REGIONAL INDUSTRIAL SITE READINESS PROJECT

Attachment to Sept. 26, 2012 Testimony for Agenda Item #1098

Volume 1:
Phase 1 and Phase 2 Analysis and Findings

REGIONAL INDUSTRIAL SITE READINESS PROJECT

AUGUST 2012

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Port of Portland — Portland Business Alliance

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City of Hillsboro
City of Portland
City of Sherwood
City of Wilsonville
Howard S. Wright
National Electrical Contractors Association – Oregon-Columbia Chapter
Oregon State Building & Construction Trades Council
Portland General Electric
Plumbing & Mechanical Contractors Association
Sheet Metal & Air Conditioning Contractors National Association
Three Oaks Development Company
Westside Economic Alliance

The Project is being funded in part through funds provided by the State of Oregon, acting by and through the Business Oregon (an Oregon state agency).

The site information contained in this report is based on publicly available data sources and is not intended to replace independent due diligence for transaction purposes. Prospective purchasers, tenants, and others shall perform and rely solely upon, their own independent due diligence with respect to the Property.

Volume 1 is one of four documents for the Regional Industrial Site Readiness Project. This volume presents the complete Project analysis and findings. Volume 2 presents the site specific details and results of the Project. Volume 3 includes all of the technical appendixes referenced in Volume 1. The Project Executive Summary is the fourth document and is included in this Volume for the convenience of the reader.

VOLUME 1: PHASE 1 AND PHASE 2 ANALYSIS AND FINDINGS

PROJECT EXECUTIVE SUMMARY

A. PROJECT PURPOSE

Traded-sector companies sell goods to buyers outside of the Metro region, bringing in additional wealth. Attracting and retaining traded-sector industrial companies is important for the Portland region's long-term economic prosperity. Establishing a supply of development-ready large industrial sites is a critical part of a strategy to attract and retain traded-sector jobs. Because the Portland region must compete with other metropolitan areas for these traded-sector jobs, it must be able to provide a reasonable inventory of available sites.

This report examines the current and near-term supply of large (25+ acres) industrial sites available to accommodate the expansion of existing employers and recruitment of potential new employers to the Portland metro region[1]. For purposes of this study, only vacant, industrially zoned, or planned lands within the Portland metropolitan Urban Growth Boundary (UGB) and selected Urban Reserves were analyzed.

The project was conceived partly in response to Metro's 2009 Urban Growth Report, which identified a shortage of large-lot industrial sites in the region and in recognition of the need to replenish large-lot industrial sites as they are developed. This project report was produced by Group Mackenzie in partnership with Business Oregon, Metro, NAIOP - Commercial Real Estate Development Association Oregon Chapter, Port of Portland and Portland Business Alliance, whose representatives served as the Project Management Team (PMT).

The project is divided into two parts. Phase 1 documented the regional inventory of large industrial sites and categorized them into three tiers based on their development readiness. Phase 2 analyzed 12 representative Phase 1 sites to provide more detail about their constraints and the potential economic benefits of development. The purpose of the project is to:

- Quantify the supply and readiness of large industrial sites in the Portland metro area.
- Determine the costs and benefits of developing a representative subset of these sites.
- Inform discussion on future tools and policies to maintain a market-ready inventory of industrial sites.

[1] The Regional Industrial Site Readiness Project examined vacant, industrially-zoned, or planned lands within the Portland metropolitan area's UGB and selected urban reserves that are suitable for large-lot industrial development by new firms moving to the region or the growth of existing firms that do not hold land for future expansion. Rural areas of Clackamas and Washington counties outside the UGB were not included in this analysis. The study identified and documented user-owned sites held for future use but excluded these from the detailed analysis because these sites were not available to the marketplace.

B. FINDINGS

1. Development Readiness

The analysis in this study shows that the region lacks a supply of industrial land that is readily available to attract and grow the types of catalytic employers that will help the region's ability to prosper. This is particularly an issue for sites of 50 acres or more.

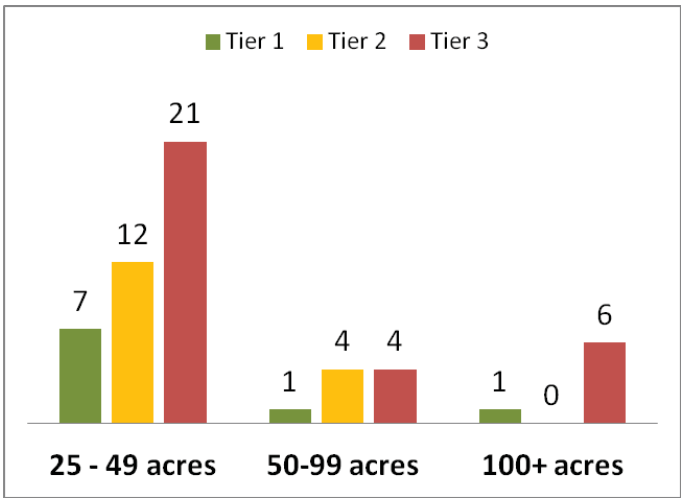
Figure 1 represents the findings of the regional inventory as of October 2011. The study found:

9 Tier 1 sites
Available for facility construction within 180 days
There are few Tier 1 "market ready" sites available for traded-sector opportunities in the near term. Further, only five of these nine sites meet broad marketability requirements.

16 Tier 2 sites
Available for facility construction between seven and 30 months
There is a modest supply of mid-term sites requiring investment and policy actions to bring these sites to market. Four of these sites require assembly of smaller lots.

31 potential Tier 3 sites
Available for facility construction beyond 30 months
There are multiple challenges and significant investment and time required to bring these pipeline sites to market. Ten of these sites require lot assembly.

Figure 1: Regional Site Distribution based on Tiers



Source: Group Mackenzie

There is a limited supply of 50-plus and 100-plus acre sites in the Portland region. The study found:

Tier 1 sites: One 100-plus acre site
Tier 2 sites: No 100-plus acre sites
Tier 3 sites: Six potential 100-plus acre sites; three require lot assembly

Industrial sites in the region are in varying states of readiness, requiring regulatory approvals (permitting, mitigation), state/local actions (concept planning, annexation, rezoning), infrastructure (sewer, water, transportation), assembly of sites, and brownfield cleanup. This report provides a clearer understanding of the actions and investments required to make more of these sites development ready to ensure the region's competitiveness.

2. *Development Costs*

Evaluation of the 12 Phase 2 case study sites shows most sites have at least one major constraint which is significant enough to preclude market activity. A lack of off-site public utilities such as water, sanitary sewer, storm water, and transportation, are the most common, and in many of the case studies, the most severe constraint. Across all 12 Phase 2 sites, off-site costs comprise roughly 44 percent of all development costs. Transportation constraints are the largest contributing factor. The median cost for off-site infrastructure ranges between $0.16 per square foot to $0.85 per square foot. Transportation is the highest at $0.85 per square foot. Beyond dollars, the time to establish infrastructure approaches 24 to 30 months.

Direct public investment to address off-site issues can have a significant positive impact. For example, the East Evergreen site in Hillsboro has a market viability gap of $13.3 million, the most significant element of which is transportation infrastructure. An investment in this infrastructure would alleviate 78 percent of the market gap for this site.

The sites with critical infrastructure deficiencies are not likely to attract large firms if investment is left solely to the private market or delayed until a business willing to commit to a site is found.

On-site constraints, such as floodplain, slope, wetlands, and brownfields are not as broadly common, but where they do exist, are often costly and cause delays.

Table1: Tier 2 and Tier 3 Development Constraints

CONSTRAINT*	NUMBER OF SITES
Brownfield/Cleanup	8
Natural Resources	13
Infrastructure	19
Transportation	18
Land Assembly	14
State/Local Actions	20
Not Willing to Transact	18

**Sites may have multiple constraints*
Source: Group Mackenzie

Eight of the Phase 2 sites have a wetland bank in their watershed, which is the preferred mitigation method and reduces time to development. The other three sites that have wetland issues either would necessitate on-site mitigation, reducing net developable acreage, or as in the case of the Troutdale Reynolds Industrial Park (TRIP), require the purchase of additional land for off-site mitigation. Currently, wetland permitting and mitigation cannot occur without a specific user and site plan in hand.

When combined with the long lag times for permitting and mitigation, wetland mitigation is a key "opportunity constraint." Investment in resources, such as creation of wetland banks or a streamlined process, could move these sites further toward marketability at a relatively low cost.

Eight of the 12 sites in this study are agricultural greenfields that have had no previous industrial use. Because of this, brownfield remediation is the smallest dollar cost constraint across all Phase 2 sites. However, even where costs are quite small, environmental remediation is typically the first activity which must occur in the development process. The median brownfield remediation time for all sites (except TRIP) is six months. If the time required for brownfield remediation were eliminated for these sites it would mean a savings of $2,800 per acre in time costs could be achieved through early environmental remediation.

Brownfield remediation for previously used industrial sites can, on the other hand, be significant. On the TRIP site in Troutdale, environmental cleanup totals $3.6 million, excluding the costs already incurred by the previous owner on this Superfund site. This is $1.28 per square foot and exceeds 7.5 percent of total site readiness costs.

Simplifying and expediting permitting and other pre-development processes can have a significant financial impact on project feasibility. There is a time cost associated to the capital required to ameliorate on and off-site constraints[2]. The Phase 2 analysis found that nearly a quarter of all site development costs are related to time and risk. Activities that reduce uncertainty and delay will implicitly reduce time and risk costs and make a site more financially feasible.

[2] This study calculated a 7 percent annualized rate from the period dollars are spent in the development schedule to site development readiness.

Front end due diligence to identify issues and early investments in preparing sites for market readiness can have a significant impact on their viability by reducing time and risk to the developer or user. Due diligence that identifies a site's constraints and the time to address them, will highlight those that have low costs but long timeframes. These types of constraints provide a good place to focus initial efforts.

One of the most significant project findings is that lot aggregation is a major hurdle to site readiness. Six of the 12 Phase 2 sites require parcel aggregation as the sites are made up of multiple parcels and multiple owners. In one case, there are eight separate owners to aggregate, and in another, 17 owners. While it was not possible to estimate how long the aggregation process may take, it is important to understand that sites that have multiple ownerships have an additional constraint that adds risk and needs to be addressed.

Constraints need to be understood from the perspective of cost, time, and risk. For sites that are close to economic viability, tools that reduce risks and time to market are likely to be most efficient. Sites with more severe constraints will require more comprehensive strategies that include financial tools to bring them to the market.

3. Economic Benefits

Significant economic and fiscal benefits can be created through investments in market ready sites (Table 2). Providing a sense of scale, the 12 sites analyzed in Phase 2 have the capacity to create an estimated 12,500 direct jobs on-site with average annual wages of $97,000. When off-site impacts are considered, associated regional job growth could create $3.7 billion in annual payroll at just over $58,000 per job at full build-out of the twelve sites.

As a result of direct job creation, the 12 Phase 2 sites have the capacity to generate $764 million in payroll tax revenue over the first 20 years of site development, construction, and operation. When all impacts are considered, the state of Oregon could potentially gain roughly $2.3 billion in payroll tax revenue over the first 20 years if all 12 sites were developed.

Phase 2 sites have the combined potential to generate a cumulative $217 million in local property tax revenues over the first 20 years and $25 million annually thereafter.

Table 2: All 12 Case Study Sites Potential Economic Benefit

	TOTAL
Total Direct Jobs	12,500
Average Annual Wage Level	$97,000
Total Property Tax over 20 Years	$217 Million
Total State Payroll Tax over 20 Years (Direct Jobs Only)	$764 Million
Total State Payroll Tax over 20 Years (Direct and Indirect)	$2.3 Billion

Source: Johnson Reid

Based on the conceptual uses assumed for the Phase 2 sites, the fiscal benefits to state and local jurisdictions are quite large. These benefits, if realized, in most cases exceed what it would cost an entity to finance infrastructure improvements necessary to make sites development ready. To sum up, from the perspective of the public, infrastructure investment can have a significant positive return.

C. CONCLUSIONS

The analysis reached the following conclusions:

- A small inventory of large industrial sites available in Tier 1 and 2 could potentially result in lost expansion and recruitment opportunities.
- Market choice is more limited for larger 50-plus and 100-plus acre sites. Parcel aggregation is a key issue to supplying larger sites.
- Tier 2 and 3 sites will require new investment, policy actions, and time to become development ready.
- Funding for infrastructure of all kinds is a critical limiting factor to site readiness.
- The cost of off-site infrastructure is the primary challenge to site readiness, comprising nearly 40 percent of total development costs. Transportation costs are the largest contributor to off-site infrastructure costs.
- Direct public investment to address off-site infrastructure needs and costs can have a significant impact.
- On-site issues vary by site. For some sites addressing on-site issues, such as brownfield remediation, has a high cost or long timeframe. An understanding of each site's constraints and the time to address them, will define those that have low costs but long timeframes. These types of constraints provide a good place to focus initial efforts.
- Nearly a quarter of total development costs are related to time and risk. The longer it takes a developer or user to address constraints and the greater the uncertainty about permitting processes, the higher the project cost and the further away from financial feasibility the project is. Front-end work on investigating and preparing sites for market readiness can have a significant impact on their viability.
- Not all sites have owners who are motivated to sell at industrial land prices (or any price). Some owners anticipate a better price with changes in circumstances or zoning that may or may not be realistic. A willing property owner and motivated jurisdiction are critical to moving sites to market.
- Significant economic benefits (jobs, payroll, and property taxes) would result from traded sector investment in these industrial sites.
- The state's general fund is potentially a big winner from associated job and associated payroll tax revenue growth.

D. RECOMMENDATIONS

Site selection decision timelines are getting shorter in order to meet companies' needs to bring goods and services quickly to market. At the same time, there are limited financial tools available to address barriers to development of industrial sites with higher degrees of complexity. The private credit market is extremely tight and private developers generally are unable to finance projects with significant upfront capital investment, longer term paybacks, and regulatory uncertainty. Public sector resources and financing tools that could play a role in infrastructure and site development are also limited.

While discussion and evaluation of potential options for addressing market readiness of industrial sites needs to take place at the regional and state level, the Project Management Team has identified recommendations for further analysis:

- Establish a mechanism for regional leaders to identify potential industrial sites of regional significance and focus resources on bringing these sites to market readiness.
- Maintain and expand existing state infrastructure funding and technical assistance programs and explore opportunities to improve and target state support.
- Investigate the creation of new funding partnerships between state and local entities to support site readiness of large lot sites for traded sector development.
- Explore opportunities to streamline or make more predictable state and local regulatory and permitting requirements and timelines to reduce permitting risk and increase private sector investment.
- Explore regulatory and policy tools in the arena of wetlands mitigation and brownfields remediation to assist in moving sites to market readiness at the local, state, and regional level.
- Explore opportunities for regional and state funding for patient developer entities, either public or private, that can invest in due diligence and site preparation without requiring a market-driven return on investment.
- Analyze the investments needed to move the remaining 36 Tier 2 and Tier 3 sites to market-readiness to assist with regional economic and infrastructure development plans.
- Perform an annual inventory update of large lot industrial sites and encourage other regions around the state to adopt the inventory methodology.
- Analyze the absorption/demand/missed opportunities for large lot industrial sites and the economics of redevelopment for industrial purposes and traded-sector competitiveness.

The recommendations listed here are meant to be the beginning of a dialogue on creating effective tools and policies for ensuring the region and state has a competitive supply of market-ready industrial sites.

In the summer of 2012, the Project Management Team plans on meeting with key regional, state, public and private leaders, culminating in fall 2012 with a meeting of an Oregon Business Plan subcommittee. The work will then be integrated into the Oregon Business Plan. Parallel efforts will be ongoing with legislators and other regional partners to facilitate action and bring about results.

E. PROJECT REPORTS

The Regional Industrial Site Readiness Project includes three volumes, in addition to the Executive Summary. Volume 1 is the complete Project analysis and findings. Volume 2 presents the site specific details and results of the Project. Volume 3 includes all of the technical appendices.

I. PHASE 1 INVENTORY

A. PURPOSE OF PHASE 1

Traded-sector companies sell goods to buyers outside of the Metro region, bringing additional wealth into the region. Attracting and retaining traded-sector industrial companies is important for the Portland region's long-term economic prosperity. Establishing a supply of development-ready large sites is a critical component of a strategy to attract and retain large industrial firms and generate traded-sector jobs. Because the Portland region must compete with other metropolitan areas for such traded-sector industries, it must be able to provide a reasonable inventory of available sites.

Phase 1 of the Project was led and funded by a Project Management Team (PMT) which includes: Business Oregon, Metro, The Oregon Chapter of NAIOP the Commercial Real Estate Development Association, Port of Portland, and Portland Business Alliance. Throughout the Project, outreach was done with local jurisdictions, regional developers and brokers, and other public and private groups.

Phase 1 produced an inventory of sites with 25 net developable acres that differentiates between development-ready sites (Tier 1) and sites that need additional work (Tier 2 and Tier 3). The Phase 1 inventory also identifies general, order-of-magnitude, investments necessary to move Tier 2 sites to development-ready status[3]. Tier 3 sites, while identified, were not analyzed on the same level. The product of this phase is a database of industrial sites to support the region's economic development efforts. The database will provide a common understanding of the barriers and investments needed to make these sites development-ready and ensure the region's competitiveness in the global marketplace. It will lay a foundation for innovative financing policy and tools, and inform the work of locational jurisdictions, the Community Investment Initiative Leadership Council, Greater Portland Inc., Metro, the Port of Portland, and the State.

A definitional distinction exists between a parcel or tax lot and a site. This distinction is critical to understanding the underlying purpose of this study. Group Mackenzie and the PMT evaluated sites as companies need to buy or lease sites, not parcels or tax lots. For purposes of this study, a site could be a single owner parcel or multiple adjacent parcels that can be combined into a single site. Combined parcels could include adjacent parcels in the same ownership and/or in multiple ownerships. In all cases, this is an inventory of sites that have 25 acres or greater of net developable land. Net buildable land is gross acres minus acres constrained by wetlands, floodplain, or slope.

[3] For specific site development costs, reference Volume 2 of this report.

B. PHASE 1 METHODOLOGY

1. Land Use Planning and Geographic Information System (GIS) Analysis

This project focused on larger industrial sites, 25 acres and greater, in the metropolitan area (inside the UGB and selected urban reserves). The focus on 25 acres and above is based on two sources, one planning related and one market related. Metro's 2009 Urban Growth Report[4] (UGR) defines large lot industrial as parcels 25 acres and greater. The UGR identified a shortage of 50-acre-and-greater sites in the metropolitan area for new traded sector investment. Additionally, Business Oregon has identified the characteristic minimum parcel size and other site requirements for most cluster recruitment targets. Most of these cluster industry recruitments require net developable sites of at least 25 acres with a number of clusters requiring much larger sites.

To identify the inventory of market-ready sites in the region, the project applied a series of filters from the perspective of potential employers. Starting with Metro's 2009 Buildable Lands Inventory, supplemented with information from local jurisdictions throughout the region, the analysis identified parcels with the following characteristics:

1. Inside the UGB or selected urban reserves;
2. Zoned or planned for industrial uses;
3. Containing at least 25 net buildable, vacant acres after accounting for wetlands, floodplain, and slope constraints; and
4. Not set aside by existing firms for future expansion needs.

The first step in this analysis (Figure 2; step 1) was to complete a GIS-based analysis on the vacant land[5] within the Metro Urban Growth Boundary (UGB) and examine all vacant parcels that were: 1) 25 or greater gross acres; and 2) industrially zoned; or 3) comprehensive planned for industrial; or 4) concept planned for industrial; or 5) Urban Reserves land that was planned for future industrial development. The study began with nearly 4,000 vacant industrial tax lots; however, only 95 of these were larger than 25 gross acres and in single ownership. Once an inventory of single 25 gross acre parcels was established, the PMT applied their local market knowledge to create sites where aggregation opportunities were possible. Select Urban Reserves sites that have industrial development potential were also added at the request of local jurisdictions.

Once this inventory was established, it was necessary to determine the net developable acreage of these sites as this study only examines parcels and/or sites with 25 net developable acres (Figure 2; step 2). Using GIS data[6], wetlands, streams, FEMA 100 year floodplain, and slope[7] (10% and greater) were calculated for each site in order to move from gross acres to net developable acres. Goal 5 regulations, individual jurisdiction development buffers or environmental overlays were not taken into consideration at this stage in the analysis due to time and budget constraints. Information on the parcels/sites that did not meet this screening requirement can be found in Section C of this report. Section C also includes information on sites that were user owned and held for future expansion. Once sites that did not have 25 net developable acres were excluded from this inventory, the infrastructure and transportation evaluation of the inventory could begin.

Using Business Oregon and industry expertise from the PMT and others, the sites identified through this initial process were further analyzed as to their market readiness based on sufficiency of infrastructure and transportation facilities, brownfield or environmental issues, need for land assembly, need for annexation, and availability for lease or sale (Figure 2; step 3). This more refined analysis resulted in an inventory of existing or potential

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[4] The urban growth report informs a regional vision for how and where to grow over the next 20 years. For more information, visit http://www.oregonmetro.gov/index.cfm/go/by.web/id=29959.

[5] This data was available as a GIS shapefile and was completed in June 2008. This data was provided by Metro and represents lands appearing unimproved on aerial photography, without regard to developability and accessibility.

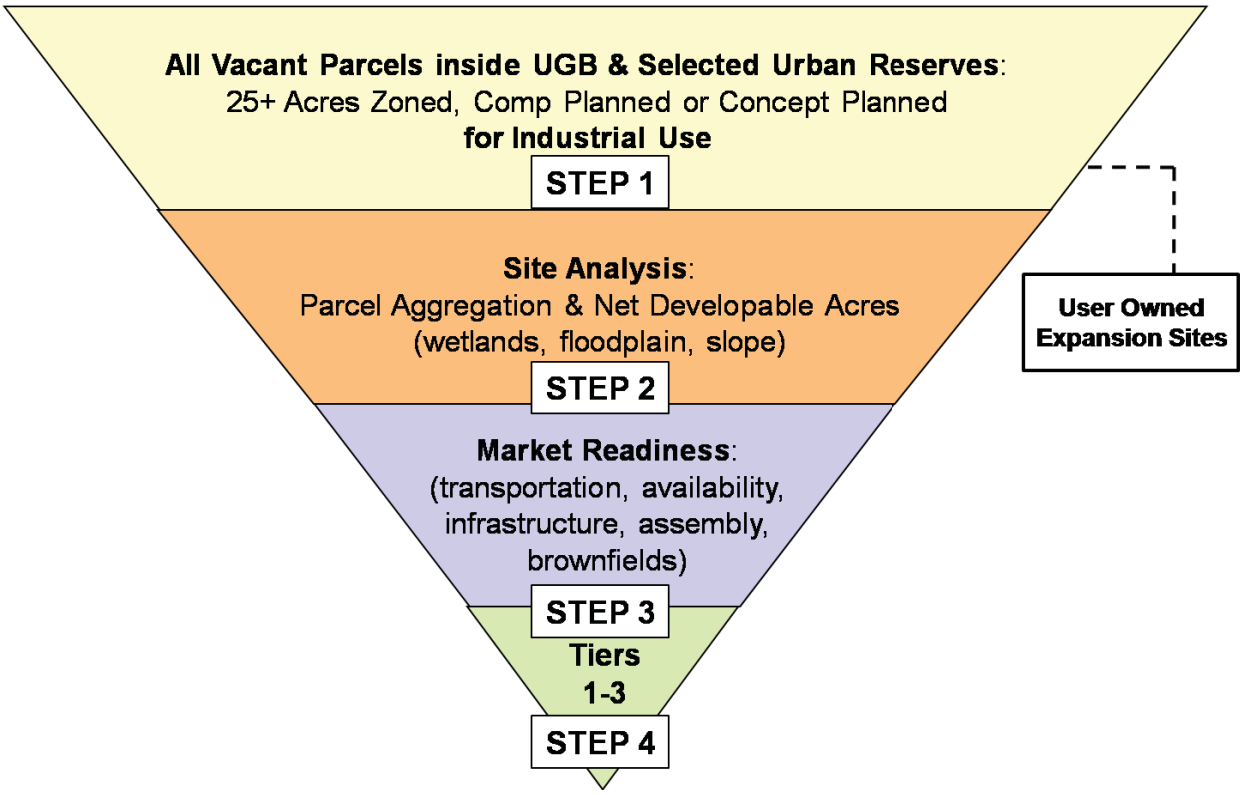
[6] All data was provided by Metro. This included: wetlands shape file from 1998 based on the National Wetlands Inventory; streams shape file from 2008; FEMA 100 year floodplain data from 2004; and slope 7-25% data, based on a LiDAR raster conversion; brownfield data based on DEQ datasets

[7] Preliminarily, slope data above 7% was used but the data was not reliable and the Consultant used 10% and greater slopes. Although, slopes under 7% are best for large scale industrial development, the data was not reliable for this study.

industrial sites that were assigned a tier based on market readiness or estimated length of time before they can be developed (Figure 2; step 4). The methodology for the tiering process was built upon the well recognized State Industrial Site Certification process along with modifications that were needed to fit the scope of this study. All additions and modifications were agreed upon by consensus of Group Mackenzie and the PMT.

