and wholesale. It does not include services (auto repair, etc.)
Use of “industrial” for demand analysis

- How much vacant industrially-designated land does the region need?
- It must accommodate most job growth in “industrial” sectors
- It must also accommodate some job growth in “non-industrial” sectors
Expected Employment Growth
Employment growth: nation and state

- Continued growth: U.S., Oregon, Region
- Convergence of regional and national growth rates
- Continued decline in “industrial” share (though increase in number)
- Continued rise in services share
### 1999 Six-County Region Employment

<table>
<thead>
<tr>
<th>Industrial</th>
<th>37%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacture</td>
<td>17%</td>
</tr>
<tr>
<td>Wholesale</td>
<td>8%</td>
</tr>
<tr>
<td>TCU</td>
<td>6%</td>
</tr>
<tr>
<td>Construction</td>
<td>6%</td>
</tr>
<tr>
<td>Subtotal</td>
<td>37%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Non-Industrial</th>
<th>63%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Services</td>
<td>32%</td>
</tr>
<tr>
<td>Retail</td>
<td>20%</td>
</tr>
<tr>
<td>FIRE + Gov</td>
<td>9%</td>
</tr>
<tr>
<td>Ag/For./Fish.</td>
<td>2%</td>
</tr>
<tr>
<td>Subtotal</td>
<td>63%</td>
</tr>
</tbody>
</table>
Regional industrial employment (000s)
Regional share of employment

- Industrial
- Non-Industrial
- Govt
Analysis:
Estimated Demand for Industrial Land
Review of Phase II demand analysis

- 8 key factors in estimating land need
  - Job growth forecasts
  - % jobs by sector that need industrial land
  - Use of non-vacant industrial land
  - Distribution of jobs to building types
  - Employment densities (sq.ft./employee)
  - Floor-to-area ratios
  - Vacancy rates
  - Non-industrial use of industrial land
Limitations

- Inherent forecasting problems
  - 25 years          Economic cycles and changes
  - Technology      Public policy

- Thus, our test
  - Given existing conditions and expectations for markets and policy, is an assumption or forecast reasonable?
  - Reasonable: no alternative assumption or forecast is obviously more likely
Changes to Phase II

- Some adjustment to % industrial
- Minor adjustment to employment densities and FAR
- More consideration of use of non-vacant land
Use of non-vacant land ("refill")

- Phase II assumptions:
  - Potentially redevelopable land considered on supply side
    - But includes wide spectrum of potential
      - How much will actually be redeveloped?
  - Other use of non-vacant land not considered in Phase 2 analysis
    - Increased shifts, on-site infill, more workers per square feet, etc.
Use of non-vacant land ("refill")

- Findings:
  - Alternative to supply-side analysis: assume a % of emp. growth to go on non-vacant land
  - Metro uses this method; found 21% of industrial employment growth accommodated by “refill” for 1994-96
  - Must take cycles into account

- Conclusions
  - Issue best addressed on demand-side
  - 15% is a reasonable long-term average
Forecast of demand for industrial land

- A few alternatives in each factor lead to thousands of possible different outcomes
- Modeled from 2000 to 2025 based on research
  - Extremes: 4,600 to 10,300 net acres
  - 90% Confidence Interval: 5,700 to 8,200 net acres
  - Mean: 6,900 net acres (our best estimate)
  - Phase II: 7,900 net acres
Site Requirements
Site requirements: why care?

- Not just about *how much* land…
- Also about *what type* of land
- If firms don’t find the right type of land, it doesn’t matter how much total industrial land is available
Site requirement trends: clustering

- Clusters are similar businesses, supportive businesses, labor force and networks
- Continued perception that proximity to existing clusters is key, BUT...
- Rising land prices and traffic congestion causing some dispersal: regionwide clusters
- Conclusion: continued strength of existing clustering, but potential growth elsewhere
Site requirement trends: utility needs

- Most industries require:
  - Good transportation infrastructure
  - Good telecommunications
- Some industries require:
  - High electricity use from reliable source
  - High water use
Site requirement trends: labor force

- Proximity to skilled labor is important for many industries
  - Region has skilled labor
  - Transportation system offers intra-region mobility
  - Proximity to training can be key
- Quality of life and affordable, diverse housing stock needed to attract and keep skilled labor
Site requirement trends: suburbanization

