APPENDICES TO THE METRO REGIONAL BROWNFIELD SCOPING PROJECT

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MAUL FOSTER ALONGI

APPENDIX A

BROWNFIELD INVENTORY DATA GAP ANALYSIS

OCTOBER 31, 2012

MAUL FOSTER ALONGI

METRO BROWNFIELD SCOPING PROJECT

Brownfield Inventory Data Gap Analysis & Extrapolation Methodology

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1. Purpose

The purpose of the brownfield inventory was to estimate the number of brownfields in the Metro region and understand their characteristics. There are existing databases of known and potentially contaminated sites, but these databases are limited and cannot be considered a comprehensive inventory of sites. Thus, a Data Gap Analysis (DGA) was conducted within the seven Study Areas selected throughout the Metro region, and the results have provided information to refine our understanding of the scale, extent, and impact of brownfield properties.

2. Objectives of the Data Gap Analysis

- Identify properties based on existing land use characteristics that have a higher probability of suspect contamination
- Develop more accurate history and use information on potential brownfield properties in selected Study Areas
- Match potential brownfield properties to Typologies (1-4)
- Extrapolate from subareas to the Metro region to provide more accurate estimate of brownfields in the Metro region

3. Principles and Assumptions

Utilizing the U.S. Environmental Protection Agency's definition for a brownfields, the DGA is based on the following assumptions:

- A brownfield site is characterized as:
  - Impacted by real or perceived environmental contamination

    And property that is vacant, partially vacant, or underutilized

This definition also complemented the economic development goals for Metro's brownfield efforts. Thus, intensive records research and field study focused on properties that are currently vacant, considered underutilized, or are considered to have suspect contamination.

4. Data Gap Analysis Methodology (See attachment B Workflow Diagram.)

The table below provides the definitions used in the DGA.

Definitions	Description
DEQ ECSI/LUST Database	Oregon DEQ's database of recorded sites with potential and confirmed contamination.
Metro Regional Land Information System (RLIS) (March, 2012)	Metro's extensive land use GIS database.
Buildable Lands Inventory (July, 2011)	Metro's buildable lands inventory that identifies vacant and partially vacant, along with underutilized properties zoned commercial and industrial.
Vacant Lands (July, 2011)	Metro's vacant lands inventory that identifies areas appearing unimproved on 2011 aerial photography.
Brownfield Typologies	Categories of brownfield properties based on historical use, size, and location/market potential.
Historical Use Documents	Historical aerial photographs (USACE, Metro), Sanborn Fire Insurance Maps, and Polk City Directories.
Site Reconnaissance	Information collected during windshield surveys of all parcels included in the DGA.
Brownfield Status Determination Information	Additional information created through the analysis of all data resources and resulting in brownfield status determinations.

The DGA methodology included the following components:

4.1 Identified Study Areas (completed by Metro)

- Study Areas:
  - Albina district: historic industrial area and main street
  - Tigard town center: historic downtown and main street

- Industrial Way: mid-century industrial area
- McLoughlin corridor: mid-century corridor
- Aloha town center: newer town center and corridor
- Tualatin-Sherwood Road: newer industrial area
- Urban reserve: rural agricultural and resource-based industries (community of Boring, Clackamas County)

▪ Factors considered in selecting Study Areas:

- Representative of a range of land use, development pattern, and contamination types
- Representative of different geographic areas in the Metro region
- Representative of different access / transportation facilities
- Areas with significant redevelopment needs or investment goals
- Represent different populations

4.2 Applied the criteria listed below in order to filter down the tax lots in the Study Areas to select parcels with a higher probability of having suspect contamination (candidate parcels). Careful consideration was given to taxlots that are currently vacant, partially vacant, and/or underutilized. Underutilized determinations were made, in part, from Metro's 2011 Buildable Lands Inventory (BLI).

Excluded:

▪ Parcels identified within the existing Oregon DEQ ECSI and/or LUST databases were recorded, and thus, excluded from the subsequent extrapolation exercise.

Included:

▪ Parcels located within one of the seven Study Areas
▪ Parcels located within a 2040 Center , Corridor, Title 4 Employment or Industrial area, or designated as Resource Land or within a Rural Reserve.
  - 2040 Center: defined as the central city, regional centers, and town centers.
  - 2040 Corridor: defined as major streets that serve as key transportation routes for people and goods.**
  - Title 4 Employment and Industrial land: defined as areas where land use is restricted to employment areas, regionally significant industrial land areas, or industrially zoned areas
  - Rural Reserve: defined as lands currently outside the urban growth boundary that is suitable for accommodating urban development over the next 50 years.
  - Resource Land: defined as rural land zoned for agriculture or forest use.

**Please note that an additional 750ft buffer was applied to Concept Corridors in order to include small areas between neighboring corridors that were previously excluded (approximately 1 city block)

- Parcels with a zoning classification of: COM, IND, MUR, RI, RC, RRFU, or VAC[1]
- Parcels defined as vacant: if the parcel appears to be unimproved on 2011 aerial photography, without regard to accessibility or redevelopment feasibility, and on partially developed parcels, only undeveloped areas .5 acres or larger are included.
- Parcels that are Underutilized:
  - As defined by Metro's BLI (zoned COM or IND only)
    - Applicable Study Areas: Downtown Tigard, McLoughlin Corridor, Aloha / TV Highway, Albina Neighborhood, Johnson Road/Industrial Way, Tualatin/Sherwood

OR

  - As defined by having a building to land value ratio of <= .5.**
    - Applicable Study Area: Boring

** Please note that the BLI was conducted within the Metro UGB. As a result, the Boring Study Area is not covered by this inventory. To assist in determining if commercial and industrial properties are underutilized, a building-to-land value ratio will be calculated. In cases where this ratio is less than 50%, an underutilized determination was applied.

4.3 Selected Focal Areas for Intensive Study

- Due to several Study Areas having a large number of parcels matching the criteria described above, random sampling was applied to select a number of taxlots within a given Study Area for more intensive study. The sample size selected through random sampling within the set of parcels meeting the criteria listed above (candidate parcels) was carefully chosen to ensure that an appropriate statistical confidence would be achieved. A breakdown of sample size by Study Area is provided below.

Study Area	Total Parcel Count	Candidate Parcels for DGA	Final Sample Size
Tigard	178	33	33
Albina	1983	170	45

[1] The project team and Technical Review Team excluded Heating Oil Tanks from the scope of this project given the relatively simple and inexpensive nature of the cleanup on these sites, which is typically resolved solely by the private market. As such, parcels in and zoned for single family residential use were also removed from our analysis.

Aloha/TV Highway	231	60	30
Johnson/Industrial	89	12	12
Tualatin/Sherwood	170	35	35
McLoughlin Corridor	203	32	32
Boring	383	92	30
Totals	***3237***	***434***	***217***

4.4 Created DGA database in ArcGIS (i.e., StudyArea_DGA feature class) to store information collected during the records and field research.

4.5 Conducted DGA history and use research on the sample taxlots using available historical record sources and through field reconnaissance. The historical records review identified site uses, including businesses and/or activities that may result in the determination of a given property having suspect contamination. Record sources and field research included:

- Historical aerial photos obtained from the US Army Core of Engineers (USACE) and Metro
- Polk City Directories obtained from local sources, including public libraries and city governments
- Sanborn Fire Insurance maps obtained from local sources and EDR
- Field reconnaissance (i.e., windshield surveys) of focal taxlots to assess the current condition and to identify 'underutilized' properties

**Please note that in some cases historical records were not available for a given parcel or were determined not to be applicable due to adequate information being present, through field reconnaissance and through a partial review of available historical record sources, to make a brownfield determination.

A complete list of record sources used for each Study Area is provided in a table below.

Study Area	Aerial Photos		Polk City Directories	Sanborn Fire Insurance Maps
	USACE	Metro		
Tigard	1936, 1940, 1953, 1968, 1977, 1983	1996, 2005, 2011	NA	1950
Albina	1936, 1948, 1955, 1966, 1970, 1974, 1983	1996, 2005, 2011	1936, 1955, 1973	1889, 1901, 1909, 1924, 1950, 1969
Aloha / TV Highway	1936, 1940, 1963, 1972, 1983	1996, 2005, 2011	1959, 1965, 1975, 1978	NA
Johnson / Industrial	1936, 1944, 1955, 1969, 1977, 1983	1996, 2005, 2011	NA	NA

Tualatin / Sherwood	1936, 1940, 1953, 1963, 1977, 1983	1996, 2005, 2011	NA	NA
McLoughlin Corridor	1936, 1944, 1956, 1966, 1972, 1983	1996, 2005, 2011	1962, 1969, 1974, 1987	NA
Boring	1935, 1956, 1976, 1981, 1989	1996, 2005, 2011	NA	NA

Table Notes:
*NA = Records not available or not applicable to study area parcels included in the DGA.
*S = Suspect Brownfield site
*U = Unknown
*N = Non-Suspect Brownfield site

4.6 Describe step of determining suspect sites.

Best professional judgment was used by MFA's environmental professionals to field-verify sites according to the following categories:

Suspect Brownfield site – Site that due to historical uses and current status indicates a higher probability of contamination issues.
Unknown – No enough information was available and field verification could not conclusively determine probability of contamination.
Non-Suspect Brownfield site – Site was determined to be in use and not detrimentally impacted by real or perceived contamination.

4.7 Suspected brownfields identified through the records research and field reconnaissance were assigned an appropriate Typology designation based on its location, land use, and parcel size.

Type 1—Small Commercial Sites. Common historical uses were gas stations, repair shops, and dry cleaners, characterized by small parcel size and located along highways, arterials, and in commercial centers, including main streets and small downtowns.

Type 2—Industrial Conversion Sites. These properties range in size and are historically found in areas that have transitioned from industrial to office, retail, and mixed use centers. Change of zoning and location often drives redevelopment of these properties.

Type 3—Ongoing Industrial. These properties are located in areas with an industrial past that continues today, particularly through regulatory controls such as Metro's Title 4 requirements and local employment sanctuary overlays. The types of historical uses vary, but they share constraints on land value and future use that can be a challenge to redevelopment opportunities.

Type 4—Rural Industry Sites. These properties are associated with rural natural resource extraction industries and agriculture. They are typically large and located on the edge of urban growth boundary, especially within urban and rural reserves.

4.8 Suspect brownfields from the seven Study Areas were then aggregated by Typology and used to collect basic information, such as:

- Types of sites identified in DGA (e.g., size, zoning classification, historical activities).

4.9 Based on the proportion of sites identified as Suspect Brownfields to Candidate Parcels through the DGA, the number of suspected brownfield sites was extrapolated to the Metro region. A complete description of the extrapolation methodology is described in Section 7 below.

5. Taxlot Dataset Preparation

The preparation of the taxlot dataset was conducted by Metro's Data Resource Center (DRC) and completed using ESRI's ArcGIS desktop suite using the following methodology:

5.1. Subset Metro taxlot dataset to the extent of each Study Area

- Used "select by location, centroid in" to select the taxlots in the study areas
- Output feature class: Study_area_taxlots_1

5.2. Added ECSI/LUST columns (i.e., 'Is_ECSI', 'Is_Lust') to Study_area_taxlots_1

- Identified suspected or confirmed contaminated sites from the ECSI/LUST database
  - LUST residential heating oil sites were previously removed from the suspected or confirmed list. These sites are not relevant to the brownfield study.[1]
- Used "select by location" tool and calculate presence (= 1) or absence (= 0)

5.3. Added building/land ratio column (BL_ratio)

- Selected where landval > 0, then calculated

5.4. Added zoning columns (i.e., 'City', 'Zone', Zone_Class', 'ZoneGen_Cl') to temporary point dataset (point dataset represents centroid of taxlots)

[1] The project team and Technical Review Team excluded Heating Oil Tanks from the scope of this project given the relatively simple and inexpensive nature of the cleanup on these sites, which is typically resolved solely by the private market. As such, parcels in and zoned for single family residential use were also removed from our analysis.

- Created "study_area_pt" feature class with "feature to point" tool. Only kept the TLID field to be used for joins. "Inside" box checked.
- Used "spatial join" tool to add zoning values to temporary point dataset using Metro's RLIS Zoning feature class. (City, zone, zone_class and zonegen_cl fields).
- Output feature class: Study_area_pt_zone

5.5. Identified vacant properties within the Study Areas

- Vacant is defined as having no building, improvements or identifiable land use or is considered to be partially vacant (i.e., a developed tax lot that has 0.5 acre or greater portion that is vacant)
- Added vacant land columns (i.e., 'Vac', 'Photo_year') to temporary point dataset.
  - Used "spatial join" tool to add these vacant land values to temporary point dataset using Metro's RLIS Vacant feature class. Calculate vac = 0 where vac is NULL
  - Output feature class: Study_area_pt_zone_vac

5.6. Identified underutilized properties within the Study Areas

- Underutilized is defined according to Metro's July, 2011 Buildable Lands Model and pertains to COM and IND zoned taxlots only.
- Added underutilized land columns (i.e., 'DevStatus', 'COMAcreFin', 'INDAcreFin') to temporary point dataset
  - DevStatus = development status, derived from the RLIS vacant land inventory; COMAcreFin = future commercial capacity in acres, from Metro's 2011 Buildable Land Inventory (includes both vacant and redevelopment land supplies); INDAcreFin = future industrial capacity in acres, from Metro's 2011 Buildable Land Inventory (includes both vacant and redevelopment land supplies)
  - Used "spatial join" tool to add these underutilized land values to temporary point dataset using Metro's Land Supply geodatabase
  - Output feature class: Study_area_pt_zone_vac_bld
  - Underutilized taxlots were identified by selecting where any of these fields were NOT NULL: 'DevStatus', 'COMAcreFin', 'INDAcreFin'.

5.7. Add study area column (Name)

- Used "spatial join" tool to add study area field to points.
- Output FC: Study_area_pt_zone_vac_bld_sa

5.8. Join Study_area_pt_zone_vac_bld feature class to Study_area_taxlots_1 feature class. Output feature class: Study_area_taxlots.

5.9. Query Study_area_taxlots feature class to get unfiltered taxlots for Data Gap Analysis

- Removed ECSI/LUST taxlots for Study Area taxlots
  - Selected not ECSI/LUST "Is_ECSI" = 0 and "Is_Lust" = 0.
- Selected desired zoning and vacant lands
  - Selected from Current Selection "ZONEGEN_CL" = 'COM' OR "ZONEGEN_CL" = 'IND' OR "ZONEGEN_CL" = 'MUR' OR "ZONE" = 'RI' OR "ZONE" = 'RC' OR ZONE" = 'RRFU' OR "VAC" = 1
- Selected underutilized land
  - Selected from Current Selection
  - (("COMAcreFin" > 0 OR "INDAcreFin" > 0) AND "Name" <> 'Boring') OR (("BL_ratio" <= .5 or "BL_ratio" IS NULL) AND "Name" = 'Boring')
  - Compared 1996 to 2011 zoning in order to identify and include taxlots that where zoning designations have changed from a desirable zoning class to an undesirable zoning class (e.g., 1996 = VAC and 2011 = MFR). This comparison did not result in the addition of any taxlots back into the study areas for inclusion in the Data Gap Analysis.
  - Cross-reference taxlots with those identified during the Polk City Directories analysis. If taxlots with undesirable zoning (e.g., SFR, MFR) are found to have Polk data, add the taxlots back to the Study_area_taxlots feature class layer.
- Output feature class: StudyArea_DGA

6. Data Gap Analysis Results

The results of the Data Gap Analysis are provided below.

Study Area	Sample Size	Type 1			Type 2			Type 3			Type 4		
		S	U	N	S	U	N	S	U	N	S	U	N
Tigard	33	3	1	25	0	1	3	0	0	0	0	0	0
Albina	45	14	3	20	0	2	4	0	0	2	0	0	0
Aloha/TV Highway	30	3	3	20	2	0	1	0	1	0	0	0	0
Johnson/Industrial	12	0	0	0	0	0	0	3	2	7	0	0	0
Tualatin/Sherwood	35	0	0	0	0	0	0	1	0	34	0	0	0
McLoughlin Corridor	32	6	6	19	0	0	1	0	0	0	0	0	0
Boring	30	0	0	0	0	0	0	0	0	0	9	2	19

Total	***217***	***26***	***13***	***84***	***2***	***3***	***9***	***4***	***3***	***43***	***9***	***2***	***19***

Table Notes:

*S = Suspect Brownfield site

*U = Unknown

*N = Non-Suspect Brownfield site

**Please note that the total number of sites identified by Study Area, Typology type, and brownfield designation category were not actually used in the final extrapolation methodology in some cases. The final extrapolation methodology is described in detail below in Section 7.

7. Brownfield Inventory Extrapolation Methodology

7.1. Objective:

The objective of the Brownfield Inventory Extrapolation was to apply the DGA findings to provide an estimate of the number and character of brownfields across the Metro region by applying the DGA. The process for completing the Metro region-wide extrapolation consisted of two parts, Study Area Extrapolation and Metro Region extrapolation, each of which is explained in detail below.

7.2. Study Area Extrapolation:

As described in sub-section 4.1, study areas were selected to represent the different types of places and brownfields found in the region. Since these different places experience different rates and types of undiscovered brownfields, there was a need to calculate an extrapolation rate for each type of place (represented by the study areas) in order to estimate the number and character of brownfields across the region.

The Study Area extrapolation methodology included:

- Estimating the total suspected brownfield sites by Study Area
  - Defined as: Suspect, Non-Suspect, or Unknown
- Assigning Typology types (as listed in sub-section 4.7) to all sampled sites
- Creating a Year Built dataset, by Census tract, which defines the earliest year built for each parcel throughout the Metro region, as geographically defined above in Section 4.2. The Year Built dataset was classified to create four time periods, including:
  - 1900 to 1929
  - 1930 to 1959
  - 1960 to 1989
  - 1990 to 2012

- Correlating all sampled sites within each of the seven Study Areas to the Year Built dataset. The table below provides an overview of how each Year Built range is represented by Study Area and Typology type. Please note that a given Study Area may represent more than one Typology type, as is the case with Albina. This is due to the diverse development types and mix of uses in the Study Area that were included in the DGA. Additionally, Typology 4 was not subjected to this specific methodology, due to its relatively homogeneous sample set. Instead, Typology 4 was subdivided by zoning classification, as described later in this section.

Year Built	Type 1	Type 2	Type 3	Type 4
1900 to 1929	Tigard, Albina*	Albina	Albina	NA
1930 to 1959	McLoughlin	Johnson	Johnson	NA
1960 to 1989	Aloha	Tualatin	Tualatin	NA
1990 to 2012	Aloha	Tualatin	Tualatin	NA

Table Notes:
* Tigard study area was applied to areas outside the City of Portland; Albina was applied to areas within the City
NA = Typology 4 parcels were not subdivided 'Year Type'

- Validating and removing erroneous parcel outliers from each Typology type and Year Built range as necessary. The results of the updated DGA analysis post-validation are provided below. The removed outliers are shown in grey for a given Study Area and Typology type.

Study Area	Sample Size	Type 1			Type 2			Type 3			Type 4		
		S	U	N	S	U	N	S	U	N	S	U	N
Tigard	33	3	1	25	0	0	0	0	0	0	0	0	0
Albina	45	14	3	20	0	2	4	0	0	2	0	0	0
Aloha/TV Highway	30	3	3	20	0	0	0	0	0	0	0	0	0
Johnson/Industrial	12	0	0	0	0	0	0	3	2	7	0	0	0
Tualatin/Sherwood	35	0	0	0	0	0	0	1	0	34	0	0	0
McLoughlin Corridor	32	6	6	19	0	0	0	0	0	0	0	0	0
Boring	30	0	0	0	0	0	0	0	0	0	9	2	19
Total	***217***	***26***	***13***	***84***	***0***	***2***	***4***	***4***	***2***	***43***	***9***	***2***	***19***

- Calculating the ratio of expected suspect brownfield sites to the total number of candidate sites for each Study Area, and according to Typology type, and Year Built.
    - A sample confidence as applied to the ratio of suspected brownfield sites
- Validation of proportions assigned to each Year Built time period, Typology type, and according to zoning classifications. As a result of careful validation by both Metro staff and MFA, the following adjustments were made to the final DGA:
    - The DGA results for Typology 2 and 3 were combined into one sample set due to similarities between their respective land use types. This resulted in both Typology 2 and 3 having the same proportion rates for each Year Built time period.
    - The calculated proportion rates for Typology types 1-3 and for the Year Built time period of 1960 to 1989 were used as the proportion rates for their respective 1990 to 2012 time periods. This was due to the parcels within the Study Areas and included in the DGA not having parcels that were correlated to this later time period.
    - Typology 4 proportion rates were subsetted into two categories according to the following zoning classes: RRFU and RI/RC. When extrapolated, the individual proportion rates calculated for each of the two categories will more closely represent estimated Brownfields for Typology 4.
- Based upon the methodology described above, the resulting DGA Study Area extrapolation rates were calculated and are provided in Attachment B.

7.3. Metro Region Extrapolation:

Each extrapolation rate was then applied to areas in the region similar to the type of place and time period for which that extrapolation rate was calculated. For example, the extrapolation rate for the mid-century corridor study area (McLoughlin Boulevard) was applied to candidate sites in other mid-century corridors in the region. Likewise, the newer industrial area rate (Tualatin-Sherwood Road) was applied to all newer industrial areas in the region. Since different places experience varying rates and types of undiscovered brownfields, this methodology enabled a region-wide extrapolation to estimate the number and character of brownfields across the region. The application of the extrapolation ratio resulted in a population range of suspect sites throughout the region. These steps are outlined in the tables below.

As with the Study Areas, Candidate Sites were identified for the Metro region using the following methodology:

- Metro region parcels were selected that met the Typology 1-4 criteria, as described above in Section 4.2.

- The Portland Superfund site was removed from the Candidate Site list, due to complexities associated with Oregon DEQ and USEPA involvement in the area. This area begins at approximately the Interstate 405 bridge and travels downstream approximately to the mouth of the Columbia River and includes all Industrial and Commercially zoned properties on either side of the river.

Please note that extrapolation best represents the geographic extents covered by Typology 1-4. This leaves out areas that are not captured in centers, corridors, employment/industrial areas, or urban reserve/resource areas. Based on our validation research, this represents a small portion of the overall potential sites. A summary table of Candidate Sites matching Typologies 1-4 and that are available for inclusion into the region-wide extrapolation is provided below.

	Inventory Extrapolation - Candidate Sites					DGA Results
Typology	Year Built	Total Parcel Count	% of Total	Total Acreage	Ave Acre/Site	Proportion (Extrapolation Factor)
Typology 1	1900 to 1929	2514	47%	807	0.32	29%
	1930 to 1959	1,783	33%	800	0.45	29%
	1960 to 1989	940	17%	972	1.03	17%
	1990 to 2012	153	3%	232	1.52	NA
	New Total	5,390	100%	2,811	1	--
Typology 2	1900 to 1929	8	6%	5	0.67	13%
	1930 to 1959	17	12%	195	11.50	33%
	1960 to 1989	91	65%	461	5.07	3%
	1990 to 2012	25	18%	105	4.20	NA
	New Total	141	100%	767	5.44	--
Typology 3	1900 to 1929	113	8%	160	1.42	13%
	1930 to 1959	362	27%	1,314	3.63	33%
	1960 to 1989	595	44%	3,193	5.37	3%
	1990 to 2012	275	20%	1,745	6.35	NA
	New Total	1,345	100%	6,412	4.77	--
Typology 4	RRFU	917	96%	3,118	3.40	13%
	RI/RC	36	4%	54	1.51	41%
Any Typology	**--**	***7,829***	**--**	***13,163***	***1.68***	***23%***

8. Inventory Extrapolation Results

The results of the Inventory Extrapolation are provided below.

Typology	Year Built	Candidate Sites	DGA Results		Inventory Extrapolation Results		
			Proportion (Extrapolation Factor)	Error Rates (a)	Suspected Brownfields	Low Estimate	High Estimate
Typology 1	1900 to 1929	2514	29%	11	724	645	803
	1930 to 1959	1,783	29%	16	518	435	600
	1960 to 1989	940	17%	15	163	139	186
	1990 to 2012	153	NA	NA	26	23	30
	New Total	5,390	--	--	1431	1241	1620
Typology 2	1900 to 1929	8	13%	23	1	1	1
	1930 to 1959	17	33%	27	6	4	7
	1960 to 1989	91	3%	6	3	2	3
	1990 to 2012	25	NA	NA	1	1	1
	New Total	141	--	--	10	8	12
Typology 3	1900 to 1929	113	13%	23	14	11	17
	1930 to 1959	362	33%	27	121	88	153
	1960 to 1989	595	3%	6	17	16	18
	1990 to 2012	275	NA	NA	8	7	8
	New Total	1,345	--	--	160	123	196
Typology 4	RRFU	917	13%	23	115	88	141
	RI/RC	36	41%	21	15	12	18
Any Typology	**--**	***7,829***	***23%***	**--**	***1,730***	***1,472***	***1,987***

Table Notes:

*NA = The calculated proportion rates for Typology types 1-3 and for the Year Built time period of 1960 to 1989 were used as the proportion rates for their respective 1990 to 2012 time periods.

(a) = Confidence Interval margin of error based on 95% confidence interval, where error = 1.96(p(1-p)/n)^1/2. p is proportion of hits, n is sample size.

Extrapolation results for suspected brownfields were added to documented, known DEQ sites to produce an estimation of total potential brownfield sites in the Metro region and is provided below.