Tier 1 sites could be development ready within 180 days (six months). With sufficient resources and expeditious jurisdiction approvals, Tier 2 sites could be development ready in seven to 30 months. Sites that will require more than 30 months to be ready for development were designated Tier 3.

Figure 2: Phase 1 Analysis Process



Source: Group Mackenzie

2. *Infrastructure*

The Phase 1 infrastructure analysis involved evaluating the existing public utility systems for their capacity to serve the selected Phase 1 industrial sites. Group Mackenzie collected publicly available utility information and documented the availability and sizes of the public water, sewer, and storm systems. The utility systems were then evaluated and scored for their ability to serve industrial development at the Phase 1 sites (Table 3). The utility evaluations were then used as part of the tiering criteria described later in this report.

Utility System Research

Group Mackenzie reviewed publicly available utility information from the service providers represented in the Phase 1 sites. The utility information included GIS data, master plans, as-built record drawings, and information received from service provider staff. In general, the publicly available information for the Phase 1 site utilities provided information on the proximity of utility services to the Phase 1 sites, utility pipe sizes and/or slopes, and for some sites the extent of known capacity deficiencies that would limit service to the site.

The table on the following page summarizes the information that Group Mackenzie reviewed from the various jurisdictions or utility service providers for the Phase 1 utility analysis.

Table 3: Phase 1 Utility Information

JURISDICTION OR UTILITY PROVIDER	UTILITY INFORMATION REVIEWED FOR PHASE 1
Clackamas County	GIS Mapping, Master Plan Documents
Clean Water Services	Online GIS, Master Plan Documents
City of Damascus	Staff-Provided GIS
City of Fairview	GIS Mapping, Information from Staff
City of Forest Grove	GIS Mapping, Information from Staff
City of Gresham	Online GIS, Master Plan Documents
City of Happy Valley	GIS Mapping
City of Hillsboro	GIS Mapping, Information from Staff, Master Plan Documents
City of Portland	Online GIS, As-Built Drawings
City of Sherwood	Online GIS, Master Plan Documents
City of Troutdale	Online GIS
City of Tualatin	GIS Mapping, Master Plan Documents
Water Environmental Services	GIS Mapping, Master Plan Documents
City of Wilsonville	GIS Mapping, Information from Staff, Master Plan Documents

Source: Group Mackenzie

Utility System Evaluation

Group Mackenzie developed a scoring system to evaluate the existing capacity of the utility systems to provide adequate industrial service to the Phase 1 sites (Table 4). This scoring system assigns a score of A, B, or C to the utility system. The scores primarily reflect the proximity of utilities to the Phase 1 sites, but they also account for utility sizes, service capacity, and complexity of expected necessary improvements.

In general the A, B, and C scores mimic the tier system used to rate the Phase 1 sites. Sites with a utility score of 'A' can be expected to have industrial-level utility service currently at the site or available within 6 months. Utilities scored as 'B' may have capacity issues or services that do not extend to the site but can be upgraded within 6 to 30 months. A utility score of 'C' is applied to utility systems that would require substantial service extensions, capacity upgrades, or other improvements in order to serve industrial uses at the site. The following table summarizes the utility scoring system used in this study.

Table 4: Utility Evaluation Scoring Criteria

Utility System	Score	Utility Evaluation Scoring Criteria
Sewer	A	≥ 8" main located adjacent to or stubbed to site or within ~200 ft of site. No downstream pipe/treatment capacity issues.
	B	≥ 6-8" main located within ~ 1000 ft, with no downstream deficiencies. Possible pump station needed.
	C	No nearby pipe and/or significant lift station and force main needed. Downstream deficiencies may be present.
Water	A	≥ 12" main adjacent or within ~200 ft, preferred loop system existing. No low-pressure issues.
	B	≥ 8" adjacent, or ≥ 12" main within ~ 1000 ft. No pump station or pressure/treatment deficiencies.
	C	No nearby pipe and/or system deficiencies present.
Storm	A	≥ 12" public main adjacent or within ~200 ft, or ability to discharge to managed surface waters. No capacity issues.
	B	≥ 12" main within ~ 500 ft; possible outfall to nearby regulated surface channel or wetland.
	C	No adjacent public storm or no available discharge point to surface water.

Source: Group Mackenzie

3. Transportation

Transportation infrastructure was evaluated at a preliminary level to determine the immediate ability to develop sites in the Phase 1 inventory. This analysis was based primarily on the quality of the surrounding transportation system and the ability of the subject property to access that system.

Specifically, the evaluation was performed by assessing the surrounding transportation system quality which was defined by two metrics:

1. **Local Access**: Defined as access to the immediate (proximate) transportation system.

   Factors to consider:

   a) Direct roadway connection to the transportation system
   b) Extent of frontage and off-site improvements necessary to connect to the proximate transportation system

   Value assigned to local access:

   Good: Property has direct connection and no off-site improvements are necessary.

   Poor: Property does not have a direct connection and/or significant improvements are necessary to gain local access.

2. **Transportation System Mobility:** Defined as the mobility on the existing freight transportation system. This includes mobility on the adjacent higher-order roadways and intersections and not just the immediate roadway system. This does not include mobility on the mainline interstate highways as it is assumed all motor vehicle freight generally has to traverse these roadways and is not critical to individual property valuation.

Values assigned to transportation system mobility:

Good: Mobility of adjacent system has a PM peak hour volume-to-capacity ratio (v/c) < 0.99 (an approximate Level of Service (LOS) F or better).

Poor: Mobility of adjacent system has a PM peak hour v/c ratio > 0.99 (an approximate LOS F or worse).

For the Phase 1 analysis, all sites were ranked based on the above-identified criteria, as follows:

A: **Local Access** and **Transportation System Mobility** are ***Good***

B: **Local Access** is ***Good*** and **Transportation System Mobility** is ***Poor***

– OR –

C: **Local Access** is ***Poor*** and **Transportation System Mobility** is ***Good***

C: **Local Access** and **Transportation System Mobility** are ***Poor***

4. Wetlands

The Oregon Department of State Lands provided preliminary wetland information for Phase 1. The first source used was the agency's Land Administration System database to determine if there were any wetland determinations or delineations on file with the agency for each site. Where such information did exist, it was used as the foundation for identifying the area of wetland constraint.

For sites with no previous wetland delineation history, the following data layers were used to identify area of potential wetland constraint:

- National Wetlands Inventory, US Department of the Interior, 1988
- Local Wetlands Inventory (for those communities with adopted inventories)
- Metro Regional Land Information System, wetlands data layer (February 2011)
- Salmon Resource and Sensitive Area Mapping program, Oregon Department. of Transportation, 2004
- Soil Survey Geographic Database (US Natural Resources Conservation Service, 2009) to identify of potential hydric (wetland) soil areas
- National Hydrography Dataset, US Geological Survey

For sites with on-site wetlands or potential wetlands the net developable acreage assumed wetland mitigation would occur in order to increase the developable acreage of the site.

5. Brownfields

Metro, the City of Portland, and the City of Gresham provided GIS shapefiles containing information regarding potential brownfield sites in the region. Metro's data provided information on Underground Storage Tanks (USTs) and Environmental Cleanup Site Information (ECSI) throughout the region. The City of Portland's data included potential brownfield sites within the City limits while the City of Gresham's data included ECSI sites within the City limits. This data was examined to determine which sites in the inventory were existing or potential brownfields. The inventoried sites were given a rank of A, B, or C based on the severity of the contamination. This was an important tiering criteria as brownfields have varying levels of contamination and timeframes for clean up. Table 5 provides more information on tiering these brownfield sites.

6. Market Readiness, Availability, and Site Aggregation

This analysis assessed the market availability of each site and determined whether the site was currently for sale or lease, and if not, whether the owner was willing to transact. Information on owner type (private, investor, public, or user) was also collected. Two of the main tiering criteria used in this study were whether a site was currently for sale or lease, and if not, whether the owner was willing to transact. Lack of availability to the market did not remove the site from the inventory; however, the site moved it to a lower tier.

Market availability information was gathered from various sources including the PMT, meetings, conversations with real estate brokers and City economic development staff, and consultant knowledge.

Site aggregation was also analyzed for all Phase 1 sites. None of the Tier 1 sites are in multiple ownerships, as that was an imperative tiering criterion chosen by the PMT to identify Tier 1 sites. Tier 1 sites must be currently for sale or lease *or* the owner must be willing to transact. Tier 2 sites must be currently for sale or lease *or* the owner must be willing to transact. Tier 3 sites may not currently be for sale or lease and/or the owner may not be willing to transact. In many cases, the site is not currently for sale or lease but the owner is willing to transact. There are also many sites in which the owner is not willing to transact. The PMT has no way to estimate when and if the owner would be willing to transact. Perhaps if the site exchanges ownership, the new owner may immediately list the site for sale or lease, potentially bringing that site up to Tier 2 status. In other situations, a Tier 3 site may be a Tier 3 sites for decades, until the owner becomes willing to transact.

7. Jurisdictional Review Process

A critical aspect of this study was to provide local jurisdictions an opportunity to review the work to gain their local input on the potential sites in the inventory. The jurisdictions first reviewed the potential inventory in the second month of the study (July 2011) after the initial vacant land inventory. Jurisdictions were given the opportunity to include any additional sites that they knew were available or if any land owners were willing to aggregate or transact together. In August 2011, jurisdictions were given another opportunity to review an updated version of the inventory. As a part of this review, jurisdictions were asked to provide GIS data that was more recent or more accurate than the Metro RLIS data that was initially used in the preliminary gross to net analysis and another gross to net developable acreage analysis was run utilizing this more accurate data, when available. Jurisdictions were also asked to provide information on current infrastructure surrounding the sites, any deficiencies of supply or treatment systems, and a city contact that could provide more specific answers regarding necessary infrastructure upgrades.

Once the inventory of sites were finalized and after the transportation and infrastructure analysis was completed along with the market availability criteria in the third month of the study (September 2011), the jurisdictions were given another chance to review the inventory and provide their feedback on the scoring based on the criteria. On September 29, 2011 all jurisdictions were invited to attend a meeting at Group Mackenzie offices to review each site individually to ensure the consultant and PMT did not leave out vital pieces of information regarding the Phase 1 sites. Throughout this process, the consultant was in regular contact with appropriate jurisdiction staff and made changes to the inventory accordingly.

8. Tiering Criteria and the Process to Score the Sites

The tiering system utilized in this study was based on development readiness. Tier 1 sites are defined as "development ready" within 180 days of submittal of a development application (i.e., projects can receive all necessary permits, sites can be served with infrastructure, and zoned and annexed into the city within this timeframe).

This timeframe is an industry standard and is the same recruitment/development timeframe used by the State's well established Industrial Site Certification Process. The seven to thirty month time-frame was for sites that while less competitive for expansions and recruitments, would still be of some interest to more patient users/developers. It was agreed upon by the Project Management Team that the Tier 3 30-month or greater window represents the least competitive sites from an expansion, recruitment, or a speculative development perspective.

These tiers are defined as follows:

Tier 1 Sites have over 25 net developable acres and are development ready or can be development ready within 180 days (6 months) and require minimal to no additional costs or time to deliver a site. It is anticipated that no or minimal infrastructure or remediation is necessary and that due diligence and entitlements could be provided and/or obtained within this time period. The site does not have a use restriction and is currently on the market for sale or lease or the ownership is willing to transact. Sites in this tier would generally qualify for Business Oregon's Industrial Site Certification program.

Tier 2 Sites require additional time, between 7-30 months and costs to deliver a development ready site. These sites may have a use restriction, for example marine or aviation only that limits, but does not eliminate, their market opportunity. They may have deficiency issues with regard to infrastructure or may require brownfield remediation, annexation, and additional entitlements that are assumed to take beyond six months time. These sites are currently on the market for sale or lease or the ownership is willing to transact. Should the site be in multiple ownerships, an agreement to aggregate must be in place within 30 months.

Tier 3 Sites require the most time, over 30 months, and costs to deliver a development ready site. In addition to the criterion for Tier 2 these sites may or may not be currently for sale or lease or the owner may or may not be willing to transact or information was not available at the time this report was published.

Table 5 displays the criteria that were used to Tier each of the sites in the inventory.

Table 5: Phase 1 Tiering Criteria

	25 net developable acres	Use Restriction	Brownfield Remediation	Annexation Required	Sewer, Water, & Storm[8]	System Mobility[9]	Currently for Sale or Lease		Willingness to Transact
Tier 1	Within 6 months	No	No or Within 6 months (Score of A)	No	A or B	A or B	Yes	***OR***	Yes
Tier 2	Within 7-30 months	Yes or No	Within 7-30 Months (Score of B)	Yes	A, B, or C	A, B, or C	Yes	***OR***	Yes or Unknown
Tier 3	>30 months	Yes or No	>30 months (Score of C)	Yes	A, B, or C	A, B, or C	Yes or No	***OR***	Yes or No or Unknown

Source: Group Mackenzie

[8] For an explanation of the scoring, refer to section 2, Infrastructure.

[9] For an explanation of the scoring, refer to section 3, Transportation.

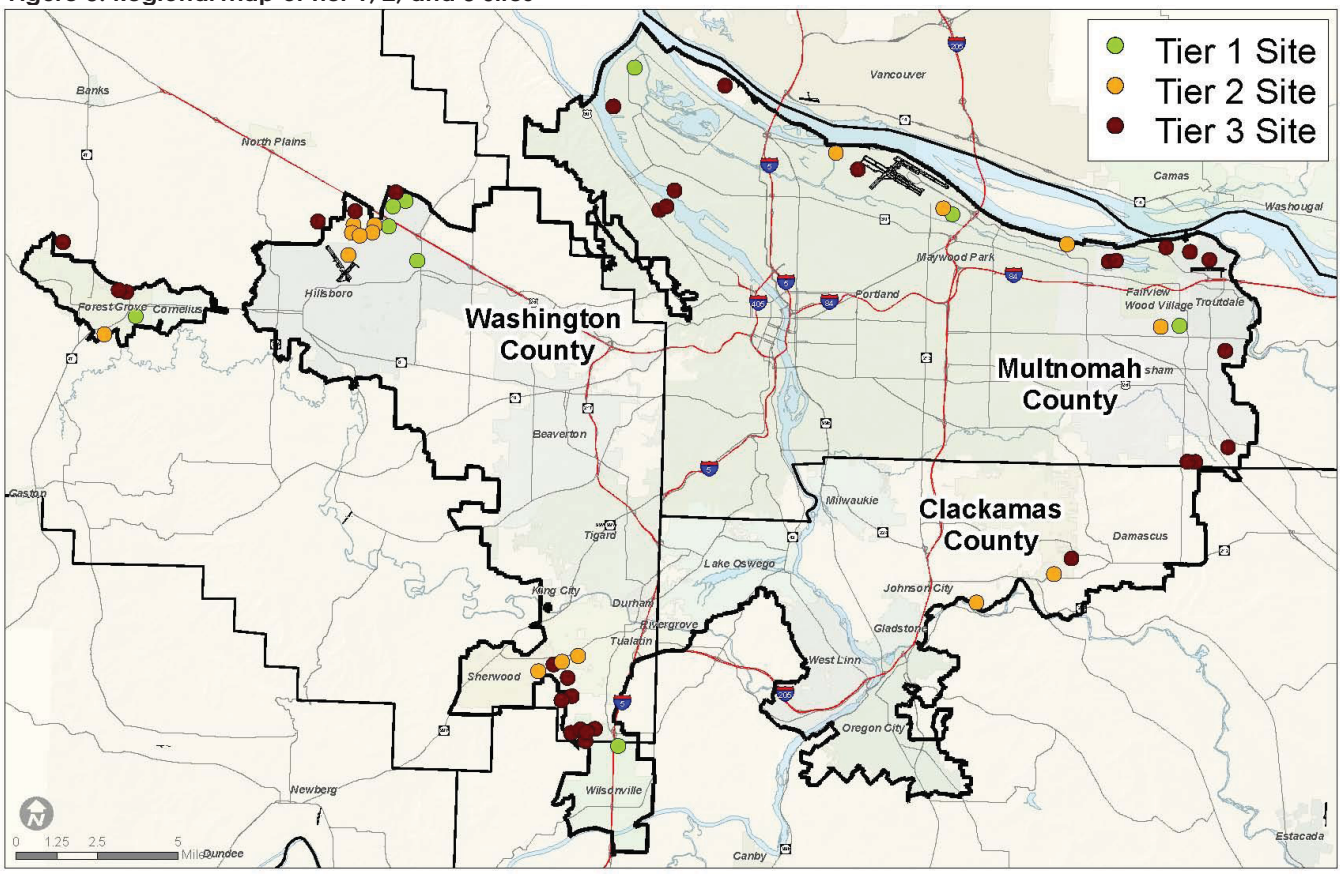
II. PHASE 1 FINDINGS

A. TIER 1, 2, AND 3 SITE RESULTS

The Phase 1 inventory was completed in October 2011. The findings in this report are based on the best available information as of that date. Since this inventory is meant to be market based, it is acknowledged that the inventory of industrial sites in the Portland region will change with certain regularity. Factors affecting this change will include better information; new properties coming on the market; properties in the inventory coming off the market due to transactions; a change in tier status based on investment or other actions; and other issues. Due to this inventory fluctuation, one of the recommendations in this report is that the industrial site inventory be regularly updated.

Based on the Phase 1 methodology described above, Group Mackenzie identified an inventory of 56 large lot industrial sites in the Metro UGB and selected urban reserves (Figure 3). Of these 56 sites in the inventory, nine sites (16%), are Tier 1; 16 sites (29%) are Tier 2; and 31 site (55%), are Tier 3 potential sites. The reference to "potential" is due to the fact that many of the Tier 3 sites have significant barriers to market readiness. The complete inventory of sites, detailing all of the data prepared for each, their location in the region, and their tiers can be found in Volume 2 and Volume 3, Appendix A.

Figure 3: Regional Map of Tier 1, 2, and 3 Sites



Source: Group Mackenzie

1. Tier 1 Sites

The analysis found that there are only nine sites in the UGB that are both 25 net acres or larger that can be developed within 180 days (Figure 4). Washington County has five of these sites, followed by three in Multnomah County, and one in Clackamas County (Figure 5). The number of very large sites is even more limited. The majority of the sites are in the 25-49 acre range. There is only one 50-acre and one 100-acre site in Tier 1.

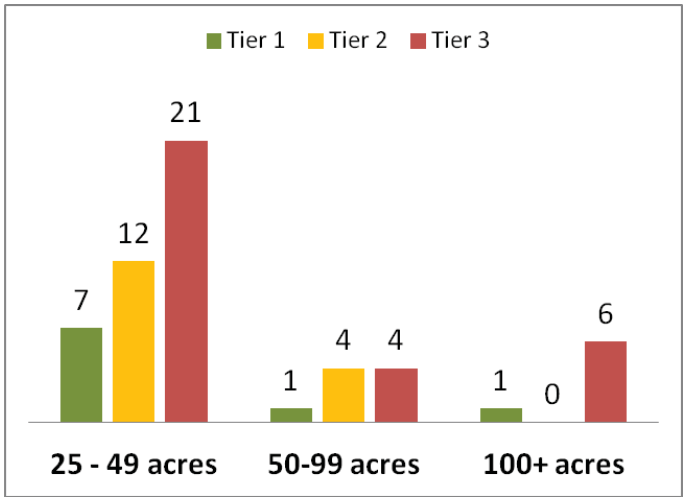
Beyond development-ready availability there are a handful of economic factors that drive the suitability of industrial sites for immediate development. A closer look at the nine Tier 1 sites (Table 6) reveals that the number of sites attractive to a broad range of potential traded-sector cluster companies is even smaller. Of the nine sites, two are for lease only, which is typically less desirable to potential users, who anticipating significant capital investments prefer to own rather than lease. Another Tier 1 site is an irregular shape and would require an unusual development footprint, possibly increasing costs and precluding market accepted building design. One last factor is price.

One Tier 1 site is currently for sale at a price that is much higher than industrial development could support. It is unclear if or when, the current owner will align the asking price with current industrial market pricing.

Over 90% of the sites in the Phase 1 inventory are in either Multnomah or Washington County. It is important to note that the inventory is only for areas within the Portland metropolitan UGB or designated urban reserves areas. As a result industrial sites located in rural Washington County and Clackamas County, such as Banks, Canby, Sandy, Molalla, and Estacada are not included in this inventory.

Table 7 details the Tier 1 sites.

Figure 4: Distribution of Sites by Acreage



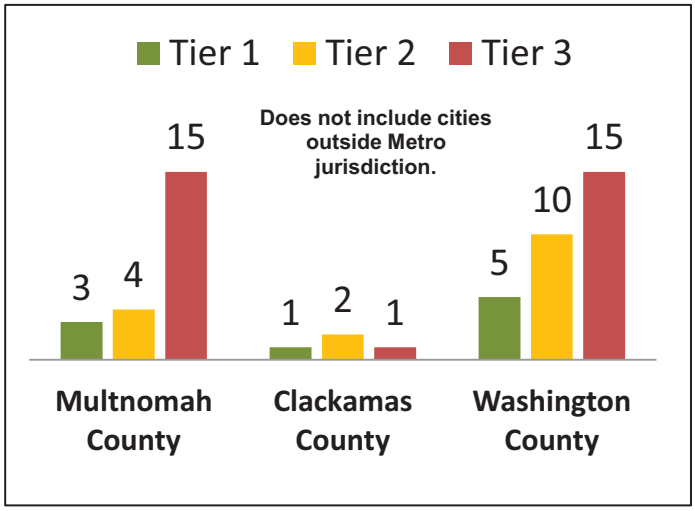
Source: Group Mackenzie

Table 6: Tier 1 Sites that Meet Development Criteria

TIER 1 SITES	9
Lease Only	-2
Irregular Shape	-1
Above Market Price	-1
TOTAL TIER 1 SITES	**5**

Source: Group Mackenzie

Figure 5: Distribution of Sites by Location



Source: Group Mackenzie

Table 7: Tier 1 Site Summary

Site ID	Owner/Site	Location	County	Gross Acres	Net Developable Acreage	Number of Tax lots	Number of Owners	Currently for Sale/Lease	Willing to Transact
1	PORT OF PORTLAND (RIVERGATE)	PORTLAND	Multnomah	51.25	43.15	5	1	L	
11	PORT OF PORTLAND (PIC EAST)	PORTLAND	Multnomah	43.50	41.18	2	1	L	
21	PORTLAND OF PORTLAND (LSI EAST)	GRESHAM	Multnomah	115.98	115.01	6	1		YES
32	ELLIGSEN RALPH & SHIRLEY	WILSONVILLE	Clackamas	32.34	32.34	1	1	S	
44	INTEL CORPORATION	HILLSBORO	Washington	31.39	31.39	3	1	S	
46	DEV. SERVICES OF AMERICA (WESTMARK SITE)	HILLSBORO	Washington	30.02	30.02	1	1	S	
48	WAFFORD DEWAYNE (BAKER/BINDEWALD SITE)	HILLSBORO	Washington	50.78	46.94	1	1	S	
49	NIKE FOUNDATION	HILLSBORO	Washington	73.88	59.86	1	1	S	
57	MERIX CORPORATION	FOREST GROVE	Washington	34.25	33.42	1	1	S	

Source: Group Mackenzie

2. *Tier 2 and 3 Sites*

The analysis found 16 Tier 2 sites (seven to 30 months from development ready) and 31 potential Tier 3 sites (more than 30 months to development ready) within the Metro UGB and selected urban reserves. The bulk of these sites are in Washington or Multnomah County. The number of larger sites in Tier 2 and Tier 3 is also very constrained. Tier 2 has no 100-plus acre sites, and only four 50-plus acre sites. Tier 3 has only four potential 50-plus acre and six potential 100-plus acre sites.

The few large sites in Tier 2 and 3 face significant challenges to becoming ready, including the need to complete brownfield clean up, build infrastructure (such as roads and sewer), mitigate wetlands, and assemble parcels currently under multiple separate ownerships. Many of these sites have multiple development constraints that limit their marketability. The Phase 1 inventory did not get into detail on individual sites and specific constraints, but Table 8 provides a list of the types of issues that constrain site development. Thirty-one of the Tier 2 and 3 sites face multiple challenges.