- Consistent trend over past 30 years
  - Perception (waning) of less traffic congestion
  - Following residential suburbanization
  - Lower price and greater availability of land

- Slowed by recent counter-trends
  - Need to attract skilled workers with urban amenities
  - Less land needed by some high-tech industries, e.g., software and bio-tech
Site requirement trends: price sensitivity

- Firms optimize: trade-offs between site needs and costs
  - Importance of quality of life, workforce skills, and clustering leading to less land price sensitivity in some industries BUT...
  - Some manufacturing/warehouse
    - Land intensive relative to capital and labor
    - Very sensitive to lease rate
    - Thus, land price (relative to other areas) matters
    - Example: timber mill
Site requirement trends: site size

- Varies greatly:
  - Across industries
  - Within industries
- Need a mix of site sizes
- Future expansion on-site is common desire
Parcel size analysis

- Based on analysis of employment size distribution of tri-county firms, from 2000 Oregon Employment Dept. data
- Translate workers to parcel size using findings on FAR, sqft./employee, etc.
- Findings: Most firms will require small parcels, but the large parcels will account for much of total acreage needs
- But, parcels can be assembled to sites
Summary
Growth and total land need

- Growth forecasts reasonable
- How much net buildable vacant industrial land will this require?
  - There are factors decreasing density (e.g., automation) and increasing density (e.g., more functions performed in warehouses)
  - Use of non-vacant land and non-industrial land decreases the need; use of industrial land by non-industrial jobs increases the need
- Our estimate: 6,900 acres
Site requirements

- Labor force, clusters, utilities, land price all important
  - Absolute and relative importance varies by industry
- Mix of parcel sizes needed
### Parcel size demand, 2000-2025

#### Tech/Flex space

<table>
<thead>
<tr>
<th>Parcel Size (Acres)</th>
<th>Total Parcels</th>
<th>% of Parcels</th>
<th>Land Needs (Net Acres)</th>
<th>% of Land Needs</th>
<th>Jobs</th>
<th>% of Job</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 0.4</td>
<td>563</td>
<td>65%</td>
<td>118</td>
<td>11%</td>
<td>2,817</td>
<td>11%</td>
</tr>
<tr>
<td>0.4 to 2</td>
<td>217</td>
<td>25%</td>
<td>226</td>
<td>22%</td>
<td>5,419</td>
<td>22%</td>
</tr>
<tr>
<td>2 to 4</td>
<td>45</td>
<td>5%</td>
<td>142</td>
<td>14%</td>
<td>3,400</td>
<td>14%</td>
</tr>
<tr>
<td>4 to 6</td>
<td>15</td>
<td>2%</td>
<td>78</td>
<td>7%</td>
<td>1,860</td>
<td>7%</td>
</tr>
<tr>
<td>6 to 8</td>
<td>6</td>
<td>1%</td>
<td>44</td>
<td>4%</td>
<td>1,057</td>
<td>4%</td>
</tr>
<tr>
<td>8 to 21</td>
<td>15</td>
<td>2%</td>
<td>225</td>
<td>22%</td>
<td>5,394</td>
<td>22%</td>
</tr>
<tr>
<td>21 to 42</td>
<td>3</td>
<td>0%</td>
<td>86</td>
<td>8%</td>
<td>2,071</td>
<td>8%</td>
</tr>
<tr>
<td>42 and above</td>
<td>2</td>
<td>0%</td>
<td>123</td>
<td>12%</td>
<td>2,942</td>
<td>12%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>866</strong></td>
<td><strong>100%</strong></td>
<td><strong>1,042</strong></td>
<td><strong>100%</strong></td>
<td><strong>24,961</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Note: Does not include allowance for non-industrial use of industrial land.

Source: ECONorthwest and Otak, based on 2000 ES-202 data for Washington, Clackamas and Multnomah Counties, and various study assumptions.
### Parcel size demand, 2000-2025