Typology	Suspected Brownfields	Reported Brownfields (Known DEQ Sites and Underutilizes)	Total Estimated Potential Brownfields
Typology 1	1,431	367	1,798
Typology 2	10	67	77
Typology 3	160	140	300
Typology 4	318	6	324
Any Typology	***1,730***	***580***	***2,310***

Attachment A

REGIONAL BROWNFIELD PROJECT
INVENTORY DATA GAP ANALYSIS (DGA) & EXTRAPOLATION

MAUL FOSTER ALONGI

STEP 1 – Confirm Study Areas & Extents

STUDY AREAS

- Downtown Tigard
- McLoughlin Corridor
- Aloha / TV Highway
- Albina
- Johnson Rd / Industrial Way
- Tualatin/Sherwood
- Boring

STEP 2 – Study Area Filter Down

EXCLUDE

- ECSI/LUST sites

INCLUDE

- Parcels located within one of the seven Study Areas
- Located in a 2040 Concept Center or Corridor, Title 4 land, Rural Reserve, or on designated as Resource Land
- COM, IND, MUR, RI, RC, RRFU, and VAC zoning
- Vacant (vacant land inventory)
- Underutilized (buildable lands model)

STEP 3– SUBSAMPLING

GRID SAMPLING

1. Establish grids
2. Randomly select taxlots for research

STEP 4 – Conduct Research

RESEARCH

- Historical Aerials
- Polk City Directories
- Sanborn Maps
- Windshield Survey

STEP 5 – Populate DGA Database

DGA DATABASE

- Taxlot Information
- Zoning
- Vacant Land Status
- Underutilized Status
- Building to Land Value Ratio (Boring only)
- Historical Use Information
- Windshield Survey Info
- Brownfield Status Determination Information

STEP 6 – Assign Typology Types

TYPOLOGY DESIGNATION

Assign each taxlot used in the data gap analysis an appropriate Typology type (1-4)

STEP 7 – Analyze Typologies

CORRELATION

- Correlate ratio of suspect brownfield sites to total number of sample sites for each study area
- Subcategorize by Typology type and by Year Built

STEP 8 – Extrapolate to Metro Region

EXTRAPOLATION

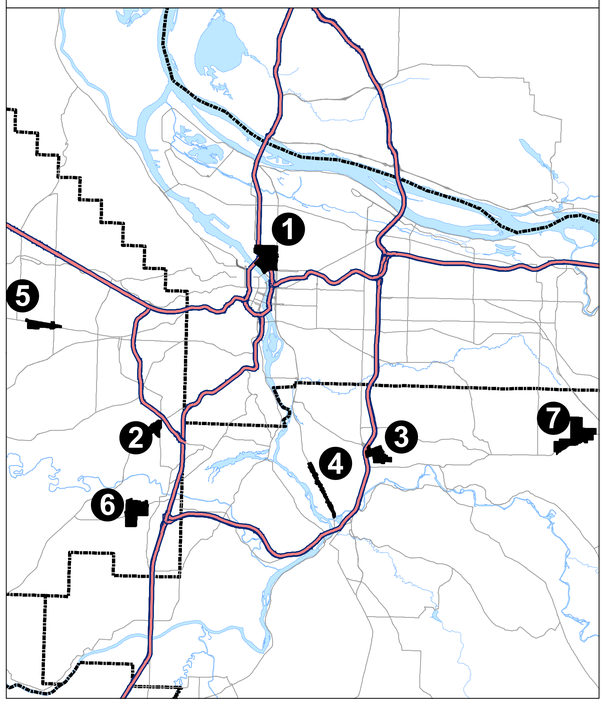
Compile Study Area ratios by Typology type using weighted average approach (by Candidate site 'Year Built') to estimate number of brownfields across metro region

Attachment B

Typology	Data Gap Analysis										
	Year Type	95% CI with margin error 15% (a)	Actual Sample Size	Study Areas	Suspect	Unknown	Non Suspect	Typology Hit Score	Proportion (Extrapolation Factor)	Error rates (b)	Error rates (c)
Typology 1	*1900 to 1929*	44	66	Tigard, Albina	17	4	45	19	29%	11%	9%
	1930 to 1959	43	31	McLoughlin	6	6	19	9	29%	16%	13%
	1960 to 1989	42	26	Aloha	3	3	20	4.5	17%	15%	12%
	1990 to 2012	34	0	Aloha	NA	NA	NA	NA	NA	NA	NA
	New Total	44	123	Tigard, Albina, Aloha, McLoughlin	--	--	--	--	--	--	--
Typology 2	*1900 to 1929*	7	8	Albina	0	2	6	1	13%	23%	19%
	1930 to 1959	12	12	Johnson	3	2	7	4	33%	27%	22%
	1960 to 1989	30	35	Tualatin	1	0	34	1	3%	6%	5%
	1990 to 2012	16	0	Tualatin	NA	NA	NA	NA	NA	NA	NA
	New Total	34	6	Albina, Johnson, Tualatin	--	--	--	--	--	--	--
Typology 3	*1900 to 1929*	32	8	Albina	0	2	6	1	13%	23%	19%
	1930 to 1959	40	12	Johnson	3	2	7	4	33%	27%	22%
	1960 to 1989	41	35	Tualatin	1	0	34	1	3%	6%	5%
	1990 to 2012	38	0	Tualatin	NA	NA	NA	NA	NA	NA	NA
	New Total	43	49	Albina, Johnson, Tualatin	--	--	--	--	--	--	--
Typology 4	*RRFU*	42	8	Boring	1	0	7	1	13%	23%	19%
	RI/RC	20	22	Boring	8	2	12	9	41%	21%	17%
Any Typology		**44**	**208**	**All**	**39**	**19**	**150**	**48.5**	**23%**	**6%**	**5%**

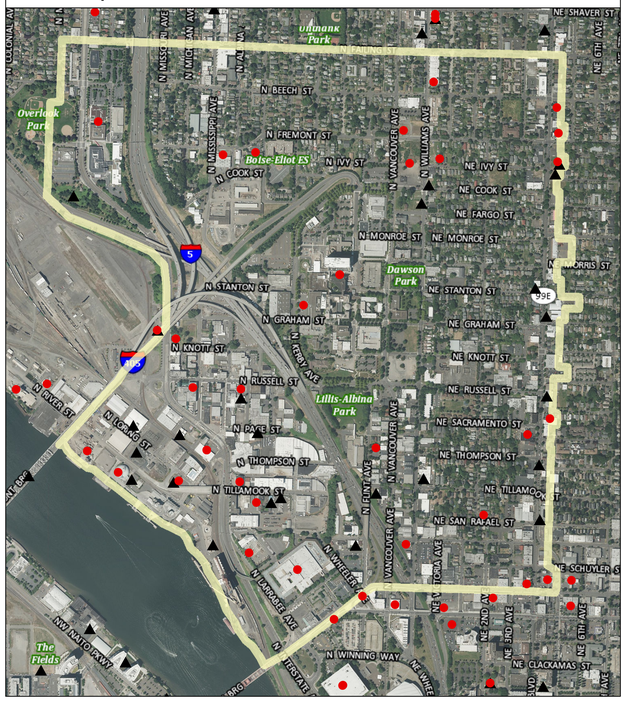
Notes:
*Data Gap Analysis Brownfield determination scoring system: Hit= 1 for "suspect", 0.5 for "unknown", 0 for "non-suspect"
*NA = Extrapolation factor estimated using the proportion rate calculated for the 1960 to 1989 year range for Typologies 1-3
*a Calculation for 95% CI with margin error 15% sample size estimation based on simplified formula in: Yamane, 1967. Statistics, An Introductory Analysis, 2nd Ed., New York: Harper and Row.
b Confidence Interval margin of error based on 95% confidence interval, where error = 1.96(p(1-p)/n)^1/2. p is proportion of hits, n is sample size.
c Confidence Interval margin of error based on 90% confidence interval, where error = 1.96(p(1-p)/n)^1/2. p is proportion of hits, n is sample size.

Study Area Locations



1. Albina district:

Historic industrial area and main street
City of Portland



2. Tigard town center:

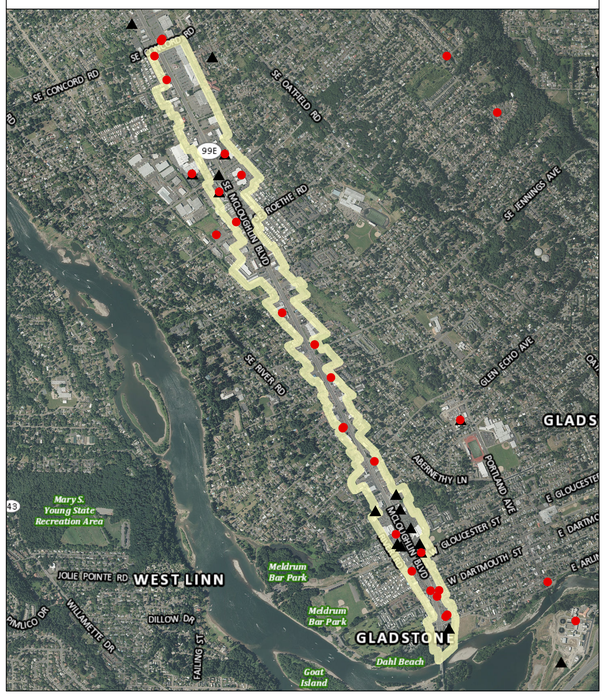
Historic downtown and main street
City of Tigard

3. Industrial Way:

Mid-century industrial area
Clackamas County

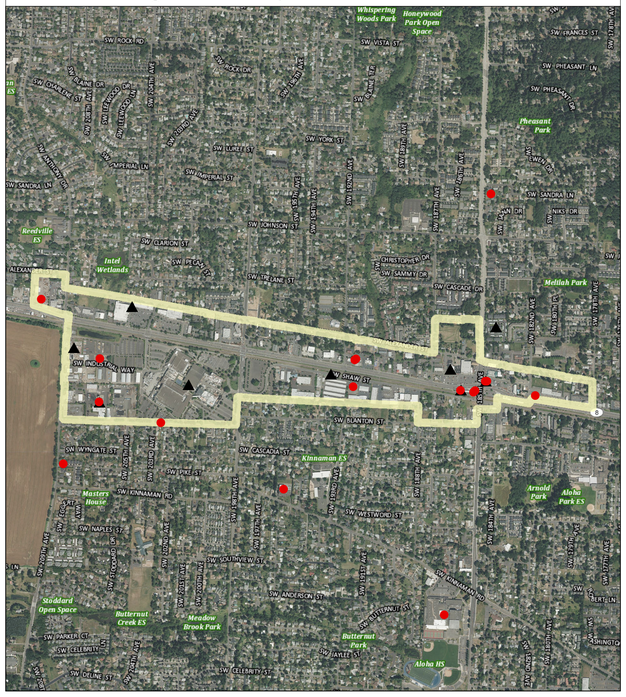
4. McLoughlin Boulevard:

Mid-century corridor
Clackamas County



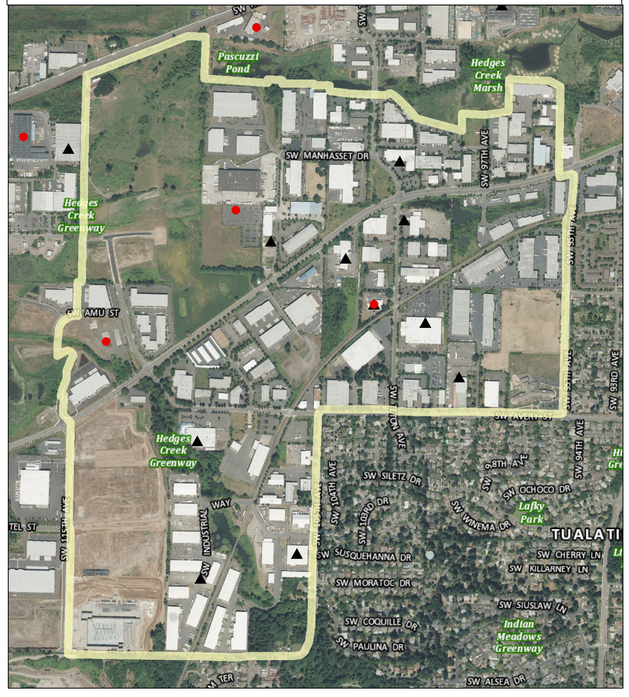
5. Aloha town center:

Newer town center and corridor
Washington County



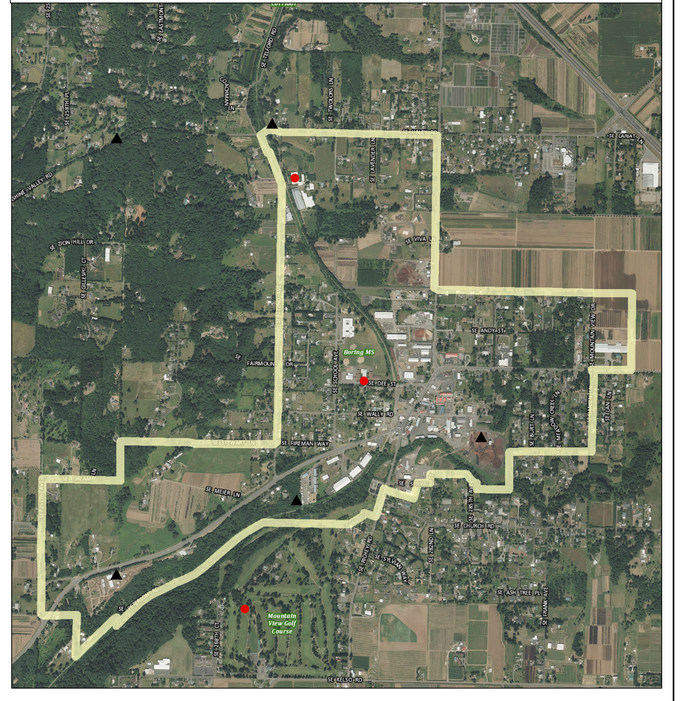
6. Tualatin-Sherwood Road:

Newer industrial area
City of Tualatin



7. Urban reserve:

Rural agricultural and resource-based industries
Community of Boring, Clackamas County



R L I S

REGIONAL LAND INFORMATION SYSTEM

Study Areas

Metro Brownfield Scoping Project
June 2012

▲ Known or potential hazardous substance contamination (DEQs Environmental Cleanup database)

● Reported petroleum releases (DEQs leaking underground storage tanks database)

Study Area Extent

METRO
METRO DATA RESOURCE CENTER
600 NORTHEAST GRAND AVENUE
TEL (503) 797-1742
drc@oregonmetro.gov
PORTLAND, OREGON 97232-2736
FAX (503) 797-1909
www.orgonmetro.gov

M:\plan\drc\projects\11132_brownfields\2_Study areas\Study areas plot.mxd

APPENDIX B

FISCAL & FINANCIAL FEASIBILITY STUDY

ECONorthwest
ECONOMICS • FINANCE • PLANNING

Phone • (503) 222-6060
FAX • (503) 222-1504
info@econw.com

Suite 1600
222 SW Columbia
Portland, Oregon 97201-6616

Other Offices
Eugene • (541) 687-0051
Seattle • (206) 622-2403

October 15, 2012 Project #: 20870

TO: **Seth Otto, Maul Foster Alongi**
FROM: **Anne Fifield, Lorelei Juntunen**
SUBJECT: **ECONOMIC, SOCIAL, AND ENVIRONMENTAL INDICATORS: METHODS, ASSUMPTIONS, AND RESULTS SUMMARY**

ECONorthwest (ECO) is teamed with Maul, Foster, Alongi (MFA) and Redevelopment Economics on a project that: (1) estimates the total number of brownfields (contaminated redevelopment sites) in the Portland Metro area, and (2) evaluates various policy approaches to addressing the brownfields challenge. This memorandum documents a portion of the analysis conducted by ECO and Redevelopment Economics, together with MFA. It provides details on the methods, assumptions, and results of analyses of the potential fiscal, social, and environmental outcomes that might result from the redevelopment of remediated brownfields in the Portland Metro area.

This memorandum is organized into the following sections:

- Purpose
- Methods and assumptions
- Results: Fiscal outcomes and financial feasibility
- Results: Social and economic indicators
- Key findings

1 PURPOSE

The Metro government is charged with long-term planning for urban growth, including considerations of regional land supply and demand. Brownfields are a part of that regional land supply, and it is clearly more difficult to develop on a brownfield site than an otherwise comparable greenfield site. However, little is known about the number of brownfields that might exist in the region, what the redevelopment potential on those sites might be, and how their redevelopment might contribute to the fiscal, environmental, and social equity situation faced by Metro and its jurisdictional partners. The overall analysis addresses all of these questions.

The analysis described in this memorandum contributes to these larger questions by providing data and findings regarding: the financial (market) feasibility of redevelopment occurring on known and suspect brownfield sites, and the fiscal and other implications of redevelopment. Its purpose is not to precisely quantify the market for brownfield and economic impact of redevelopment, but rather to take a high level look at the potential contributions of these sites to the regional economic situation, and to provide input into a larger policy conversation regarding solutions to these challenges.

The analysis in this memorandum is based on analysis conducted by MFA to estimate the number of brownfield sites in the Portland region. MFA conducted a data gap analysis (described in Appendix A of the final report submitted to Metro) to estimate the number of suspect brownfield sites and used DEQ data to determine the number of DEQ sites in the region. Table 1 shows the number of sites associated with each typology, as determined by MFA.

Table 1. Estimated number of suspect and DEQ brownfield sites, Portland region, 2012

Typology	Extrapolated Number of Suspect Sites	Number of Known DEQ Sites
1 - Small Commercial	1,431	367
2 - Industrial Conversion	10	67
3 - Ongoing Industrial	160	140
4 - Rural Industry	129	6
Total	**1,730**	**580**

Source: Calculated by Maul Foster Alongi, 2012.

Definitions of the typologies:

- **Type 1—Small Commercial Sites**. Common historical uses were gas stations, repair shops, and dry cleaners, characterized by small parcel size and located along highways, arterials, and in commercial centers, including main streets and small downtowns. These properties are commonly redeveloped for commercial, office, multi-family, and mixed uses. The small size of these sites can be a challenge to redevelopment, because they often cannot generate enough value to balance remediation costs. These types of sites are typically located in centers, corridors, and scattered in employment areas.
- **Type 2—Industrial Conversion Sites**. These properties range in size and are historically found in areas that have transitioned from industrial to office, retail, and mixed-use centers. Change of zoning and location often drives redevelopment of these properties. Sites in highly attractive, high-density areas, may be redeveloped by the private sector. This type of brownfield faces greater financial challenges in areas with weaker real estate markets.

- **Type 3—Ongoing Industrial**. These properties are located in areas with an industrial past that continues today, particularly through regulatory controls such as Metro's Title 4 requirements and local employment sanctuary overlays. The types of historical uses vary, but they share constraints on land value and future use that can be a challenge to redevelopment opportunities. These properties are typically large.
- **Type 4—Rural Industry Sites**. These properties are associated with rural natural resource extraction industries and agriculture. They are typically large and located on the edge of urban growth boundary, especially within urban and rural reserves. Structural economic changes can make these properties difficult to redevelop. There are relatively few of these types of brownfields in the Metro region and its urban reserves, but they individually can occupy large areas and can have significant regional impacts.

The analysis estimated the potential amount of development that might be contained on these sites and some key outcomes associated with that redevelopment. The analysis estimates these key indicators:

- Potential square feet of structures that could be developed on brownfield sites
- The value of the built structure
- The impact of clean up on financial feasibility
- The net new assessed value and property tax
- The new jobs that could be accommodated in the redeveloped space, wages, and income tax
- The number of housing units
- Vehicle Miles Traveled and CO_2 reduction
- Savings of open space
- Savings of infrastructure costs
- Improvements in water quality and reductions in run off

The analysis is also intended to understand how the cost of remediation affects the ability of the brownfield sites to redevelop. We estimated the potential cost of redevelopment and compared it to the potential value of development, to understand if there is a financial gap. That is, we determined if the cost of development exceeds the value of development, for each typology.

The analysis is intended to establish an upper bound of redevelopment potential. It identifies the development that *could* occur on the brownfield sites—it does not include any assumptions about demand for the sites. It aims to provide insight into the extent that brownfield sites can contribute to the supply of land in the region.

2 METHODS, ASSUMPTIONS, AND LIMITATIONS

2.1 FISCAL AND FINANCIAL FEASIBILITY

The fiscal and financial feasibility analysis (results described in Section 3 of this memorandum) has six steps:

1. Estimate the total square footage of development for each parcel in the sample.

2. Estimate the cost and value of the development of each parcel.

3. Estimate the net new property tax revenue for each parcel.

4. Estimate the net new income tax revenue for each parcel.

5. Estimate financial feasibility of each parcel.

6. Extrapolate the results from the sample for each typology.

The remainder of this section provides details on each of these steps and documents the assumptions made.

2.1.1 Estimate the total square footage of development

ECO's first step was to identify appropriate buildings that could be built on the brownfield properties. To do so, we identified building types and assigned a building type to each parcel based on its zoning. This section describes how we identified building types and applied them to zones.

MFA provided ECO with the dataset that made up the sample for the data gap analysis. Of the 208 records in the sample, MFA identified 58 records as potential brownfield sites. ECO's analysis focused on those 58 records. Each record included the following data points:

- Site address
- Site City
- County
- Size of parcel, in acres
- Land value, as identified by the County Assessor
- Building value, as identified by the County Assessor,
- Square feet for existing structures
- The year the existing structure was built
- Land use

- Zone class, a region-wide zoning category
- Suspected brownfield site status (suspect, unknown, not suspect)
- Typology

ECO relied on the zone class category to determine the appropriate building type for each parcel. The zone class is a metro-wide zoning classification system that broadly identifies the allowed uses for a parcel. The potential sites included 12 zone classes, shown and defined in Table 2.

Table 2. Zone classes and their definitions, Portland Metro area, 2012

Zone Class	Definition
CC	Central Commercial - allows a full range of commercial typically associated with CBD's and downtowns. More restrictive than general commercial in the case of large lot and highway-oriented uses. Encourages higher FAR uses including multi-story development.
CG	General Commercial - larger scale commercial districts, often with a more regional orientation for providing goods and services. Businesses offering a wider variety of goods and services (including large format retailers) are permitted in this district and include mid-rise office buildings, and highway and strip commercial zones.
CO	Office Commercial - districts accommodating a range of low-rise offices; supports various community business establishments, professional and medical offices; typically as a buffer between residential areas and more intensive commercial districts.
IC	Industrial Campus - Campus/Industrial/Business Park - permits light industrial & limited commercial uses on large/irregular parcels
IH	Heavy Industrial - districts permit light industrial and intensive industrial activity such as bottling, chemical processing, heavy manufacturing and similar uses with noxious externalities.
IL	Light Industrial - districts permit warehousing and distribution facilities, light manufacturing, processing, fabrication or assembly. May allow limited commercial activities such as retail and service functions that support the businesses and workers in the district.
MUR1	Mixed Use Commercial & Residential with FAR maximum of about 0.3
MUR8	Mixed Use Commercial & Residential with FAR maximum of about 3
MUR9	Mixed Use Commercial & Residential with FAR maximum of about 4
MUR10	Mixed Use Commercial & Residential with FAR maximum of about 12.5
RI	Rural Industrial
RRFU	Rural Residential or Future Urban - residential uses permitted on rural lands (1 dwelling unit per lot) or areas designated for future urban development, typically lots are 10 or more acres

Source: http://rlismetadata.oregonmetro.gov/.

For each zone class, ECO identified an appropriate building type, based on building prototypes described in the Envision Tomorrow ™ planning tool developed by Fregonese Associates.[1] Metro has used this tool in several of its other planning projects, including the Community Investment Initiative and the Climate Smart Communities project; using it here provided some economy and consistency in assumptions among the various projects Metro is undertaking. For each prototypical building type, the Envision Tomorrow tool describes its estimated square feet and parking needs, given a specified parcel size. The planning tool provides the portions of office, retail, industrial,

[1] For a description of the planning tool, see http://www.frego.com/services/envision-tomorrow/.

and residential uses in each building prototype. Table 3 shows the crosswalk between Metro's zone class and ECO's assigned building prototype.

Table 3. Zone classes and applied building prototype

Zone Class	Building Prototype
CC	Low Density Commercial
CG	Low Density Commercial
CO	Low Density Commercial
IC	Business Park Campus Industrial
IH	Heavy Industrial
IL	Light Industrial
MUR1	SFR Houses (Suburban Medium Lot)
MUR8	Suburban MUR, Low
MUR9	Neighborhood MU
MUR10	Mid-Rise MU Small Units
RI	Heavy Industrial
RRFU	SFR Houses (Suburban Medium Lot)

Source: ECONorthwest, with data from Metro and Fregonese Associates.

Table 4 shows the results of the assignment of building prototype to zone class. The table shows the number of suspect brownfield sites by building prototype and typology for a sample of 58 brownfield sites selected from the region. Type 1-Small Commercial and Type 2-Industrial Conversion are expected to accommodate building prototypes that include housing, offices, and retail space. Type 3-Ongoing Industrial and Type 4-Rural Industrial are expected to accommodate employment-based structures. Type 4, however, does include a small portion that will accommodate residential development.

Table 4. Building prototype by Typology, sample of suspect brownfield sites

	Typology					
Building Prototype	**1**	**2**	**3**	**4**	**Total**	**% of Total**
Business Park Campus Industrial			1		1	2%
Heavy Industrial			1	10	11	19%
Light Industrial			4		4	7%
Low Density Commercial	17				17	29%
Mid-Rise MU Small Units	2				2	3%
Neighborhood MU	15	2			17	29%
SFR Houses (Suburban Medium Lot)	1			1	2	3%
Suburban MUR, Low	4				4	7%
Total by Typology	39	2	6	11	58	100%
% of Total	67%	3%	10%	19%	100%	

Source: ECONorthwest, 2012.

The Envision Tomorrow tool calculates the building size based on the lot size. For this analysis, ECO normalized the tool for a single acre, so that the building requirements

could be applied to any parcel included in the sample.[2] ECO used build-out assumptions from the Envision Tomorrow tool to estimate the physical aspects of potential development.

ECO based its calculations of the physical elements of the potential developments on key factors in the Envision Tomorrow tool, shown below in Table 5. We multiplied the square feet per acre by the number of acres in each parcel. We applied the portions of each use type to estimate the square feet of office, retail, industrial, and residential uses.