Table 8: Tier 2 and 3 Potential Development Constraints

CONSTRAINT *	SITES WITH CONSTRAINT
Brownfield/Cleanup	8
Natural Resources	13
Infrastructure	19
Transportation	18
Land Assembly	14
State/Local Action[1]	20
Not Willing to Transact	18

**Sites may have multiple constraints*

Source: Group Mackenzie

Generally the constraints to readiness for Tier 2 sites are less extensive than Tier 3 sites, requiring less time and lower costs than the majority of the Tier 3 sites. A complete analysis of all Tier 2 sites would detail their challenges to market readiness, but it is safe to say that Tier 2 sites present the best opportunity to focus resources to bring them to market the quickest. Table 9 details the Tier 2 sites.

Table 9: Tier 2 Site Summary

Site ID	Owner/Site	Location	County	Gross Acres	Net Developable Acreage	Number of Taxlots	Number of Owners	Currently for Sale/Lease	Willing to Transact
9	PORT OF PORTLAND (NE MARINE DR & 33rd AVE)	PORTLAND	Multnomah	66.74	62.70	1	1	L	
13	ICDC LLC	PORTLAND	Multnomah	28.11	26.52	3	1	L	
22	PORT OF PORTLAND (LSI WEST)	GRESHAM	Multnomah	87.69	68.60	3	1		YES
29	CLACKAMAS COUNTY DEVELOPMENT	CLACKAMAS	Clackamas	61.93	40.00	11	1	S/L	
38	BILES FAMILY LLC	SHERWOOD	Washington	39.60	30.89	1	1	S	
40	PACIFIC REALTY ASSOCIATES LP	TUALATIN	Washington	26.80	26.80	1	1	S/L	
50	KEITH BERGER/HERBERT MOORE/BOYLES TRUST	HILLSBORO	Washington	72.40	66.14	5	3	S	
52	BERGER PROPERTIES/ HERBERT MOORE	HILLSBORO	Washington	52.00	48.10	2	2	S	
54	5305 NW 253RD AVENUE LLC	HILLSBORO	Washington	38.49	28.59	1	1		N/A
55	SPOKANE HUMANE SOCIETY	HILLSBORO	Washington	45.49	45.49	1	1		YES
56	EAST EVERGREEN SITE	HILLSBORO	Washington	71.11	71.11	9	7	S	YES
62	ROCK CREEK SITE	HAPPY VALLEY	Clackamas	40.83	34.18	5	2	S	YES
63	WOODBURN INDUSTRIAL CAPITAL	FOREST GROVE	Washington	25.10	25.10	1	1	S/L	
66	ITEL, KENNETH	TUALATIN	Washington	46.25	44.67	2	1		YES
67	PORT OF PORTLAND (PIC WEST)	PORTLAND	Multnomah	69.45	58.96	5	1	L	YES
68	PORT OF PORTLAND (HILLSBORO AIRPORT)	HILLSBORO	Washington	39.22	34.15	1	1	L	YES

Source: Group Mackenzie

3. Tier 3 Sites

Tier 3 sites come with the caveat of "potential" attached to them. While all but three of the Tier 3 sites are in inside the Urban Growth Boundary (subsequent to the completion of the Phase 1 inventory, Metro added property into the UGB in October 2011. The Metro UGB decision is considered a "final land use decision" unless set aside by LCDC or the Court), this category of sites has multiple and significant constraints that will need to be addressed to get them to market readiness.

Ten of the potential Tier 3 sites would require aggregation of parcels in separate ownership. Ownership ranges from two owners up to 17 owners for the potential Coffee Creek site in Wilsonville. Half of the Tier 3 sites have either seven or eight ownerships. The more owners involved the more complex and lengthy the development process.

Twenty of the sites in Tiers 2 and 3 will require some kind of local, regional, or state action such as concept planning, annexation, or UGB expansion to become development ready. Tier 3 examples with this issue include three potential sites that are outside the current UGB and West Hayden Island, which is engaged in a lengthy planning process with an uncertain outcome; if approved for development this site will require many years of planning and infrastructure investment to bring to market.

Another issue affecting Tier 3 sites is brownfield contamination. Four of the 6 Tier 3 sites in the City of Portland have brownfield issues, and three of these have added risk and uncertainty due to their location adjacent to the Willamette River Superfund designation.

Providing a market perspective was a major objective of this analysis. Market readiness requires first and foremost, a willingness to sell by the property owner or enter into a transaction. However, simply a lack of willingness to transact at this point in time or a lack of information of a willingness to transact was not a reason to exclude a potential site in the inventory. Of the 31 potential Tier 3 sites, 21 of them either lack a willingness to transact or the information was unable to be determined as part of this study. Slightly over 30% of the Tier 3 sites (10 sites) are currently or could be available to the market. Table 10 provides a complete list of the Tier 3 sites.

Table 10: Tier 3 Site Summary

Site ID	Owner/Site	Location	County	Gross Acres	Net Developable Acreage	Number of Taxlots	Number of Owners	Currently for Sale/Lease	Willing to Transact
2	TIME OIL CO	PORTLAND	Multnomah	43.50	25.00	2		S	
4	ESCO CORP	PORTLAND	Multnomah	37.62	33.33	6	3		NO
5	ATOFINA CHEMICALS INC	PORTLAND	Multnomah	59.76	46.76	6			NO
6	MC CORMICK & BAXTER CREOSOTING	PORTLAND	Multnomah	42.39	33.39	1			NO
7	PORT OF PORTLAND (WEST HAYDEN ISLAND)	PORTLAND	Multnomah	472.00	404.00	2			YES
10	PORT OF PORTLAND (SW QUAD)	PORTLAND	Multnomah	212.56	206.47	5			YES
15	BT PROPERTY LLC (UPS)	GRESHAM	Multnomah	51.45	49.45	4			NO
16	CEREGHINO MICHAEL	GRESHAM	Multnomah	41.63	25.00	5			NO
17	PORT OF PORTLAND TRIP - PHASE 3	FAIRVIEW	Multnomah	34.14	30.00	1		S	

Site ID	Owner/Site	Location	County	Gross Acres	Net Developable Acreage	Number of Taxlots	Number of Owners	Currently for Sale/Lease	Willing to Transact
18	PORT OF PORTLAND TRIP - PHASE 2	TROUTDALE	Multnomah	42.25	30.18	2		S	
19	PORT OF PORTLAND TRIP - PHASE 2	TROUTDALE	Multnomah	81.10	80.34	1		S	
23	MT HOOD COMMUNITY COLLEGE	TROUTDALE	Multnomah	38.40	37.40	3			NO
24	JOHNSON E JEAN	GRESHAM	Multnomah	37.17	33.82	1			YES
25	JONAK LESTER JR	GRESHAM	Multnomah	34.22	27.07	1			N/A
26	DANNAR CHARLES	GRESHAM	Multnomah	27.93	27.93	1			N/A
28	SIRI JAMES F & MOLLIE	HAPPY VALLEY	Clackamas	26.40	25.26	2			NO
33	COFFEE CREEK INDUSTRIAL AREA Site 1	WILSONVILLE	Washington	85.23	80.34	21	17		NO
34	VAN'S INVESTMENT LTD	WILSONVILLE	Washington	52.79	25.50	1			N/A
35	TONQUIN INDUSTRIAL AREA	TUALATIN	Washington	49.70	40.30	8	7		YES
36	TIGARD SAND & GRAVEL SITE	TUALATIN	Washington	296.88	128.10	15	3		NO
37	ORR FAMILY FARM LLC	SHERWOOD	Washington	96.26	42.84	1			NO
47	CRANFORD JULIAN & SHARON	HILLSBORO	Washington	28.51	27.29	1			NO
59	COFFEE CREEK INDUSTRIAL AREA Site 2	WILSONVILLE	Washington	46.37	46.27	12	8		NO
60	COFFEE CREEK INDUSTRIAL AREA Site 3	WILSONVILLE	Washington	29.65	27.05	10	7		NO
61	COFFEE CREEK INDUSTRIAL AREA Site 4	WILSONVILLE	Washington	48.56	48.56	12	8		NO
64	WOODFOLD-MARCO MFG INC. (East Oak Street)	FOREST GROVE	Washington	25.46	25.46	2	2		NO
65	WOODFOLD-MARCO MFG INC. (West Oak Street)	FOREST GROVE	Washington	53.93	53.91	5			NO
100	HOLZMEYER RICHARD HENRY ET AL	FOREST GROVE	Washington	111.37	100.12	1			N/A
101	VANROSE FARMS and VANDERZANDEN	HILLSBORO	Washington	270.5	224.83	2	2		YES
104	HILLSBORO URBAN RESERVES (Aggregate)	HILLSBORO	Washington	320	309.40	9	8		YES
109	MORSE BROS INC	TUALATIN	Washington	85.31	61.73	7			NO

Source: Group Mackenzie

4. State Traded Sector Industry Profiles

The region's economic development strategies are focused on growing the investment by traded-sector cluster firms. Business Oregon has identified the characteristic minimum parcel size and other site requirements for most cluster recruitment targets. Most of these cluster industry recruitments require net developable sites of at least 25 acres with a number of clusters, such as globally scaled high tech, requiring much larger sites. Volume 3, Appendix E contains the list and citing criteria of firms in each of the targeted clusters that match the Portland metropolitan areas locational advantages. The specific industry clusters included in this analysis were:

a. Clean tech manufacturing
b. High tech manufacturing campus
c. General manufacturing
d. Heavy manufacturing + marine
e. Warehouse and distribution

In an effort to reconcile the site inventory in this study with the state's and region's target industry focus, the PMT, in consultation with brokers, identified the potential industry end users for each site in the Phase 1 inventory using the state's industry profiles. This was not meant to be a designation of the only types of firms that could locate on each of the sites, but rather a merging of the locational attributes of each of the sites with the site selection needs of target cluster firms.

The complete inventory of sites, detailing all of the data prepared for each, their location in the region, and their tiers can be found in Volume 2 and Volume 3, Appendix A.

B. ADDITIONAL SITES

This study began with over 4,000 industrial parcels in Metro's 2009 Buildable Land Inventory. The analysis resulted in an inventory of those parcels, which either on their own or combined with other parcels, resulted in sites that have 25 or greater acres of net developable land. There are several dozen industrially designed sites that did not "make the cut" in the Phase 1 inventory. These sites fall into 3 categories:

1. The parcel/site is greater than 25 gross acres, but when constraints (environmental or restrictive zoning/overlay) are taken into consideration, the net developable acreage falls below 25 acres.
2. The parcel/site is owned by a company that has future development plans and the site is therefore not currently on the market for a prospective user (land banked).
3. The parcel/site has a current use and/or existing building on site, making it not vacant, but there is potential for redevelopment.

Although these sites do not appear in the Phase 1 inventory of this report, they are still an important portion of the region's industrial land supply.

1. Sites with Less Than 25 Net Developable Acres

There are 16 parcels and/or aggregated sites that do not have 25 net developable acres. However, these sites are still part of the region's potential inventory of industrial land as they may be developable for smaller users. These sites are identified in Table 11 but are not included in the Phase 1 inventory because they did not meet the criteria of this study.

Table 11: Parcels or Sites with Less Than 25 Net Developable Acres

Owner	Location	Gross Acreage	Approximate Net Developable Acres	NOTES
McCormick & Bassili Investments LLC	Happy Valley (HWY 212 & 162nd)	33.98	7.5	Environmental constraints result in <25 net developable acres - per Clackamas County
Weaver Russell	Happy Valley (HWY 212 & 162nd)	34.19	3.5	Environmental constraints result in < 25 net developable acres - per Clackamas County
Fazio	Portland (East of NE MLK & Gertz)	34.96	22	Existing drainage ditch bisects site into a 21.5 acre site; net developable acres in largest development parcel is less than 25 acres
Graphic Packaging	North Portland (Marine Dr & Portland)	26.26	2.75	Environmental constraints result in < 25 net developable acres
Catellus	Portland (N of Airport and 185th)	31.99	3.5	Environmental constraints result in < 25 ac remaining (wetlands and floodplain)
Langer Family	Sherwood (TS Rd & Adams)	56.48	< 25	PUD overlay on site results in < 25 net developable
Orwa Sherwood LLC	Sherwood (T/S Rd & Adams)	50.25	6	Bisecting road results in <25 net developable acres
Fred Fields property	Tigard (Hall and Hunziker)	35.6	<25	Environmental constraints result in < 25 net developable acres (market/site knowledge)
David Young	Wilsonville (S of Boeckman W of I5)	33.9	0	SROZ environmental constraints 100% of site - Per City of Wilsonville
Gary Walgraeve	Tualatin (Herman Rd & 118th)	54.95	14.5	Environmental constraints result in < 25 net developable acres - per City of Tualatin
Edward Wager	Tualatin (T/S Rd & 124th)	32.14	13	Environmental constraints result in < 25 net developable acres - per City of Tualatin
Joe Bernert	Wilsonville (Wilsonville Rd & Boones Ferry)	31.18	13.5	Significant environment constraints (SROZ) - per Wilsonville
Port of Portland	Portland (NE 33rd; South of Marine Dr)	28	23	Drainage ditches result in < 25 net developable acres
Port of Portland	Portland (South of SW Quad)	67.5	0	Reserved for open space/wetlands mitigation. Land is not greater than 25 net developable acres - per Port of Portland
Port of Portland	Fairview (South of site 17)	100	0	Reserved for open space/wetlands mitigation. Land is not greater than 25 net developable acres - per Port of Portland
Port of Portland	Troutdale (East of site 20)	64	0	Reserved for open space/conservation. Land is not greater than 25 net development acres - per Port of Portland

Source: Group Mackenzie

2. *User Owned and User Designate Sites*

This analysis also excluded land-banked parcels that are owned and held for future expansion by existing regional firms. These parcels are included in the report because they are an important part of the regional industrial land inventory, but since they are being held by their current owners for future development they are not considered to be available to the market, which is the focus of this study. While these parcels may become available to the market for another potential user in the future, there is currently no way to judge if or when this might occur.

There are 23 user-owned sites that are being held for future development (Table 12). Nine of these sites are vacant (for future use) with 25 or more net developable acres; and 14 are partially vacant with buildings on site but still have a minimum of 25 acres vacant for future expansion.

Table 12: User Owned and User Designated Sites

Owner	Location	Gross Acreage	Vacant Acreage	Vacant: for future use	Partially Vacant: in use	NOTES
N Pacific Union Conf Assn SDA	Gresham (Foster & Tillstrom)	66.9	66.9	x		Vacant; for future use
Providence Health	Happy Valley (HWY 212 & 162nd)	49.7	49.7	x		Vacant; for future use - per Clackamas County
Intel (Future parking lot)	Hillsboro (Cornell & Cornelius Pass)	47.36	47.36	x		Vacant; for future use (parking lot)
Legacy Health Services	Hillsboro (Cornell & Cornelius Pass)	28.95	27.3	x		Vacant; for future use (easement on site)
Intel	Hillsboro (West Union & Cornelius Pass)	72.54	68.4	x		Vacant: for future use and not available
Entercom[10]	Portland (Marine Dr & 166th)	40.4	39.8	x		Vacant; for future use. Communication towers on site.
Phight LLC	Tualatin (T/S Rd & 118th)	28.8	28.8	x		Vacant; for future use
Mentor Graphics	Wilsonville (S of Boeckman E of I5)	43.4	43.4	x		Vacant for future use - split from main campus by public street; SROZ on site and some wetlands
Port of Portland	Troutdale (East of site 17)	34	32.7	x		Vacant; reserved for utility use (substation) - per Port of Portland
Clackamas CDA	Clackamas County (I205/82nd)	32.2	32.1		x	Excess land - in use and not available - per Clackamas County

[10] At the time of the Phase 1 analysis, this site was reserved for future Entercom use. Through the Phase 2 analysis, Entercom informed the Consultant that the owner is willing to transact. This site was aggregated with Site 13 (of the Phase 1 inventory) to create a 46 net developable acre site in the Phase 2 analysis.

Owner	Location	Gross Acreage	Vacant Acreage	Vacant: for future use	Partially Vacant: in use	NOTES
Great American TVR	Clackamas County (I205/82nd)	49.35	47.5		x	Communication towers and infrastructure on site
State of Oregon (3 parcels)	Clackamas County (I205/Hwy 212)	232	97		x	In use and not available - per Clackamas County
Nacco	Fairview (Marine & Blue Lake Rd)	78.7	58.7		x	Excess land; some environmental constraints on site
Linde	Gresham (Glisan & 223rd)	137	75		x	Not available – per Port of Portland
Mutual Materials	Gresham (Hogan Rd)	86.08	56.8		x	Excess land: currently in use
PGE	Gresham (Powell & E of 182nd)	72.13	62.8		x	Not available reserved for future use
Solar World	Hillsboro (Evergreen & 253rd)	94.05	72.3		x	Excess; in use and for future use and not available
Genentech (entire campus)	Hillsboro (Evergreen & Brookwood)	75.3	60		x	Excess land; for future use and not available
Tokyo Ohka Kogyo	Hillsboro (Evergreen & Brookwood)	38.89	28.5		x	Excess land; for future use and not available
Intel (Ronler Acres)	Hillsboro (Shute Rd)	111.7	61		x	Excess land; for future use and not available
PGE Portland	North Portland (St Helens)	63.1	43.9		x	Excess; in use
Cookin (Siltronic)	Portland (St Helens Rd)	79.27	38.6		x	Excess land; for future use and not available
Xerox (2 parcels)	Wilsonville (East of I5)	95.81	49.3		x	Excess land; for future use and not available

Source: Group Mackenzie

3. Redevelopment Sites

Another factor in the region's industrial inventory is the potential impact that redevelopment can play in accommodating large lot industrial demand. The following are key questions with respect to redevelopment:

1. What is the inventory of industrial sites that could be considered as likely and/or potential redevelopment sites?
2. Within what time frame can these sites be expected to be available to serve the market?
3. What is the net industrial capacity associated with these sites?

The scope of this study did not allow for a thorough analysis of the redevelopment potential of existing industrial sites in the region. One meeting was held with Metro and regional planners where the issue was discussed and Johnson Reid has prepared a memorandum that can be found in Volume 3, Appendix F that discusses the issues and proposes methodologies that could be used for future analysis.

C. PHASE 1 CONCLUSIONS

The Phase 1 industrial land inventory analysis confirms that Portland-metropolitan area's market-ready supply of large-lot industrial sites for traded-sector employer expansion and recruitment is limited. This is particularly the case for potential developments that require 50 acres or more. The sites that are available are concentrated in the Columbia Corridor in Multnomah County and around Hillsboro and Wilsonville/Tualatin in Washington County, limiting the potential to more broadly distribute job opportunities within the Portland-metro area. The location distribution reflects previous local and regional land use planning decisions to maintain a compact regional form.

This study found:

9 Tier 1 sites
There are few Tier 1 "market ready" (within 6 months) sites and choice for traded-sector opportunities in near term. Only 5 of these 9 sites meet broad marketability requirements.

16 Tier 2 sites
There is a modest supply of mid-term sites requiring investment and policy actions to bring these sites to market. Four of these sites require assembly.

31 potential Tier 3 sites
Multiple challenges and significant investment and time to market required to bring these pipeline sites to market. Ten of these sites require assembly.

In addition, there are limited opportunities for 50-plus and 100-plus acre sites. This study found:

Tier 1 sites: One 100-plus acre site
Tier 2 sites: No 100-plus acre sites
Tier 3 sites: Six potential 100-plus acre sites; 3 require assembly

Larger sites are more complex and take patience to acquire and develop. Parcel aggregation is a key issue to supplying larger sites to the market.

While this analysis has identified the available sites and, at a high level, outlined the challenges that exist to bringing Tier 2 or 3 sites to development ready status, the timeframes in the analysis assume that the jurisdictions, property owners, land-use regulatory bodies, and potential interveners are all working in support of the potential employer and the site's development.

It is important to note that this inventory is a snapshot in time. As Tier 1 sites are absorbed by the marketplace, the expectation is Tier 2 sites will move to Tier 1 status and Tier 3 sites will move to Tier 2. This assumes the necessary investments and actions are taken to move these sites to market readiness. One of the goals of the study is to ensure that the database of market ready industrial sites is updated over time and is used to support the region's recruitment and expansion efforts.

The experience of state and regional economic development experts indicates that accomplishing our region's industrial retention, expansion, and recruitment strategy depends on the immediate availability of an adequate supply of well-located, market-priced, and readily developable large-lot industrial lands. This land inventory analysis provides a snapshot of the industrial land supply inside the Metro UGB and selected urban reserves established in mid-2011. The inventory can be used as a reference for monitoring and tracking changes of absorption of industrial land in the region and can also be used by Portland-metro municipalities as the basis for making informed land use and investment decisions around the supply, regulation, and market readiness of industrial lands.

III. PHASE 2 SITE ANALYSIS

A. PURPOSE OF PHASE 2

Phase 1 of the Regional Industrial Site Readiness Project identified an inventory of 56 sites that offer potential locations for new traded sector investment. The sites were categorized into tiers based on their market readiness, taking into consideration infrastructure, natural resources, brownfield issues, and market availability. Each of the sites in the inventory received a similar level of analysis that allowed for comparison and ranking. The goal of Phase 2 was to conduct a more thorough investigation and analysis of a selected number of sites to better understand the issues confronting sites that are not market ready and what it would take to bring these particular, or more generally all of the non Tier 1 sites, to market readiness.

The Project Management Team that was established in Phase 1 continued to serve their same leadership role during Phase 2 of the Project. Funding for Phase 2 expanded from the original Phase 1 group[11] to include jurisdictions from around the region as well as other private sector organizations[12].

Phase 2 sites were chosen from the Tier 2 and Tier 3 inventory to represent the wide variety of development barriers found in these categories. The PMT chose the Phase 2 sites in order to illustrate the challenges of bringing Tier 2 and Tier 3 sites to Tier 1 development-ready status. The Phase 2 analysis focused on both the costs and time required to make the sites development ready. Additionally, the analysis identified the potential economic benefits that could be generated through investment and development of the individual sites.

B. PHASE 2 METHODOLOGY

1. Selection and Concept Planning of the Phase 2 Sites

The PMT identified 11[13] Phase 2 sites from the total list of 47 non-Tier 1 sites for more detailed analysis. This subset of sites represent the challenges and opportunities found in the full inventory of Tier 2 and Tier 3 sites as well as a diversity of site size and tiers. Specific criteria for Phase 2 sites included:

- Representative of the development constraints
- Distribution around the region
- Diversity of potential traded sector users

Table 13: Tier 2 and 3 Potential Development Constraints

CONSTRAINT *	SITES WITH CONSTRAINT
Brownfield/Cleanup	8
Natural Resources	13
Infrastructure	19
Transportation	18
Land Assembly	14
State/Local Action[1]	20
Not Willing to Transact	18

**Sites may have multiple constraints*

Source: Group Mackenzie

[11] Project Management Team included: Business Oregon, Metro, NAIOP Oregon Chapter, Port of Portland, and Portland Business Alliance

[12] Phase 2 project funders included: Commercial Real Estate Economic Coalition (CREEC), Clackamas County, City of Gresham, City of Hillsboro, City of Portland, City of Sherwood, City of Wilsonville, Howard S. Wright, National Electrical Contractors Association, Oregon-Columbia Chapter, Oregon State Building & Construction Trades Council, Portland General Electric, Plumbing & Mechanical Contractors Association, Sheet Metal & Air Conditioning Contractors National Association , Three Oaks Development Company, and Westside Economic Alliance.

[13] One of those 11 sites was split into two separate sites, therefore for the remaining portion of this report there will be 12 Phase 2 sites.

Representative of Development Constraints

Phase 1 of the project identified a list of issues constraining the development readiness of Tier 2 and 3 sites in the region, which can be seen in Table 13.

These development issues fell into three broad categories: environmental and natural resource; infrastructure; and land use issues. The chosen Phase 2 sites covered all of these constraints, with all of the sites having more than one constraint. Table 14 displays the development issues by both major category and then by specific constraint that was used in the analysis of each of the Phase 2 sites.