- **Warehouse/Distribution space**

<table>
<thead>
<tr>
<th>Parcel Size (Acres)</th>
<th>Total Parcels</th>
<th>% of Parcels</th>
<th>Land Needs (Net Acres)</th>
<th>% of Land Needs</th>
<th>Jobs</th>
<th>% of Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1</td>
<td>669</td>
<td>63%</td>
<td>335</td>
<td>13%</td>
<td>3,347</td>
<td>13%</td>
</tr>
<tr>
<td>1 to 5</td>
<td>303</td>
<td>28%</td>
<td>758</td>
<td>30%</td>
<td>7,583</td>
<td>30%</td>
</tr>
<tr>
<td>5 to 10</td>
<td>63</td>
<td>6%</td>
<td>470</td>
<td>19%</td>
<td>4,698</td>
<td>19%</td>
</tr>
<tr>
<td>10 to 15</td>
<td>16</td>
<td>1%</td>
<td>196</td>
<td>8%</td>
<td>1,961</td>
<td>8%</td>
</tr>
<tr>
<td>15 to 20</td>
<td>5</td>
<td>0%</td>
<td>85</td>
<td>3%</td>
<td>854</td>
<td>3%</td>
</tr>
<tr>
<td>20 to 50</td>
<td>11</td>
<td>1%</td>
<td>386</td>
<td>15%</td>
<td>3,857</td>
<td>15%</td>
</tr>
<tr>
<td>50 and above</td>
<td>3</td>
<td>0%</td>
<td>297</td>
<td>12%</td>
<td>2,972</td>
<td>12%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,070</strong></td>
<td><strong>100%</strong></td>
<td><strong>2,527</strong></td>
<td><strong>100%</strong></td>
<td><strong>25,272</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Note: Does not include allowance for non-industrial use of industrial land

Source: ECONorthwest and Otak, based on 2000 ES-202 data for Washington, Clackamas and Multnomah Counties, and various study
Parcel size demand, 2000-2025

- General Industrial space

<table>
<thead>
<tr>
<th>Parcel Size</th>
<th>Total Parcels</th>
<th>% of Parcels</th>
<th>Land Needs (Net Acres)</th>
<th>% of Land Needs</th>
<th>Jobs</th>
<th>% of Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 0.4</td>
<td>1,265</td>
<td>70%</td>
<td>258</td>
<td>14%</td>
<td>6,327</td>
<td>14%</td>
</tr>
<tr>
<td>0.4 to 2</td>
<td>409</td>
<td>23%</td>
<td>418</td>
<td>22%</td>
<td>10,233</td>
<td>22%</td>
</tr>
<tr>
<td>2 to 4</td>
<td>70</td>
<td>4%</td>
<td>214</td>
<td>11%</td>
<td>5,236</td>
<td>11%</td>
</tr>
<tr>
<td>4 to 6</td>
<td>28</td>
<td>2%</td>
<td>145</td>
<td>8%</td>
<td>3,555</td>
<td>8%</td>
</tr>
<tr>
<td>6 to 8</td>
<td>9</td>
<td>1%</td>
<td>66</td>
<td>4%</td>
<td>1,616</td>
<td>4%</td>
</tr>
<tr>
<td>8 to 20</td>
<td>21</td>
<td>1%</td>
<td>304</td>
<td>16%</td>
<td>7,457</td>
<td>16%</td>
</tr>
<tr>
<td>20 to 41</td>
<td>5</td>
<td>0%</td>
<td>167</td>
<td>9%</td>
<td>4,103</td>
<td>9%</td>
</tr>
<tr>
<td>41 and above</td>
<td>4</td>
<td>0%</td>
<td>300</td>
<td>16%</td>
<td>7,352</td>
<td>16%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,813</td>
<td>100%</td>
<td>1,872</td>
<td>100%</td>
<td>45,879</td>
<td>100%</td>
</tr>
</tbody>
</table>

Note: Does not include allowance for non-industrial use of industrial land

Source: ECONorthwest and Otak, based on 2000 ES-202 data for Washington, Clackamas and Multnomah Counties, and various study assumptions
## Forecast by location, 2000-2025

<table>
<thead>
<tr>
<th>County</th>
<th>Demand 2000-2025 (net acres)</th>
<th>Tier A Supply (from Phase 2, gross acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washington</td>
<td>2,100</td>
<td>483</td>
</tr>
<tr>
<td>Clackamas</td>
<td>2,000</td>
<td>47</td>
</tr>
<tr>
<td>Clark</td>
<td>1,600</td>
<td>1,345</td>
</tr>
<tr>
<td>Multnomah</td>
<td>900</td>
<td>442</td>
</tr>
<tr>
<td>Yamhill</td>
<td>250</td>
<td>0</td>
</tr>
<tr>
<td>Columbia</td>
<td>50</td>
<td>70</td>
</tr>
</tbody>
</table>