Table 5. Assumptions for building prototypes, physical elements

	Protoype							
Variable	Business Park Campus Industrial	Heavy Industrial	Light Industrial	Low Density Commercial	Mid-Rise MU Small Units	Neighborhood MU	SFR Houses (Suburban Medium Lot)	Suburban MUR, Low
Square Feet per Acre	13,860	13,003	14,249	14,241	352,048	152,460	18,368	47,258
Use Type Portions								
Office	20%	0%	20%	30%	10%	0%	0%	0%
Retail	5%	5%	5%	70%	10%	20%	0%	25%
Industrial	75%	95%	75%	0%	0%	0%	0%	0%
Residential	0%	0%	0%	0%	80%	80%	100%	75%
Residential								
Square feet per unit	0	0	0	0	600	1,100	2,500	950
Parking Spaces								
Square feet per space	400	400	400	400	255	255	400	255
Surface Parking-Number/Acre	42	33	41	57	20	0	8	49
Structured Above-Number/Acre	0	0	0	0	0	0	0	0
Structured Below-Number/Acre	0	0	0	0	142	0	0	0
Tucked-Number/Acre	0	0	0	0	73	85	7	0

Source: Envision Tomorrow™, Fregonese Associates.

The calculations yielded estimates of the total potential developed square feet in the sample, by use type, for each of the four typologies.

2.1.2 Estimate the cost and value of development

In order to estimate the potential value associated with the region's brownfields, ECO estimated the value of the prototypical developments based on construction costs and likely market rents.

To estimate the costs, ECO estimated construction costs for each prototype. We identified hard costs for building types and parking. We multiplied the per-foot construction costs by the calculated square feet for each use type in each parcel and the cost for parking spaces by the number of spaces to estimate a total construction costs for each parcel. We then increased the costs by an estimate of soft construction costs (architectural fees, permitting fees, and others), a developer fee, and contingency. Table 6 shows the assumptions for each prototype.

[2] Some of the potential brownfield parcels are very small and unlikely to develop. It is reasonable, however, to assume that development on the smaller sites could occur if assembled with adjacent parcels.

Table 6. Assumptions for building prototypes, construction cost elements

	Protoype							
Variable	Business Park Campus Industrial	Heavy Industrial	Light Industrial	Low Density Commercial	Mid-Rise MU Small Units	Neighborhood MU	SFR Houses (Suburban Medium Lot)	Suburban MUR, Low
Cost per SF-Office	$85		$85	$95	$155			
Cost per SF-Retail	$85	$75	$85	$95	$155	$110		$120
Cost per SF-Industrial	$80	$75	$85					
Cost per SF-Residential					$155	$110	$120	$120
Cost per Space-Surface Parking	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000	$3,000
Cost per Space-Above Parking	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000
Cost per Space-Underground Parking	$55,000	$55,000	$55,000	$55,000	$55,000	$55,000	$55,000	$55,000
Cost per Space-Tuck-in Parking	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000
Soft Costs	30%	30%	30%	30%	30%	30%	30%	30%
Contingency	10%	10%	10%	10%	10%	10%	10%	10%
Developer Fee	4%	4%	4%	4%	4%	4%	4%	4%

Source: Envision Tomorrow™, Fregonese Associates.

To estimate the value of each redeveloped parcel, ECO identified a range of market rents for each use type. We multiplied the rent by the leasable square feet for each building type and subtracted out allowances for vacancies and management costs, yielding a stabilized net operating income.

We divided the net operating income by a 7% capitalization rate—a rough estimate of a market-normal, regional average rate—to determine an estimated value for each parcel. For structures designed to be occupied by the owner (such as single family housing) we estimated a per-foot value for the property type. Table 7 shows the assumed rents and other factors that affect value. We calculated a 'low' and 'high' value for each parcel. Table 7 shows the factors used to estimate the values of the parcels.

Table 7. Assumptions for building prototypes, market value elements

	Protoype							
Variable	Business Park Campus Industrial	Heavy Industrial	Light Industrial	Low Density Commercial	Mid-Rise MU Small Units	Neighborhood MU	SFR Houses (Suburban Medium Lot)	Suburban MUR, Low
Leasable SF-Non-Residential	85%	85%	85%	85%	85%	85%	85%	85%
Leasable SF-Residential					85%	80%	100%	85%
Occupancy Rate	95%	95%	95%	95%	95%	95%	95%	95%
Annual Rents (triple net)								
Office-High	$26.50		$25.00	$25.00	$24.00			
Retail-High	$26.50	$20.00	$25.00	$25.00	$24.00	$25.00		$20.00
Industrial-High	$12.50	$13.50	$14.00					
Residential-High					$22			
Office-Low	$21.50		$20.00	$20.00	$19.00	-$5.00		-$5.00
Retail-Low	$21.50	$15.00	$20.00	$20.00	$19.00	$20.00	-$5.00	$15.00
Industrial-Low	$7.50	$8.50	$9.00					
Residential-Low					$16.84			
Management Fee	8%	8%	8%	8%	8%	8%	8%	8%
Capitalization Rate	7%	7%	7%	7%	7%	7%	7%	7%
Residential Owner Value Per Foot-High						$155	$182	$181
Residential Owner Value Per Foot-Low						$130	$157	$156

Source: ECONorthwest.

2.1.3 Estimate the property tax revenue

ECO used the estimated market value of the properties to calculate the expected property tax revenue. In Oregon, property taxes are determined by multiplying the property tax rate by the property's assessed value. For newly developed properties, the

assessed value is the market value by the 'changed property ratio' or CPR. The CPR is specific to land type (residential, commercial, industrial) and varies by county.

For each parcel, we identified the primary use of the development to determine the land use category. We applied the appropriate CPR to each parcel based on its County and its primary use. Table 8 shows the assigned primary use and the CPRs for each building prototype.

Table 8. Assumptions for building prototypes, property tax elements

	Protoype							
Variable	Business Park Campus Industrial	Heavy Industrial	Light Industrial	Low Density Commercial	Mid-Rise MU Small Units	Neighborhood MU	SFR Houses (Suburban Medium Lot)	Suburban MUR, Low
Primary Use	Industrial	Industrial	Industrial	Commercial	Residential	Residential	Residential	Residential
CPRs								
Clackamas	0.961	0.961	0.961	0.886	0.821	0.821	0.821	0.821
Washington	1	1	1	0.655	0.787	0.787	0.787	0.787
Multnomah	0.8376	0.8376	0.8376	0.4883	0.6931	0.6931	0.6931	0.6931

Source: Envision Tomorrow™, Fregonese Associates and the Oregon Employment Department.

The parcels in the brownfield sample include properties that have actively used structures on them. These structures generate property tax revenue. To calculate the *net new* property tax, ECO excluded the existing property tax revenue. ECO collected data for each parcel in the sample from Assessor's Offices in the three counties.[3] We then subtracted existing assessed value from the calculated potential assessed value, to determine the net new value.

Property tax rates vary across a County. A single parcel may be included in a City, a school district, a parks district, a fire district, and other special districts. The boundaries of all the taxing districts are different so parcels within a single County can experience very different taxing rates. For this analysis, ECO applied a single property tax rate of $15 per $1,000 of assessed value, which is the Measure 5 limit for property tax rates. Subsequent changes to property tax law have made it possible for rates to exceed that (and General Obligation bonds for capital improvement are excluded from the Measure 5 limit). This analysis uses the $15 limit to provide a general estimate of property tax revenue across three Counties and a variety of taxing districts.

2.1.4 Estimate the income tax revenue

To estimate income tax revenue, ECO first estimated the number and type of job associated with redevelopment in the four typologies. Here, we relied on the job estimates provided in the Envision Tomorrow planning tool. The planning tool provides estimates of the number of jobs per building use type based on assumptions about typical space needs per worker. ECO divided the square feet in each parcel by the

[3] Multnomah County: http://portlandmaps.com/maps/raptor/;
Washington County: http://washims.co.washington.or.us/InterMap/index.cfm:
and Clackamas County: http://web5.co.clackamas.or.us/taxmap/

square feet per employee to estimate the number of employees, by type, in each development.

To estimate wages associated with the jobs in the redeveloped sites, we relied on 2011 income data reported by the Oregon Employment Department. The Employment Department reports total employment and payroll by industrial sector for regions across Oregon. To estimate the average wage per job, we used wage data specific to the Portland metropolitan region.

- For retail jobs, we took the mean wage for the "Food services and drinking places" sector.
- For Office jobs, we took the mean wage for the "Financial Activities", "Real Estate Rental & Leasing", "Professional & Business Services", "Administrative and support services", "Waste management and remediation services", and "Education & Health Services" sectors.
- For industrial jobs, we took the mean wage for the "Manufacturing" and "Wholesale" sectors.

For each parcel, we multiplied the jobs by the average annual wage to estimate the total potential wages for that parcel. Table 9 shows the assumptions regarding square feet per employee and the calculated average wage for each building type.

Table 9. Assumptions for building prototypes, employment elements

	Protoype							
Variable	Business Park Campus Industrial	Heavy Industrial	Light Industrial	Low Density Commercial	Mid-Rise MU Small Units	Neighborhood MU	SFR Houses (Suburban Medium Lot)	Suburban MUR, Low
SF per Employee								
Office	1,210	2,212	1,000	734	434	434	434	0
Retail	1,210	2,212	1,000	734	1,246	1,246	1,246	1,246
Industrial	1,210	2,212	1,000	734				
Residential	0	0	0	0	0	0	0	0
Average Annual Wage								
Office	$49,048	$49,048	$49,048	$49,048	$49,048	$49,048	$49,048	$49,048
Retail	$23,301	$23,301	$23,301	$23,301	$23,301	$23,301	$23,301	$23,301
Industrial	$73,117	$73,117	$73,117	$73,117	$73,117	$73,117	$73,117	$73,117

Source: ECONorthwest and Assessor's Offices in Clackamas, Washington, and Multnomah counties.

The parcels in the brownfield sample include properties that have actively used structures on them. These structures have employees and associated wages. To calculate the *net new* jobs, wages, and income tax, ECO subtracted the existing jobs and their wages from our estimate of potential jobs and wages on the parcels.

ECO obtained parcel-specific data regarding the number of employees and their wages for the parcels in the sample from the Oregon Employment Department. The Employment Department allowed ECO to review confidential Quarterly Census of Employment and Wages (QCEW) employment data for 2010. We matched the employment data to our existing land use dataset and then subtracted the existing jobs and wages from our estimated potential jobs and wages, to determine the net new jobs and wages.

To estimate potential net new income tax, we multiplied the effective income tax rate in Oregon for personal income tax by the net new income associated with jobs at the parcels. The effective tax rate differs from the state's personal tax rate. The effective rate is the mean rate paid by all Oregonians after all deductions and credits have been factored into all individuals' total tax burden. The effective tax rate for tax year 2010 was 5.6%.[4]

2.1.5 Estimate financial feasibility

To understand the financial feasibility of developing brownfield sites, ECO measured the difference between the fair market value for each site (as described in Section 2.2) and the cost of developing each site. If the market value exceeds the cost, the site is considered to be financially feasible. ECO calculated a low and high fair market value for each site.

The development costs, however, do not include the cost of remediating the brownfield site. The fact that these sites are potentially contaminated adds remediation costs to the total development costs. ECO used remediation costs provided by MFA.

Remediation costs are challenging to model because they vary greatly between each site and cannot be estimated accurately without field investigation on specific parcels. To account for the costs of remediation, real-world cleanup costs were collected from brownfield case studies in the Metro region and published data from cleanup projects in Oregon and across the country. Based on this dataset of approximately 100 cleanup projects, low, mid, and high remediation costs per acre estimates were calculated.

- Low – $58,920 per acre
- Middle - $255,871
- High - $695,639 per acre

These costs include the total costs associated with assessment and remediation, including engineering and remedy implementation. ECO used the low and the high costs to estimate the best and worst cases. We added the remediation costs to the total development costs and then compared the new, larger costs to the fair market value to determine if individual sites were financially feasible.

2.1.6 Extrapolation

The final step in ECO's fiscal analysis was to extrapolate the findings across the Metro region.

ECO determined the mean acres per parcel for each typology in the sample of 208 suspect brownfield sites. MFA conducted an analysis to extrapolate the sample into the

[4] Oregon Department of Revenue. *Personal Income Tax Statistics, 2012 Edition. Tax Year 2010*, page 17.

expected number of sites across the Portland region. ECO multiplied the extrapolated number of sites by the mean site size in the sample to extrapolate the expected number of acres of brownfield sites across the Portland region. Table 10 shows the data for the sample and the extrapolated number of sites and acres. The data show that the majority of the potential brownfield *acres* are in the Type 3 - Ongoing Industrial areas. Type 1 - Small Commercial areas, however, account for the majority of the *number of sites*. Type 1 – Small Commercial and Type 4 - Rural Industry areas each account for about 20% of the total. Type 2 - Industrial conversion accounts for less than 1% of potential brownfield acres. The table also shows the acres and number of sites for known DEQ sites.

Table 10. Number of sites and acres in known DEQ, sample, and extrapolated brownfield sites in the Portland Metro Area

	DEQ Sites			Sample			Extrapolated		
Typology	Acres	Number of Sites	Mean Acres/Parcel	Acres	Number of Sites	Mean Acres/Parcel	Acres	Number of Sites	% of Total
1 - Small Commercial	341	367	0.9	15	39	0.4	544	1,431	20%
2 - Industrial Conversion	690	67	10.3	0	2	0.2	2	10	<1%
3 - Ongoing Industrial	2,389	140	17.1	63	6	10.6	1,689	160	61%
4 - Rural Industry	91	6	15.2	46	11	4.2	542	129	20%
Total	**3,511**	**580**		**125**	**58**		**2,777**	**1,730**	100%

Source: ECONorthwest with data from MFA.

The analysis described in Sections 2.1 through 2.4 estimated the square footage and tax impacts for the 58 parcels in the sample. For each data point, ECO summed the values within each typology and divided the sum by the total acres in that typology to calculate a normalized per-acre figure. For example, ECO calculated the per-acre assessed value for each typology, a weighted mean of all the individual assessed values.

To extrapolate the analysis from the sample to the full expected number of brownfield acres in the region, ECO multiplied the per-acre values for each typology by the extrapolated number of acres and by the number of acres in known DEQ sites to determine the full expected value. ECO also estimated the values for each typology of known DEQ sites by multiplying the per-acre values for each typology by the number of acres in known DEQ sites.

2.1.7 Limitations

- This analysis required many assumptions about income from and costs of construction, type and density of redevelopment that might occur, kinds of jobs and associated wages, value of new construction, and others that are detailed in this section. In all cases, these assumptions are intended to provide order-of-magnitude results that are roughly accurate across the region in an average development market. They are not intended to be accurate for any individual site in the Portland region, but rather are intended to provide a high-level

understanding of the opportunities and constraints associated with redevelopment market for brownfield sites on average across the region.

- The estimates of total redevelopment potential provide an upper bound on the amount of redevelopment that might occur on suspect sites, because they assume that all suspect sites redevelop. In the real world, 100% redevelopment is unlikely to occur. The financial feasibility section provides some analysis of how many sites are likely to develop without public or other intervention, based on an evaluation of the market.

- The findings include estimates of the amount of "space for new jobs" that could be accommodated in the redevelopment. This language is important. Jobs estimates are based on typical densities of jobs per square foot, relative to the amount of new square footage that is likely to redevelop. These estimates do not account for industrial trends and the likelihood that the private sector will expand sufficiently to fill that new space, and they do not account for a multiplier effect. In short, they should not be read as "net new jobs" to the region, but as "net new space that can accommodate jobs."

2.2 ENVIRONMENTAL AND SOCIAL INDICATORS

Brownfield remediation and redevelopment can create a wide range of benefits to the Metro area beyond the fiscal and other benefits discussed in earlier sections of this memorandum. The additional benefits are both environmental (reduced contamination in groundwater and storm water, reduced toxics in soils) and social (public health and social justice improvements). Since many of Metro's brownfields are located near rivers and wetlands, the improvements to habitat and water quality resulting from cleanup of legacy contamination is particularly significant. Brownfield redevelopment can also address environmental justice issues to the extent that contaminated lands may be located near low-income and minority populations.

To begin to evaluate some of the additional benefits that may also accrue to the region as a result of a targeted brownfield remediation strategy, analysis completed by Redevelopment Economics reviews national research that estimated these indirect environmental benefits, and applies them to the Portland Metro area:

- Lowered vehicle miles traveled (VMT) and lowered greenhouse gases due to locating economic activity in existing communities
- Conservation of rural lands and opens space accommodating growth within the envelope of developed areas
- Reduced infrastructure costs that may have been required to accommodate alternative development
- Reduced runoff and improved water quality because of greater density than alternative development patterns

The memorandum summarizes Redevelopment Economics' analysis and presents order of magnitude estimates for each of these measures; when possible, Redevelopment Economics adjusted these national figures to account for Oregon's unique growth management framework, but more specific and rigorous research that is specific to the Metro area would be required to fully understand the magnitude of environmental outcomes that might be associated with brownfield redevelopment in the Metro area. The report recommends this additional research as a next step if additional information is needed to support continued policy discussion. Nonetheless, the analysis here is a helpful starting place for a conversation around environmental and social justice effects.

3 RESULTS: FISCAL AND FINANCIAL FEASIBILITY

The aim of this analysis to understand the potential development and fiscal impacts associated with the underutilized status of brownfield properties throughout the region. It is important to note that this analysis has estimated an **upper bound** of potential lost development and revenues—the analysis simply calculates the potential value associated with all the sites. The financial feasibility analysis more carefully consider what portion of these properties might redevelop with and without public sector support or other subsidy.

3.1 FISCAL ANALYSIS

The methods used by Metro and MFA to estimate the total number of sites across the region focused on the four typologies. The extrapolation of the development and fiscal factors is limited to those four typologies.

The analysis determined that the region's brownfields could support approximately 234 million new square feet of built space, as shown in Table 11.[5] This is roughly equivalent to 390 new high-rise buildings similar to the KOIN Tower in downtown Portland. Across typologies, the largest portion of the brownfield acres is most likely to support residential uses, with industrial uses being the second largest portion. Only 6% of the brownfield acreage is expected to support office space.

[5] Large office buildings in downtown Portland range from roughly 500,000 to 750,000 square feet.

Table 11. Square feet of potential new development possible on suspect and DEQ brownfield sites in the Portland Metro Area

	SF of New Development		% by Typology			
Typology	Suspect sites	DEQ & Suspect sites	Office	Retail	Industrial	Residential
1 - Small Commercial	40,905,000	66,526,000	8%	21%	0%	71%
2 - Industrial Conversion	258,000	105,454,000	0%	20%	0%	80%
3 - Ongoing Industrial	22,288,000	53,806,000	3%	5%	92%	0%
4 - Rural Industry	7,358,000	8,594,000	0%	4%	81%	15%
Total	**70,809,000**	**234,380,000**	**6%**	**14%**	**37%**	**43%**

Source: ECONorthwest, 2012.

The new square feet of built space would add assessed value to the region, as summarized in Table 12. The table shows a 'low' and 'high' estimate. The low estimate is based on the low rents and market values and the high is based on the high values, shown in Table 7.

The data show that the majority of the assessed value is expected to be in Type 1 - Small Commercial areas. Type 1 accounts for about 60% of total assessed value, but only 20% of all the acres. Type 3 - Ongoing Industrial areas accounts for about 30% of total assessed value, yet accounts for 60% of the acres. As shown in Table 11, Type 1 - Small Commercial areas are dominated by residential uses and Type 3 - Ongoing Industrial areas are dominated by industrial uses. The estimated per-acre value of industrial land is much lower than the per-acre value of residential land.

The region's suspect brownfield have the potential to increase the region's assessed value by $6.7 billion to $9.2 billion. The region's suspect and known brownfields combined have the potential to increase the region's assessed value by $21.6 billion to $28.4 billion. Current assessed value for all property in the three counties is:

- Clackamas - $38 billion
- Multnomah - $58 billion
- Washington - $48 billion

The region's suspect brownfields have the capacity to increase the entire region's total assessed value by 5% to 6%. The known and suspect sites have the capacity to increase the regions total assessed value by 15% to 20%

Table 12. Potential net new assessed value if all suspect brownfield sites redevelop; Portland Metro Area

Typology	Low		High	
	$ Millions	% of Total	$ Millions	% of Total
1 - Small Commercial	4,274.4	63%	5,407.4	59%
2 - Industrial Conversion	23.2	<1%	28.5	<1%
3 - Ongoing Industrial	1,845.7	27%	2,873.7	31%
4 - Rural Industry	603.8	9%	906.1	10%
Total	**6,747.2**	**100%**	**9,215.7**	**100%**

Source: ECONorthwest, 2012.

Table 13. Potential net new assessed value if all known DEQ and suspect brownfield sites redevelop; Portland Metro Area

Typology	Low		High	
	$ Millions	% of Total	$ Millions	% of Total
1 - Small Commercial	6,951.8	32%	8,794.4	31%
2 - Industrial Conversion	9,504.9	44%	11,645.4	41%
3 - Ongoing Industrial	4,455.8	21%	6,937.4	24%
4 - Rural Industry	705.2	3%	1,058.4	4%
Total	**21,617.7**	100%	**28,435.6**	100%

Source: ECONorthwest, 2012.

The analysis estimated the potential property tax revenue that could be generated by the redevelopment of the region's brownfields (see Table 14 and Table 15). The region's redevelopment brownfields have the capacity to generate approximately $324 million to $427 million in new property tax revenue. This revenue would be distributed across all taxing districts in the region. If all the suspect and known DEQ brownfields redeveloped, this would represent a 13% to 17% increase in the three-county property tax revenue.

Table 14. Potential net new property tax revenue if all suspect brownfield sites redevelop; Portland Metro Area

Typology	Low	High
1 - Small Commercial	$64,117,000	$81,112,000
2 - Industrial Conversion	$349,000	$427,000
3 - Ongoing Industrial	$27,686,000	$43,105,000
4 - Rural Industry	$9,056,000	$13,592,000
Total	**$101,207,000**	**$138,235,000**

Source: ECONorthwest, 2012.

Table 15. Potential net new property tax revenue if all known DEQ and suspect brownfield sites redevelop; Portland Metro Area

Typology	Low	High
1 - Small Commercial	$104,277,000	$131,917,000
2 - Industrial Conversion	$142,574,000	$174,682,000
3 - Ongoing Industrial	$66,837,000	$104,061,000
4 - Rural Industry	$10,578,000	$15,875,000
Total	**$324,266,000**	**$426,535,000**

Source: ECONorthwest, 2012.

Table 16 shows the potential number of jobs that could be supported in the newly built structures on brownfield sites, and the estimated wages and the potential personal income tax paid to the state of Oregon from those jobs.[6]

Based on the building types assumed to be built on the parcels, Type 1 - Small Commercial and Type 3 - Ongoing Industrial areas are expected to generate the most additional space for new jobs. Type 1 - Small Commercial areas accounts for 22% of net new jobs; Type 3 – Ongoing Industrial areas accounts for about 59% of net new jobs. The Portland region currently has about 850,000 jobs. The 69,000 new jobs associated with known and suspect brownfield redevelopment would increase the total number of jobs in the Portland metropolitan region by about 8%.

We estimate that if all of the new employment space were filled with new jobs, roughly $3.3 billion in additional wages would be generated, which would in turn generate about $183 million in personal income tax to the state of Oregon. Type 3 - Ongoing Industrial sites are expected to generate the majority (59%) of wages and income tax. Type 3 - Ongoing Industrial areas accounts for a larger portion of income tax because the typology has a high portion of industrial land and the average wage for the industrial sector is higher than the average wage in both the retail and office sectors.

Table 16. Potential new jobs and associated wages if all suspect brownfield sites redevelop; Portland Metro Area

Typology	Jobs	% of Total Jobs	Wages ($millions)	Personal Income Tax ($millions)	% of Total Income Tax
1 - Small Commercial	13,142	48%	$440.9	$24.7	31%
2 - Industrial Conversion	41	<1%	$1.0	$0.1	<1%
3 - Ongoing Industrial	11,410	42%	$798.4	$44.7	55%
4 - Rural Industry	2,839	10%	$200.5	$11.2	14%
Total	**27,433**	**100%**	**$1,440.8**	**$80.7**	**100%**

Source: ECONorthwest, 2012.

[6] This analysis did not calculate corporate income tax that would be generated by the businesses on the redeveloped brownfield sites.

Table 17. Potential new jobs and associated wages if all known DEQ and suspect brownfield sites redevelop; Portland Metro Area

Typology	Jobs	% of Total Jobs	Wages ($millions)	Personal Income Tax ($millions)	% of Total Income Tax
1 - Small Commercial	21,370	31%	$717.1	$40.2	22%
2 - Industrial Conversion	16,930	24%	$394.4	$22.1	12%
3 - Ongoing Industrial	27,550	40%	$1,927.5	$107.9	59%
4 - Rural Industry	3,320	5%	$234.2	$13.1	7%
Total	**69,170**	**100%**	**$3,273.2**	**$183.3**	**100%**

Source: ECONorthwest, 2012.

Table 18 shows the potential number of dwelling units that could be built on the suspect and known DEQ sites. Based on the density assumptions, the full set of brownfield sites could accommodate about 138,000 new dwelling units. It is important to remember that this figure does not reflect *demand* for housing. Instead, this analysis identifies the total capacity for the new dwelling units on the existing brownfields.

Table 18. Potential new dwelling units if all known DEQ and suspect brownfield sites redevelop; Portland Metro Area

	Number of New Dwelling Units	
Typology	Sample sites	Known & Sample sites
1 - Small Commercial	37,656	61,243
2 - Industrial Conversion	188	76,694
3 - Ongoing Industrial	0	0
4 - Rural Industry	431	504
Total	**38,275**	**138,441**

Source: ECONorthwest, 2012.

3.2 FINANCIAL FEASIBILITY ANALYSIS

To understand the impact that remediation costs have on the financial feasibility of a site's redevelopment, ECO subtracted the development costs with and without remediation costs from the estimated market value of each parcel. This evaluation provides some context for thinking about what properties are likely to redevelop, and which are likely to need additional support.

We evaluate a "worst case" scenario, which combined the high end of the remediation costs with the low end of the achievable rent costs, and a "best case" scenario, which combined low-end clean up costs with high achievable rents, to bracket the results in a range. This measure is one indicator of redevelopment feasibility and potential interest from the private sector in reinvesting in the site.

Overall, the analysis showed that the majority of sites cost more to develop *even if remediation costs are not included* than the estimated market value, an indicator that the sites are not likely to redevelop without market intervention.