Table 14: Development Issues for Phase 2; Tier 2 and Tier 3 Sites

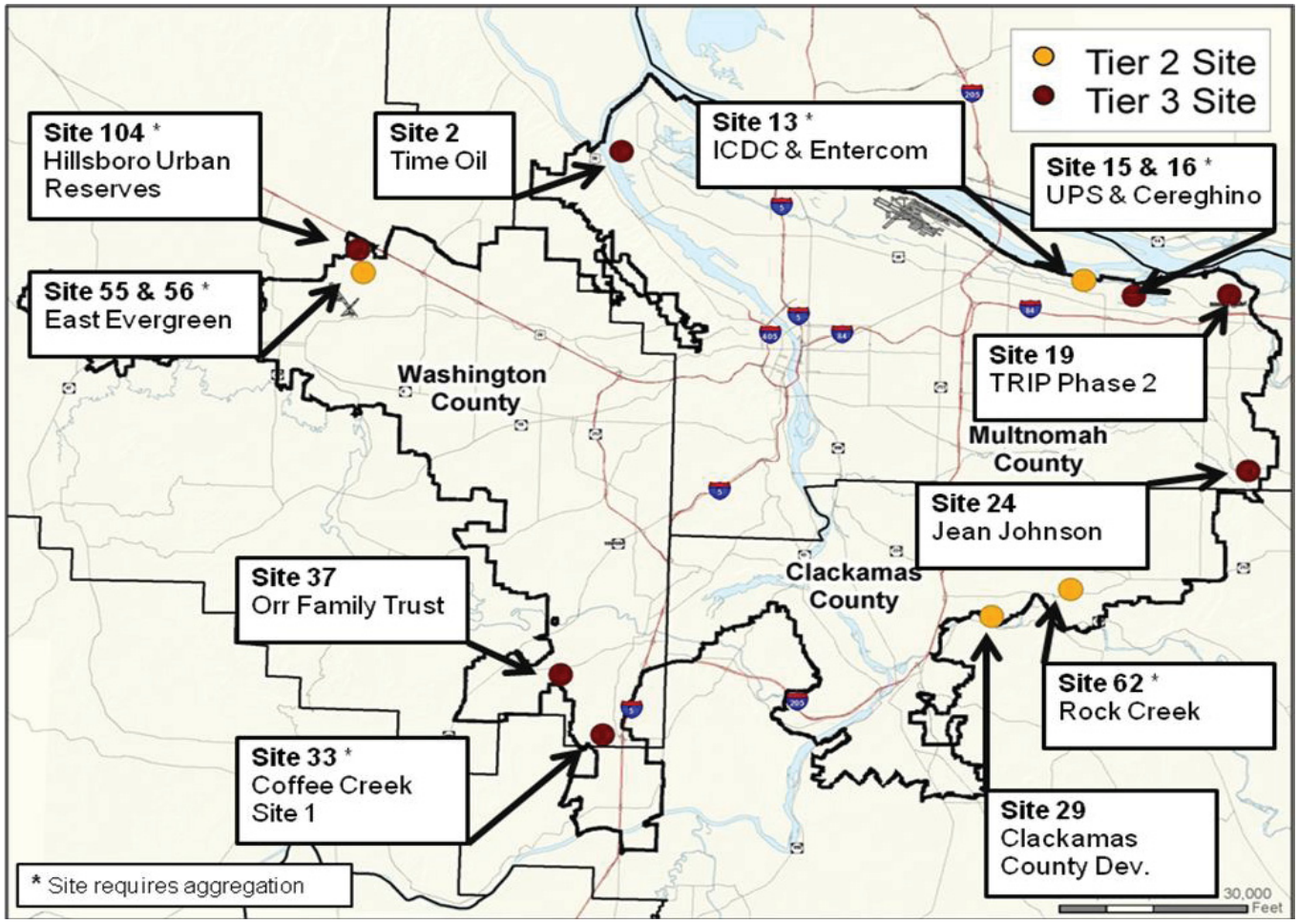
Environmental and Natural Resource Issues	Infrastructure Issues	Land Use Issues
Brownfield Cleanup	Water	Aggregation
Wetland Fill	Sewer	Annexation
Floodplain Fill	Storm	Outside UGB
Slope Mitigation	Transportation	

Source: Group Mackenzie

Distribution around the Region

The Portland metropolitan area has different development submarkets that reflect cluster industry development, market demand, pricing, development issues, and jurisdictional governance. Phase 2 sites reflect this diversity of geography and are distributed around the metropolitan area (Figure 6).

Figure 6: Phase 2 Site Map



Source: Group Mackenzie

Diversity of Potential Traded Sector User

Phase 1 of the study identified potential targeted industries for each of the Phase 1 inventory of sites based on those included in state and regional economic development strategies. Business Oregon profiles of these traded sector industries are included in Volume 3, Appendix E. Each of those targeted industries has at least one Phase 2 site that has the potential to meet their requirements. The traded sector industry profile for each site was chosen based on several factors including location, size, transportation, infrastructure, and surrounding industry type. Each site was individually reviewed by the PMT and several local real estate professions. The final designated use for each site was approved by the local jurisdiction.

Taking into consideration these three decision criteria, the list of Phase 2 sites is shown in Table 15.

Table 15: Phase 2 Sites

Site	Location	Ownership	Tier	Potential Development Constraint	Traded Sector Industry
13. ICDC LLC and Entercom (46 net acres)	Portland Multnomah County	Private	Tier 2	Potential wetlands	Warehouse distribution
29. Clackamas County Development (40 net acres)	Clackamas Clackamas County	Public	Tier 2	Brownfield cleanup; wetland mitigation	General manufacturing
55. Spokane Humane Society **56. East Evergreen** (116 net acres)	Hillsboro Washington County	Private	Tier 2	Aggregation; wetland mitigation	Clean Technology Campus
62. Rock Creek (36 net acres)	Happy Valley Clackamas County	Private	Tier 2	Aggregation; slope mitigation	High Technology Campus
2. Time Oil Company (39 net acres)	Portland Multnomah County	Private	Tier 3	Brownfield Cleanup; Floodplain fill	Heavy industrial manufacturing and marine
15. BT Property (UPS) **16. Michael Cereghino** (65 net acres)	Gresham Multnomah County	Private	Tier 3	Aggregation; Owner not willing to transact; Potential wetlands	General Manufacturing
19. TRIP (Phase 2) (54 net acres)	Troutdale Multnomah County	Public	Tier 3	Brownfield cleanup; Wetland mitigation	Warehouse Distribution
24. Jean Johnson (33 net acres)	Gresham Multnomah County	Private	Tier 3	Annexation	High Technology Campus
33. Coffee Creek Site 1 (67 net acres)	Wilsonville Washington County	Private	Tier 3	Aggregation	General Manufacturing
37. Orr Family Farm[14] (77 net acres)	Sherwood Washington County	Private	Tier 3	Annexation; Slope mitigation; Owner not willing to transact	General Manufacturing
104. Hillsboro Urban Reserves (309 net acres)	Hillsboro Washington County	Private	Tier 3	Aggregation; Annexation; Infrastructure	Clean Technology Campus
TOTAL	5 Mult. Co. 4 Wash. Co. 2 Clack. Co.	2 Public 9 Private	4 Tier 2 7 Tier 3		

Source: Group Mackenzie

[14] Later on in the Phase 2 analysis, this site was split into two separate sites, with two separate uses, at the request of the City of Sherwood.

2. *Site Concept Plans*

The industry profiles were used to prepare a conceptual site master plan and identify the off-site infrastructure demand as well as the economic benefits for each of the 12 sites. The individual site concept plans are based on industry and development knowledge of the consultant team. The concept development plan was created for a full build-out scenario to show the maximum/best use of the site. Brownfield remediation costs were estimated as well as wetland mitigation costs. Permitting and development timelines for the necessary improvements were also estimated. Development cost analyses were completed for each of the concept plans to show the financial gap that would need to be overcome in order for the site to meet market pricing requirements. Economic benefits were determined by preparing key economic performance measures for each of the site development scenarios based on the types of industry sectors assumed for each of the sites.

The following sections provide a more detailed description of the Phase 2 methodology.

3. *Off-site Infrastructure Analysis*

The Phase 2 infrastructure analysis included evaluating the existing public utility systems for their capacity to serve the selected industrial use identified for each site. Group Mackenzie developed a utility demand model for the proposed industrial uses and then identified improvements to the utility system that would be needed in order to extend or upgrade service to accommodate development at the Phase 2 sites. Finally, cost estimates were developed for the utility improvements.

Utility Demand Model

The utility demand for each of the Phase 2 study sites was determined for the public water and sewer systems using a model based on the Business Oregon's industrial use profiles, which presents minimum utility capacities and pipe sizes for various industrial use types.

Group Mackenzie converted the State's utility demand models to a per-acre basis by dividing each utility demand by the profile site acreage. As described above, the PMT assigned an industrial use type to each of the Phase 2 sites. Table 16 below summarizes the utility demand model for each of the industrial uses represented in the Phase 2 sites.

Table 16: Utility Demand Model for Types of Uses

Site Profile	Clean Technology Campus	Heavy Industrial	General Manufacturing	High-Tech Manufacturing	Warehouse and Distribution
Site Acreage (ac)	100	25	10	25	80
Water Demand (gpd)	1,000,000 10,000 gpd/ac	36,100 1,444 gpd/ac	17,000 1,700 gpd/ac	65,300 2,612 gpd/ac	12,000 150 gpd/ac
Sewer Demand (gpd)	1,000,000 10,000 gpd/ac	32,500 1,300 gpd/ac	15,300 1,530 gpd/ac	58,800 2,352 gpd/ac	11,700 146 gpd/ac

Source: State of Oregon – Oregon Business Development Department

The estimated utility demand for each Phase 2 site was calculated by multiplying the model per-acre demand by the net developable acres for each site. Table 17 summarizes the estimated utility demands for the Phase 2 sites.

Existing Utility System Evaluation

Group Mackenzie evaluated the current public utility systems at each Phase 2 site to determine the capacity of the existing infrastructure to accommodate the proposed industrial development. The Phase 2 utility review followed much of the same methodology as the Phase 2 research described previously in this report. However, the Phase 2 analysis focused more on identifying specific capacity issues that could hinder the ability to serve the industrial uses on the Phase 2 sites.

Group Mackenzie reviewed publicly available utility information for the Phase 2 sites, including GIS mapping, previously prepared master plans, and information provided by public staff. Table 18 summarizes the information sources reviewed for the Phase 2 sites.

Table 17: Estimated Utility Demands for Phase 2 Sites

Site	Industrial Use Type	Net Developable Acreage	Estimated Water Demand (gpd)	Estimated Sewer Demand (gpd)
1. ICDC LLC and Entercom	Warehouse distribution	48.5	23,000	23,000
29. Clackamas County Development	General manufacturing	40	68,000	61,200
55. Spokane Humane Society **56. East Evergreen**	Clean Technology Campus	116	1,160,000	1,160,000
62. Rock Creek	High Technology Campus	34	88,800	80,000
2. Time Oil Company	Heavy industrial manufacturing and marine	25	36,100	32,500
24. Jean Johnson	High Technology Campus	33.8	88,300	79,500
15. BT Property (UPS) **16. Michael Cereghino**	General Manufacturing	74.45	126,500	113,900
19. TRIP (Phase 2)	Warehouse Distribution	80	12,000	11,700
33. Coffee Creek site 1	General Manufacturing	80.34	136,600	122,900
37. Orr Family Farm[15]	General Manufacturing	42.8	72,800	65,500
104. Hillsboro Urban Reserves	Clean Technology Campus	309.20	3,092,000	3,092,000

Source: Group Mackenzie

[15] The southern portion of the site was designated as a business park.

Table 18: Existing Utility System Evaluation Sources

Phase 2 Site	Utility Information Reviewed
13. ICDC LLC and Entercom	▪ City of Portland GIS mapping and as-built plans
29. Clackamas County Development	▪ Clackamas County Capps Road Site Preliminary Concept Planning (Group Mackenzie, 2010) ▪ FEMA Flood Insurance Rate Map 41005C0045D
55. Spokane Humane Society **56. East Evergreen**	▪ City of Hillsboro Water Department staff information ▪ North Hillsboro Industrial Strategy (Group Mackenzie, 2011) ▪ Clean Water Services staff information ▪ Clean Water Services GIS Mapping
62. Rock Creek	▪ Sunrise Water Authority GIS mapping ▪ Clackamas County Sewer District No. 1 Sanitary Sewer Master Plan (June 2009)
2. Time Oil Co.	▪ City of Portland GIS mapping and as-built plans ▪ FEMA Flood Insurance Rate Map 4101830060F ▪ Port of Portland staff information
15. BT Property (UPS) **16. Michael Cereghino**	▪ City of Gresham GIS Mapping ▪ City of Gresham staff information
19. TRIP (Phase 2)	▪ City of Troutdale GIS Mapping ▪ Port of Portland staff information
24. Jean Johnson	▪ Springwater Community Plan Report Public Facilities Plans (November 2005) ▪ City of Gresham GIS Mapping ▪ City of Gresham staff information
33. Coffee Creek site 1	▪ City of Wilsonville GIS Mapping ▪ Coffee Creek Planning Area Preliminary Engineering Summary (March 2011) ▪ City of Wilsonville staff information
37. Orr Family Farm	▪ City of Sherwood staff information ▪ City of Sherwood Sewer Master Plan (2007) ▪ City of Sherwood Water Master Plan (2005) ▪ City of Sherwood Stormwater Master Plan (2007) ▪ Clean Water Services GIS Mapping ▪ Clean Water Services Sanitary Master Plan Update (2009)
104. Hillsboro Urban Reserves	▪ City of Hillsboro staff information ▪ City of Hillsboro GIS Mapping ▪ Clean Water Services staff information ▪ Clean Water Services GIS Mapping

Source: Group Mackenzie

Public Utility Improvement Cost Estimates

Group Mackenzie developed cost estimates for public utility improvements that would be necessary at the Phase 2 sites to extend service or expand capacity in order to accommodate the proposed industrial developments. The utility improvements identified in this study represent the expected minimum construction required to serve the site based on the reviewed utility information listed above. This includes utility extensions at the edge of the existing service boundary, where jurisdictions generally require that developers extend utilities from the current boundary to the far edge of the site, even if the site does not require the public main beyond a proposed connection point.

The utility cost estimates were developed based on minimum pipe footage for the public utility systems. The unit costs used in the study are intended to represent a per-foot cost for the entire utility system including associated accessories. For example, the unit cost for storm piping incorporates a contingency cost for catch basin inlets, manholes, and water quality treatment facilities. The sewer and water pipe unit costs incorporate similar manholes, hydrants, valves, etc.

This study incorporates utility improvements to the public system only and does not include on-site utilities that would be needed to serve the proposed developments. For example the storm system improvements identified for a site does not include on-site piping, manholes, water quality treatment facilities, detention ponds, or other stormwater related systems that handle runoff from the private development. Where appropriate, Group Mackenzie has tried to incorporate regional detention facilities at the Phase 2 sites, which could eliminate the need for separate private detention ponds to be constructed on site. Such regional detention facilities are expected to be sized to handle stormwater runoff from both on-site surfaces and the public right-of-way.

The public utility analysis summary for each site is provided in the Phase 2 Utility Valuation, presented in Volume 3, Appendix G.

4. Off-site Transportation Analysis

Transportation infrastructure was evaluated for Phase 2 sites in the following manner:

- Planning documents were reviewed. This includes transportation system plans (TSPs), specific area plans, capital improvement plans, specific infrastructure plans, etc. It should be noted not all planning documents reviewed were adopted, nor were all relevant projects funded. In cases where future transportation infrastructure was identified in planning documents that were not adopted or the projects were not funded, agency staff were specifically consulted to determine appropriate assumptions to make regarding the provision transportation infrastructure and construction timing.
- The consultant worked with the jurisdictional agency to specifically determine property access locations from the existing/future public roadway road system. This also included working with the Group Mackenzie design team to ensure the public roadway connections function with the conceptual site layouts.
- Planning level infrastructure improvement costs were determined. Based on combined agency infrastructure cost estimates, unit costs were determined. The base unit costs include:
    - $1,400 per linear foot of industrial roadway, and
    - $250,000-$500,000 per intersection improvement, additional travel lanes or signalization.
- Infrastructure improvement needs were determined. This included identifying improvements to existing roadways, new roadways and alignments, and intersection improvements. Infrastructure assumptions were also confirmed with the jurisdictional agency to ensure all necessary improvements were identified.
- The above-identified unit costs were then applied to the necessary improvements. The resulting infrastructure costs were then compared to agency-assumed costs if available. If differences existed, agency staffs were consulted and estimates were modified as necessary.

- Time to construct transportation infrastructure was determined. In most cases, it was assumed the necessary transportation infrastructure improvements can be designed and constructed in one construction season which is typically less time than for site building improvements. Therefore, infrastructure construction is generally not considered on the critical path.

Overall, the intent was to identify accurate transportation infrastructure costs and recognizing specific agency needs while maintaining a consistent assumption set. The transportation analysis summary for each site is provided in Volume 3, Appendix H.

5. On-Site Wetlands

For the Phase 2 sites, Oregon Department of State Lands' (DSL) staff first consulted the agency's Land Administration System database to determine if there were any wetland determinations or delineations on file with the agency for each site. Where such information did exist, it was used as the foundation for identifying the area of wetland constraint.

For sites with no previous wetland delineation history, the following data layers were used to identify area of potential wetland constraints:

- National Wetlands Inventory, US Department of the Interior, 1988
- Local Wetlands Inventory (for those communities with adopted inventories)
- Metro Regional Land Information System, wetlands data layer, (February 2011)
- Salmon Resource and Sensitive Area Mapping program, Oregon Dept. of Transportation, 2004
- Soil Survey Geographic Database (US National Resources Conservation Service, 2009) to identify of potential hydric (wetland) soil areas
- National Hydrography Dataset, US Geological Survey
- 2011 Oregon Explorer Imagery (aerial photography 1m resolution) to identify photo-signatures that may indicate areas of prolonged soil saturation or inundation.

The wetland mitigation cost estimates for each Phase 2 site[16] are presented in Volume 3, Appendix I. It is important to note that the methodology for this study assumes a user for each site so that all costs and timelines can be estimated. However DSL does not allow wetland permitting and mitigation to occur without a user in place, so the wetland mitigation estimates provided are not conclusive[17]. Furthermore, this study does not utilize the costs provided by DSL for two of the Phase 2 sites, 55/56 East Evergreen and 104 Hillsboro Urban Reserves due to local knowledge specific to these sites[18].

6. On-site Brownfields Remediation Analysis

Ash Creek Associates, Inc. (Ash Creek) prepared an assessment of environmental conditions on the Phase 2 industrial development sites. Ash Creek's report[19] evaluated whether potential hazardous substances (including petroleum hydrocarbons) may be present at the 12 sites. Where potential impacts by hazardous substances were identified, Ash Creek developed conceptual cost estimates for assessment and remediation. The cost estimates and schedules are conceptual in nature because:

1. They are based on a limited review of publicly-available files;
2. Ash Creek staff did not enter the subject properties or interview property owners; and

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[16] The wetland analysis for the Orr Family site was analyzed separately, as the north and south portion of the site have different wetland issues.

[17] This issue is identified in the Recommendations section of the report as one to potentially address to improve site readiness.

[18] These two sites are located directly adjacent to each other. Costs identified from the previously completed North Hillsboro Industrial Development Strategy (March 2011) were used for the East Evergreen site; no wetland costs were identified for the Hillsboro Urban Reserves site 104 based on a lack of both informed DSL information and on the ground analysis, but local knowledge from the previously completed work.

[19] Ask Creek Associates, Inc. prepared a more detailed methodology and results report in Volume 3, Appendix L.

3. Collection and analysis of environmental media (soil, sediment, groundwater, air) was not performed. The information presented herein, along with a number of factors, will be considered by Group Mackenzie to assess overall development costs for the prospective development sites.

Ash Creek was provided with the list of Phase 2 development sites[20]. Ash Creek completed the following scope of services for each candidate site:

1. Obtained and reviewed historical aerial photographs.
2. Reviewed the Oregon Department of Environmental Quality (DEQ) Facility Profiler and the Environmental Cleanup and Site Information (ECSI) online databases of sites with known or suspected use or releases of hazardous substances.
3. Performed a site reconnaissance to observe current conditions and obtain photographs of the subject properties and surrounding facilities of interest.
4. For properties that are listed in the DEQ Facility Profiler or ECSI databases due to releases of hazardous substances (confirmed or suspected), Ash Creek obtained and reviewed readily available relevant files.
5. In cases where hazardous substances are suspected or confirmed, Ash Creek developed a cost estimate and schedule for anticipated environmental assessment and remediation activities.
6. Developed an assessment and remediation cost estimates for each property where hazardous substance contamination is suspected or confirmed.

The brownfield remediation cost estimates and detailed analysis for each Phase 2 site are presented in Appendix L of this report.

7. Other On-site Issues

Floodplain Fill Mitigation

According to Title 3 (Water Quality and Flood Management) of the Metro Urban Growth Management Functional Plan, construction and development within the base flood floodplain cannot result in an increase of the flood elevation. Additionally, any earthwork fill that is placed within the floodplain must be balanced by an equal volume of cut in order to maintain the flood storage volume within the floodplain.

At a minimum, the floodplain balance requirement applies to the 100-year-flood as documented on a Flood Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM). Metro has also identified certain areas which must meet more stringent flood requirements and need to balance all fill placed within the February 1996 Flood Inundation zone.

In addition to balancing all fill placed within the floodplain, development within the 100-year-floodplain (or 1996 Inundation zone if required) must also provide minimum clearance above the documented base flood elevation to the first floor of structures within the floodplain.

Since industrial buildings are generally considered non-habitable structures, they may be legally exempt from the freeboard requirement; however, it is generally accepted practice that buildings should be located at least one foot above the base flood elevation for insurance requirements. Storage yards or truck maneuvering areas should be no lower than about 18 to 24 inches below the base flood elevation, and automobile parking areas should be no lower than about six inches below the base flood. Only one Phase 2 site, Time Oil, has floodplain issues present.

[20] Ash Creek did not analyze the two sites on the Orr Family property separately, as they are on one parcel.

Building Pad Surcharging

Several of the sites in the Phase 2 inventory require the building pad area to be surcharged to reduce the potential for total and differential site settlement. Settlement occurs when the load from a building consolidates the subsurface soil and effectively squeezes out water from the soil profile. This results in the building floor dropping and can cause slab cracking, uneven floors, and in extreme cases structural instability.

Consolidation settlement is most likely on sites with soft or loose underlying soils, which are common in many areas across the Portland region. Settlement is often mitigated by constructing a soil berm across the proposed building footprint, which surcharges the subsurface soils and initiates the consolidation settlement under the soil load. Once the settlement is complete from the soil loading, the soil berm is removed and the site is prepared for the building construction. This way, the surcharged soil will not experience further settlement under the building load.

The cost and timeframe for the surcharging process can vary widely depending on the amount of soil used to pre-load the site. A shallower depth of soil imparts a lighter load to the soil than a tall soil berm, and will take substantially longer to achieve full consolidation of the underlying soil. For the Phase 2 site analysis, Group Mackenzie has assumed that the sites would be surcharged with an approximate 8-foot-tall soil berm.

Additionally, Group Mackenzie has assumed that the building pad areas would be surcharged with a series of soil berms that are rolled in stages across the site. In this process, a portion of the site is surcharged fully until the soil berm is moved to the next section of the building. Group Mackenzie has assumed that each surcharge stage would take approximately six months to reach full consolidation before getting moved to the next stage of the building pad.

The surcharge process can be expedited by adding more soil to the berm. If the berm is expanded to cover the entire building area at once, then the berm does not need to be staged across the building footprint. Alternatively, if the soil berm is thickened, then the time to reach full consolidation is reduced. In general, Group Mackenzie estimates that doubling the volume of soil (thereby doubling the cost) would cut the entire surcharge process time approximately in half.

The site surcharge cost estimates are presented in the Phase 2 Utility Valuation in Volume 3, Appendix G.

Slope Mitigation

In general, industrial development sites have relatively strict limitations on the slope that can be reasonably accommodated across a site. Industrial buildings generally have large footprints with a level floor slab, so minimal grade difference can be accommodated across the buildings. Similarly, truck maneuvering areas should be limited to about five percent slope to facilitate safe and efficient truck movements on site. In general, the average slope across an industrial site should be limited to about five to seven percent.

Several of the Phase 2 sites contain sloped areas that exceed the average slope maximum and would require significant levels of site grading to accommodate industrial development. Group Mackenzie estimated the amount of site grading earthwork and retaining structure construction that would be required to mitigate steeply sloped areas on the Phase 2 sites. The slope grading earthwork estimate represents only the construction required to flatten steep slopes, and does not include mass grading associated with leveling and preparing the site for building pads, vehicular areas, or other site facilities. Such on-site grading is assumed to be included in the on-site construction costs associated with a specific site development plan.

The slope mitigation cost estimates are presented in the Phase 2 Utility Valuation in Volume 3, Appendix G.

8. *Land Use Planning Issues*

Annexation

The annexation process and timeframe differs in each jurisdiction. For example, in the City of Gresham, the property must be adjacent to the current city limits boundary in order to annex. If the property is not, the owner must wait until adjacent properties that are adjacent to the city limits boundary annex. In the City of Sherwood, the annexation is owner initiated and annexation requires voter approval on the May or November ballot. The annexation process for each of the Phase 2 sites that require annexation was identified by the local jurisdiction and reflected in the timelines for each site.

Aggregation

The need to aggregate individual parcels into a development site is a significant constraint for potential sites that have multiple owners. The aggregation process can take significant time, thus adding to the overall timeline and complexity of bringing sites to Tier 1 readiness. It is impossible to determine this aggregation time and therefore this is a variable that this study was unable to estimate. The study made the very conservative assumption that an agreement to aggregate was in place prior to initiating the permit timelines.

This study estimates, a "short", "medium", and "long" aggregation period, depending on the number of property owners in question in order to show the potential complexity of this issue. Similar to the tiering timelines, it was assumed that "short" aggregation period is 6 months or less; "medium" is between 6 months and 2.5 years; and "long" is over 2.5 years. Table 19 describes the assumptions used to determine the aggregation time.

Table 19: Aggregation Timeline Determination

MARKET AVAILABILITY	AGGREGATION TIMELINE DETERMINATION
If **all** properties are currently on the market	1.5 months per property owner
If owner(s) is/are on the market **and** other(s) is/are willing to transact	1.5 months per on the market property plus 3 months for willing to transact property
If owner(s) is/are not on the market **but** willing to transact	6 months per property owner
If property(ies) is/are not on the market **and** not willing to transact	Not able to estimate

Source: Group Mackenzie

9. *Electrical Power Supply*

Group Mackenzie coordinated with Portland General Electric (PGE) to review the existing electrical power system's capacity to provide service to the proposed industrial developments at the Phase 2 sites. The electrical demand for an industrial user can be very specific to the industrial processes and uses occurring on site, even within similar industrial types. Therefore, PGE's review of the Phase 2 site power infrastructure included developing a broad estimate for power demand and general improvements that would be necessary to supply power to the proposed industrial developments. PGE reported the power improvements for each site based on a scale of 1 (easy) to 3 (hard) to demonstrate the relative cost and complexity of extending or upgrading the existing power infrastructure to serve the proposed new developments. PGE's detailed report is provided in Volume 3, Appendix J.

10. Economic Costs and Benefits

The development costs and fiscal impact analysis prepared for this study by Johnson Reid focused on determining the cost "gap" to bring each of the 12 Phase 2 sites from their current status to development readiness. The analysis also determined the potential jobs and tax revenues that could be created by a conceptual development plan prepared for each of the sites.

For the "gap" analysis, the work evaluated Phase 2 sites from the perspective of market participants that are responsible for development activity. Market participants can include land owners, end-users, land developers, and public agencies. The decision making is fundamentally dictated by economic and fiscal constraints. This analysis evaluates the development costs associated with the identified constraints (e.g., lack of utilities and transportation infrastructure, wetland and floodplain mitigation, brownfield cleanup) and the time required to address these constraints *in relation to* the future value of the site. This "cost-value" approach translates the sum of development costs into an assessment of the market's ability or inability to bring sites to a development or recruitment ready status.

Market Viability Analysis Methodology

While making investment decisions, market participants will evaluate the balance of dollar costs[21], time, and risk against the future value of the investment. Presented numerically:

Equation 1

$$Future\ Value \geq \sum (Dollar\ Cost,\ Time,\ Risk)$$

When this equation holds true, and the future value of a site outweighs or is at least equal to the sum of costs associated with site development, the market will tend to produce development activity in the long-run, all else equal. However, this balance does not always hold true. Particularly for sites with considerable constraints, the equation is reversed:

Equation 2

$$Future\ Value < \sum (Dollar\ Cost,\ Time,\ Risk)$$

In this condition, a number of outcomes could occur. When the differential between cost and value is narrow, enough time may pass for future land values to appreciate to a level which may persuade market activity[22]. Alternatively, a market participant with a lower risk and time threshold may emerge. However, when the differential is large relative to future value, the potential reward is not sufficient to encourage private investment. In this instance, the more likely scenario is for the site to remain in an unusable condition, or eventually transition to a higher value use to justify higher future land value[23].

With this basic foundation in mind, Johnson Reid evaluated each half of this balance individually. The value/cost balance was then reconciled to determine the aforementioned differential, and elaborated on its meaning and implications on site readiness.

The evaluation process began with an assumption that owners are motivated to transact and that the sites are aggregated. This is clearly not always the case, and aggregation is a costly obstacle to site development. However, aggregation costs and timing are difficult to estimate and therefore are not included in the analysis. For this analysis, Johnson Reid erred on the side of a conservative cost estimate.

[21] Including acquisition

[22] Although land appreciation generally requires increasing scarcity relative to demand.

[23] Higher value users most often require a change in zoning, for example, industrial zoning to commercial or residential zoning.

Costs: Dollar Cost, Time, and Risk

Johnson Reid's cost analysis evaluated the development constraints precluding Tier 1 status. Constraints included lack of off-site infrastructure and transportation, and on-site costs for wetland mitigation, floodplain fill, slope mitigation and brownfield cleanup. For one site, Time Oil adjacent to the Willamette River, infrastructure also included the in-water construction of a dock to accommodate a marine-dependent metals manufacturing use of the site.

Group Mackenzie provided dollar costs (Hard Costs) for addressing each site's off-site and on-site constraints[24] and development schedules (time) for each identified constraint. Johnson Reid then considered Soft Costs[25], and utilized the development schedules for each activity to calculate the time cost of money[26]. Development schedules were also used to quantify the cost of risk[27], the premium required to encourage investment. Taken together, these baseline inputs determined the total cost of bringing the site to development readiness. Stated numerically:

Equation 3

$$\textit{Total Site Development Cost} = \sum \textit{(Hard Cost, Soft Cost, Time Cost, Risk Premium)}$$

In addition to site development, an acquisition price an entity would pay a current land owner for sites "as-is" must also be considered. This is a difficult assumption to make, as it does not indicate the residual "value" of the land from a purely market perspective. Rather, it represents the price a land owner would reasonably transact today; this is referred to as the "strike price". In reality, the real strike price will vary widely by site. Absent each aggregated site being listed on the open market, there is no true way of knowing what this will be. As a necessary supplement, Johnson Reid assumed that an across the board strike price of $4.50 per-square-foot would reasonably encourage land owners to enter contract negotiations. Therefore, the entire right side of Equations 1 and Equation 2 is represented by the following:

Equation 4

$$\sum \textit{(Dollar Cost, Time, Risk)} = \textit{(Strike Price + Total Site Development Cost)}$$

Future Value

On the left side of equations 1 and 2, the future market value of each site as a development ready site was calculated; in other words, after site development activities have occurred. The future value of a site is simply a function of its current value as-if a Tier 1 site, plus time, plus an assumed land appreciation (or depreciation) rate. Again, numerically:

Equation 5

$$\textit{Future Value} = \textit{Current Tier 1 Price } (1+\textit{Appreciation Rate})^{t}$$

$$\textit{Where } t = \textit{Site Development Period}$$

Time in this case is the actual site development period provided by Group Mackenzie, and the land appreciation rate is consistent with 30-year growth in inflation[28]. However, the assumption of current Tier 1 value for each site required more diligence. This assumption was derived out of both quantitative and qualitative elements. Where available, Johnson Reid began with comparable sale and listing prices by submarket. This information provided a sound basis, but data points were limited and land deals are often highly unique. Therefore, two alternative sources

[24] Building construction costs and project specific site costs are not included. On-site costs were taken through what is referred to as "mass grading".

[25] Calculated at 20% of Hard Costs. Represent architectural, engineering, legal, fees, SDC's etc.

[26] Calculated at a 7% annualized rate from the period dollars are spent in the development schedule to site development readiness.

[27] Risk thresholds were estimated linearly as 2.5% for every 6 months of development time, from a 24 month basis of 15%. For example, a site with a site development period of 24 months would be associated with a 15% return on costs, while a site with a 30 month development timeline would require a 1.75% return. Risk premiums were grossed up by 1/6th for site with moderate brownfield remediation and by 1/3rd for sites requiring significant brownfield remediation.

[28] As measured by the Consumer Price Index.

of information were consulted; the industrial real estate brokerage team at CB Richard Ellis (CBRE) and member brokers of the local chapter of Society of Industrial and Office Realtors (SIOR). Each of the Phase 2 sites where discussed with these experts and a price was identified for market ready, similar sized sites in each of the submarkets where the sites where located. Responses were combined with the physical data to determine a market ready price[29].

Reconciliation of Value and Costs

Finally, Johnson Reid reconciled Equation 1 to determine the differential between the future value of a site and its associated costs. This differential represents the "Market Viability Gap" or "Surplus" of the site. Numerically:

Equation 6

$$MV = Future\ Value - \sum (Dollar\ Cost, Time, Risk)$$

Where MV is negative, a viability gap exists; the cost to acquire and provide infrastructure exceeds expected market value. Where MV is positive, the site should attract the interest of the market, within the construct of this model.

Where they exist, Johnson Reid looked to identify "market viability gaps" of constrained sites and then quantified these gaps in both dollars and time to understand "how far away" the site is from market viability. Because an assumption of land appreciation was used, this assumption can be quantified both in terms of dollars and the length of time it would take for the site to be priced for a market based transaction. This allowed the consultants and PMT to understand the magnitude of the gaps, and begin thinking about solutions to improve market viability.

Economic and Fiscal Impact Methodology

Once the necessary gap that sites would require for improvement has been quantified, Johnson Reid evaluated the potential benefits those catalytic investments could generate. This process began with the assumption of a Tier 1 site and motivated end user. This analysis is theoretical in nature. Group Mackenzie produced concept plans for each site to represent a conceptual end user. Based on what is known about how these types of industries operate, and the costs of building their facilities[30], Johnson Reid derived economic and fiscal estimates of these activities. This analysis considered the following impacts:

Economic Impacts from site development, facility construction, and on-going operations:

- Business Revenues, *(Direct, Indirect/Induced)*
- Jobs, *(Direct, Indirect/Induced)*
- Payroll Wages, *(Direct, Indirect/Induced)*

Fiscal Impacts from site development, facility construction, and on-going operations:

- Property Tax Revenues from real property, and
- State Payroll Tax from payroll wage impacts.

The fiscal impact of property taxes is underestimated due to the methodology excluding capital equipment from the analysis. This is taxed as personal property as opposed to real property. For large users, the assessment of such property is determined on an individual basis, with complicated measures of depreciation, value, and incentives. The analysis erred on the side of conservative estimates vs. speculating on these broadly varying impacts. It should be noted that these investments can be significant, especially among high-tech and clean-tech users. As such, the economic impact findings are highly conservative. Local fees and taxes were also excluded, again resulting in some under estimating of the positive fiscal impacts on local governments.

[29] This price was then reviewed by the consultant team and Kirk Olsen of Dermody Properties, a member of the PMT, for a final determination.

[30] Per-Square-Foot construction cost by facility type was provided by Group Mackenzie with support from Perlo Construction. The construction costs were calculated at: Spec general manufacturing at $55/SF; general manufacturing at $70/SF; warehouse at $25/SF; clean manufacturing/fab at $75/SF; office at $130/SF; Central Utility Building at $150/SF.

IMPLAN Economic Impact Methodology

To model the economic impacts of various activities, Johnson Reid utilized IMPLAN (IMPact for Planning)[31] input/output multiplier model methodology. This methodology is widely used by public and private entities.

Economic impact analysis generally seeks to assess changes in overall economic activity within a specific geographic area as a result of a change in one or many specific activities. In this case, site development, facility construction, and on-going business activity were modeled. The ripple effect of a gain or loss in economic activity is identified in three stages: *Direct Impacts*, *Indirect Impacts* and *Induced Impacts*.

- *Direct Impacts:* The actual change in activity affecting a local economy. For example, if a new high-tech building is constructed, direct economic impacts comprise the business revenues for that firm/user, as well as the jobs required by that business and the labor income paid.
- *Indirect Impacts:* The response of all other local businesses within the geographic area to the direct impact. Continuing the previous example, indirect impacts of a high-tech user would comprise revenues for related venders, i.e. materials wholesalers, subcontractors, etc., and the jobs and labor income thereby generated.
- *Induced Impacts*: The response of households within the geographic area affected by direct and indirect impacts. In the given example, induced impacts would be the increase in all categories of spending by households in the geography directly or indirectly employed by the businesses' activities.

Because IMPLAN's multiplier approach recognizes the relationship between revenues, jobs, and payroll, only one input is needed to determine the others. Therefore, job estimates could be used to determine business revenues, or vice versa. Johnson Reid's approach to estimating each activity type is outlined below.

Site Development

Economic impacts were calculated based on the dollar cost and site development schedules provided by Group Mackenzie. Hard and soft impacts were considered separately and summed.

Facility Construction

Estimates of facility construction costs for different types of structures (e.g., production, office) provided by Group Mackenzie, with support from Perlo Construction, were the starting point. These dollar costs were inputs in the IMPLAN model to produce jobs and payroll estimates. However, assumptions of the rate to which firms in different industries absorb space were needed. To avoid making hypothetical phasing estimates of conceptual plans, all of the facility construction and on-going impacts were related to a linear build-out over a determined period of time. To determine the different industry absorption rates, Johnson Reid evaluated case studies of large industrial expansion from around the region to determine typical absorption periods. Based on the evaluated case studies, the assumptions used in the analysis range from warehouse and distribution facilities (being absorbed by a single user at building occupancy) to 120,000 square feet per year for clean tech.

Ongoing Activity

As mentioned above, ongoing impacts were included in the model at the rate of facility construction. Direct job impacts were used as the IMPLAN input for on-going operations. Average employment densities outlined by Metro's Urban Growth Report[32] were utilized to create direct job estimates.

Fiscal Impacts

The analysis considered only taxes on real property and state payroll tax associated with payroll impact estimates outlined above.

[31] Minnesota IMPLAN Group (MIG), Inc., Stillwater, Minnesota.

[32] 14.7 jobs per acre for manufacturing; 8.8 jobs per acre for warehouse/distribution. Metro, 2009-2030 Urban Growth Report, January 2010.

Property Tax Impacts

Property tax revenues (only real property, not personal property) were calculated on the *net-new* assessed value created by facility construction. Future assessed values were estimated by applying the cost of replacement to the changed property ratio (CPR) for industrial development in each respective county. For example, in year-one if there were a $1,000,000 facility improvement on a site in Multnomah County, that increase in real market value would be multiplied by 0.876 (the industrial CPR in Multnomah County) to determine assessed value. Property taxes were estimated[33] on assessed values by the according millage rate for each site. A maximum annual assessed value increase on existing land and improvements of 3% in accordance with Measure 50 was assumed.

State Payroll Tax Impacts

State payroll taxes were applied to all taxable income[34] according to the State's current 2012 tax rates[35]. Payroll taxes were considered on payroll associated with the direct, indirect, and induced impacts of all construction and on-going operational activities.

The above discussion addresses both the development costs and fiscal impacts of the Phase 2 sites. A more complete description of the methodology is in Volume 3, Appendix L.

11. Jurisdiction Review

Similar to the Phase 1 methodology, the consultant and PMT reached out to local jurisdictions that had a Phase 2 site. In March of 2012, the Group Mackenzie provided the following information for jurisdictional review on each Phase 2 site:

1. The final concept site plan;
2. Infrastructure (water, sanitary, storm, and slope mitigation) costs with an explanation of the methodology used;
3. Transportation upgrade costs and explanation;
4. Wetland mitigation costs (provided by DSL); and
5. Brownfield remediation costs (provided by Ash Creek Associates, Inc.).

Jurisdictions were able to make suggestions on altering the concept development site plans, for example, requesting two access points to the site, or increasing building square footage, etc. Group Mackenzie made changes if deemed appropriate based on feedback.

Prior to publishing, the local jurisdictions were able to review the materials for final approval. Jurisdictions were asked to provide land owners this information for review prior to publishing. On June 7, 2012, a meeting for all project funders and local jurisdictions was held to share the results of this study.

[33] Where a site is located in an Enterprise Zone, property tax impacts are frozen for five years beginning with the first year of facility construction.

[34] Taxable income is assumed to be 75% of total payroll wage. Reduction accounts for federal withholding, standard deductions, and other miscellaneous deductions.

[35] Oregon Department of Revenue, Oregon Withholding Tax Formulas, January 2012

IV. PHASE 2 FINDINGS

A. PHASE 2 RESULTS

The purpose of Phase 2 of the Regional Industrial Site Readiness Project was to look in more detail at the constraints affecting development readiness of the 12 sites. The intent was to use these sites to gain a broader understanding of the constraints facing non Tier 1 sites throughout the region. Through this process a significant level of analysis was done for each of the sites.

Volume 2 of this report includes detailed site concept plans, and specific costs and benefits for each of the Phase 2 sites. This section focuses on each of the constraints and compares and contrasts their impact on site development.

Additionally, the findings focus on the potential economic benefits, both specifically and more generally, if these sites were to be developed.

1. Marginal Impact of Identified Constraints and Cost Factors

Phase 2 sites were specifically selected to look in more detail at the site development constraints identified in Phase 1 of the project. These broad ranges of known constraints limit the market viability of industrial sites. In this section, each constraint or cost factor is individually examined to consider its marginal impact on site development cost. Total development costs include hard costs, soft costs, time, and risk.

Hard costs constraints come in two categories: off site (water, sanitary sewer, stormwater and transportation; and on site (wetland, slope, site surcharge, floodplain, and brownfield cleanup). These constraints are examined in terms of their hard cost dollar contribution to developing each individual site. Soft costs, risk and time for each site are addressed separately.

- Soft costs are calculated at 20% of hard costs and include architectural, engineering, legal services as well as System Development Charges (SDCs).
- Risk thresholds were estimated linearly as 2.5% for every 6 months of development time, from a 24 month basis of 15%. For example, a site with a site development period of 24 months would be associated with a 15% return on costs, while a site with a 30 month development timeline would require a 1.75% return. Risk premiums were grossed up by 1/6th for site with moderate brownfiled remediation and by 1/3rd for sites requiring significant brownfield remediation.
- Time is calculated at 7% nominal annualized rate for the length of the site development schedule.

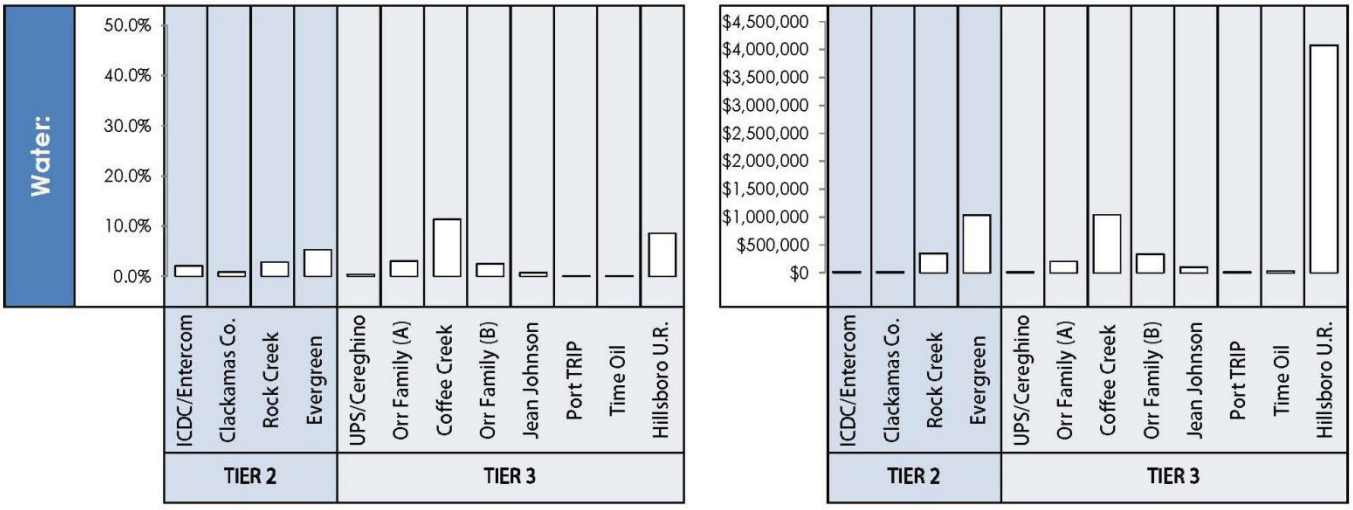
It is important to understand the role that risk and time contribute to development ready status. For example, addressing a certain constraint could cost relatively little in terms of dollars (hard costs), but could contribute significantly to the time period necessary to bring the site to a development ready status. Therefore, discussion with respect to timelines is included as necessary in the off-site and on site cost discussion and then presented in more detail in subsequent discussion.

Off-Site Development Costs

Water

Water infrastructure is not generally a contributing cost factor among most of the Phase 2 sites (Figure 7). In eight of the Phase 2 sites, water costs represent roughly 3.5% of development costs. Only in outlying geographic areas where infrastructure is being extended to new areas does it become a significant cost constraint. The two Hillsboro sites (East Evergreen and Urban Reserves), Coffee Creek in Wilsonville, and the Orr Family (A) site in Sherwood have costs in excess of 3%. Beyond dollars, time intervals to establish water infrastructure approach 24-30 month periods, a constraint in and of itself.

Figure 7: Phase 2 Site Water Development Costs

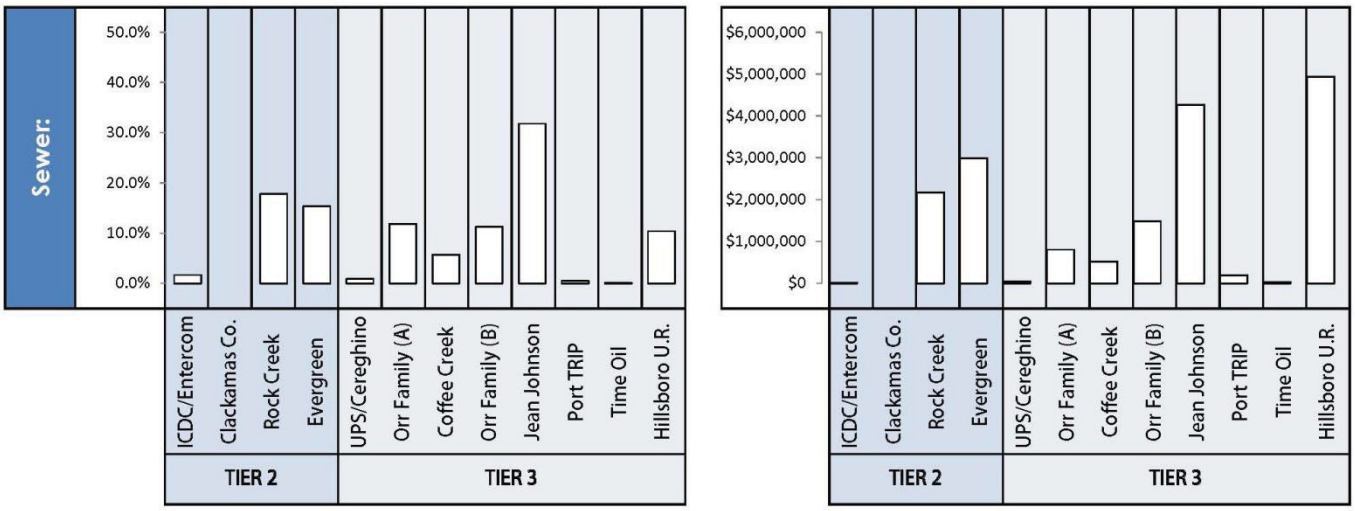


Source: Johnson Reid

Sewer

Sewer capacity is among the primary limiting constraints for many of the Phase 2 sites. Across all sites, sewer represents about 8.5% of total development costs, and in extreme cases, exceeds 30% (Figure 8). Similar to water, sewer constrains are more prevalent in outlying areas such as in unincorporated Hillsboro (East Evergreen and Urban Reserves sites), Happy Valley (Rock Creek site), and unincorporated Multnomah County (Jean Johnson site).