Figure 1 shows the per-acre difference between market value and costs. The figure shows four data points for each typology:

- **Development Costs Only-Worst Case -** The per-acre difference between market value and development costs, with the 'low' rent assumption.
- **Development Costs Only-Best Case -** The per-acre difference between market value and development costs, with the 'high' rent assumption.
- **Plus Remediation Costs-Worst Case -** The per-acre difference between market value and development costs, including the 'high' cost of remediation, with the 'low' rent assumption.
- **Plus Remediation Costs-Best Case -** The per-acre difference between market value and development costs, including the 'low' cost of remediation, with the 'high' rent assumption.

The data show that, on average across all typologies, rents affect the financial feasibility more than the cost of remediation. In Type 1 - Small Commercial sites[7] - both 'worst' case scenarios are not financially feasible. But both 'best' case scenarios are feasible. Thus, if the market rents for this typology are low, subsidizing remediation will not push development into feasibility without additional support to overcome a gap that is based on an overall weak market.

Type 2 - Industrial Conversion sites[8] - parcels have the most difficulty achieving financial feasibility, on a per-acre basis. The financial gap is large even if rents are high and there are no remediation costs. In strong, close-in markets near the City center, conversion of an industrial property to a higher value, higher density commercial or residential use could be the best path to feasibility. However, in outlying town centers and corridors that make up the majority of these parcels across the entire region, market challenges are hindering development of higher value product such as mixed use or office even when brownfields are not an issue. Very little new development of this type is taking place in the region outside of close-in locations in the current market.

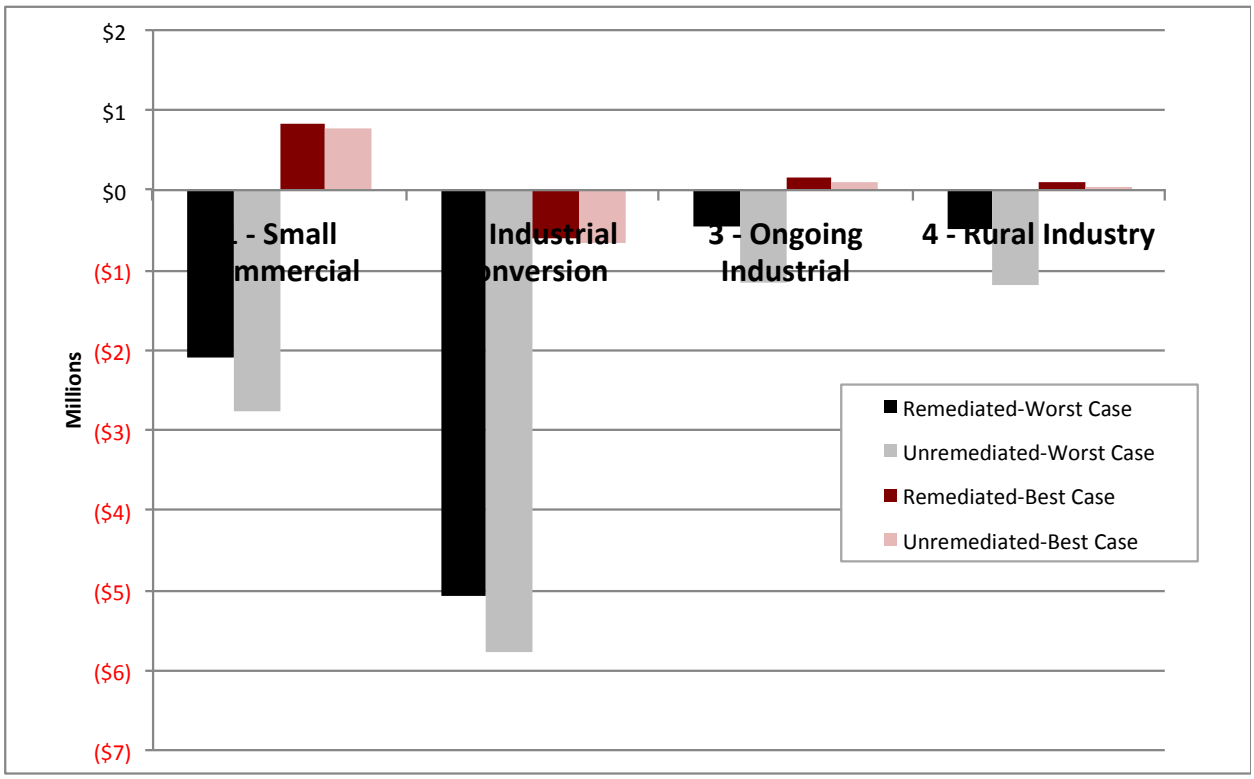
[7] Type 1 - Small Commercial definition reminder: Common historical uses were gas stations, repair shops, and dry cleaners, characterized by small parcel size and located along highways, arterials, and commercial centers. These properties are commonly redeveloped for commercial, mixed use, offices, and multi-family residences. The small size of these sites is often a challenge to redevelopment, because they often cannot generate enough value to balance remediation costs. This typology is the most numerous in the Metro region, with sites located in centers, corridors, and employment areas.

[8] Type 2 - Industrial Conversion definition reminder: These properties range in size and historically housed various uses in areas that have transitioned from industrial to office, retail, and mixed use centers. Change of zoning and use often drives redevelopment of these properties. The potential for redevelopment of these properties is driven largely by location and density. Sites in highly attractive, high density areas, such as the Pearl District often are redeveloped by the private sector. This type of brownfield faces greater financial challenges in areas with weaker real estate markets.

For typologies 1 and 2, when evaluating on average across the entire region, this analysis finds that it is unlikely that an investment in brownfields will overcome market variables. For certain parcels however, where market fundamentals are strong but the cost of remediation is high, an investment in reducing or eliminating the cost of remediation could be the variable that affects feasibility and generates redevelopment. The policy challenge will be to identify those parcels where the investment in brownfield remediation will make the difference and create the fiscal and redevelopment outcome that is desired.

Type 3 - Ongoing Industrial - and Type 4 - Rural Industrial - both show a small positive difference between market value and costs. The data show that the range of market rents affects the feasibility to a greater degree than the cost of remediation. However, more of the parcels are closer to the feasibility indicator mark where development costs are equal to market value than in the other typologies. In particular, even in the best-case scenarios, most redevelopment is barely feasible. This suggests that any changes in development factors--whether it is land costs, entitlement issues, achievable rents, or long-term financing terms—is more likely to have an overall effect on feasibility.

Figure 1. Market value minus development costs (with and without remediation) average per acre of suspect brownfield sites, by brownfield typology, Portland Metro Area

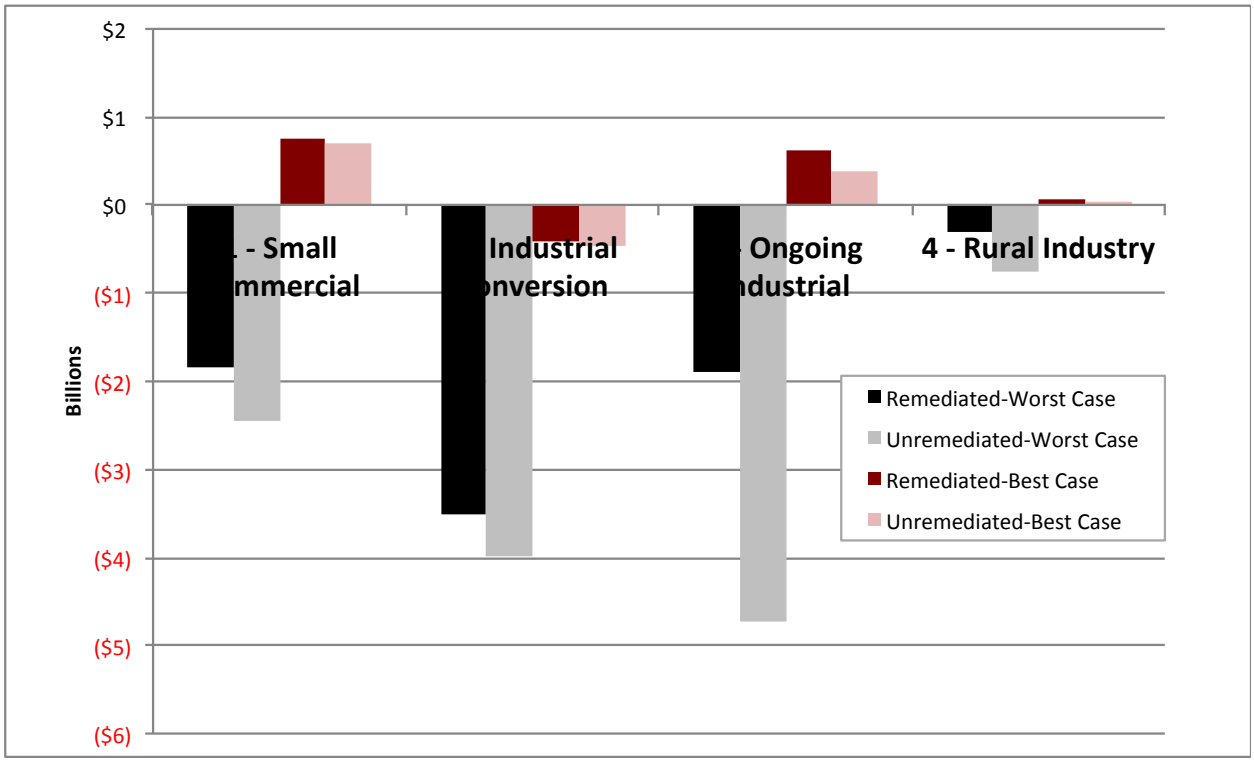


Source: ECONorthwest, 2012.

Figure 2 shows the same analysis, but with the per-acre costs multiplied across all acres of suspect and known DEQ brownfields in the region. It is a slightly different way of considering the data that highlights which typology has the biggest dollar gap. In essence, Figure 2 shows the total funding gap by typology. The figure shows that Type 3 - Ongoing Industrial has a relatively small per-acre financial gap, but there are many acres of the typology across the region.

Overall, only Type 2-Industrial Conversion has a financial gap under best-case scenario even if remediation costs are eliminated. The other typologies show no financial gap, with or without remediation, under best-case assumptions. This indicates that market rents for buildings is a key determinant of whether or not redevelopment is financially feasible.

Figure 2. Total market value minus development costs for known DEQ and suspect sites (with and without remediation), by brownfield typology, Portland Metro Area



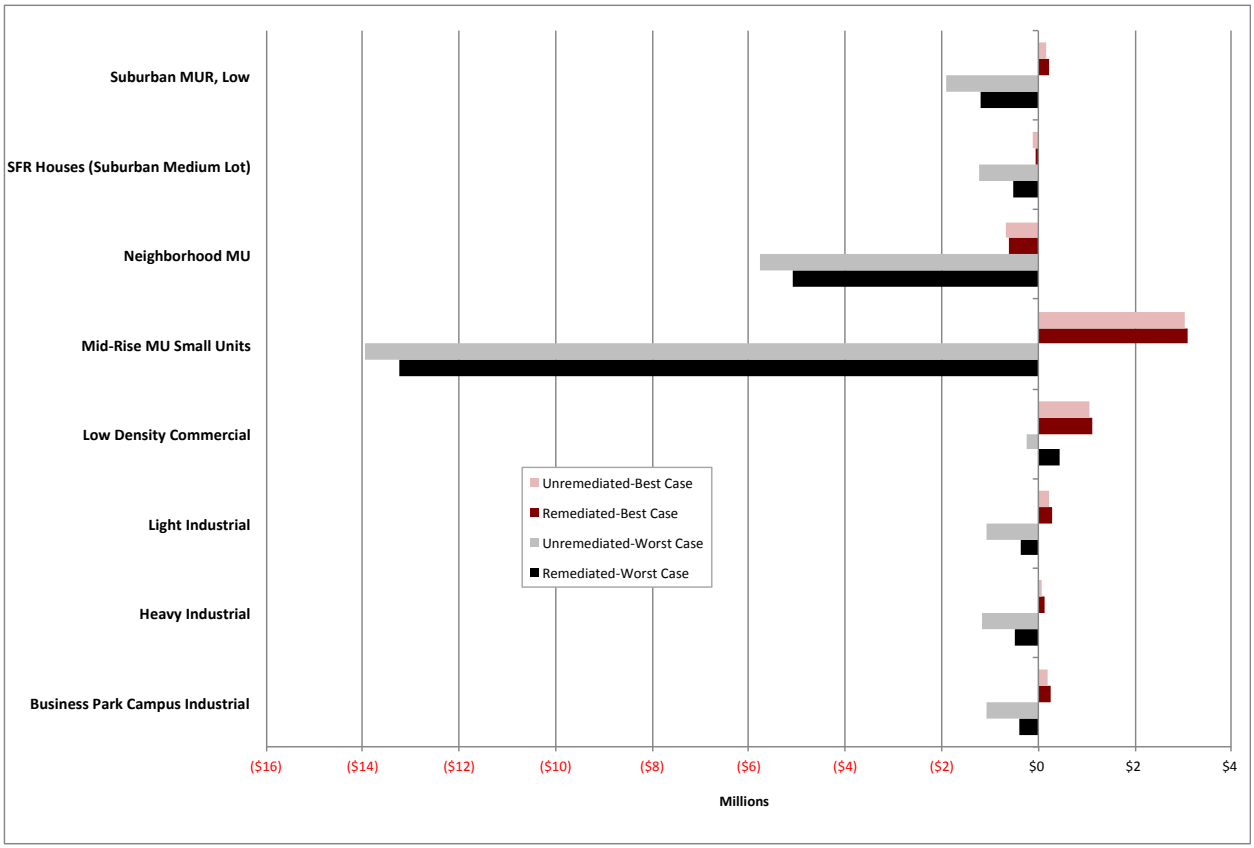
Source: ECONorthwest, 2012.

Figure 3 provides the same information by *development type*, per acre of redevelopment. Again, those development types that have the shortest bars – where all cases hover closest to the feasibility marker of $0 (development costs equal to market value)—are those development types that are most likely to have feasibility positively affected by an investment in brownfield remediation. Key findings:

- Those development types with the highest development costs (mid-rise mixed use, neighborhood mixed use) are the most strongly affected by overall market conditions. In these development types, remediation costs are a lower proportion of total development costs, and investment in remediation, on average, does not affect feasibility. Again, at the site level, this pattern may not hold. An individual site that has high remediation costs but has strong market fundamentals may become feasible if the remediation costs are removed. On average, however, these investments don't swing the needle.

- All other development types are more sensitive, and are more likely to be affected by investment in remediation.

Figure 3. Market value minus development costs (with and without remediation) average per acre of suspect brownfield sites, by development type, Portland Metro Area



Source: ECONorthwest, 2012.

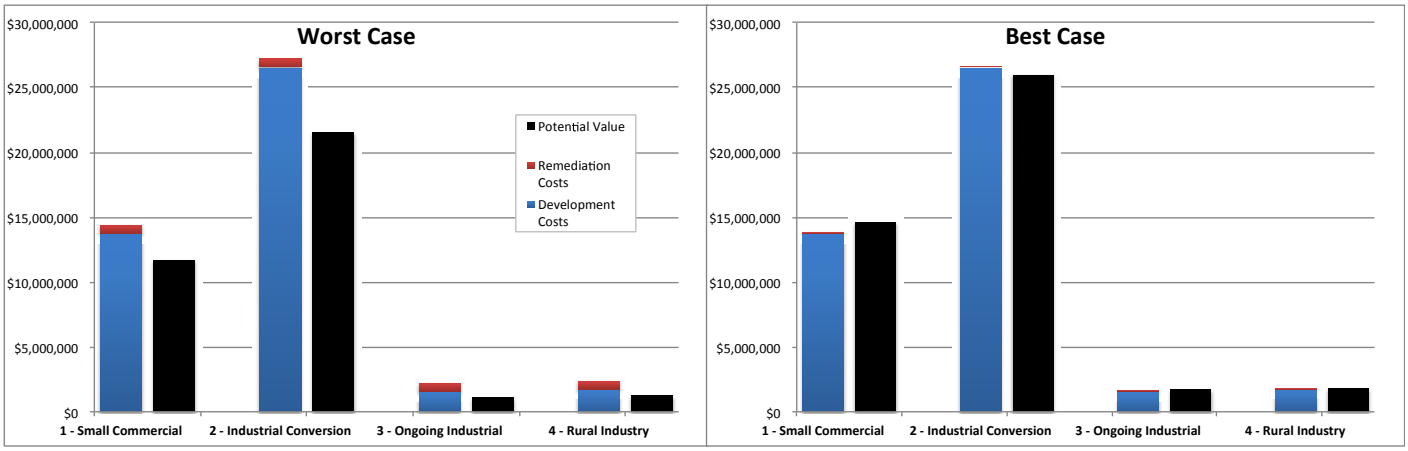
Figure 4 shows the per-acre development costs, remediation costs, and the potential market value. The left chart shows the worst-case scenario and the right chart shows the best-case scenario.

The blue bar shows the development costs, with the red portion representing remediation costs. The black bar shows the potential market value. The two charts

highlight some factors that affect how important remediation costs are to development and how those costs can vary.

- In Types 1 and 2, remediation costs make up a small portion of total development costs, even if the remediation costs are at the high end of the cost spectrum (worst case). Dense building prototypes dominate Types 1 and 2, leading to high per-acre development costs. If remediation costs are at the low end of the cost spectrum, the account for a very small portion of overall costs.
- In Types 3 and 4, remediation costs can make up a large portion of overall costs. If the remediation costs are high and market rents are low, the cost of remediation equals about one-third of all development costs. If, however, remediation costs fall at the low end of the cost spectrum and market rents are high, remediation costs are a small portion of total development costs.

Figure 4. Per-acre costs and potential development value, suspect brownfield sites, by brownfield typology, Portland Metro Area



Source: ECONorthwest, 2012.

4 RESULTS: SOCIAL AND ECONOMIC INDICATORS

Note: All research in this section of the report was completed by Redevelopment Economics, in collaboration with Maul Foster Alongi and ECONorthwest.

Brownfield remediation and redevelopment can create a wide range of environmental and social benefits to the Metro area beyond the fiscal and other benefits discussed in earlier sections of this memorandum. To begin to consider some of the additional benefits that may also accrue to the region as a result of a targeted brownfield remediation strategy, this analysis reviews national research that estimated these indirect environmental benefits, and applies them to the Portland Metro area:

- Lowered vehicle miles traveled (VMT) and lowered greenhouse gases due to locating economic activity in existing communities

- Conservation of rural lands and opens space accommodating growth within the envelope of developed areas
- Reduced infrastructure costs that may have been required to accommodate alternative development
- Reduced runoff and improved water quality because of greater density than alternative development patterns
- Proximity of brownfields to disadvantaged populations

The report presents order of magnitude estimates for each of these measures; national statistics have been adjusted when possible to account for Oregon's unique growth management framework, but more specific and rigorous research that is specific to Portland would be required to fully understand the magnitude of environmental outcomes that might be associated with brownfield redevelopment in the Metro area. Nonetheless, the analysis here is a helpful starting place for a conversation around environmental and social justice effects.

4.1 AUTOMOBILE GREENHOUSE GAS EMISSIONS

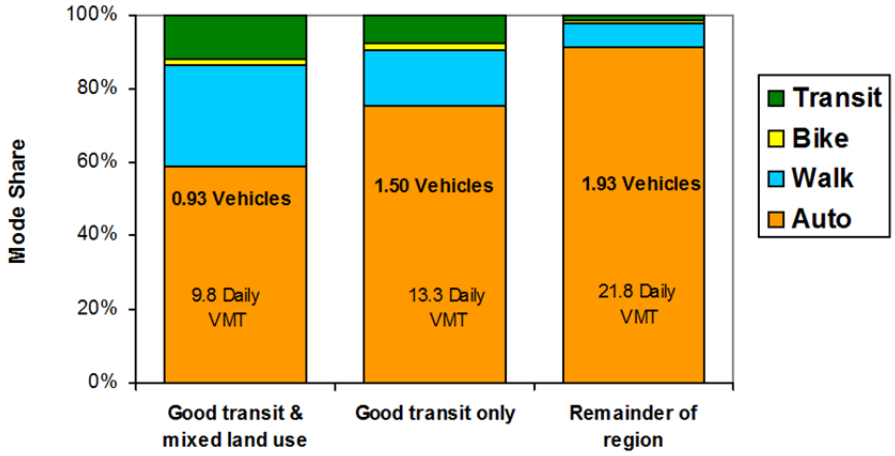
A recent US EPA study found that, on average, VMT and carbon dioxide (CO_2) emissions associated with brownfield redevelopment projects are 32% – 57% lower than typical greenfield, suburban development patterns.[9] The finding is reflective of national research that correlates VMT and CO_2 reduction with urban densities, mixed uses, access to job centers, street connectivity, and access to transit.

Research focused on the Portland metropolitan area (not specific to brownfields) supports this, finding that development sites with good access to mass transit and a mix of use types result in approximately 50% lower VMT and CO_2 than areas that rank low for those same two factors (See Figure 5).[10]

[9] US Environmental Protection Agency, Air and Water Quality Impacts of Brownfields Redevelopment, September, 2011.

[10] Todd Litman, "Can Smart Growth Policies Conserve Energy and Reduce Emissions?" Victoria Transport Project, *Center for Real Estate Quarterly Journal*, May 2011. Available here: www.vtpi.org/REQJ.pdf.

Figure 5. Transit Oriented Development Impacts on Per Capita Vehicle Ownership and Vehicle Miles Traveled



Source: Litman 2011.

As with the other social and environmental indicators discussed in this memorandum, more specific research would be necessary to determine this research transfers to brownfield redevelopment in the Metro area; nonetheless, it does provide a starting point for quantifying the effect on CO_2.

Because the Portland metropolitan area has stronger growth controls than is typical across the country, Redevelopment Economics applied the lower end of the EPA estimates were used to estimate the potential VMT and CO_2 reductions related to redevelopment of brownfields (32% reduction). Though the factors affecting VMT are somewhat different than in other regions in the country, for the purposes of an order of magnitude estimate, this analysis assumes that redevelopment of the Portland brownfields inventory has the potential to produce an industrial development pattern that will reduce VMTs and CO_2 by the same percentage: 32% reduction relative to alternative development areas.

Applying these research findings to the inventory of potential brownfield sites in the Metro area suggests that redevelopment of 100% of the sites would reduce CO_2 to remove the equivalent of taking about 30,000 cars off the road.

4.2 PROTECTION OF RURAL LAND AND OPEN SPACE

As with other types of infill development, redevelopment of brownfield properties reduces pressure to build on undeveloped "greenfield" land, including open spaces and productive farmland in the urban and rural reserves that surround the Portland Metro area. One national study estimated that one acre of redeveloped brownfield property

absorbs growth that would otherwise consume 4.5 acres of undeveloped land.[11] This comparison is driven largely by the higher density that urban infill development projects can achieve. Generalizing this national finding to the Metro inventory of 6,288 acres of potential brownfields would result in "saving" a maximum of 28,000 acres of open space and rural land.

This estimate, based on national figures, probably overstates the potential benefit in the Portland metro area given the requirement to maintain industrial uses in the industrial/employment sanctuaries, and the fact that development on the urban fringe of the Portland metro area often occurs at a higher density than it does at the fringes of other regions across the country. Nonetheless, these estimates do underscore the very real potential for brownfield redevelopment to reduce the development pressure on the urban fringe.

4.3 INFRASTRUCTURE COST SAVINGS

Redevelopment of brownfields typically allows development to connect to existing infrastructure rather than requiring construction of new or expansion of existing roads, water, and sewer lines. When existing infrastructure has excess capacity, infill and redevelopment can allow local governments to take advantage of this excess capacity and reduce the need to build new infrastructure.

Redevelopment Economics cites two national research findings have quantified this connection between infrastructure costs and infill development, and can serve to create a basis for estimating infrastructure savings attributable to brownfields redevelopment in the Portland area.[12] One study by the Center for Neighborhood Technology estimates the differential between greenfield and infill development at five to one or $49,000 per dwelling unity (in 2012 dollars).[13] Another estimates a more modest 45 to 50 percent savings, or $31,500 per dwelling unit (assuming 15-dwelling units per acre for infill development and 3 to 5 units per acre for greenfield development).[14]

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[11] George Washington University, "Public Policies and Private Decisions Affecting the Redevelopment of Brownfields: An Analysis of Critical Factors, Relative Weights and Areal Differentials," 2001, http://www.gwu.edu/~eem/Brownfields/

[12] For a more comprehensive analysis of the research on infrastructure costs within the brownfields vs. greenfields construct see: Evans Paull, "Infrastructure Costs, Brownfields vs. Greenfields," Excerpt, "Analysis of the Economic, Fiscal, And Environmental Impacts of the Massachusetts Brownfields Tax Credit Program," Redevelopment Economics, June, 2012. See: http://redevelopmenteconomics.com/yahoo_site_admin/assets/docs/Infrastructure_Costs_-_brownfields-greenfields_final2.213114938.pdf

[13] Scott Bernstein, "Using the Hidden Assets of America's Communities and Regions to Ensure Sustainable Communities." Center for Neighborhood Technology, 2003, http://www.cnt.org/hidden-assets/pt1f.html

14 James Frank, "The Costs of Alternative Development Patterns: A Review of Literature." Washington, DC. Urban Land Institute. 1989.

National research on this topic cannot easily be applied to any particular specific site, or even to a specific region, without at least acknowledging some of the site-specific and local characteristics that could result in different outcomes:

- It is important to note that the location of the redevelopment and increased density and site characteristics can greatly affect these outcomes. Infill and redevelopment is only helpful as an infrastructure cost savings mechanism if it is located such that it doesn't trigger major new systems (a new sewage treatment plant, or a new arterial or highway to accommodate additional density, for example). In some locations, infill development may actually be more costly than greenfield redevelopment from an infrastructure perspective.

- Life cycle costs of infrastructure are rarely considered in analyses of this type. In some cases, building new infrastructure with newer and more sustainable technologies may be less expensive, when ongoing maintenance and operations costs are also accounted for, than the ongoing maintenance and upgrading of existing infrastructure over time.