Figure 8: Phase 2 Site Sewer Development Costs

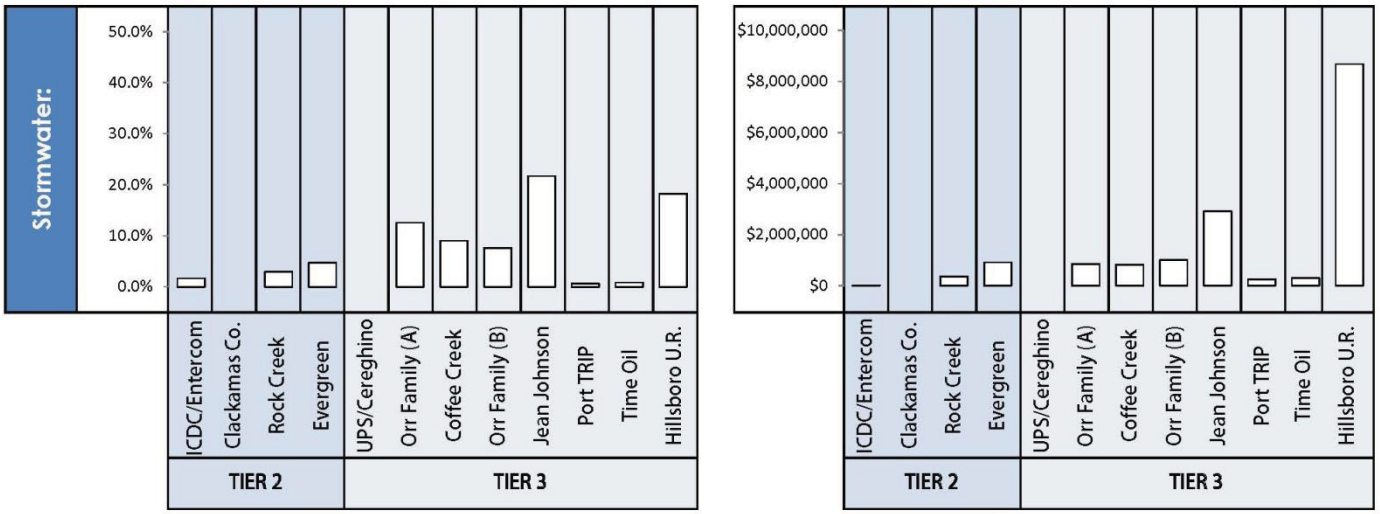


Source: Johnson Reid

Stormwater

Stormwater constraints are similar to sewer, but at a lower magnitude. In the most difficult situations (Jean Johnson and Hillsboro Urban Reserves), stormwater accounts for 18%-21% of total developments costs and roughly $8.6 million in the case of Hillsboro's Urban Reserves site. In most cases, stormwater contributes between $250,000 and $1 million of the total costs (Figure 9). Because they are installed concurrently, water, sewer, and stormwater have similar time lags and associated non-dollar time constraints.

Figure 9: Phase 2 Site Stormwater Development Costs



Source: Johnson Reid

The analysis of these 12 sites shows that sites in areas where urban development has occurred have lower public utility (water, sanitary and stormwater) costs. Five sites, ICDC/Entercom and Time Oil (Portland); Clackamas County (unincorporated Clackamas Industrial Area); UPS/Cereghino (Gresham); and Port TRIP (Troutdale) all fall into this category.

Five other sites, East Evergreen (Hillsboro); Rock Creek (Happy Valley); Orr Family A and B (Sherwood); and Coffee Creek (Wilsonville) are all proximate to existing development but need infrastructure extensions, and therefore have the next highest public infrastructure costs.

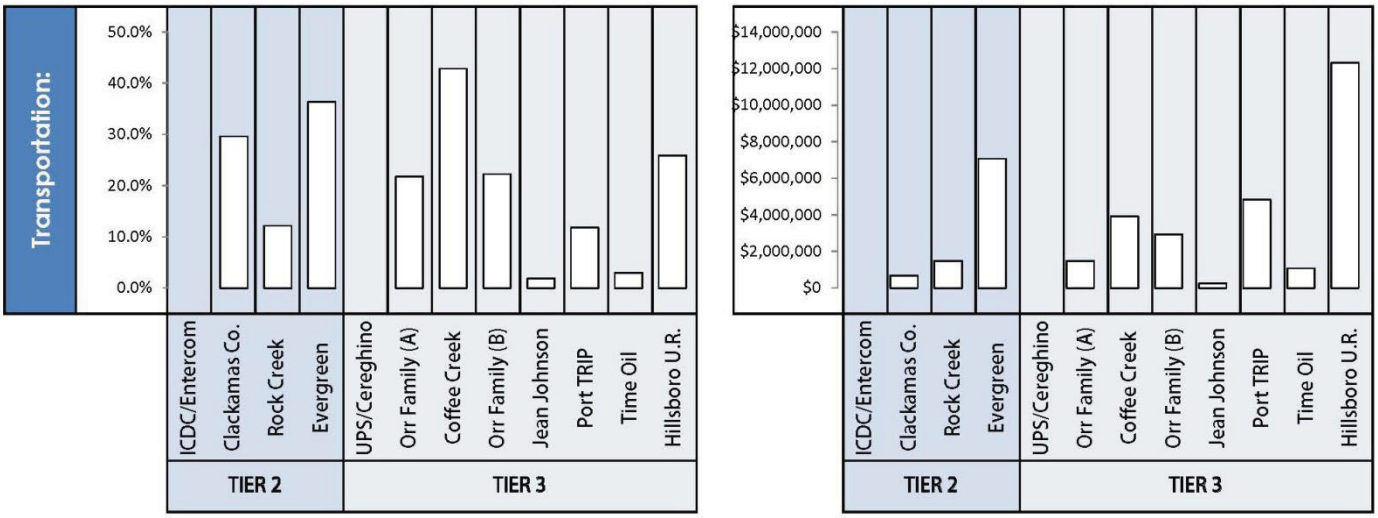
Finally, the two sites that are in new urban areas (Hillsboro Urban Reserves and Jean Johnson) have the highest public infrastructure costs.

Transportation

The analysis reveals that transportation, the fourth off site infrastructure cost, is the most limiting physical land constraint from a dollar cost perspective. And transportation does not fit as neatly into the three location categories as public utilities. Transportation issues are more localized to specific sites and need to be analyzed on a site by site basis.

Transportation is a significant component of cost in all but three of the Phase 2 sites, contributing to as much as 43% of site development costs (Figure 10). In six cases, transportation costs comprise nearly than one of every five dollars towards development. Most transportation constraints have manageable time lags ranging from nine to 18 months, with 24 months representing the upper bound.

Figure 10: Phase 2 Site Transportation Development Costs

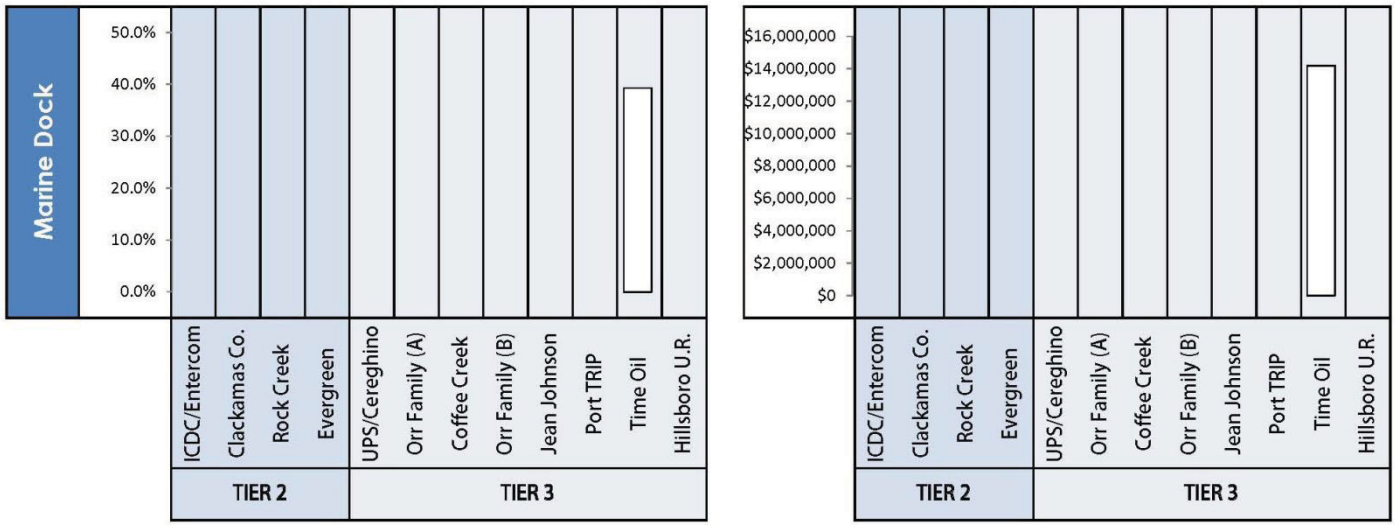


Source: Johnson Reid

Marine Dock

The need for a functional marine dock is only prevalent to one of the Phase 2 sites, Time Oil. This site has a City of Portland zoning requirement for a river related or river dependant use and therefore, a functional dock is a basic infrastructure requirement. In this one case, the marine dock construction contributes $14.1 million, or 39%, of total development costs (Figure 11). Absent this constraint Time Oil's market viability gap is reduced by 85%.

Figure 11: Phase 2 Site Marine Dock Development Costs



Source: Johnson Reid

On-Site Development Costs

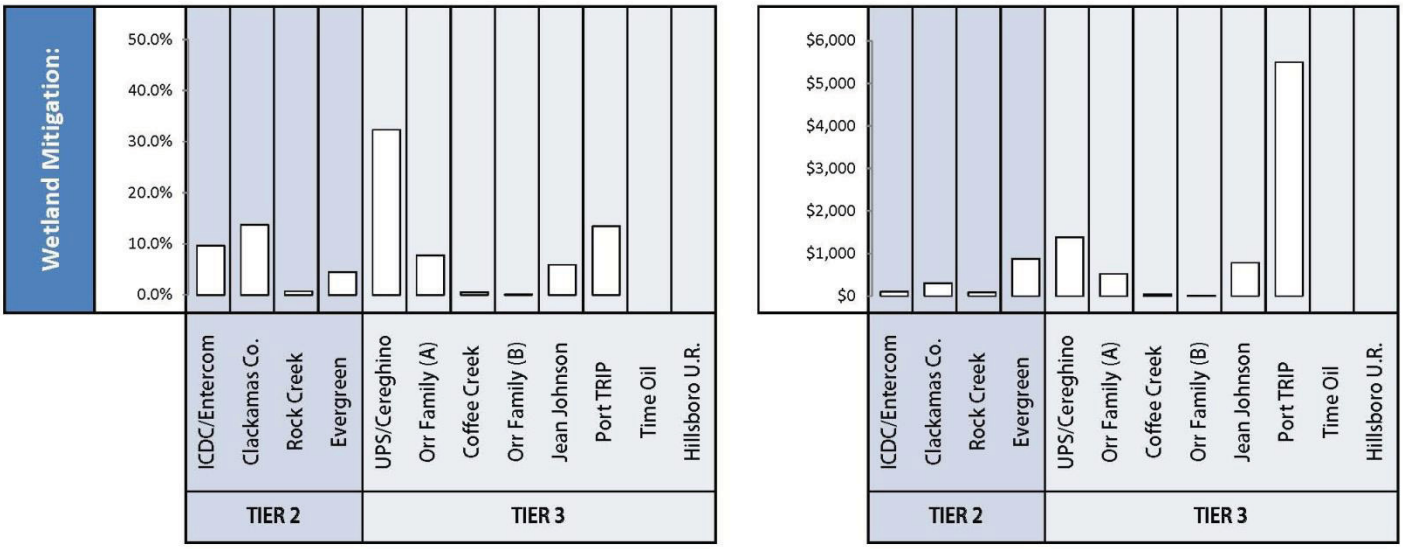
Wetland Mitigation

Some degree of wetland mitigation is a common constraint found in Phase 2 sites, and in some cases it is quite severe (Figure 12). Wetland constraints are most severe on the TRIP (Troutdale Reynolds Industrial Park) site, contributing over $5.4 million or nearly 12% of project costs. Mitigation costs for this site include the purchase of 25 acres of land for off-site mitigation and the permitting, construction and maintenance of the new wetland.

Eight of the Phase 2 sites have a wetland bank in their watershed. For these sites, the preferred and assumed mitigation method is purchase of mitigation credits. The other 3 sites that have wetland issues either have to do on site mitigation, thus reducing net developable acreage, or, as in the case of TRIP, purchase additional land for mitigation. One of the sites, Hillsboro Urban Reserves, does not include wetland mitigation costs. Reliable estimates of existing wetlands were not are available, therefore no cost are shown. The Time Oil site does not have wetlands on site.

With the exception of TRIP, wetland constraints are most severe on the sites with lower overall off site infrastructure costs. In other words, the dollar cost is relatively small, but is a significant share of overall development costs. When combined with the long time lags for permitting and mitigation, wetland mitigation is a key "opportunity constraint" that a combination of dollars and/or a streamlined process could move several Phase 2 sites further toward marketability at a relatively low cost.

Figure 12: Phase 2 Site Wetland Mitigation Costs

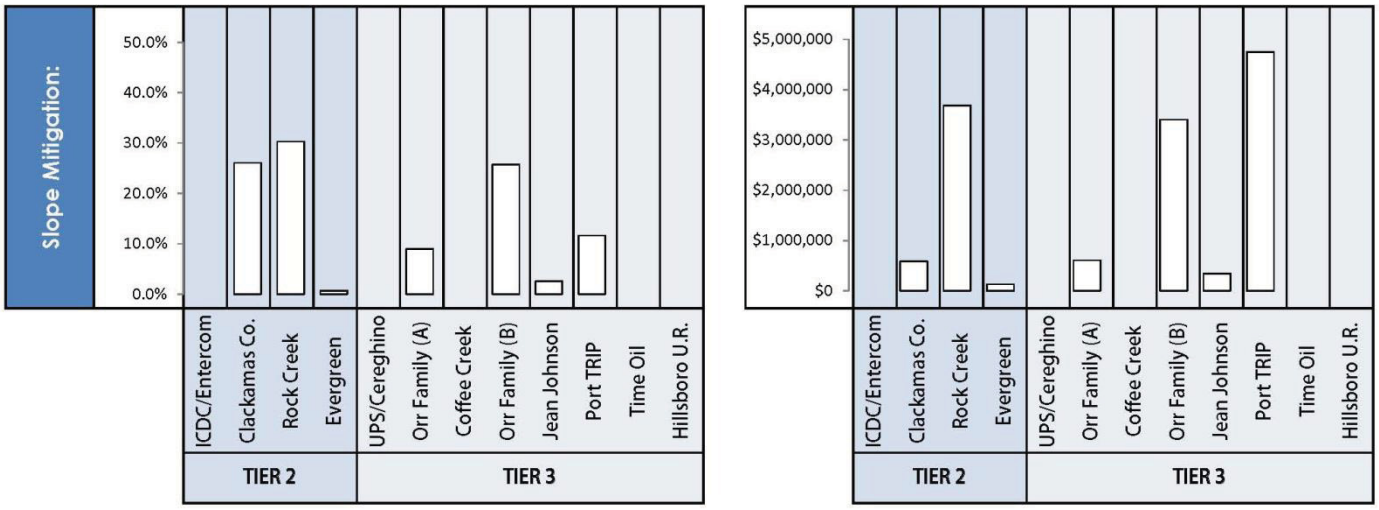


Source: Johnson Reid

Slope Mitigation

The professional determination by Group Mackenzie is that an industrial site can have a maximum of 7% slope in order to be considered development ready. Therefore, for those Phase 2 sites that were in excess of 7%, a mitigation cost was determined. Slope mitigation is a constraint that exists on half of the Phase 2 sites and it is quite severe (Figure 13). On three of the sites, Clackamas County, Rock Creek and Orr Family B, slope mitigation exceeds 25% of total development costs. For two of these sites, slope is the most severe constraint. Similar to wetland mitigation, the process must begin very early in the site development period. Therefore, slope constraints compound both time costs and risk premiums.

Figure 13: Phase 2 Site Slope Mitigation Costs



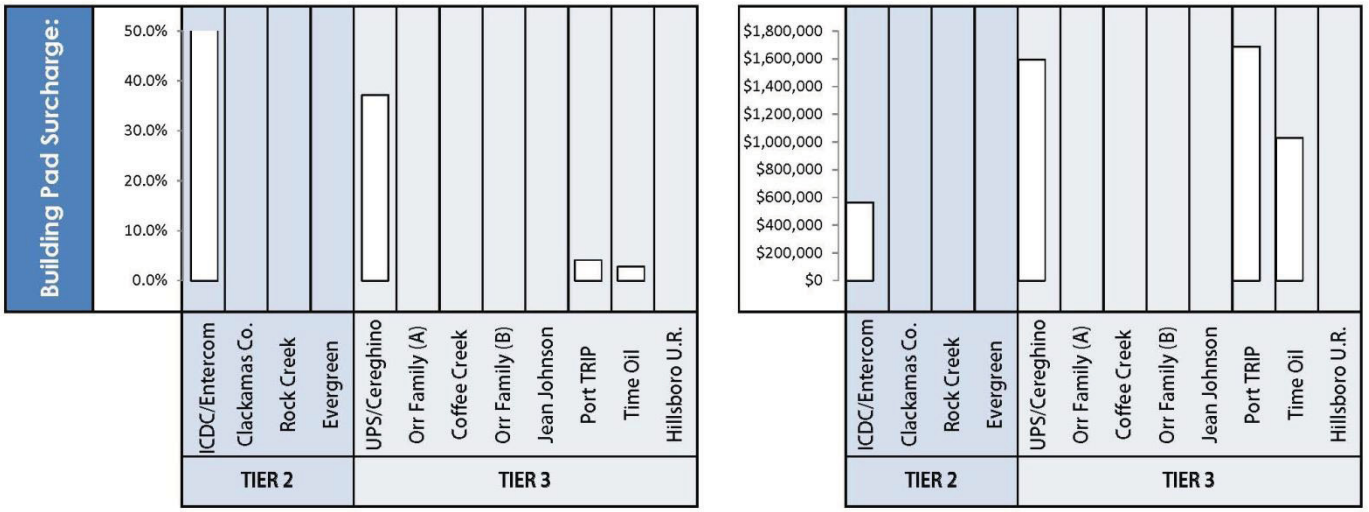
Source: Johnson Reid

Building Pad Surcharge

Surcharge is an issue on four of the Phase 2 sites, and a significant share of cost on two sites (Figure 14). However, this constraint appears on two of the lowest cost sites. Surcharge is a cost appearing on both TRIP and Time Oil, however, relative to other issues on those sites, surcharge is quite small. However, it was found that in these cases that surcharge is not necessarily a cost prohibitive factor, but a time related constraint. Using ICDC/Entercom as an example, surcharge is only a $500,000 hard cost, but is a 27-month long process. In this instance, it is the time, not the cost, prohibiting the site from moving to Tier 1.

It is important to reiterate, that Group Mackenzie assumed that the sites would be surcharged with a series of soil berms that are rolled in stages across the building pad site in six month periods of time. The surcharge process can be expedited by adding more soil to the berm or by extending the berm to the entire building site. Either of these actions would reduce the time allocated to surcharge and increase the cost. Surcharge is a tradeoff between time and costs. In general, Group Mackenzie estimates that doubling the volume of soil (thereby doubling the cost) would cut the entire surcharge process time approximately in half.

Figure 14: Phase 2 Site Surcharge Costs

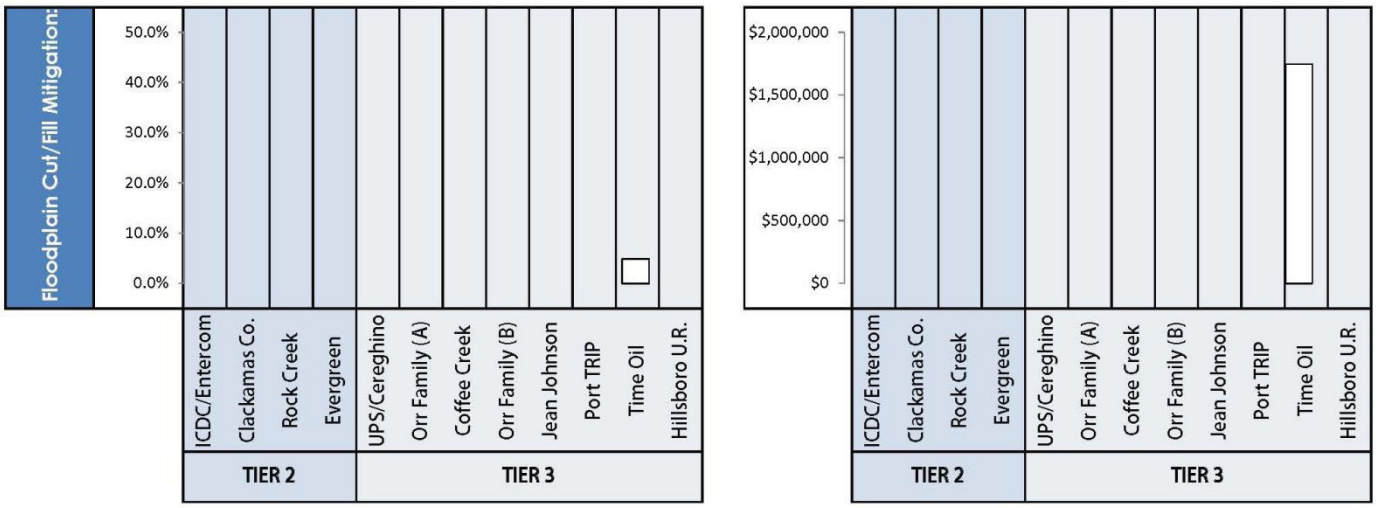


Source: Johnson Reid

Floodplain Mitigation

Floodplain mitigation does not appear to be a significant constraint within the construct of the study (Figure 15). It only appears on Time Oil and is relatively small both in terms of dollars and time. The challenge with the Time Oil site is that this mitigation needs to occur with a cut fill balance exclusively on site. The net developable acreage is therefore reduced by this requirement.

Figure 15: Phase 2 Site Floodplain Mitigation Costs

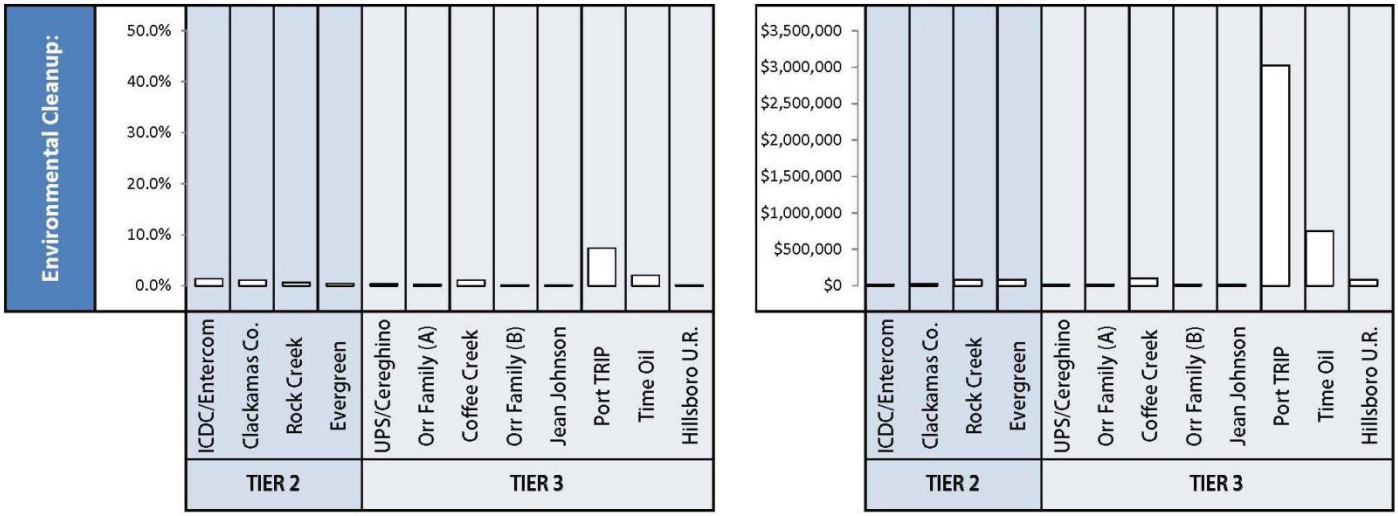


Source: Johnson Reid

Environmental Cleanup

Environmental cleanup and brownfield remediation are very small constraints on the Phase 2 sites (Figure 16). With the exception of TRIP, where environmental cleanup exceeds 7% of development costs, brownfield cleanup is one of the smallest dollar cost constraints. However, even where costs are quite small, environmental cleanup is typically the first activity which must occur in the development process. Excluding the Troutdale Reynolds Industrial Park site, the development schedule for all Phase 2 sites could be reduced by six months at $2,800 per acre through environmental cleanup.