- Growth management policies can also affect the outcome. In the Portland Metro area, there is very little development of any significant density outside of UGBs. This has resulted in a situation where urban "greenfield" development on the fringe and in UGB expansion areas (such as Damascus and North Bethany) is extremely expensive because all of the backbone infrastructure (water, sewer, and transportation arterials) has to be provided to support development. In metro areas with less strict growth management controls, some of this backbone infrastructure may be available to greenfield development, reducing the cost savings relative to infill development.

Collectively, it is difficult to determine which direction these caveats might push Metro area cost savings relative to national norms. However, to begin to consider what infrastructure cost savings might be realized, this research applies the more conservative estimate of 50% savings to the Metro area, and finds that redevelopment of the full inventory of potential brownfields in Metro could save a maximum of $480 million in public infrastructure investment that would have otherwise been required to accommodate growth on greenfields.

4.4 STORM WATER MANAGEMENT AND WATER QUALITY

Studies have also found that dense urban development can result in less storm water runoff than comparable scale of suburban development. EPA studies indicate that brownfields and similarly dense redevelopment projects have been found to reduce run-off by 47 to 62 percent relative to sprawl development patterns.[15] Given the allowed

[15] US EPA, ibid.

densities in the Metro area, it can be assumed that redevelopment of brownfields in the City can reduce stormwater impacts by a similar range.

4.5 SOCIAL INDICATORS

The benefit associated with cleanup and redevelopment of Brownfields includes the protection of present and future public health, safety, and welfare. Oregon rules require consideration of existing and reasonably likely human health impact as a result of exposure to hazardous substances at these sites. Cleaning up properties to levels that are considered protective of human health results in remedies that ensure that individual's health are not adversely affected, or that populations are not exposed to hazardous substances that could result in an increased risk of serious degenerative illness.

Geospatial analysis of the existing DEQ sites database has shown that the location of brownfield sites appears to be strongly correlated with communities designated as underserved by Metro's Equity Composite, an analysis which highlights areas that simultaneously have a high underserved population (non-white, elderly, low-income, non-English speaking, youth), a low density of essential services (food, essential retail, health, civic, financial/legal), and low proximity to non-auto transportation (conducted originally for the Regional Flexible Funding Allocation). There is no documented nexus between brownfields and underserved populations; however, the risk to human health presented by environmental contamination can clearly be seen as an additional challenge faced by underserved communities in the region.

4.6 ECOLOGICAL HEALTH

Approximately 50 percent of the DEQ sites are in, or within 1,000 feet of, sensitive environmental areas, such as wetlands and streams, as designated by Title 3 and Title 13 of the region's Urban Growth Management Functional Plan. Brownfield redevelopment may be of particular benefit to the environment for properties that are situated near areas of high ecological value (e.g., estuaries, rivers, and wetlands). The remediation of environmental contamination on brownfield properties can help protect from adverse impacts to ecological receptors, including threatened or endangered species, as a result of exposure to hazardous substances.

5 KEY FINDINGS

- Overall and on average, the analysis showed that the majority of sites cost more to develop *even if remediation costs are not included* than the estimated market value, an indicator that the sites are not likely to redevelop without market intervention. Those development types with the highest development costs (mid-rise mixed use, neighborhood mixed use) are the most strongly affected by overall market conditions.

- For certain parcels however, where market fundamentals are strong but the cost of remediation is high, an investment in reducing or eliminating the cost of remediation could be the variable that affects feasibility and generates redevelopment. The policy challenge will be to identify those parcels where the investment in remediation will make the difference and create the fiscal and redevelopment outcome that is desired.

- While more research would be needed to fully evaluate the magnitude of environmental and social effects associated with redevelopment of brownfields rather than developing on greenfields,

APPENDIX C

BROWNFIELDS CASE STUDIES

BROWNFIELD CASE STUDY ANALYSIS

1.1 Case Studies Overview

To provide on-the-ground experience as a foundation for this Regional Brownfield Scoping Project, research was conducted on select case study brownfield projects in the metro region and across the state. The study collected quantitative data on costs of cleanup and economic impacts of redevelopment, along with qualitative information on lessons learned, common challenges, and characteristics of successful projects.

Based on input from the Technical Review Team, Metro staff, and the consulting team, a set of 29 representative brownfield properties were identified and examined as case studies. Site selection was conducted on a statewide scale to draw from a greater regional perspective and to illustrate the full breadth of opportunities and challenges. Careful consideration was taken to incorporate a wide range of site characteristics, including size, location, use, and redevelopment strategy.

Preliminary public records research was conducted for each of the sites. Sources references included the Oregon Department of Environmental Quality (DEQ) database of contaminated sites, Metro's regional land use information system (RLIS), and city and county database websites. More detailed information was collected through interviews and written surveys of people directly involved with the case study projects including private developers, owners, and public agency staff.

1.2 Methodology

The case study analysis was overseen by the brownfield project Technical Review Team (TRT). The TRT includes a range of policy experts, technical professionals, public agency staff, private sector professionals, and non-profit organizational leadership. TRT members were asked to identify and recommend contaminated sites that have undergone, are currently undergoing, or plan to undergo a cleanup and redevelopment process.

Once case studies were identified, staff conducted preliminary public records research for each of the sites. Sources references include the DEQ website, ECSI database, PortlandMaps, and County GIS database websites.

A survey questionnaire was designed to collect additional information from a primary contact involved in site cleanup and/or redevelopment. At least one individual for each site was contacted to inform them of the study and request participation in the survey. Staff attempted to contact an even share of private and public sector participants. Electronic surveys were administered to collect basic, factual information for each case study to allow

for objective comparison and categorization into brownfield typologies. Follow-up calls were conducted in some cases to elicit additional responses.

Site specific attributes collected by the survey include the following :

SITE INFORMATION	CLEANUP	REDEVELOPMENT
• Location	• Extent of contamination (as % of site)	• Type of reuse
• Ownership (past and present)	• Class of contaminates (metals, petroleum, etc)	• Intensity of development
• Acreage	• Contaminated media (soil/groundwater)	• Jobs yielded (temp. and permanent)
• Historical use	• Regulatory Pathway (VCP, ICP, PPA, Order)	• Redevelopment costs
• Current use	• Cost of cleanup	• Funding sources (grants, equity, loan)
• Property value (prior/post)	• Funding sources	• Length of permitting process
• Metro 2040 and URA designations (if any)	• Length of cleanup process	• Level of other local investments
	• Funding sources available (grants, claims, loans, etc.)	

Participants were also asked to provide qualitative comments on their overall experience with the project, including lessons learned, difficulties, and successes. Responses were intended to identify opportunities and challenges associated with financial and regulatory issues.

Case Study 1— Case Study 1 is located in inner Northeast Portland. The property was formerly the site of a metals reclaiming company and later an auto repair garage. These previous uses left more than half of the 0.7 acre site with soil contamination, including metals, PAHs, and PCBs. PDC restored the site into high density residential using tax increment financing and federal EPA grants.

Case Study 2-Case Study 2 is a downtown property located in Central Oregon and is the site of a former gas station. The redevelopment effort included the 0.3 acre gas station, as well as the entire city block which had

been impacted from groundwater contamination relating to gasoline and associated VOCs. The City redeveloped the site into government offices using Oregon DEQ Orphan Site Account funds and contributions from liable parties.

Case Study 3—Case Study 3 is the site of a former gas station, located in Western Oregon off Highway 101. The 0.9 acre site had petroleum related contamination in both the soil and groundwater. The City is redeveloping the site for public use as a parking lot with restrooms, picnic tables, and bike racks. The project is a result of a community visioning process and was realized through volunteer work, contributions from the liable party, and a Prospective Purchaser Agreement.

Case Study 4—Case Study 4 is a former battery recycling facility in North Portland impacted by lead contaminants in the soil. The small 0.3 acre site was redeveloped into offices for a neighborhood organization, which provides employment services and other community development programs. Financial assistance for the project was provided through the Portland Brownfield Program.

Case Study 5—Case Study 5 is a mixed-use, transit oriented development in North Portland. The half-acre site was formerly occupied by a gas station and auto repair shop, with petroleum-related soil contamination. The site was redeveloped via the Portland Brownfield Program.

Case Study 6—This small site was redeveloped into a mixed-use development by a religiously affiliated social services organization. The site struggled with soil contamination issues related to methane, heavy metals, and petroleum as a legacy of the site's formal industrial use. The project received financial assistance from the Portland Brownfield Program.

Case Study 7—Case Study 7 is located in Portland's Old Town and is a former rail yard. The property had issues with soil contamination that included lead, arsenic, and petroleum product. Portland Development Commission redeveloped the site into office space and housing, with associated open space, using tax increment financing.

Case Study 8—Prior to redevelopment, Case Study 8 was an abandoned rail yard on the edge of Portland's Old Town and Pearl Districts. The site suffered from soil contamination and was redeveloped with a mix of uses through the use of tax increment financing and financial contributions from liable parties.

Case Study 9—Case Study 9 is a six-acre site located in outer Northeast Portland. The property was previously a site for agricultural chemical formulation, leaving behind associated soil and groundwater contamination. Redevelopment occurred through the use of a Prospective Purchaser Agreement, private equity, and a public low-interest loan from Business Oregon.

Case Study 10—Case Study 10 is located in the downtown of a Portland metropolitan suburb with nearby light rail access. The 3.6 acre site was once

occupied by a dry cleaners and had soil contamination related to solvents, PCE, and degradation products. The site has been restored through private equity, loans from Business Oregon, and an EPA innovated technology grant. The future use will likely remain commercial, but no redevelopment has occurred to date.

Case Study 11—Case Study 11 is located in industrial North Portland, along the Columbia Slough. The eight-acre site was almost entirely contaminated from previous uses related to oil processing and petroleum bulk storage. The cleanup has been in process for twenty years and is a result of the site assessment program. No public funding has been used for its restoration. The site has not undergone redevelopment, but will be divided for multiple uses.

Case Study 12—Case Study 12 is a 50-acre site located in Oregon's Rogue Valley. Only a small portion of the full site experienced contained contamination, both soil and groundwater, due to previous on-site harvesting and production of hops. Cleanup actions have been funded through grants via the Oregon Brownfields Redevelopment, American Recovery Reinvestment Act, and Oregon Coalition Brownfield Cleanup funds.

Case Study 13—Case Study 13 is an industrial parts repair and custom parts manufacturer in industrial North Portland along the Columbia Slough. The majority of the approximately two-acre site suffered from both soil and groundwater contamination due to its adjacency to an old construction debris landfill and oil re-refining facility. The owner plans to make property improvements on-site, but no major redevelopment is anticipated.

Case Study 14—Case Study 14, located in Lane County, is a 220-acre site once occupied by a timber mill. Historical operations led to soil and groundwater contamination on about half of the site. The City used public low-interest loans and public grants to restore the sites. Redevelopment plans, currently underway, include revitalizing industrial uses at site of a former mill, and residential townhomes along the adjacent river.

Case Study 15—Case Study 15 is located in Linn County, and is the result of a collaborative effort between City staff, Oregon DEQ, the local Urban Renewal Area, and developers. The site was an operating foundry and pattern shop from the 1930s to the 1960s. Historical uses had left the site contaminated and blighted in the City's downtown core. Today, the site is a mixed-use development containing apartments, townhomes, and office space.

Case Study 16—Case Study 16 is located in Southeast Portland, just east of I-205. The site contained soil and groundwater contamination resulting from previous site uses, including storage, refinishing, and a sales facility for grocery and retail store fixtures. The project has received financial support from various public sources including the Portland Brownfield Program and EPA's Targeted Brownfield Assessment (TBA).

Case Study 17—Case Study 17 is located in industrial North Portland, along the Columbia Slough. The historical uses of the 15-acre included truck and

trailer storage, liquid freight handling, and tanker cleaning services. A local trucking and storage container business purchased the property using a Proposed Purchaser Agreement with DEQ to revitalize the property and expand business operations.

Case Study 18-Case Study 18 is located in Portland's South Waterfront District. The neighborhood is a hot bed for redevelopment, with access to public transportation and other urban facilities. The former shipyard site had been used for ship dismantling, scrapping, and metals recycling operations. The 8-acre site was redeveloped by the owner via the VCP program. Redevelopment plans are still in development.

Case Study 19—Case Study 19 is located in an industrial area of Northeast Portland, just west of Portland International Airport. The property had been previously occupied by a construction company, medical testing laboratories, a drum recycler, and airline services, leaving petroleum related contamination, chlorinated solvents, and PCP in soil and groundwater. Remedial action began in the fall of 2010 with the installation of a bioremediation system.

Case Study 20—Case Study 20 is a locally owned and operated coffee shop that was once the site of a gasoline service station. Soil and groundwater contamination cleanup was funded through the DEQ Underground Storage Tank Orphan Site Program and a Prospective Purchaser Agreement. The site's downtown location in a metropolitan city contributed to the site's success.

Case Study 21—Case Study 21 has been nationally recognized for the collaboration between public and private partners and has set a new standard for industrial brownfield redevelopment. The property was formerly the site of an aluminum plant and was purchased by the Port of Portland via a Prospective Purchaser Agreement. The effort required the remediation of 700 acres of industrial property. Since its redevelopment, a national logistics services company has established a warehouse onsite, employing approximately 800 workers. Once the site is fully built out, the Port estimates the project will yield nearly 3,500 jobs.

Case Study 22—Case Study 22 is an environmentally friendly biofuel station, once the site of a gasoline service station. The site is located south of Eugene along I-5. The site's petroleum contamination was restored with public assistance from the Brownfields Cleanup Grant, Oregon Brownfields Revolving Loan Program, and the Oregon Department of Energy Sustainable Loan Program.

Case Study 23—Case Study 23 was a former automotive service station located in the downtown of a Northwest Oregon town**.** The entire city block required environmental restoration work to address petroleum relation soil and groundwater contamination. The site is being restored using funds from the American Recovery and Reinvestment Act and DEQ's Leaking Underground Storage Tank Program. No redevelopment plans are in place to date.

Case Study 24—Case Study 24 is a project lead by the City of Portland's Housing Bureau in Southwest Portland. The property had been the site of a night club since the 1950s and had petroleum-related contamination in both the soil and groundwater. The redeveloped site is a mix of apartments and townhomes, including senior and workforce housing. Site construction includes a variety of green infrastructure and low impact development features including green roofs, rain gardens, and pervious pavement.

Case Study 25—Case Study 25 is a Portland Harbor Superfund site located in industrial Northwest Portland**.** The site was previously the location of a chemical producer until 2001 and has a complicated set of soil and groundwater contamination issues. Some initial cleanup efforts have been completed, though property owners remain in negotiation with the EPA to determine the details of official liabilities and cleanup obligations.

Case Study 26—Case Study 26 site is located along the Columbia Slough in North Portland. The site was developed in the 1940s as a calcium carbide manufacturing plant and was plagued with PAH, cyanide, and metals contamination in the soil.

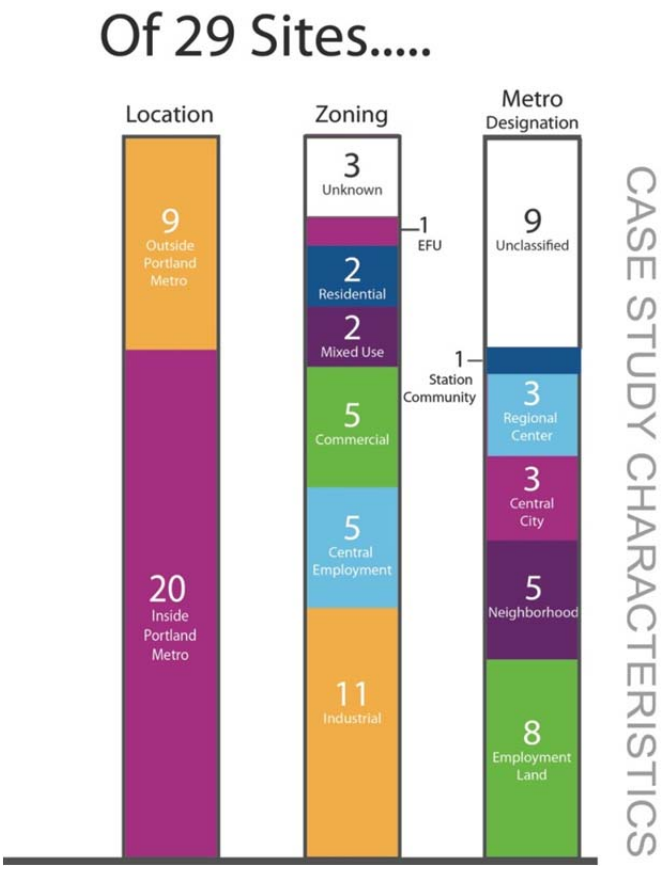
Case Study 27—Case Study 27 is located in the Columbia River Gorge and was the site of aluminum reduction processing over the course of multiple decades, beginning in 1958. The site was designated a federal Superfund site in 1987 and delisted in 1996. Since, cleanup activities have continued to address remaining contaminants, including cyanide and fluoride in both soil and groundwater. Site cleanup is largely completed and awaiting NFA designation. Upon completion, NW Aluminum will be one of largest industrial shovel ready site in Oregon.

Case Study 28—Case Study 28 is just north of the City of Corvallis**.** The property is home to a former plywood mill site. Soils and groundwater in the former plywood mill area are contaminated with low levels of pentachlorophenol. The site has undergone site investigation and a Targeted Brownfield Assessment.

Case Study 29—Case Study 29 is 25-acre site located in North Portland in the City's industrial sanctuary. The site's previous use as a sawmill and industrial distribution site left lead contamination in the soil and groundwater, as well as PAH in soil. Sediment samples revealed that the site is a source of contamination for the Portland Harbor Cleanup efforts are further complicated by an underground plume originating from the contamination of an adjacent property.

Data Summary

The case study analysis evaluated 29 contaminated sites, more than half of which yielded qualitative survey responses and personal perspectives. A summary of general site characteristics are listed in the chart below:



Survey Limitations—Several challenges emerged during the case study research. First, understanding the trends of brownfield cleanup projects generally involves collecting sensitive and sometimes confidential information. Even after cleanup, property owners are often reluctant to divulge information that is not already in public record. Financial data was particularly difficult to collect.

The complexity and number of parties involved in a cleanup project makes acquiring a full picture difficult. In ideal cases, both public and private sector entities were engaged to provide feedback. However, private property owners were often difficult to contact or reluctant to participate. Public agency staff were more responsive to information requests, but had limited time and resources to volunteer for completing surveys.

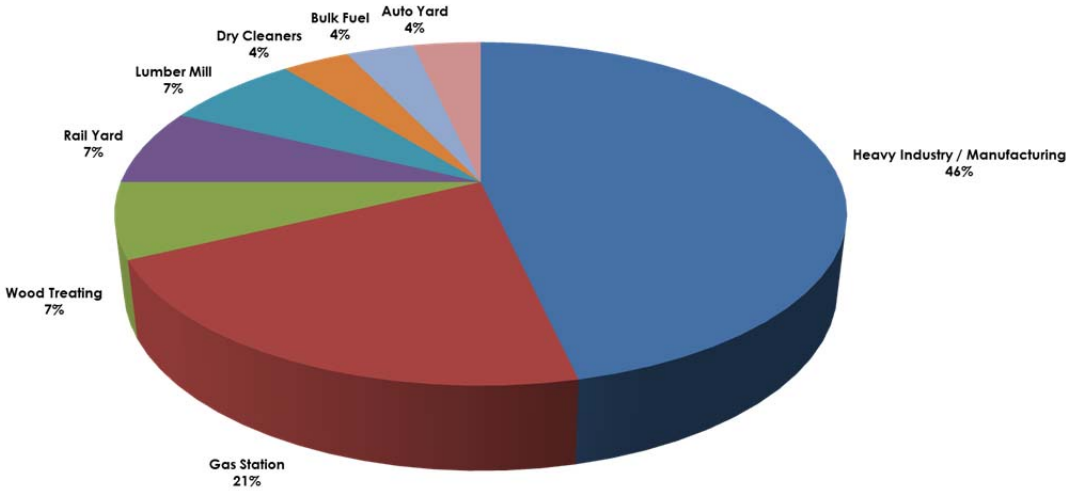
1.3 Case Study Findings

The case study research provided valuable, consistent, and informative results despite the inherent limitations. These case studies provide important information to characterize brownfield properties, the challenges they face, and key factors that lead to successful cleanup and redevelopment.

1.3.1 Brownfield Contamination

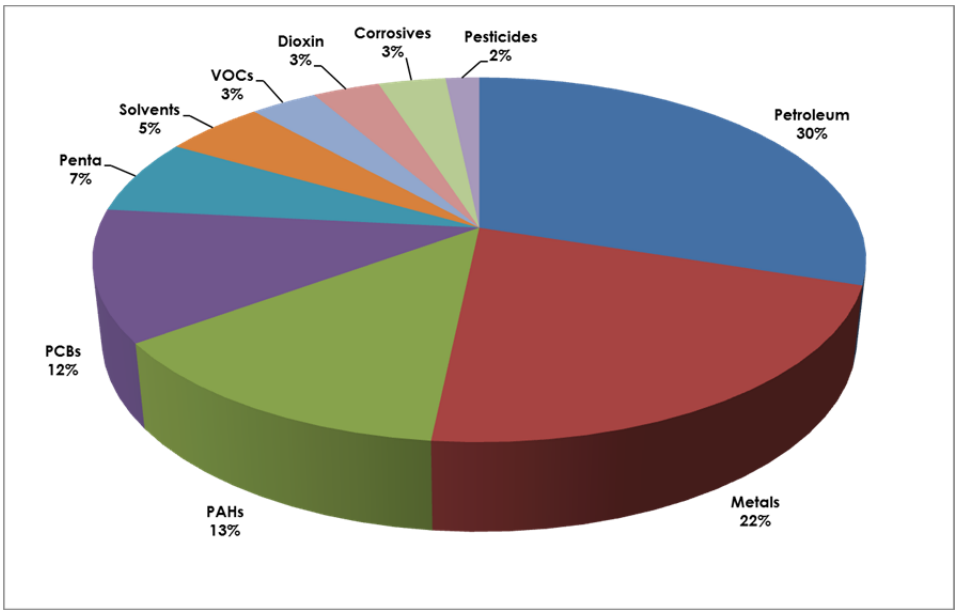
Contamination on brownfield properties is commonly related to historical activities that occurred before the passage of modern environmental laws. The case study projects represent a wide range of past uses and contamination types that are representative of the industrial history of the Portland Metro region. The most common historical uses on the case study properties were heavy industry/manufacturing and gas stations, representing 46 percent and 21 percent of the case study sites respectively (See figure 2-1). The industrial/manufacturing category broadly includes processing of raw materials and chemicals, machining, and fabrication.

Figure 2-1. Historical Uses of Case Study Properties



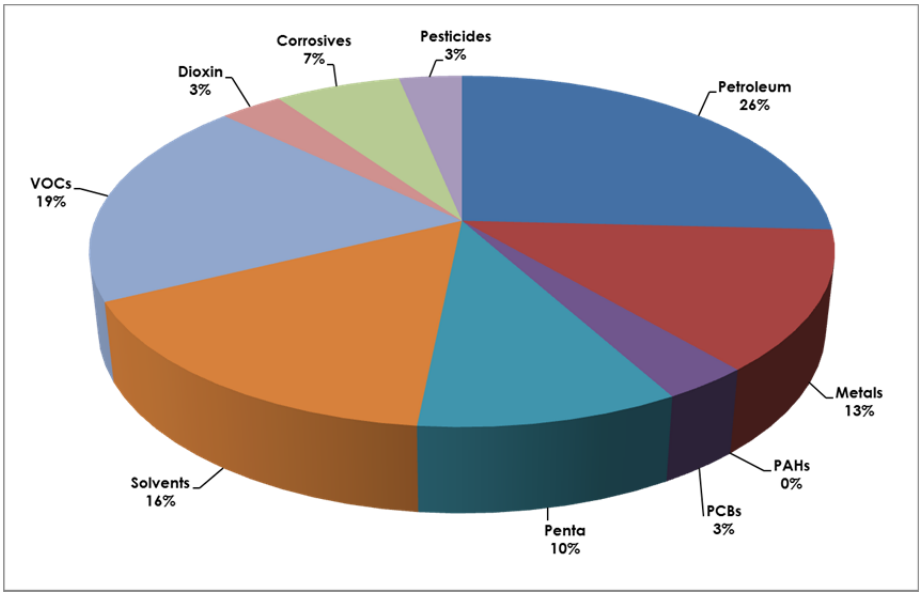
Contamination on the identified brownfield properties is commonly found in soil, but can also occur in groundwater and river sediments. The most common contaminants in soil in the case study projects were petroleum, metals, polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs). The hazardous materials are associated with the use of heavy machinery and automobiles. Petroleum and PAHs can be released from storage tanks, spills, or leaks from machinery. Metals contamination in soil can occur from the friction of machinery parts. (See Figure 2-2)

Figure 2-2: Soil Contaminants in Case Study Properties



Common contaminants in groundwater include petroleum and petroleum-related compounds including PAHs along with volatile organic compounds (VOCs) and solvents. These compounds tend to be soluble and leach into groundwater, while metals tend to bind to the soil. See Figure 2-3

Figure 2-3: Groundwater Contaminants in Case Study Properties



The prevalence of these contaminants is consistent with the DEQ database of contaminated sites and aligns with findings of similar studies in Washington State and nationwide.

1.3.2 Cleanup of Brownfields

The case study projects are representative of the range of complexity and cost of brownfield remediation. The self-reported time to complete site assessment and cleanup varied from 1 to 23 years, with an average of 8.3 years and a median of 5.5 years (16 of 29 sites reporting). The median duration aligns well with analysis of the DEQ database of contaminated sites that indicates an average of 4.5 years to complete the cleanup process in the agency's Oregon Northwest region (as compared to 5.5 years in the Eastern and 3.5 in the Western regions of Oregon). Despite that, many sites in the DEQ database do complete the cleanup process in less than 2 years. This is generally considered to be a longer timeframe than what is experienced in other regions of the nation.

The duration of the cleanup process can be elusive to pin down because many sites have long histories and periods of activity and inactivity. In addition, survey respondents may have varying perspectives on what marks the beginning or end of the process. Survey respondents were also asked to identify what they perceived to be the longest step in the cleanup process. The most common responses were: site assessment, conducting the actual cleanup action, negotiations with the regulatory agency, and securing financing.

Like the duration of the cleanup, the reported costs of cleanup also ranged widely from $50,000 to over $60,000,000 for one very large and complex site. With the exception of the outlier, total cleanup of the case study properties had a mean average of about $500,000 and a median of $2,000,000.

Brownfield Success Story: Port City, Portland

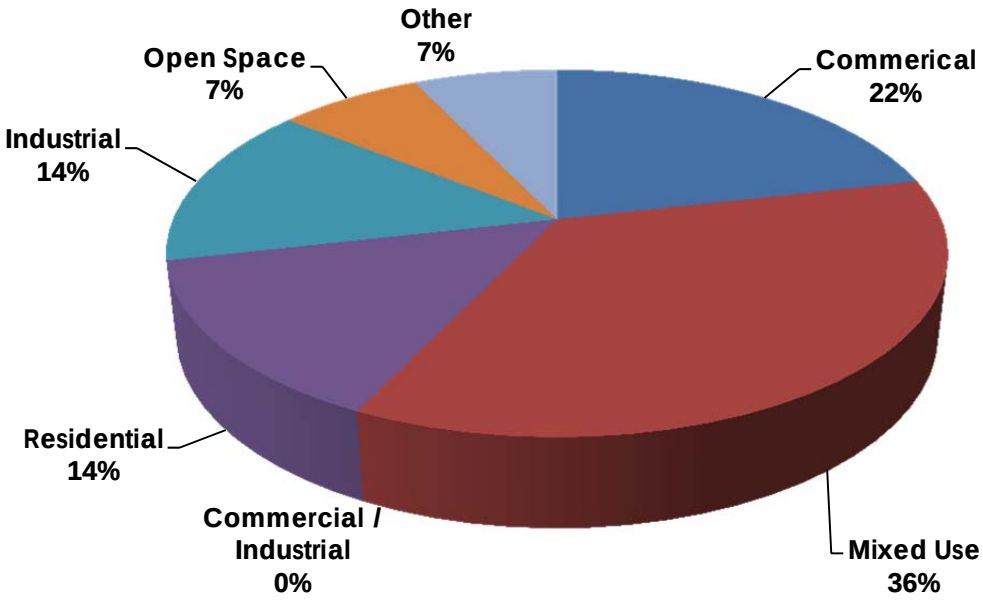
The Port City site is a former battery recycling facility impacted by lead contaminants in the soil. The small 0.3 acre site was redeveloped into offices for the Port City Development Center, an organization which provides employment and other community development services. Financial assistance for site assessment and characterization was provided through the Portland Brownfield Program.

Remediation of the six gas station case study sites ranged from $50,000 to $1,200,000. Removing one outlier, cleanup costs for the gas station properties had a mean average of about $315,000 and a median of $400,000.

1.3.3 Redevelopment of Brownfields

Approximately half of the case study projects have successfully been redeveloped to a new use. The most common redevelopment uses were mixed use and commercial (See figure 2-2). It is important to note that over 50 percent of the redevelopment projects represent a change in use type and zoning. These use changes were predominantly from an industrial to a commercial or mixed use.

Figure 2-2. Redevelopment Uses of Case Study Properties



The change in use from industrial to commercial and mixed use appears to be a major factor in the financial feasibility of brownfield projects. Though sufficient data to conduct this analysis was limited to just four case study projects, the findings have important implications. The cost of cleanup exceeded the value of the land in its historical use by 13-192 percent in three of the case studies (See table 2-2). The cleanup cost was only 3 percent to 43 percent of the land value after redevelopment. The potential to generate sufficient value to offset the cost of remediation is fundamental to the financial feasibility of brownfield projects. The change of use appears to be a common and effective strategy that creates value and drives redevelopment of certain brownfields. This analysis underscores the reported difficulty of redeveloping industrial brownfields for continuing industrial use.

Table 2-2. Remediation to Redeveloped Value

Case Study Project	Cost of Environmental Cleanup as a Percentage of the Land Value Before Remediation	Cost of Environmental Cleanup as a Percentage of Land Value After Remediation and Redevelopment
1	67%	30%
4	36%	7%
6	13%	1%
7	134%	6%
8	162%	3%
9	192%	43%

In cases where change of use has been successful, the case study projects demonstrate the potential for brownfield redevelopment to drive employment growth. Job creation figures self-reported in the case study totaled over 10,000 jobs (both construction and permanent jobs). For individual brownfield sites, the responses ranged from 2 to 700 permanent new jobs per site (with greater numbers projected for the future on sites not yet fully built out). These numbers translate to an average of 23 jobs per acre and median of 10 jobs per acre. The job creation figures compare favorably with Oregon State Department of Land Conservation and Development estimates for commercial and light industrial employment density, of 12-20 and 10-15 jobs per acre, respectively.

1.3.4 Lessons Learned and Keys to Success

Several key themes emerged from interview and qualitative survey responses from the case studies regarding lessons learned and keys to success.

Financing—Cleanup and redevelopment projects require significant capital and the projects frequently hinge on access to financing. For the case studies, this often involved accessing public grants or loans, claims on historical insurance policies, or finding a commercial lender that was knowledgeable about brownfields. Difficulty securing financing was commonly cited as a limiting factor for projects.

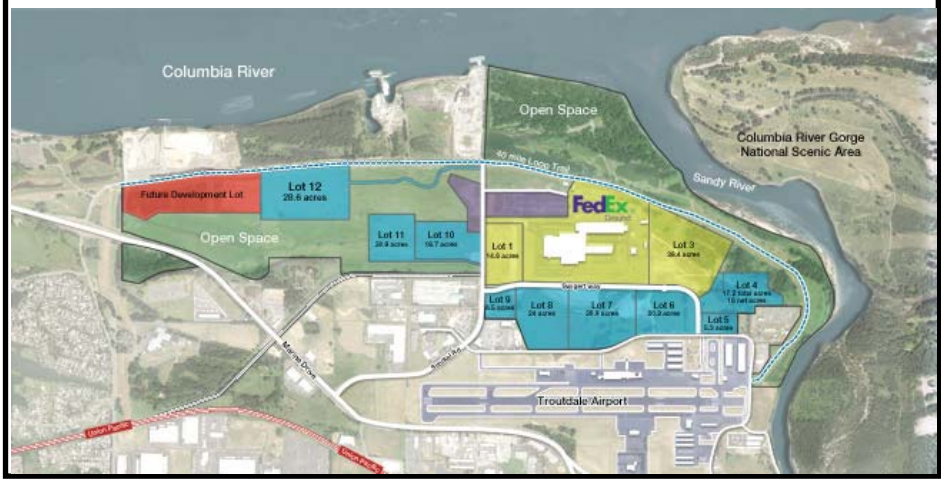
Coordination and Teamwork—Several case studies point to the importance of the property seller, buyer, regulatory agency, and other stakeholders working together toward a common goal as key to success. This often included early involvement and understanding by the regulatory agency of financial limitations. In contrast, tension and disagreement between these parties was cited as reasons why projects were typically delayed.

Land Use Transition--Transition from industrial use to commercial or mixed use was fundamental to the financial success of many projects. The change in use drives a higher land value that can then offset the remediation costs. Maintaining historically industrial sites as a similar land use is a challenge. Since industrial properties tend to have a constrained value per square foot, the financial gap between cleanup costs and redeveloped value can be significant. Therefore, the study takes a critical eye toward identifying solutions to address the need for maintaining industrial and employment lands in the region.

Liability and Risk—Defining the extent of contamination and remediation cost along with strategies to minimize risk was critical to the success of several projects. Risk management tools provided through the Voluntary Cleanup Program, Prospective Purchaser Agreements, and the willingness of the DEQ or Business Oregon to dedicate resources was key to the success of several case study projects

Brownfield Success Story: Troutdale Reynolds Industrial Park

The Troutdale Industrial Park has been a huge success and nationally recognized for the collaboration between public and private partners. The property was formerly the site of an aluminum plant and was purchased by the Port of Portland via a Prospective Purchaser Agreement (PPA) with Oregon DEQ. The effort required the remediation of 700 acres of industrial property. Since its redevelopment, Fed Ex has established a warehouse onsite, becoming the first industrial tenant on the newly restored property, employing 800 workers. Once fully built out, the port estimates the project will yield nearly 3,500 jobs.



APPENDIX D

CURRENT BROWNFIELD POLICIES AND PROGRAMS

OREGON REGULATORY POLICIES AND PROGRAMS FOR BROWNFIELD REDEVELOPMENT

Prepared for
METRO

BROWNFIELDS TECHNICAL REVIEW TEAM

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Prepared by
Maul Foster & Alongi, Inc.
2001 NW 19th Avenue, Suite 200
Portland, OR 97209

MAUL FOSTER ALONGI

CONTENTS

ACRONYMS AND ABBREVIATIONS

CERCLA	Comprehensive Environmental Response, Compensation and Liabilities Act
DEQ	Department of Environmental Quality
DLCD	Department of Land Conservation and Development
ECSI	Environmental Cleanup Site Information
TIF	Tax-Increment Financing
ICP	Independent Cleanup Pathway
NFA	No Further Action
OAR	Oregon Administrative Rule
ORS	Oregon Revised Statute
PPA	Prospective Purchaser Agreement
TGM	Transportation and Growth Management
TOD	Transit-Oriented Development
URA	Urban Renewal Area
USEPA	United States Environmental Protection Agency
VCP	Voluntary Cleanup Pathway
VHDZ	Vertical Housing Development Zone

1 INTRODUCTION

The cleanup and redevelopment of contaminated properties is managed through a set of local, state, and federal policies, regulations, and financial incentives.

Federal Context

The federal Comprehensive Environmental Response, Compensation and Liabilities Act (CERCLA or Superfund Law) established a federal role in the cleanup of contaminated sites and provided the model many states adopted in their own laws, including definitions of who is legally liable for contamination and the strict, joint and several liability regime. This liability structure has created great anxiety in the lender and developer community and has led to the unintended consequence of deterring investment in potentially contaminated properties, which became known as brownfields. CERCLA and state laws have been reformed over time to alleviate these concerns to some extent.

Who is a Potentially Liable Party?

Owners & operators—Past and present since hazardous substances released;

Arrangers—for the disposal of hazardous substances; and

Transporters of the materials.

What is Strict, Joint & Several Liability?

Strict—Responsibility applied regardless of fault

Joint and Several—All responsible parties can be forced to bear all costs of the cleanup regardless of the existence of other potentially liable parties

CERCLA is the primary regulatory framework for sites with high levels of contamination, which are put on the federal National Priorities List. The Portland Harbor was designated as a National Priorities List site in 2001, so many of the industrial properties in Portland fall under that jurisdiction. Analysis of the implications of the Portland Harbor Superfund listing is beyond the scope of this memo. Brownfield sites typically do not merit designation on the National Priorities List and are remediated under the jurisdiction of the state.

Oregon Cleanup Law

The Oregon Cleanup Law (Oregon Revised Statute 465), which is implemented by the state Department of Environmental Quality (DEQ), is the primary law regulating remediation of brownfields in the state. It establishes the procedural and technical requirements for remediation of contaminated properties. The Cleanup Law incorporates several fundamental policies designed to promote cleanup and redevelopment of brownfields. The most important of these are a risk-based approach to cleanup, the Voluntary Cleanup Program, and Prospective Purchaser Agreements.

Risk-based Approach—cleanup levels and remedial actions are selected based on the potential for human and ecological receptors to be exposed to contaminants. Site specific risk assessments often lead to remedial actions that are protective of human health and the environment, while also being more cost effective than the traditional approach of meeting uniform numeric standards for all sites.

Voluntary Cleanup Program—provides an expedited administrative process in which the schedule and level of involvement of the DEQ is controlled by the project proponent.

Prospective Purchaser Agreements—creates a mechanism for innocent parties to negotiate the extent of cleanup and liability settlement with the State before purchasing a brownfield property.

A number of financial tools have also been established at the federal, state, and local level to promote cleanup and redevelopment of brownfields. These include: public grants, public low-interest loans, tax-increment financing, and tax incentives.

These programs are described in greater detail in the following sections.

2 OREGON CLEANUP PROGRAMS

The DEQ offers multiple programs to help advance the organization's efforts in environmental cleanup and site restoration. The Cleanup Program's three administrative pathways allow property owners and government officials the flexibility to address cleanup based on site-specific criteria and the necessary level of agency oversight.

The Site Response Program is the original administrative process that occurs when DEQ discovers a highly toxic site. In this scenario, DEQ opts to take control of the remediation effort rather than wait for a responsible party to take action. Outside of the Site Response Program, participants interested in receiving DEQ oversight must decide between one of the following Voluntary Cleanup Program pathways.

2.1 Voluntary Cleanup Program

1) In the **Voluntary Cleanup Pathway (VCP)**, property owners willfully enroll. VCP sites may be of low, moderate, or high environmental priority. In this program, DEQ provides active oversight throughout the investigation and remediation through a collaborative process with the participant.

2) The **Independent Cleanup Pathway (ICP)** is a subset of all **Voluntary Cleanup Program** enrollees and is designed for property owners of low- to moderate- risk sites. The Independent pathway is similar to the VCP program in that participants voluntarily enroll. However, DEQ provides little to no oversight in the ICP, thereby leaving the participant responsible for more liability and risk.

The Voluntary Cleanup Program was authorized by the 1991 Legislature in order to provide willing parties DEQ oversight while they investigate and, if necessary, cleanup contamination from their properties. This cooperative process helps parties move through the process efficiently, and meet sometimes tight funding and redevelopment deadlines. If DEQ determines that the chemicals of concern have been adequately characterized and restored to a level protective of human health and the environment, DEQ will issue a No Further Action (NFA) letter to the responsible party. NFAs are only issued after cleanup activities are completed, reviewed, and approved by a public comment process.

The Voluntary Cleanup Program is the most common administrative pathway for cleanup of brownfield properties. In 2010, DEQ reported that

there were approximately 400 active Voluntary Cleanup Program sites, with approximately 300 sites following the traditional VCP, and approximately 100 in the Independent Cleanup Pathway program.

2.2 No Further Action Designations

The level of DEQ involvement throughout the remediation process is dependent upon the administrative pathway chosen. As stated, the VCP offers more agency oversight than the ICP. Additional DEQ oversight often results in a more time-intensive and costly process than an independent cleanup, but provides more certainty in the outcome of the project and a better chance of achieving a No Further Action designation (NFA).

During the 2010 fiscal year, DEQ issued NFA decisions at 51 sites. Since its inception in 1988, DEQ's Cleanup Program has made NFA decisions at 1,453 sites. This amounts to nearly one-third of all sites in the state's Environmental Cleanup Site Information (ECSI) database. Of these NFAs, approximately 787 were issued to sites within the VCP program, allowing far more NFAs than the Site Response Program could have completed alone.

A NFA represents a formal declaration from DEQ that the site has been restored to a level that no longer poses unacceptable risks to human health and the environment. Achieving a NFA means that property owners and developers can more confidently invest in their property and limits threats of future environmental regulatory measures.

However, NFA determinations may be rescinded or reopened under specific circumstances. In some instances, NFAs are issued on a conditional basis whereby the property owner must complete specific remediation efforts, engineering, and institutional controls as outlined by the NFA letter. If DEQ finds that these measures have not been successfully completed, the NFA may be revoked. Additionally, NFAs may specifically address individual contaminants and certify successful cleanup as it relates to those toxins mentioned by name in the NFA. If new hazards are discovered on-site, or advancements in scientific knowledge raise new concerns, DEQ may reopen the NFA and impose additional cleanup requirements. DEQ is very careful with regards to "re-openers" though, and only occasionally reopens cases when there is clear evidence of a new risk to human health or the environment.

The VCP is designed to help participants reach their environmental goals for a site as quickly and inexpensively as possible. However, with proper notification to DEQ, participants have the option of withdrawing from VCP, and if this occurs, DEQ is unlikely to take any follow-up action unless it considers the site a high environmental priority.

While very small, some risks do exist for participants who willfully enroll into the VCP program. For example, should the participant decide to drop out of the VCP or not perform cleanup requirements within a reasonable timeframe, DEQ is likely to move it to the Site Response program if the agency considers the site a high priority.

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3 PROSPECTIVE PURCHASER AGREEMENT

3.1 Definition & Purpose

A Prospective Purchaser Agreement (PPA) is a legally binding agreement between the Department of Environmental Quality (DEQ) and a prospective purchaser or prospective lessee, which limits the purchaser's or lessee's liability under state law for environmental cleanup at the property in exchange for providing a "substantial public benefit" (ORS 465.327).

From the purchaser's perspective, the PPA is a risk management tool that provides certainty about the requirements for cleanup and protection from potential claims. With these protections, a purchaser can have greater certainty about cleanup costs and liability for past releases. PPAs can also satisfy lender concerns and make it easier for a project to obtain outside financing.

PPAs are a frequently used tool for promoting cleanup and redevelopment of brownfields in Oregon. Between 1995 and 2010, DEQ had negotiated 128 PPAs.[1]

3.2 Structure

Eligibility—The state places a number of requirements on a purchaser to allow them access to the protections provided by a PPA.

- Innocent Purchaser—The prospective purchaser must not be responsible for contaminating the property. Under the strict, joint, and several liability regime, this means they cannot have caused the contamination as an operator of a facility or the transporter of hazardous materials, or be responsible as an owner of the property.
- Future Use—The proposed future use of the property will not exacerbate the contamination or interfere with necessary cleanup actions.
- Significant Public Benefit—This factor is evaluated on a case-by-case basis, but typically involves
  - Substantial new resources to facilitate cleanup
  - Substantial environmental cleanup activities
  - Productive reuse of a vacant or abandoned industrial or commercial facility

[1] Landman, C. Oregon Department of Environmental Quality. Personal communication. May 25, 2011.

- Development of the property by a public agency or non-profit to addresses an important public purpose

Legislative Enhancements to PPAs in 2011 – New legislation signed by Gov. Kitzhaber and effective January 01, 2012 protects "innocent purchasers" (i.e., persons not responsible for prior contamination at a site) from litigation by third parties. It also expanded PPAs to include the release or spilling of oil (in addition to hazardous substances), and allows DEQ the option to streamline the process for PPAs by providing greater liability protection through administrative order than judicial decree.

Type of PPAs—The legislation described above has resulted in three different forms of PPAs: Administrative Agreement PPA, Consent Order PPA, and Consent Judgment PPA. The Administrative Agreement version is the simplest and quickest, but cannot provide third-party liability protection. The Consent Order and Consent Judgment versions do provide third-party protection, but both require a 30-day public notice and comment period. The fundamental difference between these two types is that a Consent Judgment is formally reviewed and executed in court while the Consent Order is accomplished administratively by the DEQ. Prospective purchasers decide which type to use based on their risk tolerance and schedule constraints.

Process—The following steps summarize the process for entering into a PPA.

1. Initial Meeting—DEQ determines whether a property and purchaser are eligible for a PPA, reach agreement on the type of PPA desired if possible, and discuss the type of "substantial public benefit" the purchaser would offer, on a conceptual level

2. Application—Prospective purchaser submits application form and cost recovery agreement to pay for DEQ staff time to review and process the PPA.

3. Environmental Investigation—Purchaser (or seller) completes necessary study to define nature and extent of contamination (if not already done) and propose remedial actions. DEQ will require that contamination issues be well understood before entering into negotiations on terms of PPA. Cleanup actions typically are conducted after the PPA is executed and land transaction is closed.

4. Drafting of PPA—DEQ and purchaser negotiate and agree on specific terms of the PPA. DEQ drafts the PPA for Administrative Agreements and Consent Orders. The Attorney General's office is always involved in Consent Judgment PPAs, and may also be involved in other types, depending on the nature of the site and the outcomes desired.

5. Public Notice Period—Required for Consent Order PPA and Consent Judgment PPA, but not for Administrative Agreement PPA.

6. Execute PPA—For Administrative Agreement and Consent Order PPA, DEQ signs and executes. For Consent Judgment, the Attorney General's office files in circuit court which executes the agreement.

7. Recording—Purchaser records the PPA with the appropriate county.

8. Performing PPA Obligations—Cleanup actions are conducted on the property, and after review for completion, DEQ issues a letter (for Administrative Agreement PPAs) or a Certificate of Completion (for Consent Order and Consent Judgment PPAs).

Summary Comparison of PPA Types

Elements	Administrative Agreement PPA	Consent Order PPA	Consent Judgment PPA
State Liability Protection	State agrees not to require purchaser or future owners to perform or pay for cleanup actions beyond those defined in the PPA.	Same	Same
Contribution Protection	No contribution protection under state law.	Protects purchaser and future owners from contribution claims	Protects purchaser and future owners from contribution claims
Third-Party Liability Protection	No protection provided	Protects purchaser and future owners from third-party liability claims.	Protects purchaser and future owners from third-party liability claims.
Public Notice Requirements	None required for PPA. Future remedial action may require notice.	30-day public notice period required before executing PPA.	30-day public notice period required before executing PPA.
Administrative Process	Negotiated and executed by DEQ	Negotiated and executed by DEQ	Negotiated by DEQ. Attorney General's Office files with Circuit Court to be approved by a judge.

References

Prospective Purchaser Program Guidance. Oregon Department of Environmental Quality. December 2011. http://www.deq.state.or.us/lq/pubs/docs/cu/GuidanceProspectivePurchaserProgram.pdf

Fact Sheet: Key Information About Prospective Purchaser Agreements in Oregon. Oregon Department of Environmental Quality. December 2011. http://www.deq.state.or.us/lq/pubs/factsheets/cu/ProspectivePurchaserAgreement.pdf

4 TAX INCREMENT FINANCING

Tax Increment Financing (TIF) is the primary redevelopment and economic development tool associated with urban renewal areas (URAs). It helps Oregon cities and counties revitalize public and private properties and provide development-supportive infrastructure within URA boundaries. As such, TIF has been used to address environmental cleanup as this is one example of a blighting condition. TIF investments are guided by the goals outlined in the urban renewal plan for each URA. Urban renewal and tax increment financing enable local governments to focus resources on a particular area and stimulate much larger private investments. TIF offers a number of advantages over other funding alternatives: it is locally created and controlled; it can be invested more flexibly than general fund dollars; it provides a more certain and stable source of funding; and it leverages other public and private investments.

Urban renewal funds are primarily used to update and improve an area's infrastructure, including capital expenditures on transportation improvements and parks, and to provide incentives for desired development such as mixed-use projects, affordable housing, storefront improvement, and building rehabilitation. By leveraging TIF with private and other public investments these improvements help revitalize blighted areas.

4.1 Urban Renewal Plans

In order for land in Oregon to access TIF funding, a city or county must create an Urban Renewal Agency. Urban renewal agencies are enabled by state law (ORS Chapter 457), but are activated and approved by city council or county commission. The agencies become separate legal bodies from the council/commission, but in many cases, the urban renewal agency board is composed of members of city council/county commission.

In Oregon, all urban renewal areas must have an urban renewal plan which, among other criteria, needs to show how the area within the proposed boundaries is considered "blighted". The term is defined by ORS 457.010, as an area that by reason of deterioration, faulty planning, inadequate or improper facilities, deleterious land use, or the existence of unsafe structures, is detrimental to the health, safety, or welfare of the community. Many agencies choose to do a feasibility study prior to engaging in a URA plan. These feasibility studies usually include a preliminary assessment of blight as well as information regarding property values, projections of tax increment revenues, development conditions, the availability and condition of streets and utilities, and a preliminary listing of potential projects.

If the area is found eligible for urban renewal, the city council or board of commissioners must adopt a formal urban renewal plan and accompanying urban renewal report that declare the area blighted and define the issues, challenges, and opportunities within the proposed boundaries. The plan and report serve as a roadmap for public investment and capital improvement priorities and include elements such as estimates for completion date, when the property tax base is frozen, money needed for various projects, when indebtedness will be retired, and the fiscal impact on the taxing entities. The planning must involve citizens at every stage, especially when determining projects and activities to be undertaken. Plans can be approved only after public notice, hearing, and public testimony. The plan is then presented to the planning commission for recommendations and adopted by city council or county commission. In some communities plans are adopted only after a vote of the citizenry. Substantial changes must be approved according to the same process as the adoption of the original plan.

4.2 The Mechanics of TIF

Once an urban renewal plan is approved, a URA can be established. Funds are generated by the properties in the URA by freezing the assessed value of real property within the defined area of investment. The tax collected above the frozen base is the increment. The agency may collect property tax generated through appreciation of value of existing properties and any new taxable development that occurs, regardless of which taxing district would have collected them otherwise. The urban renewal agency acquires capital by issuing short term borrowings and/or long term bonds against the future projected increase in property taxes for that area. The bond proceeds are invested in improvements or projects within the area. These investments can be direct payments for public improvement as well as loans and/or grants to assist with private redevelopment projects. TIF serves as a strong financial incentive to stimulate additional investment in targeted areas so that blighted conditions can be addressed thereby enhancing its economic vitality and physical vibrancy.

4.3 Eligible Expense

Urban renewal agencies have authority to use TIF and other resources for: construction or improvement of streets, utilities, and other public uses; rehabilitation or conservation of existing buildings; acquisition and improvement of property; and/or resale and lease of property. A URA plan may authorize other projects and programs that fulfill economic development and jobs related goals, but TIF may only be used for the capital side of those endeavors. The renewal agency may provide assistance and incentives to enhance for-profit and non-profit business and/or property development using TIF loans and grants, or other funding programs. These projects are often supportive of wealth creation, economic development, and

employment plan goals of a community. Renewal agencies are also given powers regarding land disposition, and are authorized to sell, lease, exchange, subdivide, transfer, assign, or pledge land.

TIF is regularly used to invest in environmental cleanup projects in states like Montana, Massachusetts, Connecticut, and Wisconsin. While the practice is less common in Oregon, TIF has been used to address environmental cleanup as this is one example of a blighting condition. State statutes and administrative rules pose no obvious limitations on the use of TIF funds for such applications. According to ORS 457 and OAR 150-457, a URA project of any nature must simply demonstrate how improvements would benefit the neighborhood as a whole, improve property values, and leverage future investments.