Figure 16: Phase 2 Site Environmental Clean Up Costs



Source: Johnson Reid

Site Aggregation

Six of the 12 Phase 2 sites require parcel aggregation as the sites are made up of multiple parcels and multiple owners. In one case, there are 17 separate owners to aggregate, and in another, eight owners. The aggregation process may be an extensive one, and this study does not have a way to accurately estimate how long it could potentially take to put an aggregation agreement in place. This study estimates, a "short", "medium", and "long" aggregation period, depending on the number of property owners in question in order to show the potential complexity of this issue.

Similar to the tiering timelines, it was assumed that "short" aggregation period is 6 months or less; "medium" is between 6 months and 2.5 years; and "long" is over 2.5 years.

Table 20: Phase 2 Site Aggregation

Site	Tier	Total Parcels	Total Owners	Currently on the Market	Owner Willing to Transact	Aggregation Period
13. ICDC LLC & Entercom (46 net acres)	Tier 2	5	2	1 for lease	1 Willing to Transact	Short
29. Clackamas County Development (40 net acres)	Tier 2	11	1	Lease	Yes	N/A
55. Spokane Humane Society **56. East Evergreen** (116 net acres)	Tier 2	10	8	6 taxlots for sale (4 owners)	4 taxlots willing to transact (4 owners)	Medium
62. Rock Creek (36 net acres)	Tier 2	5	2	2 taxlots for sale (1 owner)	1 Owner willing to transact	Short
2. Time Oil Co. (39 net acres)	Tier 3	7	1	For sale	Yes	N/A
15. BT Property (UPS) **16. Michael Cereghino** (65 net acres)	Tier 3	9	2	No	No	Long
19. TRIP (Phase 2) (54 net acres)	Tier 3	1	1	For Sale	Yes	N/A
24. Jean Johnson (33 net acres)	Tier 3	1	1	No	Yes	N/A
33. Coffee Creek site 1 (67 net acres)	Tier 3	21	17	No	No	Long
37. Orr Family Farm (77 net acres)	Tier 3	1	1	No	No	N/A
104. Hillsboro Urban Reserves (309 net acres)	Tier 3	9	8	No	Yes	Medium

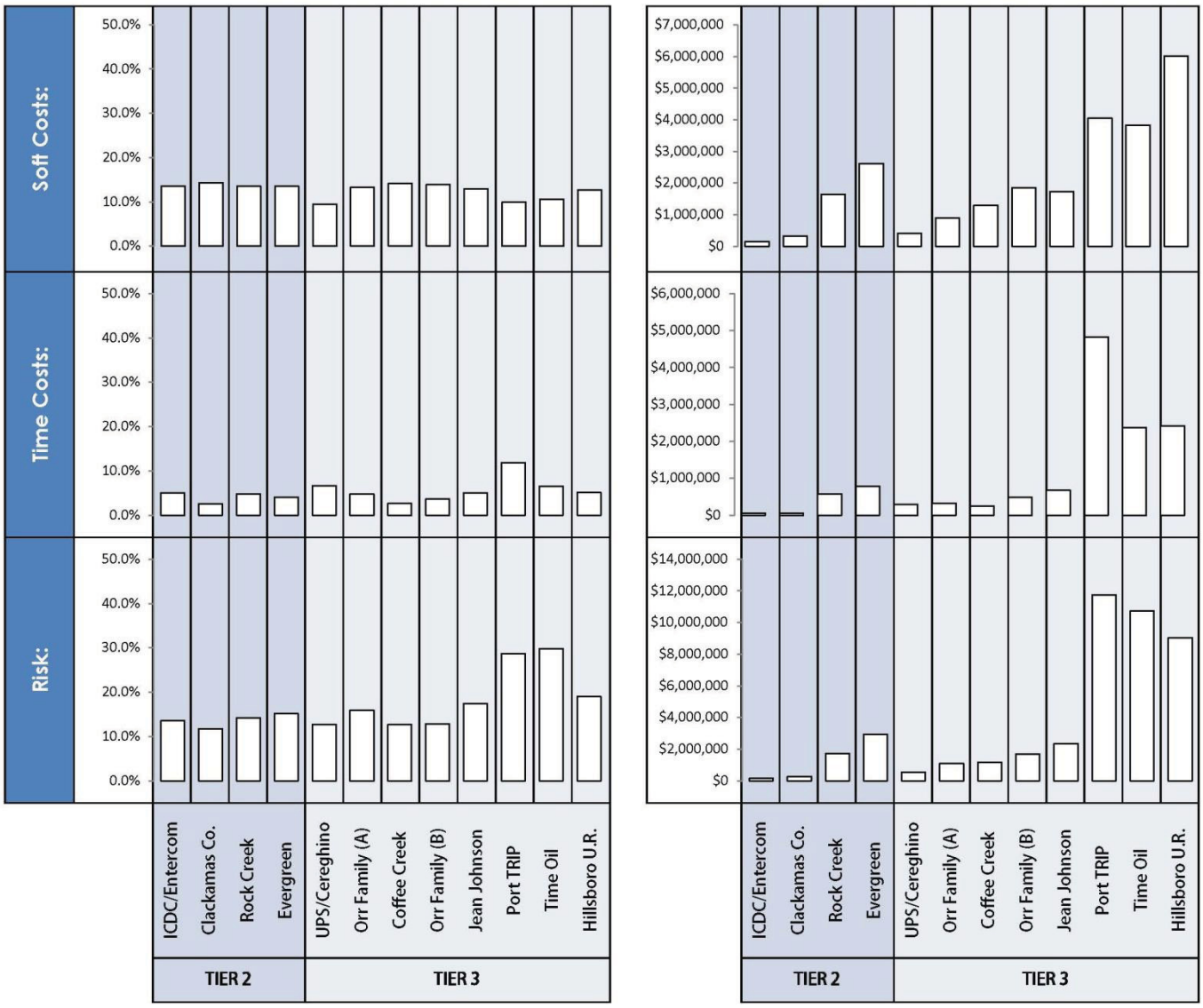
Source: Group Mackenzie

The assumption for all the analysis in this study was that the property owners had an aggregation agreement in place before the clock started for permits and on and off site improvements. It is important to understand that for those site that have multiple ownerships there is an additional constraint that will need to be addressed, beyond simply the cost and timelines identified in the study.

Other Cost Variables

In addition to on and off site hard costs evaluated previously, soft costs, time costs, and risk costs associated with site development impact the total development costs for each site. This section illustrates how these costs also contribute to site feasibility. Figure 17 presents each of these costs and shows their impact.

Figure 17: Phase 2 Site Additional Costs



Source: Johnson Reid

Soft costs in this analysis were assumed as a fixed percentage of hard costs; therefore, they are fairly consistent across all sites, contributing 10% to 14% to total costs. However, it is clear the magnitude to which time and risk are contributing to development costs.

Time cost are a function dollars spent (hard/soft costs), and the period when dollars must be spent in the development schedule relative to project completion. Across all sites, time costs range from 2.5% to 12% of total development costs. Each constraint has a time cost associated with it, as each constraint has a dollar cost (hard/soft cost) and an associated development schedule. Naturally, constraints where large sums are required early in the development process are the greatest contributors to time costs. For example, the Rock Creek site has $3.7 million in slope mitigation that must begin early in the development process. The time costs associated with this constraint alone is over $325,000.

Risk thresholds or risk premiums are also a function of dollars spent (hard/soft costs), the time period those funds are tied up, and in some cases, the existence of a particularly risky activity[36]. Again, as a function of time, activities which reduce the total development schedule will reduce required threshold return. Across all sites, risk comprised 12% to 30% of total development costs. The larger the dollar cost of each constraint the greater the required return. For example, on the TRIP site environmental cleanup requires $3.6 million in hard and soft costs. However, because brownfield sites require and additional risk premium on all costs, the risk associated with environmental cleanup actually exceeds the dollar value at $4.4 million.

2. Market Viability Determination

The site evaluations support conclusions about the nature of development constraints among Phase 2 sites. Most sites have at least one major constraint, which is significant enough to preclude market activity. Off-site constraints, such as sewer and transportation, are both the most common and in many cases, most severe. Taken together, off-site costs comprise roughly 40% of all development costs across all sites. Severe on-site constraints, such as slope mitigation and wetlands, are not broadly common, but are costly both in terms of time and dollars. Generally, constraints that have low costs but long time lags are candidates for moving Tier 2 sites closer to Tier 1 status. Tier 3 sites more commonly have such severe constraints that they will require alternative strategies to bring them to the market. Financial variables, such as time, cost, and risk, are directly correlated with development schedules and dollar costs. Activities that reduce those inputs will implicitly reduce time and risk costs.

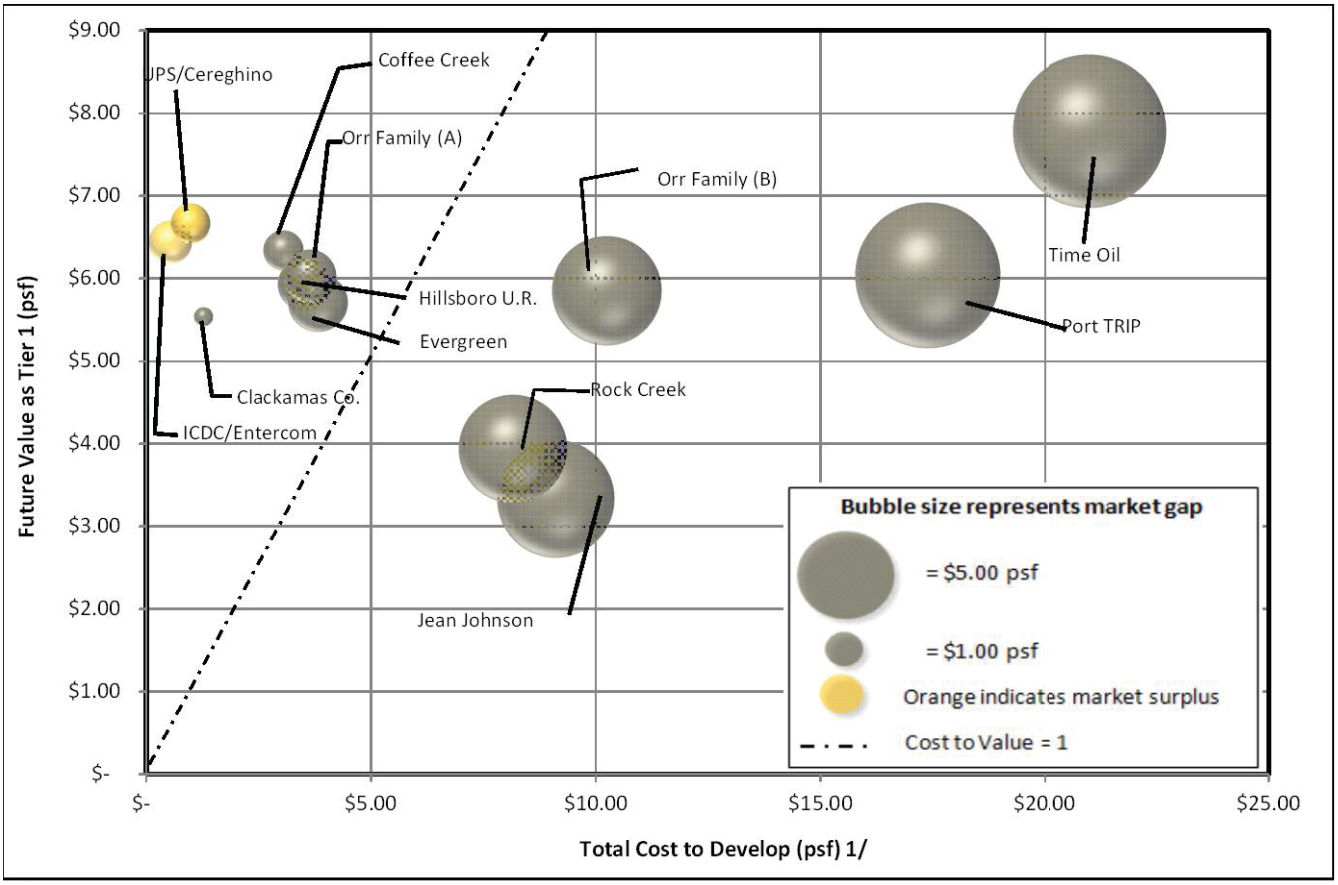
In addition to assessing how each potential constraint is contributing to the overall cost of developing Phase 2 sites, Johnson Reid also evaluated the sites in light of their estimated future value (as a Tier 1 site). Much in the way a market participant would consider site evaluation, the cost of development relative to the value of development was evaluated. The residual between costs and value defined the market viability gap or surplus[37].

Figure 18 below stratifies the Phase 2 sites by their cost to develop (horizontal axis) to Tier 1, their estimated future value (vertical axis), and their estimated market viability gap (bubble size). Sites to the left of the dotted line have a higher market value relative to their cost and are more likely to be developed. This condition is clear in generally smaller viability gaps per-square-foot.

[36] In this analysis we assume an additional 1/6th to 1/3rd gross up of required return of costs for sites with moderate to severe brownfield constraints.

[37] A detailed discussion of terms and methodology in included Volume 3, Appendix L.

Figure 18: Phase 2 Sites: Future Value vs. Total Development Costs



1/ Excludes Acquisition

Source: Johnson Reid

A Cost-to-Value Ratio less than 1.00 indicates that value exceeds development costs, and the site has a higher propensity for market feasibility. The farther up and to the left in the graph, the more viable the site is likely to be.

Most of the Phase 2 sites have future value in the vicinity of $6.00 per square foot or higher. Only two sites are below $4.00 per square foot. However, these sites have significant costs associated with them as well, and value is not the leading contributing factor limiting viability. For example, if Rock Creek were to obtain a 50% increase in value, it would still face a gap of over $5.00 per square foot.

The analysis reveals that three of Phase 2 sites, ICDC/Entercom, Clackamas County and UPS/Cereghino, are close to market viable. Not surprisingly, these sites are the least costly to develop. The next four costly sites are marginally less viable. They have gaps ranging from $1.20 to $2.63 per square foot[38]. Finally, the five sites with the most severe constraints have large gaps ranging from $8.74 to $17.74 per square foot.

[38] The development cost analysis begins with the assumption that site aggregation has occurred. This is important due to three of these four sites (Coffee Creek, East Evergreen, and Hillsboro Urban Reserves) require aggregation of between 8 and 17 ownerships thus adding time, cost and uncertainty to these sites.

Addressing Market Viability

The Phase 2 findings show that time costs and risk premiums are a function of hard and soft costs and schedules and that together they comprise 27% of all site development costs. Using Rock Creek as an example, environmental cleanup on the site is a relatively small cost, only $99,000 or less than 1% of hard/soft costs. However, it must occur before all other activities can begin. Therefore, an exogenous action which eliminates that constraint to the market would allow the entire development schedule to condense by 6 months. The marginal impact therefore, isn't $99,000, it is $265,000 when time and risk savings from the shorter schedule are considered.

Activities that consider reductions in development schedules in many cases may have greatest "bang for buck". Additionally, there are alternative non-dollar activities that can be implemented to reduce market viability gaps by shortening development schedules. The impacts of these activities are smaller in magnitude, but measurable in instances where market viability gaps are small. Dollar subsidies are not the only answer to site constraints. A jurisdiction that successfully develops a program which streamlines a permitting process can reduce costs facing the market. For example, on the Jean Johnson site near Gresham, a process that reduced utility schedules (water, sewer, storm) by only three months would translate into $275,000 in cost savings.

Phase 2 found that sites have several constraints of varying magnitudes. Different sites require varying degrees of action. Sites that are close to feasibility may be moved forward by less interventionist approaches. However, some sites have constraints too severe to be addressed by the private market alone. For example, sites such as the Clackamas site are very close to feasibility, and may attract market interest at a relatively low cost. However, the TRIP site in Troutdale has severe constraints which are over three times the future value of the site. As such, TRIP will only develop with the assistance of public intervention.

Phase 2 shows that critical off-site infrastructure is the primary constraint, comprising nearly 44% of total development cost. For example, the East Evergreen site in Hillsboro has a market viability gap of $13.4 million dollars, the most significant element of which is transportation infrastructure. An exogenous investment in this infrastructure, such as a TIGER grant, would alleviate 78% of the gap. To conclude, all else equal, sites with critical infrastructure deficiencies are not likely to develop as industrial if left solely to the market. For many of the Phase 2 sites, off-site costs alone comprise most or all of market viability gaps. This raises the issue of the public's role in providing critical infrastructure.

Another major Phase 2 finding was that beyond constraints, the acquisition cost and future value are significant inputs to market viability. For example, on the Rock Creek site in Happy Valley and Jean Johnson site, the assumed as-is strike price[39] is below what experts estimate the development ready value is on those sites. No rational market participant is likely to pay a price below site ready market value. The acquisition/strike price assumed in this analysis is the dollar value a land owner would reasonably consider accepting for their land. In some cases, the actual transaction price may be higher or lower than the assumed $4.50. A residual land value is the price the market could pay for a site assuming both the estimated development costs and future value. The majority of sites in this analysis have residual land values less than this strike price. The ability of the market (or another entity) to negotiate acquisition prices based on existing conditions will impact market viability.

Furthermore, in today's economy, for many users land price is less of a factor than it was in previous business cycles. This is especially the case in clean-tech and high-tech, where shorter product life cycles and sophisticated capital improvements require flexibility. Users can occasionally be willing to pay above market for particular sites that fit their site need criteria. An example would be a clean-tech firm interested in the East Evergreen site that fits their selection criteria exactly due to its size, utility costs, and proximity to a highly-trained workforce. If this user is willing to pay $1.00 psf above the estimated market ready price for this particular site that would reduce the site's viability gap by 38%.

One of the most significant Phase 2 findings is that aggregation is a major hurdle that was unable to be modeled in this analysis. Within the construct of this model, the UPS/Cereghino site is market viable. However, the site is classified as a long-aggregation period, with one of the two parcel owners necessary to make this a site is not willing to transact. An entity succeeding in changing this dynamic would move the site closer to development

[39] The price a land owner would reasonably transact at today.

ready status and likely strike the interest of private investment. This study concludes that aggregation and willingness of owners to transact remain major impediments to site development. This condition provides an avenue for entities such as a jurisdiction or the state to act as intermediaries to move sites forward.

Another significant Phase 2 finding is that the ability to attract a user once the site is developed is another considerable hurdle that is not modeled. This analysis considers the user period to begin once the site is developed, which is not going to be the case. This condition adds time and risk from the perspective of the market. This creates another potential role for entities such as jurisdictions and the state as an intermediary. A program off-setting or subsidizing these carrying costs would reduce risk thresholds and time costs facing the market.

3. Economic and Fiscal Impacts

The impact from new traded sector development stimulates the economic base of the region through increases in jobs and wages, that translate into payroll taxes; capital investment that translates into property tax revenue; and exports and trade that provides broad based benefits to the local economy. The average Portland metro traded sector wage pays an average of $14,600 more than a non traded sector job[40]. Traded sector industries also provide employment opportunities for all skills levels of the region's workforce and support local supplier businesses.

Nearly one-fifth of the Portland metropolitan economy is generated by exports, which translates into jobs. For every $1Billion in exports, an average of 5,400 jobs is created. The Portland metropolitan area had $21 Billion in exports in 2010, which was 18% of the region's economy.[41] The Portland region is one of a few regions to have doubled export value during the last decade and exports are a key focus of its economic development efforts going forward. Exports along with domestic trade are important elements of the region's traded sector development strategies.

The Portland metropolitan area's economic development strategy is focused on the industry clusters that support traded sector job creation and an export-oriented economy. Concept plans for each of the Phase 2 sites were prepared based on the development needs of users aligned with the region's targeted clusters[42]. Single user campuses or buildings were assumed for each of the sites, and in two cases a multi-tenant business park was the identified use. The economic and fiscal impacts for this study are derived from the uses that were assumed for each of the sites.

[40] "2010 Check-Up on the Portland Region's Economic Health"; EcoNorthwest for the Value of Jobs Coalition; 2010

[41] Greater Portland Export Plan – Metro Export Initiative; Brookings Institute; 2012

[42] Clean Tech; High Tech; General Manufacturing; Warehouse and Distribution

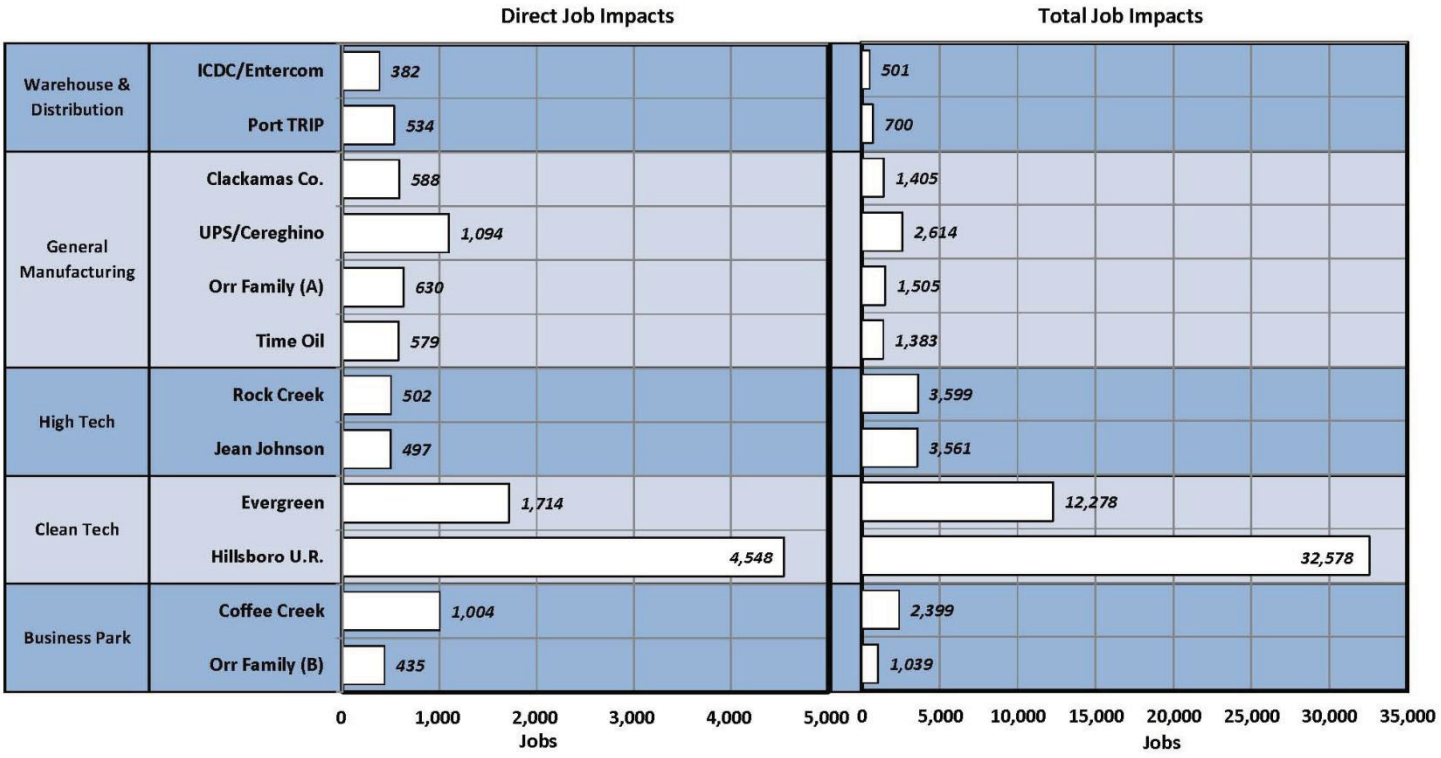
Economic Impacts

Jobs and payroll are the two measurable outputs that are used to determine economic impacts. While these are not the only outputs of economic activity, they are the ones used in this study.

The number of jobs and payroll associated with a site are a function of two inputs. First, the physical size of the site obviously determines the scale or capacity for industrial space. The larger the site, the more space is available for growth. Second, the conceptual use assumed for each site will impact job densities, average wages, and indirect/induced economic impacts. For example, manufacturing generally produces jobs at almost twice the density as warehousing and distribution. In other words, a 30-acre distribution site will have half the jobs as a 30-acre manufacturing site[43]. Similarly, high-tech and clean-tech industries require a highly trained and specialized workforce, paying wages well above a manufacturing median. Further, high-tech and clean-tech manufactures have high utilization rates of area vendors, thus indirect impacts are greatly compounded in these industries.

Figure 19 below outlines the estimated employment impacts from site development for conceptual users for each Phase 2 site. Across all sites, there is capacity to create an estimated 12,500 direct jobs on-site. Each of the four industry-specific uses plays a vital role in the metropolitan economy. The fifth use category, business park, allows for all of these uses to be present in a multi-tenant, developer initiated environment. When all impacts are considered, the development of these sites would support over 63,500 jobs throughout the region.