State regulations do, however, make explicit mention of other limitations. For example, TIF cannot be used as a funding mechanism for social programs, operating expenses of non- or for-profit entities, or wage and income support. In addition, urban renewal funds cannot be used to condemn private property for private development.

4.4 Limitation Issues

Though they are a powerful tool for urban redevelopment, URAs are restricted in their application. Oregon law limits the percentage of land in a city that can be designated for urban renewal. In a large cities (population greater than 50,000), the area inside URAs may exceed neither 15% of a city's total area nor 15% of its assessed valuation. In smaller jurisdictions (population less than 50,000), URAs may not exceed 25% of a city's total land area nor 25% of its assessed valuation. These limitations do not currently affect communities like Tigard, which have just begun to tap into their URA allowance. Alternatively, the City of Portland has approached 14% of its land (15% total allowance), effectively meaning that an existing URA district would need to be reduced or discontinued before a large new one is established.

Other restrictions on urban renewal dictate that area boundaries cannot be expanded by more than 1% without new voter approval under the City charter amendment approved by voters in 2008.

Changes to tax laws over the past two decades have also placed limitations on TIF. Measures 5 (1990) and 50 (1997), affected how TIF is collected and categorized three types of urban renewal areas.

Tax increment financing also comes with its political challenges. Sometimes jurisdictions whose taxes are included in an urban renewal area oppose deferring property tax gains associated with TIF, as this can impact their

operating budgets. Recent state legislation has mollified this concern with a revenue sharing formula that is now incorporated into the creation of new or amended URAs. While this most recent change has helped earn more support from taxing jurisdictions that contribute their share of increment to URAs, it does limit the amount of TIF available to a URA over a longer term.

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5 TAX PROGRAMS

Tax incentives are financial tools that governments implement to encourage private investment to accomplish various economic and social objectives. The State of Oregon does not have tax incentives specifically targeted to brownfield cleanup and development, but there are several business tax credit and property tax abatement programs that may be applicable to certain brownfield projects. Tax incentives offer advantages to local governments by providing financial support to developers without directly taking money out of the current budget.

Oregon's property tax assessment framework includes a provision for reducing the assessed value of a property by the cost to cure environmental impacts. This valuation system has been used to reduce property taxes on some contaminated properties to nearly zero and is often critiqued as a policy that discourages cleanup of brownfields.

5.1 Tax Credits and Exemptions

Oregon offers a number of corporate and income tax credits and exemptions to encourage business investment in targeted sectors such as renewable energy and research. These include:

Oregon Investment Advantage—This income tax exemption program helps businesses start or locate in mostly rural counties by providing a multi-year deduction for all income-based taxes related to the new business operations, potentially eliminating state business tax liability during that multi-year period. General company eligibility requirements include: creation of at least five new full-time, year-round jobs that receive minimum level of compensation; facility operations need to be the first of their kind in Oregon for that company; and facility operations cannot compete within the local economy.

Business Energy Tax Credit—Eligible for costs including the building, equipment, machinery and other expenses related to the manufacturing of renewable energy products such as solar cells, wind turbines or components manufactured for the exclusive use in products using renewable energy. Businesses are eligible for a tax credit equal to 50% of up to $40 million in eligible costs. The tax credit may be monetized through transfer to individuals or companies with Oregon tax liability at a discount rate determined by the state

5.2 Property Tax Abatements

Property tax abatements allow cities or counties within the state to temporarily reduce property taxes for certain housing development and rehabilitation projects. These tax incentives are often connected to designation of special districts. These programs can be used to offset front end costs and support financial feasibility of brownfield redevelopment projects in these designated areas. Examples of these programs include:

Enterprise Zones—Enterprise zones exempt businesses from local property taxes on new investments for a period of three to five years (ORS 285C.050). Sponsored by municipal or tribal governments, an enterprise zone typically serves as a focal point for local development efforts. Portland has established an Enterprise Zone that encompasses North and Northeast areas of the City. The Portland Enterprise Zone is managed by the Portland Development Commission and provides five-year property tax abatements for industrial-based businesses making new investments.

A new building/structure, structural modifications or additions, or newly installed machinery and equipment may qualify for exemption, but not land, previously used property value and miscellaneous personal items. To qualify for the tax exemption, businesses need to meet a number of criteria, including:

- Increase full-time, permanent employment of the firm inside the enterprise zone by the greater of one new job or 10% (or less with special-case local sponsor waivers);
- Generally have no concurrent job losses outside the zone boundary inside Oregon;
- Maintain minimum employment level during the exemption period;
- Enter into a first-source agreement with local job training providers;
- Compensate new workers at or above 150% of the county average wage.

Vertical Housing Program—encourages construction or rehabilitation of properties in targeted areas called Vertical Housing Development Zones (VHDZs) by providing a tax abatement opportunity for higher density, mixed-use developments in these areas (OAR 803.013). This policy is designed to reduce front-end costs to promote additional investment based on the recognition that higher density projects often carry greater development costs.

VHDZs are established by local jurisdictions applying to the state for the designation. Approval is based on considering a number of factors such as

proximity to transit and location in city core areas. To receive the tax abatement, a developer applies directly to the state. Eligible projects must be located entirely in a VHDZ and meet a number of criteria focused on density and mix of uses.

All projects meeting state regulations receive the property tax abatement on the improvement value for a ten-year period. The number of floors constructed or rehabilitated for residential use in proportion to the total square footage of a project determines the tax exemption rate the developer will receive. The rate of the abatement ranges from 20 to 80 percent:

- 20 percent for one floor of housing
- 40 percent for two floors of housing
- 60 percent for three floors of housing
- 80 percent for four or more floors of housing.

5.3 Tax Assessment on Contaminated Property

The Oregon Department of Revenue developed an administrative rule to provide a methodology for valuing contaminated property for the purpose of assessing property taxes (OAR 150-308.205-(E)). The rule defines a "contaminated site" as real property that is on the USEPA National Priority List (a Superfund site), in the DEQ inventory of confirmed releases, an illegal drug manufacturing site, or demonstrated to have had a release of hazardous substances. The rule requires that all three commonly used appraisal methods, the sales comparison approach, the cost approach, and the income approach be used to determine real market value of a contaminated site. The property values derived from these methods are adjusted to account for a number of factors related to the contamination including:

- Cost to cure defined as "the discounted present value of the estimated after tax cost of the remaining remedial work specific to the subject property to remove, contain, or treat the hazardous substance. Cost to cure may include the cost of environmental audits, surety bonds, insurance, monitoring costs, and engineering and legal fees. The costs must be directly related to the clean up or containment of a hazardous substance"

- Limitations on use of the property due to the contamination or governmental restrictions

- Fiscal implications such as the increased cost to insure or finance the property.

6 PUBLIC FUNDING MECHANISMS

A number of public grants and loans are available in Oregon through various federal, state, and local government agencies to help overcome financial obstacles associated with brownfield redevelopment. Successful brownfield projects often combine funding from a number of sources that are targeted for both cleanup and redevelopment. The following section provides a brief overview of the primary public funding sources for brownfield projects in Oregon. While these are identified as the primary funding sources, brownfield projects are often able to leverage funds from a variety of sources beyond those discussed in the memo.

U.S. Environmental Protection Agency

Assessment Grant—The Assessment grants provide funding to inventory, characterize, assess, and conduct planning and community involvement related to brownfield sites. Applications are solicited on an annual basis. The maximum award is $400k for a single applicant or $350k for a single assessment.

Cleanup Grant—These grants provide funding for the cleanup activities on brownfield sites. Applications are solicited on an annual basis. The maximum award is $200k per site.

Oregon Department of Environmental Quality

Brownfield Program—The Brownfield Program provides grants to public and quasi-public entities to promote redevelopment or property transfers. Grant awards typically equate to about $35k.

Site-Specific Assessment—The Site-Specific Assessment exists to provide technical assistance to assess sites for public and quasi-public entities. The assistance is provided by DEQ pro bono staff time.

Oregon Department of Land Conservation and Development

Periodic Review and Technical Assistance—DLCD awards grants and technical assistance for planning, economic development, planning and zoning processing, and other planning steps that can be used to leverage the redevelopment of various brownfield sites. The assistance is available to local, regional, and tribal governments.

Transportation and Growth Management Program—The TGM Program provides grants for planning, specific development and redevelopment, land use and transportation plans, infill and redevelopment strategies, and development design. Assistance is provided in the form of a matching grant to local, regional, and tribal governments, as well as some special districts, councils of governments, metro planning organizations and coalitions. TGM funds can be utilized by public agencies to address brownfields at a local or regional scale through specific policies that address blighted properties and/or encourage infill and redevelopment.

Oregon Housing and Community Services

Housing Development Grant— These grants are awarded for new construction, rehabilitation, and/or acquisition of low- and very-low-income housing units; predevelopment costs, planning, engineering or feasibility studies to government agencies, nonprofit community organizations, private individuals, and corporations. Thus, brownfield assessment and cleanup could be financed as a qualifying predevelopment cost. Grants are awarded in amounts up to $100k.

Oregon Business Development Department, Business Oregon

Oregon Coalition Brownfield Cleanup— Business Oregon awards loans and grants for brownfield site cleanup, similar to a revolving loan fund, to local governments, nonprofits, public, and private entities as a 20% cost share award in amounts up to $1 million.

Brownfield Redevelopment Fund— This fund provides for loans and grants for site assessment and cleanup projects in varying amounts to local governments, nonprofits, public, and private entities.

Oregon Metro

Brownfields Recycling Program— Oregon Metro provides environmental assessments and redevelopment plans for qualifying petroleum-contaminated sites within the Metro region. This program is funded through the U.S. Environmental Protection Agency. Currently, applications are not being accepted.

Transit-Oriented Development— TOD financial incentives are issued for the construction of multi-family housing, mixed-use buildings, commercial, school, senior housing, or retail uses, as long as there is a relationship to transit. Public, nonprofit, or private entities can be award grants and incentives up to $250k. The TOD funds can assist redevelopment of brownfield properties that meet the criteria for participation in the program.

City of Portland, Bureau of Environmental Services

Brownfield Program— The Bureau of Environmental Services Brownfield Program provides site assessments funded through the U.S. Environmental Protection Agency. The City is also in the process of initiating a new revolving loan fund, capitalized by an USEPA grant, for cleanup activities on privately or publically owned sites.

APPENDIX E

POLICY TOOLS ASSESSMENT

BROWNFIELD POLICY OPTIONS

APPENDIX E OF REGIONAL BROWNFIELD SCOPING PROJECT FINAL REPORT

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Prepared by
Maul Foster & Alongi, Inc.
2001 NW 19th Avenue, Suite 200
Portland, OR 97209

In Partnership with
EcoNW, LLC
Redevelopment Economics, LLC

MAUL
FOSTER
ALONGI

CONTENTS

ACRONYMS AND ABBREVIATIONS

CERCLA	Comprehensive Environmental Response, Compensation and Liabilities Act
DEQ	Department of Environmental Quality
EPA	Environmental Protection Agency
EZ	Enterprise Zone
GIS	Geographic Information Systems
MPAC	Metro's Policy Advisory Committee
MTAC	Metro's Technical Advisory Committee
OAR	Oregon Administrative Rule
ORS	Oregon Revised Statute
PDC	Portland Development Commission
PPA	Prospective Purchaser Agreement
SNAP	Small Nonprofit Accelerated Program Bond
TIF	Tax-Increment Financing
TRT	Technical Review Team
UGB	Urban Growth Boundary
URA	Urban Renewal Area

1 INTRODUCTION

The Regional Brownfield Scoping Project is a first attempt to grasp the scale and impact of brownfields at the regional level and to present policy options that help address the various aspects of the issue. This report contributes to the Regional Brownfield Scoping Project by assessing a potential policy tools to promote cleanup and redevelopment of contaminated properties.

There are a number of potential policy tools that could be adopted to address the challenges of brownfield cleanup and redevelopment. The Portland metro region can look to policies that have proven effective for other states and local governments, can look for ways to improve existing policies and programs, and can revisit and refine recommendations from previous brownfield initiatives in the Portland area. This report section presents a set of potential policy tools based on review of best practices nationwide, meetings of the Technical Review Team, input from local brownfield experts, and previous planning studies.

These policies are presented for discussion purposes and will be reviewed and prioritized by the project's Technical Review Team and Metro Council, Metro's Technical Advisory Committee, and Metro's Policy Advisory Committee.

2 BROWNFIELD POLICY OPTIONS

The solutions are organized in categories to align with the challenges described in the Regional Brownfield Scoping Project Final Report:

- Financial Capacity (F1-F12)
- Managing Risk (M1-M3)
- Linking Cleanup and Redevelopment (L1-L5)
- Regulatory Process (R1-R4)

It is important to note, that there is likely no silver bullet: no single policy tool will resolve the complex brownfield issues facing the region. Rather these tools can be prioritized and packaged to provide a coordinated set of policies that are mutually supportive, targeted to specific types of brownfields, and designed to resolve the problems in the current regulatory and incentive framework.

The discussion of policy options is crafted to provide a brief overview and summary analysis of the tools including the following elements:

Challenge—Describes what brownfield challenges the tool addresses

Solution—Briefly describes the policy tool

Mechanics—Outlines how the tool works and how it can be implemented in the Portland metro region

Considerations—Outlines key issues or concerns to address in implementing the tool

Implementation Actions – Key next steps in developing the policy

Lead and Support – Identifies which agencies could take a lead or supporting role in implementing or managing the proposed policy solution

Typologies Targeted—Indicates which brownfield typologies will most likely benefit from the tool

The tools are summarized in the following table and are individually described in the following narrative.

Metro Brownfield Policy Tools Matrix

Tool	Description	Typology				Level of Gov.	States Where Adopted
		Small Commercial	Industrial Conversion	On-Going Industrial	Rural Industrial		
FINANCIAL/CAPACITY							
F1. Target Policies to Priority Areas	Use existing policies and objectives to leverage the cleanup of specific properties. Conduct outreach to property owners of sites which impact multiple public programs. (i.e. Metro-designated town centers, urban renewal areas, enterprise zones)					Metro and Local	N/A
F2. Tax Credit for Remediation	Consider expanding the use of tax incentives, such as income tax credits for dollars spent on site investigation and environmental cleanup.					State	13 States, MA is a model
F3. Integrated Planning & Site Assessment Grants	Establish a publically funded Brownfield Integrated Planning Grant to conduct environmental assessments and support site-specific redevelopment strategies.					State, Metro, or Local	WA, NJ, NY
F4. Community Investment Initiative	Building on models being explored in Metro's Community Investment Initiative, create a new entity to combine public and private funds and foster unique joint venture opportunities.					Metro and Local	N/A
F5. Public Equity in Sites	Make it easier for public development organizations to provide gap financing for projects in exchange for securing an equity interest in the property.					State , Metro, or Local	
F6. Property Tax Abatement	Modify tax abatements associated with Enterprise Zones and urban infill programs to extend the duration of tax abatements in any area and make brownfield remediation for industrial development more viable.					State Policy Change; Local Implementation	Multiple states incl. NJ, IL, AI, TX
F7. Reform Contaminated Property Tax Assessment	Modify tax assessment valuation rules to include time restrictions on the value reduction associated with a cleanup liability to discourage moth-balling					State	N/A
F8. TIF Reforms	Modify policy to make TIF a more effective tool for promoting brownfield cleanup and redevelopment. Use policy mechanisms to create better tie-ins between tax increment financing and brownfield projects to incentivize redevelopment.					State Policy Change; Local Implementation State	Models: WI, MI, PA, KY
F9. Pooled Bonding	Allow localities to use bond proceeds to purchase a pool of general obligation bonds to fund cleanup projects (i.e. SNAP program).					State Policy Change; Local Implementation	

Note:
Green Icon—Strong potential benefit for typology
Gray Icon—Modest potential benefit for typology

Metro Brownfield Policy Tools Matrix

Tool	Description	Typology				Level of Gov.	States Where Adopted
		Small Commercial	Industrial Conversion	On-Going Industrial	Rural Industrial		
F10. Job Credits	Provide a tax credit to new businesses based on the number of new jobs created by a completed development.					State	Multiple, models, FL
F11. Historical Insurance Support	Provide technical support to assist work parties in making claims on historical insurance policies.					State, Metro, or Local	IN
F12. Dedicated State Cleanup Fund	Establish a dedicated fund for cleanup and redevelopment of brownfields. The revenues or the fund should be generated from a source that has both a nexus with contamination and the potential to generate a substantial revenue stream.					State	NY, MI, MN, WA
MANAGING RISK							
M1. Pooled Environmental Insurance	Establish a program that would decrease the transaction costs and reduce the cost of purchasing environmental insurance to covers risk.					State or Local	WI, MA
M2. Model Purchase and Sale Agreement	Create a model agreement with indemnification language and distinctions between upland and in-water liabilities along with standard transfer issues such as due diligence period, timing of cleanup, warranties, and inspection period.					State or Local	
M3. Public Land Bank	Establish a land bank to acquire contaminated properties, manage and finance cleanup and redevelopment, and sell property back into the private market.					State Legislation; implemented at State or Local level	MI, MN

Note:
Green Icon—Strong potential benefit for typology
Gray Icon—Modest potential benefit for typology

Metro Brownfield Policy Tools Matrix

Tool	Description	Typology				Level of Gov.	States Where Adopted
		Small Commercial	Industrial Conversion	On-Going Industrial	Rural Industrial		
LINKING CLEANUP AND REDEVELOPMENT							
L1. Use by Right/ Regulatory Flexibility	Local governments could apply a zoning code overlay to contaminated sites or create a brownfield inventory list for priority sites that would allow developers and property owners to develop the site with greater regulatory flexibility.					Local	
L2. Brownfield Guidebook	Provide more effective resources to educate land owners and prospective buyers about the cleanup and redevelopment process and the resources available to assist these projects.					State or Local	Multiple Models: WA, CO, WV
L3. Build Market Demand	Develop programs to link more risk tolerant investors and developers with brownfield properties.					State or Local	NJ, PA
L4. Universal Database	Create an open system to share environmental information across projects. This system could include analytical data on groundwater flow, contaminant concentrations, along with beneficial use determinations.					State or Local	WA
L5. One Stop Shop	Create a system for inter-agency coordination for permitting and funding brownfield projects.					State and Local	PA
REGULATORY PROCESS							
R1. Formalize Presumptive Remedies and Standards	Establish guideline documents for simple cleanup sites with common redevelopment uses.					State	Multiple
R2. Licensed Site Remediation Professional	Give licensed professionals authority to certify cleanups, decreasing the role of the state and the administrative process on every site.						
R3. CERCLA Prospective Purchaser Agreements	EPA provide Prospective Purchaser Agreements, jointly with Oregon DEQ to provide certainty and liability protection to innocent purchasers of contaminated properties under federal Superfund Law.					Federal	N/A
R4. CERCLA De Minimis Settlements	EPA provide expedited settlement agreements for owners of properties that likely cause minor impacts to the Harbor.					Federal	N/A

Note:
Green Icon—Strong potential benefit for typology
Gray Icon—Modest potential benefit for typology

FINANCIAL

Typologies Targeted

Type 1—Small Commercial

Type 2—Industrial Conversion

Type 3—On-going Industrial

Type 4—Rural Industrial

F1. Target Policies to Priority Areas

Challenge—The successful cleanup and redevelopment of a brownfield is driven by a number of factors beyond the cost of cleanup, such as market potential, timing, location, and amenities. Redevelopment typically occurs on an ad hoc basis, driven as much by opportunity and happenstance as by a coordinated and concerted effort.

Solution—Metro implements a number of policies and programs to promote infill development, such as the Transit Oriented Development program. As an overarching policy, brownfield properties that also meet the objectives of these other programs can be targeted with a coordinated package that leverages multiple funding sources to stimulate catalyst projects.

Mechanics—This policy tool can be implemented by funding agencies through minor changes to internal guidelines. Using the inventory of historical property uses, identify potential brownfield properties located in areas of prioritized public investment. Coordinate between Metro departments to create a strategic approach to conduct outreach and work with property owners to support cleanup and redevelopment of those targeted brownfields.

Considerations

- Creating criteria to prioritize financial incentives to properties in targeted areas while maintaining equitable distribution of resources
- Establishing management and coordination structure with minimal administrative demands

Implementation Actions

- Identify the suite of Metro programs and policies that align with brownfields redevelopment
- Map geographic areas of focus for Metro's land use and economic development programs
- Identify brownfield properties within those targeted areas
- Focus brownfield recycling program resources in those targeted areas

Lead and Support

Metro and Local Governments

FINANCIAL

Typologies Targeted

Type 1—Small Commercial

Type 2—Industrial Conversion

Type 3—On-going Industrial

Type 4—Rural Industrial

F2. Tax Credit for Remediation

Challenge—There is limited public financial support for cleanup and redevelopment of brownfields.

Solution—Provide an income tax credit for costs of conducting site investigation and environmental cleanup. Income tax credits have become a popular brownfield incentive in states across the country. The reasons are that, in comparison to grant and loan programs:

- A tax credit program is a more predictable source of funding—it can be counted on in the initial consideration of project feasibility
- Tax credit programs offer a substantial inducement for private investment; whereas grant programs are often limited to public and non-profit developers
- A tax credit is not subject to annual appropriations and is therefore more likely to be maintained even when other programs are being cut

Mechanics—Establishing a brownfields income tax credit would involve a statewide statutory change. The mechanics of how tax credit programs operate in other states vary among the 13 states that have adopted this type of policy.[1] The major policy points include:

- Cap on the overall total financial capacity of the program
- Limits to credit available for an individual project
- Transferability of the tax credit
- Eligible costs (limited to cleanup or inclusive of site preparation or other redevelopment expenses)
- Needs testing;
- Links to certain public benefits, such as job creation or investment in distressed areas.

Generally, the programs that offer the possibility of greater subsidy of redevelopment costs (not just cleanup) also have more needs testing and overall program caps, and, consequently, the tax credit is far from automatic. New York, Connecticut, Iowa, and Missouri are in this category.

[1] Redevelopment Economics, Chart of State Brownfields Tax Credits, see http://www.redevelopmenteconomics.com/yahoo_site_admin/assets/docs/State_Tax_Credits_chart_7-11.208190334.pdf

At the other end of the spectrum are state programs that are fully automatic but are limited by per project ceilings (Mississippi, Colorado, Illinois, Florida, and Kentucky), and are therefore unable to offer a substantial inducement for larger more complex cleanups.

Several states (Wisconsin, New York, and New Jersey) do not make their credits transferable, which means that non-profits cannot benefit, and many developers with limited tax liability cannot take advantage of the incentive.

Massachusetts is the only state that offers a brownfields tax credit with the combination of being: 1) fully automatic; 2) fully transferable; and 3) not subject to per project ceilings. The Massachusetts program is also a model in that unrestricted use cleanups are rewarded (a 50 percent credit for unrestricted-use cleanups versus a 25 percent credit for restricted use cleanups). The program is also restricted geographically to Massachusetts designated Economically Distressed Areas.[2]

A draft report on the impact of the Massachusetts Brownfields Tax Credit) prepared by Redevelopment Economics outlines the impacts of 44 completed projects (representing between 50 and 65 percent of all tax credit projects):

- $54 million in tax credits have helped leverage $2 billion in brownfields investments. All tax credit investments are in state-designated Economically Distressed Areas (a statutory requirement) so all investments assist struggling communities and neighborhoods.

- The state's investment in tax credits is repaid six times over in only ten years of operation. That is, state tax revenues derived from initial construction and from ten years of the on-going impacts of businesses locating at brownfield tax credit sites exceed the initial public investment (taxes waived) by a factor of more than six to one.[3]

The other tax credit program which has well documented benefits is the Missouri Remediation Tax Credit Program. An analysis of 50 sites that had received the tax credits found that those projects represented $2.2 billion in investments and created over 11,000 jobs.

Considerations—State government fiscal constraints are likely to make any new tax incentive difficult to implement. There are two potential responses to fiscal concerns.

[2] See: http://www.mass.gov/dep/cleanup/bfhdout2.htm

[3] This calculation counts only direct impacts (not multiplier-derived impacts) and does not count the retail businesses attracted to BTC sites.

- Conduct fiscal analysis that would forecast the costs versus benefits of a brownfields tax credit.

- Structure the credit so that only projects that produce net positive fiscal benefits to the state are eligible. Missouri does this through an application process that includes an independent impact analysis. New Jersey accomplishes the same objective by not granting the credit until a post-development accounting demonstrates positive fiscal benefit to the state.

Implementation Actions

- Conduct financial analysis of potential tax credit including impacts on state budget and forecasted benefits from promoting brownfield redevelopment

- Decide on key elements of tax credit structure, such as eligibility and limits. This work could be conducted as a follow up to the Regional Brownfield Scoping project with the current Technical Review Team or through another forum.

- Draft proposed legislation and review with appropriate state agencies and legislative committees

Lead and Support

State of Oregon would need to implement legislative change.

Local governments and interested stakeholders could play a key role in advocating for the legislation and defining how this policy should be shaped

FINANCIAL

Typologies Targeted

Type 1—Small Commercial

Type 2—Industrial Conversion

Type 3—On-going Industrial

Type 4—Rural Industrial

F3. Integrated Planning & Site Assessment Grants

Challenge—Local governments often lack resources to perform adequate due diligence and planning to acquire or redevelop brownfields in their communities. Existing site assessment grant programs help to address this need, but only support environmental investigation. This can create the situation where an owner learns that their property has an expensive environmental liability, but has no strategy to offset that cost.

Solution—The State or local governments could establish a publically-funded Brownfield Integrated Planning and Site Assessment Grant. The grant would be used to conduct environmental site assessments to understand cleanup needs, and also fund studies to support a site-specific redevelopment strategy. These planning studies could include: market assessment, architectural and engineering analysis of existing buildings, land use analysis, infrastructure assessment, geotechnical assessment, site planning, and property appraisal. These studies would be integrated with the environmental assessment to develop plans that create a viable redevelopment vision and strategy for a property. As the financial analysis of brownfields conducted as part of the Regional Brownfield Scoping Project has shown, these market and site development factors are often as significant as the contamination issues in achieving financial feasibility for redevelopment.