Figure 19: Direct Jobs Impacts

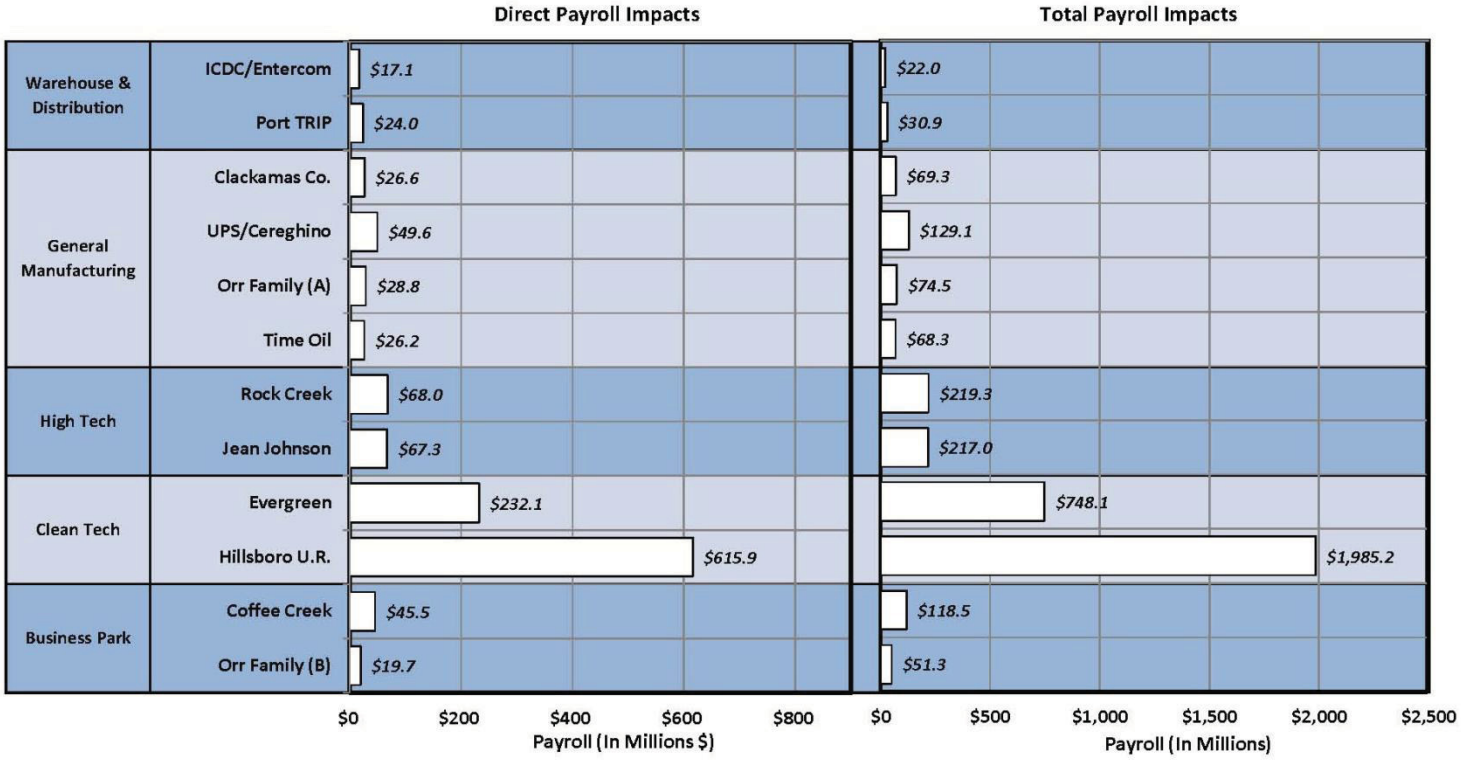


Direct Jobs On-Site: ***12,507***
Total Job Creation: ***63,562***

[43] Though job densities on distribution sites are lower, warehouse and logistic operations play a critical strategic role in business productivity for all traded sector industries. Trends suggest that transportation and logistics (handling and shipping management) will remain the future focus of business to further improve productivity; business to business E-commerce will increase this trend. Logistics accounts for up to 40% of some commodities costs. Anticipating and planning for the need for distribution facility development near transportation facilities are key to improving the competitiveness of this region's traded sector businesses.

Figure 20 outlines the estimated payroll impacts from site development. Across all sites, direct job creation could create over $1.2 billion in annual payroll at an average annual wage of roughly $97,000. That is an estimated 12,500 jobs at $97,000 annually. When all impacts are considered, associated regional job growth could create $3.7 billion in annual payroll at just over $58,700 per job.

Figure 20: Annual Direct Payroll Impacts (at full capacity)



Direct Payroll On-Site:	***$1,221,000,000***	***Average Wage (Direct Jobs):***	***$97,625***
Total Payroll Creation:	***$3,734,000,000***	***Average Wage (All Jobs):***	***$58,746***

Source: Johnson Reid

Fiscal Impacts

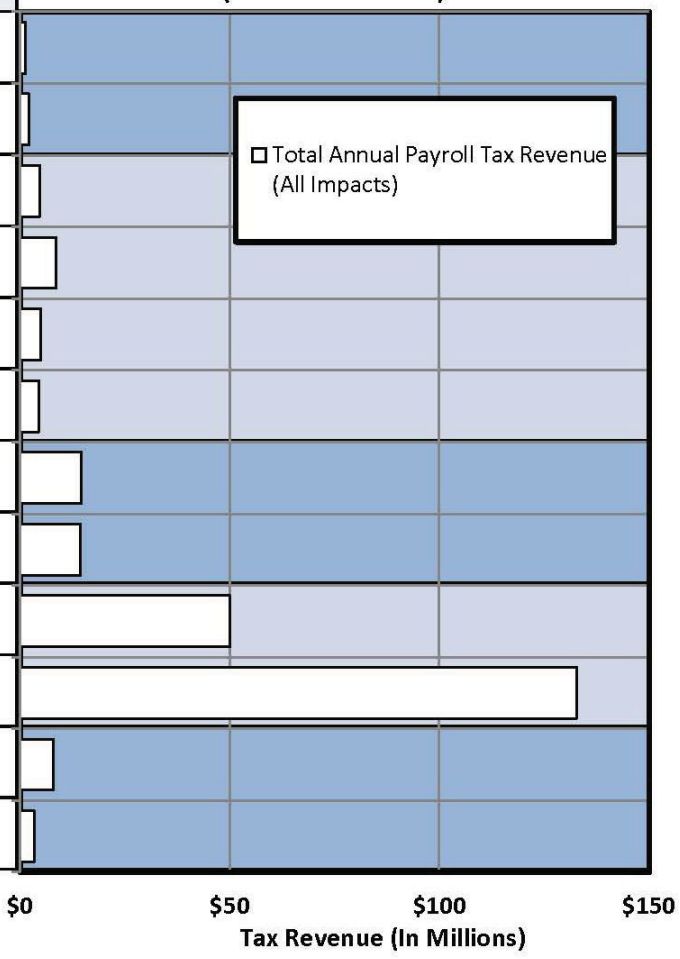
The fiscal impacts quantified in this analysis are represented by State payroll tax impacts associated with new job and payroll creation and property tax revenue from real property. Real property is considered land and building improvements only. Capital equipment is considered personal property, taxed differently and not considered in this analysis.

Payroll tax generation is simply payroll impacts from each of the conceptual site developments multiplied by the typical tax rates in Oregon. This process yields Figure 21 below. Considering only direct payroll creation, the Phase 2 sites could generate $764 million in payroll tax revenue over the first 20-years of site development, construction, and operation. When all impacts are considered, the State could stand to gain nearly $2.3 billion in tax revenue over the first 20-years if these sites were developed. Thereafter, total payroll tax impacts would average nearly $250 million annually.

Source: Johnson Reid

Figure 21: Annual and Cumulative Payroll Tax Impacts

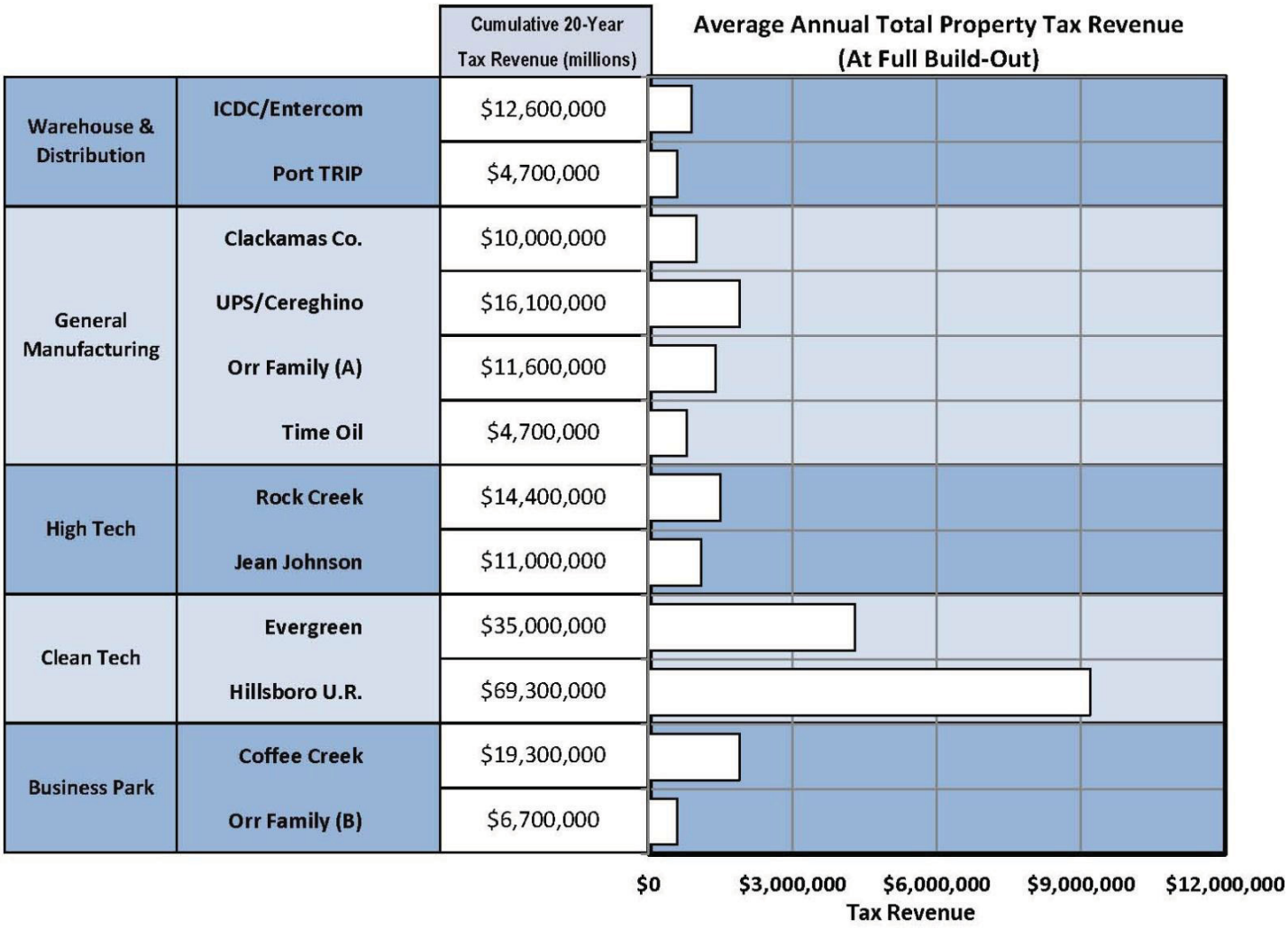
		Cumulative 20-Year Tax Revenue (millions)	
		Direct	Total
Warehouse & Distribution	ICDC/Entercom	$19.1	$24.6
	Port TRIP	$20.5	$26.4
General Manufacturing	Clackamas Co.	$20.1	$52.2
	UPS/Cereghino	$26.9	$69.8
	Orr Family (A)	$17.3	$44.9
	Time Oil	$12.4	$32.1
High Tech	Rock Creek	$57.4	$183.6
	Jean Johnson	$52.2	$167.1
Clean Tech	Evergreen	$152.6	$488.5
	Hillsboro U.R.	$332.2	$1,063.5
Business Park	Coffee Creek	$35.2	$91.4
	Orr Family (B)	$18.4	$47.8



20-Year Direct Payroll Tax Revenue	**$764,000,000**
20-Year Total Payroll Tax Revenue	**$2,292,000,000**

Property tax revenue is not associated with economic impacts such as jobs and payroll. Rather, it is related to the actual investments a company makes in real property on site. Under our assumed concept plans, facility investment, **excluding capital equipment** ranges from $24 million to as high as $300 million. Local property tax rates applied to future estimated assessed values, the Phase 2 sites are likely to generate $217 million in local property tax revenues over the first 20-years. On an annual basis, as facility development occurs, property tax generation could average $25 million annually across all sites at full build-out.

Figure 22: Annual and Cumulative Property Tax Impacts



Source: Johnson Reid

Volume 2 of this report provides the detailed costs and benefits for each of the Phase 2 sites. The findings presented in this section show that the economic and fiscal benefits of bringing these sites to market readiness can be substantial in both jobs and tax revenue.

B. PHASE 2 CONCLUSIONS

The goal of the Phase 2 analysis was to investigate in more detail the development constraints confronting the Tier 2 and Tier 3 sites in the region. The findings in the preceding section provide specific details on a site by site basis of the costs and benefits of the assumed site concept plans. This approach was taken with the intent of being able to showcase the different barriers to development across all Tier 2 and Tier 3 sites, not simply to focus on the 12 sites. The approach was taken to 1) provide State and regional policymakers with case studies of the development costs and benefits of bringing industrial sites in the region to market readiness, and 2) develop a methodology for analysis that can be replicated with other sites in (and not currently in) the region's industrial sites inventory.

Table 21 below presents the information, not from a site specific perspective, but from the perspective of the specific constraints to development.

Table 21: Constraint Cost and Remediation Timeline Comparison

	TIME (MONTHS)			TOTAL COST			COST (PER DEVELOPABLE SF)		
Off-Site Infrastructure	**Min**	**Median[44]**	**Max**	**Min**	**Median**	**Max**	**Min**	**Median**	**Max**
Water	3	10.5	30	$14,000	$270,000	$4M	$0.005	$0.16	$0.68
Sanitary Sewer	3	15	30	$18,000	$662,500	$4.9M	$0.009	$0.27	$2.90
Storm	6	15	30	$18,000	$593,250	$8.6M	$0.009	$0.21	$1.98
Transportation	3	12	24	$250,000	$1,480,000	$12.3M	$0.17	$0.85	$2.47
On-Site Natural Resource	**Min**	**Median[45]**	**Max**	**Min**	**Median**	**Max**	**Min**	**Median**	**Max**
Wetlands	3	4.5	18	$12,000	$206,500	$6.4M	$0.009	$0.12	$2.73
Floodplain	9	9	9	$1.74M	$1.74M	$1.74M	$1.02	$1.02	$1.02
Slope Mitigation	9	9	33	$130,000	$236,000	$3.68M	$0.03	$0.13	$4.27
Site Surcharge	21	31.5	39	$563,000	$1.31M	$1.68M	$0.28	$0.55	$0.72
On-Site Environmental	**Min**	**Median[46]**	**Max**	**Min**	**Median**	**Max**	**Min**	**Median**	**Max**
Brownfields	3	6	6	$15,000	$53,750	$3M	$0.005	$0.01	$1.28

Source: Group Mackenzie

Cost per square foot is the preferred way to examine constraint costs. Using this number normalizes the costs across the sites and it also allows for adding costs to a base purchase or value of the site to reflect bringing it to market. The median cost for off-site infrastructure ranges between $0.16/SF and $0.85/SF. Transportation is the highest $0.85/SF. The median time to move these sites to market is from 10 to 15 months.

On-site natural resource mitigation ranges from $0.12/SF and $1.02/SF for floodplain. However, only one site, Time Oil, requires floodplain mitigation. As a result, 11 of the 12 sites have relatively low on-site mitigation costs. The median time to move these sites to market is from 4.5 to 9 months. The exception to this is site surcharge, which is expensive and requires significant time of 31.5 months. The need to surcharge is very site specific (only

[44] Median time and cost numbers were utilized in this analysis.

[45] Median time and cost numbers were utilized in this analysis.

[46] Median time and cost numbers were utilized in this analysis.

applicable to four sites) and the time to surcharge is directly impacted by the cost, meaning that surcharging more rapidly can be achieved by bring in more material, which increases the cost.

Brownfield remediation is the lowest median cost across all constraints. Brownfield remediation is directly related to a site's previous use. Eight of the 12 sites in this study are greenfields that have had no previous industrial use as they are agricultural. Costs and time for these sites is minimal (the median time to move these sites to market is six months). Brownfield remediation for previously used industrial sites can, on the other hand, be significant. The TRIP site has a total of $3 million in cleanup costs or $1.28/square foot. This is in addition to the cost already incurred by the previous owner, Alcoa Aluminum, on this Superfund site. Looking at the number of times a constraint is a major issue and impacts the cost of development is key. Development constraints are defined as having a significant issue or impact in terms of total costs and/or percent of costs. The comparative impact of mitigation costs of each constraint was examined to determine which constraints were the most significant contribution to the overall costs for each site.

Based on the results displayed in Table 22, it is clear that there are a variety of issues facing the development of each of the Phase 2 sites. However, a few issues have comparatively greater significance Nine out of the 12 Phase 2 sites require significant transportation improvements to make the site development ready. Sanitary sewer and stormwater, wetland fill, and site aggregation and annexation are all of significance. The other constraints or issues have less of an influence on development readiness.

The findings of the analysis above supports conclusions about the nature of development constraints among Phase 2 sites. Most sites have at least one major constraint, which is significant enough to preclude market activity. Off-site constraints, such as sewer and transportation, are both the most common and in many cases, most severe. Taken together, off-site costs comprise roughly 44% of all development costs across all sites. Severe on-site constraints, such as slope mitigation and wetlands, are not broadly common, but are costly both in terms of time and dollars. Generally, constraints that have low costs but long time lags are candidates for moving Tier 2 sites closer to Tier 1 status. Tier 3 sites more commonly have such severe constraints that they will require alternative strategies to bring them to the market. Financial variables, such as time, cost, and risk, are directly correlated with development schedules and dollar costs. Activities that reduce those inputs will implicitly reduce time and risk costs.

Table 22: Phase 2 Total Constraints Table

Environmental and Natural Resource Issues	Infrastructure Issues	Land Use Issues
Environmental Clean Up **2 sites**	Water **4 sites**	Aggregation **6 sites**
Wetland Fill **7 sites**	Sewer **7 sites**	Annexation **6 sites**
Floodplain Fill **1 Sites**	Storm **6 sites**	Outside UGB **1 site**
Slope Mitigation **4 sites**	Transportation **9 sites**	Marine Dock **1 site**

Source: Group Mackenzie

From the Phase 2 findings, several tools have the potential to reduce the costs of site development and encourage the interest of private investment. For sites that are close to viable, tools that reduce market time and risk are likely to be most efficient. For example, implementing an aggregation assistance organization or streamlining one or more of the development permit processes.

For the next level sites with measurable but not extreme gaps, several other impactful tools could include negotiation for lower acquisition price with land owners in light of identified constraints, or public assistance for critical infrastructure. For example, transportation infrastructure alone for East Evergreen, Coffee Creek, and Orr Family A would move all three sites to a near viable state. Another approach would be economic development efforts that recruit users or developers willing to take on additional risk or pay a premium for a particular site do to its unique location or attributes.

For sites with extreme and highly costly constraints, it is likely that some form of public involvement or direct assistance will be necessary to overcome development challenges. This could come in the form of direct infrastructure assistance or an entity acting as a patient developer with lower sensitivities to time and risk, or a

combination of both. In any case, when site development costs approach two or three times market value, development constraints are far too great for the private market to tolerate.

For the region to be competitive for new investment by traded sector firms it requires an inventory of Tier 1 sites to meet the specific locational requirements of the target firms. A large, single owner warehouse and distribution firm has different locational requirements (access to freeway and Port facilities) than a high or clean tech company (adjacency to suppliers and workforce) and different economic and fiscal impacts. It is important to understand the variables that go into the decision making by different industry groups and to have a variety of sites in the inventory that meet those requirements.

Table 23 shows the average economic impacts for each Phase 2 traded sector industry profile. The Portland metropolitan area's economic development strategy is focused on these industry clusters that support traded sector job creation and an export-oriented economy. The table shows that a single firm in each of these target industries that locates on a market ready site has substantial long term economic benefits, in terms of jobs, payroll and tax benefit to the state and local governments.

Table 23: Average Direct Economic Impacts

	WAREHOUSE AND DISTRIBUTION	GENERAL MANUFACTURING	HIGH TECH	CLEAN TECH	BUSINESS PARK
Average Site Size[47]	50	49	34	163	49
Average Jobs	458	723	500	2,323	720
Average Payroll*	$20.55	$32.7	$67.7	$314.5	$32.6
Average Cumulative 20 Year Payroll Tax Revenue*	$20	$17.7	$50.1	$129.3	$26.1
Average Cumulative 20 Year Property Tax Revenue*	$9.25	$9.36	$11.8	$36.3	$12.6

**Costs are displayed in millions of dollars*

Source: Group Mackenzie

When sites are developed they are marketable to users. This study finds that when users build facilities on these sites, there are significant economic and fiscal impacts. Based on the conceptual uses placed on the Phase 2 sites, the fiscal impacts to State and local jurisdictions are quite large. These impacts, if realized, in most cases exceed what it would cost an entity to finance infrastructure improvements necessary to move sites to a development ready status. To sum up, from the perspective of the public, infrastructure investment can have a significant positive return.

There is public interest in ensuring industrial land within the UGB is available for industrial development. As shown by the Phase 1 inventory and 12 Phase 2 site assessments, the current inventory of industrial sites is substantially constrained and requires actions and investments to solidify land use decisions to preserve the region's compact urban form. This analysis has served to create a framework for identifying constraints, understanding their magnitude, and quantifying the potential economic and fiscal impact of private investment in market ready sites. The intent is that this information will provide a basis for further discussion and recommendations by state and regional policy makers.

[47] Average site size was calculated per the net developable acreage of the Phase 2 sites that were identified for the specific industry cluster.

V. RECOMMENDATIONS

Site selection decision timelines are getting shorter in order to meet companies' needs to bring goods and services quickly to market. At the same time, developers are rarely patient and there are limited financial tools available to address barriers to development of industrial sites with higher degrees of complexity. The private credit market is extremely tight and private developers generally are unable to finance projects with significant upfront capital investment, longer term paybacks, and regulatory uncertainty. Public sector resources and financing tools that could play a role in infrastructure and site development are also limited.

While discussion and evaluation of potential options for addressing market readiness of industrial sites needs to take place at the regional and state level, the Project Management Team has identified recommendations for further analysis:

- Establish a mechanism for regional leaders to identify potential industrial sites of regional significance and focus resources on bringing the sites to market readiness.
- Maintain and expand existing state infrastructure funding and technical assistance programs and explore opportunities to improve and target state support.
- Investigate the creation of new funding partnerships between state and local entities to support site readiness of large lot sites for traded sector development
- Explore opportunities to streamline or make more predictable state and local regulatory and permitting requirements and timelines to reduce permitting risk and increase private sector investment.
- Explore regulatory and policy tools in the arena of wetlands mitigation and brownfields remediation to assist in moving sites to market readiness at the local, state and regional level.
- Explore opportunities for regional and state funding for patient developer entities, either public or private, that can invest in due diligence and site preparation without requiring a market-driven return on investment.
- Analyze the investments needed to move the remaining 36 Tier 2 and Tier 3 sites to market-readiness to assist with regional economic and infrastructure development plans.
- Perform an annual inventory update of large lot industrial sites and encourage other regions around the state to adopt the inventory methodology
- Analyze the absorption/demand/missed opportunities for large lot industrial sites, and the economics of redevelopment for industrial purposes and traded-sector competitiveness.

The recommendations listed here are meant to be the beginning of a dialogue on creating effective tools and policies for ensuring the region and state has a competitive supply of market-ready industrial sites.

In the summer of 2012, the Project Management Team plans on meeting with key regional, state, public and private leaders, culminating in fall 2012 with a meeting of an Oregon Business Plan subcommittee. The work will then be integrated into the Oregon Business Plan. Parallel efforts will be ongoing with legislators and other regional partners to facilitate action and bring about results.