Mechanics—The grant program could be managed by existing brownfield programs such as Metro's Brownfield Recycling Program or Business Oregon. Grants would be awarded on a competitive application basis that could incorporate criteria to ensure the projects align with multiple Metro policy goals (as described in tool F1).

Policy Tool Examples

Washington State—The State of Washington has created an Integrated Planning Grant program as a pilot initiative that provides up to $200,000, with no match requirement, to local governments to conduct due diligence and create a strategy for cleanup and redevelopment of contaminated sites before investing local funds. In the first three years since the program was initiated approximately thirteen communities have received or applied for the grants. These projects have focused both on properties currently owned by local governments and on vacant lands being considered for public acquisition to promote redevelopment.

Adair Village, Oregon—With a grant from Business Oregon, the City of Adair Village has embarked on a pilot project to create a redevelopment plan for a former mill site that integrates cleanup and adaptive re-use of the property. The plan incorporates market analysis, community involvement, land use planning, and strategy for risk management and funding. Without the leadership of the City of Adair Village, the contaminated site would have likely remained in a blighted condition for years to come.

Considerations

- Funding source for the grant program
- Minimizing grant match requirements to reduce the barrier to entry
- Strategically focus grants on smaller sites, well-located sites with existing infrastructure, or sites with minimal environmental issues to have the most impact
- Do not require local governments to currently own the property
- Whether to allow potentially liable party to be eligible for grant funds

Implementation Actions

- Identify funding source such as EPA Assessment grants and Business Oregon revolving loan fund sub-grants, or Dedicated Brownfield Cleanup Fund (See Policy Tool F12.)
- Determine most appropriate agency to manage the grant program
- Establish grant program guidelines including applicant eligibility, allowed costs, and grant evaluation criteria
- Develop a legislative proposal to establish funding program

Lead and Support

State or Oregon (DEQ or Business Oregon) or Metro

FINANCIAL

Typologies Targeted

Type 1—Small Commercial

Type 2—Industrial Conversion

Type 3—On-going Industrial

Type 4—Rural Industrial

F4. Community Investment Initiative

Challenge—The metro region has an estimated $27 to $40 billion infrastructure hurdle over the next two to three decades, and the area is lacking in sufficient industrial lands to accommodate future growth[4]. Brownfields are recognized as having a special set of infrastructure-related challenges, and remediating them could create a huge return on property tax revenues, job creation and other benefits. Overcoming this challenge will take a new mix of public and private resources to more effectively see the redevelopment of these compromised sites.

Solution— Create a public-private funding partnership entity that invests in infrastructure and brownfield remediation to provide viable returns to each participating sector. This concept has been proposed by the Community Investment Initiative, a group of public and private sector leaders seeking mechanisms to overcome infrastructure challenges, including those related to brownfield remediation.

Mechanics—The public-private partnership for infrastructure funding concept is still under development by the Community Investment Initiative. The details of how the concept could be implemented, including how the funding entity would be structured and how projects would be prioritized have not yet been determined.

Considerations

- Creating a viable public-private entity will require restructuring resources and creatively packaging funds to meet project needs, as well as securing commitments from various private sector institutions/businesses to allocate funds for infrastructure
- While ranking high among infrastructure needs, brownfields would have to compete for funds, and decision making criteria have yet to be established
- Coordination with state infrastructure funding programs in addition to local government and private sector contribution

Implementation Actions

- Continued work of the Community Investment Initiative, including further analysis of structural and operational issues to set up a regional infrastructure entity

[4] Metro. 2008. Regional Infrastructure Analysis. http://library.oregonmetro.gov/files/regionalinfrastructureanalysis.pdf

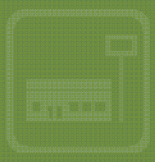
- Establish criteria for prioritizing projects for funding

Lead and Support

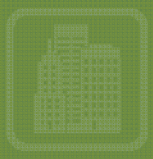
Community Investment Initiative, Metro, and Local Governments

FINANCIAL

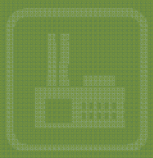
Typologies Targeted



Type 1—Small Commercial



Type 2—Industrial Conversion



Type 3—On-going industrial

Type 4—Rural Industrial

F5. Public Equity in Brownfield Sites

Challenge—Brownfield sites are often financially upside down and developers often don't have patient capital. Public subsidy of brownfields is typically through financial grants or low interest loans that provide only limited direct return on investment. The public return on investment typically comes through increased tax revenues generated through redevelopment

Solution—Government entity takes an equity interest in the property to offset its remediation investment and recognizes the ongoing potential revenue stream or the marginal increase of property value in the event of a sale. This scenario is in line with the orientation of the region's Community Investment Initiative.

Mechanics—Make it easier for public development organizations like the Portland Development Commission or a regional infrastructure entity such as that being proposed by the Community Investment Initiative, to provide gap financing for projects in exchange for securing an equity interest in the property. The advantage to the developer is that it lowers net investment in the property, so decreases front end investment. The advantage to the public entity is greater return on the capital invested in the project. The public entity could create a revolving equity fund through its investment.

Considerations

- Encumbrances of public dollars in private projects (such as prevailing wage requirements, additional review processes, and public record requirements) which may deter private investors
- Extended return time on public investment
- Financial disclosure of private parties (a potential deterrent)
- Public perception concerns about inappropriate use of public funds or "handouts" to developers
- Likely to focus on larger project, not Type 1 Small Commercial sites

Implementation Actions

- Conduct further analysis of the potential implication of this policy
- Legal review of constraints on lending public credit to private parties

Lead and Support

Metro and Local Governments

FINANCIAL

Typologies Targeted

Type 1—Small Commercial

Type 2—Industrial Conversion

Type 3—On-going Industrial

Type 4—Rural Industrial

F6. Property Tax Abatement

Challenge—Current tax abatement programs are limited and not adequate to overcome the financial challenges of many brownfield properties.

Solution—Utilize some of the key criteria existing for enterprise zone tax abatement and apply these to brownfields throughout the state. Seek enabling legislation to secure a tax abatement term for up to 15 years for brownfields that can be placed back into industrial uses. The length of the tax abatement will be based on criteria that have yet to be identified (e.g., amount of investment, job creation and/or retention, etc.).

Mechanics—Changes to the current tax abatement policy would require state legislative action. The state and many local jurisdictions offer property tax abatement to stimulate certain types of redevelopment and economic development. Oregon offers the Enterprise Zone as one mechanism that abates property taxes on economic development improvements within designated areas of a community. Abatements last for 3 to 5 years in urban areas and up to 15 years in rural areas.

As a further inducement to redevelop brownfields, the tax abatement could be offered for a period of 3 to 5 years for any property meeting the definition of a brownfield, regardless of its location inside or outside an Enterprise Zone. The duration of the abatement could be extended for industrial projects if that is a state-wide or regional priority.

Considerations

- Assessment of costs and benefits to public and private sector from the proposed policy change, such as job creation and tax revenue impacts from returning fallow land into productive uses, and property tax losses for the abatement period
- Administrative guidelines for the program, such as eligible projects, duration of the abatement, and penalties for failure to perform
- Flexibility of tax abatement program to meet needs of various types of sites and coordination with other assistance programs

Implementation Actions

- Explore potential options for structuring the abatement program
- Conduct cost/benefit analysis of expanded abatement program based on several models for key elements such as project eligibility, abatement period, and types of redevelopment

- Draft legislative proposal

Lead and Support

State or Oregon, Metro and Local Governments

FINANCIAL

Typologies Targeted

Type 2—Industrial Conversion

Type 3—On-going Industrial

Type 4—Rural Industrial

F7. Reform Contaminated Property Tax Assessment

Challenge—Currently, owners of contaminated sites are able to secure significant reductions in their property taxes based on the impact contamination has on a site's value for development purposes. These deep reductions in taxes can last a long time and a site may not be remediated for decades. This situation not only adds to the burdens of local governments and schools by diminishing their financial resources and consequently their services, but also tends to hamper development potential for nearby properties. Tax reductions in their current form provide a disincentive for cleanup and redevelopment.

Solution—Revise the current property tax assessment criteria for contaminated sites by setting time limits for the value reduction whereby lack of remedial action by the property owner results in diminishing tax reductions over time. An additional, or alternative, solution would require that the value of the tax reduction be dedicated to covering the costs of the property cleanup.

Mechanics—The administrative rule establishing procedures for assessing property taxes includes a methodology for valuing contaminated properties (OAR 150-308.205-(E)). This methodology currently discounts the assessed value of contaminated properties based on the estimated cleanup cost, redevelopment constraints, and financing implications. The administrative rule could be amended so that this discount diminishes over time.

Considerations

- Review legal implications of changing this policy.
- Potential financial impacts on existing businesses that currently take advantage of the existing valuation reduction
- Establishing a reasonable period for the discount that is long enough to be realistic for property owners to conduct remedial actions, but short enough to discourage mothballing of property
- Explore how this program can be bundled with other assistance programs that enable property owners to access funds and/or reduce ongoing liability for clean up
- Potentially apply time limit on value reduction only to vacant properties (to avoid impacts to active business operations)
- Engaging private sector owners and/or businesses to incorporate their perspective and gain support for this reform

Implementation Actions

- Obtain data from county tax assessors or other sources to more accurately quantify the scale of impact of the current property value assessment policy

- Conduct further analysis of the impact of the current policy on the remediation and redevelopment status of properties and fiscal impact on tax revenues

- Coordinate with Oregon Department of Revenue and the private sector on structuring key elements of contaminated property assessed value methodology, including time limits.

- Conduct administrative rule update process.

Lead and Support

State of Oregon lead on administrative rule update process. Research and support conducted by State, Metro, and/or Local Governments.

FINANCIAL

Typologies Targeted

Type 1—Small Commercial

Type 2—Industrial Conversion

Type 3—On-going Industrial

F8. Tax Increment Financing Reforms

Challenge—Limited public funds are available to support cleanup and redevelopment of brownfields. Tax Increment Financing (TIF) has been an important financial tool to support a number of brownfield projects in the Portland metro region. There is potential for TIF to be refined to be a more effective tool for promoting brownfield cleanup and redevelopment

Solution—Modifications to the existing TIF policy that could provide greater support to brownfields include

- Making brownfields outside of urban renewal areas eligible
- Exempt brownfield projects from land and tax base TIF limits
- Use TIF to support credit enhanced borrowing
- Augment local TIF revenues with state funds
- Use TIF to support an environmental insurance pool

Mechanics—Most of the potential modifications to TIF would require legislative changes or revising criteria for property tax evaluations. However, some proposals might be advanced through administrative mechanisms. Several specific potential modifications for using TIF for brownfields redevelopment in Oregon are presented below.

Urban Renewal Plan Exception. The urban renewal-related requirements dictate that TIF is used only for area redevelopment, not for the redevelopment of isolated or small individual/brownfield sites. Some states, such as Wisconsin, make an exception so that brownfields sites can use TIF without the urban renewal plan requirement. In Oregon a statutory change would be required to create a similar exception, but the result would mean that numerous brownfield sites could potentially make use of TIF. More subtle, limited changes to support isolated or small sites could include: 1) limiting brownfield TIF to sites that have been vacant for a certain time period; and/or, 2) limiting brownfield TIF expenditures to cleanup and site preparation, not infrastructure or vertical development.

Land / Tax Base Limitation. The limitation that localities may not designate TIF districts for more than 15 percent of their land or 15 percent of their assessable base in TIF districts may hamper TIF redevelopment, particularly in Portland. Several states have made exceptions to debt limitations for brownfield TIF projects. For example, sites eligible for Wisconsin's Environmental Remediation TIF program are not subject to the general requirement that TIF districts not exceed 15 percent of the equalized value. Alternative Borrowing Sources to Assist with Upfront Costs. Private bond

market TIFs normally assist vertical development because that is the point where potential investors see a predictable revenue stream. Brownfield sites, however, usually need extensive upfront investment so alternative or "credit enhanced" borrowing would help make the brownfields-TIF connection work. The City of Portland already has in place an alternative TIF borrowing source—the Direct TIF Loan Program.[5] Other options from other states include:

- Pennsylvania TIF Loan Guarantee Program, which backs local TIF projects that meet certain state objectives, up to $5 million per project

- Michigan's Brownfields Redevelopment Loans (for cleanup) and Revitalization Revolving Loans (for demolition and site preparation) are designed to work with TIFs. They feature flexible repayment terms, such as no payments due for the first five years and two percent interest rates.

- Connecticut's Brownfields Redevelopment Authority, which provides both an alternative borrowing source, and a state guarantee.

State Revenues Dedicated to Assist Projects that Meet State Objectives. Oregon does not currently dedicate state revenues to supplement local TIFs. Sometimes dubbed "super TIFs," the pledge of state revenues can make a very significant difference in gap financing, and the logic of the state committing funds to support projects that meet state objectives is indisputable. One of the best examples is Kentucky's support for "Signature Projects," defined as mixed use redevelopment projects that involve a minimum $200 million private investment and can be demonstrated to create net positive economic and fiscal impacts for the State.

TIF and Environmental Insurance. Consideration should be given to developing a proposal to use TIF to subsidize environmental insurance premiums. See discussion in the Pooled Environmental Insurance section (M1).

Considerations

- Examine the potential to make proposed modifications in a way that has limited fiscal impact

- There are considerable political hurdles and widespread misgivings about the use of TIF. Opening the legislative discussion on TIF

[5] See: http://www.pdc.us/bus_serv/finance-pgms-detail/direct-tif.asp

allows for the potential for additional and/or alternative impacts to the TIF program.

Implementation Actions

- Refine proposed TIF modifications through the Technical Review Team and discussion with other stakeholders
- Conduct financial analysis of the costs and benefits of proposed TIF modifications
- Draft proposed legislative amendments

Lead and Support

State of Oregon lead on legislative process. Research and support conducted by State, Metro, and/or Local Governments.

FINANCIAL

Typologies Targeted

Type 1—Small Commercial

Type 2—Industrial Conversion

Type 3—On-going Industrial

Type 4—Rural Industrial

F9. Pooled Bonding

Challenge—Issuing bonds is an important tool for funding infrastructure and development projects. Brownfield sites that lend themselves to redevelopment can significantly increase the return on investment for private parties (e.g., commercial conversion of former industrial sites), and can successfully access bonding as a funding source. While others, such as industrial to industrial redevelopment projects, and many smaller brownfield sites owned by entities with lesser resources, cannot.

Solution—Small brownfield sites owned by entities with limited resources and larger sites that have expensive remediation may find assistance through pooled tax-exempt revenue bonds. It may be possible to issue revenue backed tax-exempt bonds for remediation of a number of challenged sites if these can be bundled in a manner that provides a viable revenue stream to repay the bonds. This may result in variable rates of participation in the repayment schedule by different site owners.

Mechanics—State and local jurisdictions have the ability to issue tax-exempt (as well as taxable) revenue backed bonds for a variety of purposes. These bonds do need to be repaid in some form by the projects to which they are applied. The state, through the Oregon Facilities Authority (OFA), currently pools bonds (SNAP bonds) for smaller scale non-profit entities. This program can be a useful model for a brownfield focused bond pool.

The pooled bonding effort would need several elements to be successful:

- Local area with multiple brownfield sites
- Strong case that it is in the public interest to remediate the sites
- Viable bond repayment revenue stream

Considerations

- Potential for the Community Investment Initiative public-private partnership entity to lead, if it's formed
- Avoid general obligation bonding that holds the local jurisdiction or state liable.
- Potential revenue streams from the bundled projects to service debt (it could come through a variety of sources, e.g., land lease payments, sale and/or refinance proceeds, rental payments from end users, increased tax payments, etc.)
- Limitations on lending of public credit to private parties

Implementation Actions

- Explore with the state and willing local jurisdictions, interest in running a demonstration effort for pooled brownfield remediation bonding.

Lead and Support

Metro, and/or Local Governments.

FINANCIAL

Typologies Targeted

Type 2—Industrial Conversion

Type 3—On-going Industrial

Type 4—Rural Industrial

F10. Jobs Tax Credit

Challenge— Redevelopment of brownfield properties requires substantial upfront investment to assess the nature and extent of contamination, develop a cleanup plan, and conduct the remedial actions. This financial challenge often leads to properties lying abandoned or underutilized for years.

Solution—Provide a tax credit to developers based on the number of jobs provided by a completed development.

Mechanics—This policy would require state legislation for implementation. In 2011, Oregon legislators considered a bill that would provide job tax credits for completed projects[6]. If the legislation had been approved, participants in the DEQ Voluntary Cleanup Program (VCP) would receive a $1,000 credit per job for a taxpayer who creates 25 or more jobs during a removal or remedial action.

Similar suggested legislation has proposed that participants of the VCP receive a $5,000 tax refund for each new job created that exceeded average annual county wage and a $2,500 tax refund for each new job that didn't. The incentive would only apply for full-time jobs created in Oregon.

The job credit would be approved following the verification of jobs and awarded as a refund paid out of taxes paid by entities to the State, including corporate taxes. Refunds would be distributed annually with no more than 25% of the approved total bonus refund to be paid in a single fiscal year. DEQ would be responsible for certifying eligible tax payers for the credit prior to redevelopment.

This proposal is similar to jobs tax credits that have proven to be effective in other states. Florida, for example provides a $2,500 tax refund for each new job created in a designated brownfield redevelopment area.

Considerations

- Any tax credit measure will need to consider the financial impact to the state as a primary concern
- Limiting applicability of jobs tax credits to designated areas, such as Urban Renewal Areas or economically distressed areas

[6] House Bill 2949, 76th Oregon Legislative Assembly, 2011 Regular Session

Implementation Actions

- Conduct analysis of costs and benefits of the jobs tax credit proposal, incorporating several options for the magnitude of the tax credit and criteria for project eligibility

- Prepare legislative proposal

Lead and Support

State of Oregon lead legislative process. Research and support conducted by State, Metro, Local Governments, and interested stakeholders.

FINANCIAL

Typologies Targeted

Type 1—Small Commercial

Type 2—Industrial Conversion

Type 3—On-going Industrial

Type 4—Rural Industrial

F11. Historical Insurance Recovery Support

Challenge—Site investigation and cleanup costs can be expensive. Historical insurance policies provide a potentially significant source of funding to support these efforts, but they can be challenging to access.

Solution—Provide technical support to assist parties in making claims on historical insurance policies.

Mechanics—In the past, Oregon DEQ provided technical support to guide parties through the process of submitting a claim on historical insurance policies. The state or Metro could fund staff to provide this service again.

Before the mid-1980s, commercial general liability policies did not contain exclusions for liabilities caused by environmental damage. Therefore, cost recovery may be pursued from historical insurance policies that were in place when pollution occurred and that covered the property owner, operators, or other potentially liable parties. Historical insurance recovery requires a commitment of time and resources, but is becoming a standard industry practice. Oregon state law and court decision precedents make it one of the most favorable states in the nation for substantiating environmental claims on historical insurance policies.

Making a claim on an historic insurance policy requires substantiating information of a liability and proof of coverage during the period of the environmental contamination. It is typically recommended to work with an attorney to make an historical insurance claim, but there also can be a large amount of document research needed to provide proof of coverage

Considerations

- Funding for staff (could be a fee for service payable upon settlement with the insurance carrier)
- Potential opposition from insurance carriers

Implementation Actions

- Determine appropriate agency to manage the program and staff
- Decide on appropriate funding mechanism
- Seek approval for program and staff

Lead and Support

State, Metro, or Local Government could each lead

FINANCIAL

Typologies Targeted

Type 1—Small Commercial

Type 2—Industrial Conversion

Type 3—On-going Industrial

Type 4—Rural Industrial

F12. Dedicated State Cleanup Fund

Challenge—Oregon State grant and loan programs for brownfields are limited in their financial capacity. These programs are either capitalized by federal grants or appropriated through the state general fund. Tipping fees at waste disposal facilities do provide a dedicated source of revenue for environmental programs, but they are limited.

Solution—Oregon or the Portland region could establish a dedicated fund for cleanup and redevelopment of brownfield properties. The revenues for the fund should be generated from a source that has both a nexus with contamination and the potential to generate a substantial revenue stream.

Mechanics—Several other states, like Michigan and New York, have passed large bond measures to support environmental cleanup. The federal government and some states have implemented taxes or fees dedicated to environmental cleanup. The federal CERCLA originally included the Superfund Tax on hazardous materials to support cleanup of priority sites. The Superfund Tax applied to certain chemical and pesticides, but notably excluded petroleum. The Superfund Tax expired in 1996 and has not been reinstated. Washington State's cleanup law that was passed by voter initiative included a fee on the wholesale value of hazardous substances, including petroleum, at a rate of $7 per $1,000 of wholesale value. The funds are used to support hazardous waste cleanup and prevention activities. The hazardous substance tax has generated over $100 million per year in revenues in the last five years. This high level of funding has been driven almost entirely by the high price of oil.

The Twin Cities of Minneapolis-St. Paul demonstrate how a local government can establish a cleanup fund. Ramsey County has been authorized by the state to collect a mortgage registry and deed tax to establish a fund to provide gap financing for brownfield. The use of the fund is very flexible and can cover remediation, site improvements, and indemnification associated costs. The Twin Cities Metropolitan Council also manages a cleanup loan and grant fund that is funded through a property tax levy.

The Oregon constitution includes a provision that prohibits the use of a fuel tax for any purpose other than transportation, so this particular model would have limited effectiveness in the state. There may be other products, such as the proposed transshipment of coal through Oregon ports, that could be used as a tax revenue stream to support brownfield cleanup and redevelopment. The Minneapolis-St. Paul approach may provide a model of a tax revenue stream that could support brownfield cleanup and redevelopment. The large bond model may also be applicable for Oregon.

Considerations

- Establishing eligibility requirements for funds
- Equitable distribution of funds
- An oil tax is not a sustainable source of funds

Implementation Actions

- Identification of potential products or services to generate tax revenue stream
- Prepare legislative proposal

Lead and Support

State of Oregon lead with support from Metro, and/or Local Governments.

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M1. Pooled Environmental Insurance

Challenge—A high level of risk and uncertainty is inherent in cleanup of contaminated properties, based on a number of factors, including:

- Cost of cleanup
- Potential discovery of unknown contaminants
- Claims by other potentially liable parties
- Third-party injury claims
- Regulatory changes in the future that may alter cleanup standards and reopen a completed cleanup

Solution—The State of Oregon, Metro or the City of Portland could establish a program that would decrease the transaction costs and reduce the cost of purchasing environmental insurance that covers these risks.

Mechanics—Environmental insurance is a tool for transferring the financial responsibility for certain risks or costs that may be present in contaminated property transactions. There are a number of environmental insurance products on the market. The two most prevalent are pollution legal liability and cleanup cost cap insurance.

Pollution legal liability insurance typically protects the insured against pollution-related losses associated with previously unknown conditions, including cleanup costs and third-party property damage or bodily injury claims. These policies can also cover regulatory re-openers, reduction of property value, and business interruption losses. These policies are highly flexible and provide a financial backstop that can facilitate loan approvals and capital investment.

Cost cap policies are designed to pay for unanticipated remediation project costs that exceed original project estimates. These policies are typically most cost effective for cleanups that cost over $10 million. Currently these policies are difficult to obtain on the market, however they are a powerful tool for managing one of the largest financial risks related to brownfield projects.

There are several options for a public role to facilitate the use of environmental insurance that could be effective for addressing brownfield challenges in the Metro area. These include:

Pre-Selected Insurers—To reduce the transaction costs of environmental insurance and make it more accessible for smaller sites, the state or Metro could pre-select brokers or insurance carriers. This type of program could offer cost cap insurance, pollution legal liability insurance, or blended risk

policies. The insurers would establish standard guidelines and template policies to make the process of drafting and executing a policy more efficient. For the privilege of having business directed to the insurers, they could agree to a discounted premium cost (the states of Wisconsin, California, and Ohio programs both provide 10% discounts).

Another approach to reducing the premium costs is for the state or Metro to subsidize the insurance premiums. For example, Massachusetts covers 50 percent of the premium costs of eligible projects (with a $50,000 limit for private projects and $150,000 limit for publicly sponsored projects).[7] The California program is also authorized with a 50 to 80 percent subsidy, but the subsidy aspect has not been funded for several years.[8]

In 2009, the Massachusetts program reported that, over the 10-year life of the program, $6.6 million in state funds had assisted 330 projects with an upside potential of 27,000 jobs and $4.1 billion in new investment. The Ohio, California, and Wisconsin programs are both more recent and less aggressive; so impact numbers are likely more limited.

Public Insurance Pool—In this model, the state or Metro would allow project proponents to make a payment to the government as closure for tailing environmental liability. The government could in turn use those funds to buy insurance policies to cover a pooled group of sites. This method of contribution to reach closure is similar in principle to the current program addressing contaminated sediments in the Columbia Slough. A pooled insurance model could be particularly effective in the Portland Harbor. The program could allow for small contributors to the Portland Harbor Superfund site (those only connected to the Harbor through stormwater discharge) to reach closure ahead of the final federal settlement. Upon completion of upland cleanup actions and implementation of stormwater best management practices, the parties would pay a premium that funds the environmental insurance. If the EPA or other potentially liable parties seek contribution from that party, the claim would be directed to the environmental insurance policy.

Considerations

- Connection to TIF or Tax Abatement—One way to pay for environmental insurance under any of the above options, is to craft a TIF or tax abatement program that is designed to offset some or all the extra cost of the environmental insurance. For example, if the determination is that the highest priority is the extra risks associated with business investment in the Superfund-impacted area, a TIF or tax abatement program could be crafted

[7] See: Massachusetts Brownfields Access to Capital Program - http://www.bdcnewengland.com/brownfields-redevelopment/brac-benefits-eligibility/
[8] See: http://www.calepa.ca.gov/Brownfields/Fair.htm

so that a public sector commitment (TIF or tax abatement) could automatically receive funding if the proposed project meets certain criteria. To limit the budgetary impact of such a program, the subsidy could be limited to the Superfund-related risks and would not include cost-cap insurance.

- Local government willingness to be associated with CERCLA liability

- Market availability of an environmental insurance product of this type

- Demand and potential use of the insurance pool. Even with reduced premiums, the insurance pool would likely still not be attractive for Type 1 Small Commercial sites with low cleanup costs

- Criteria for eligible applicants

- The degree to which the required standardization for the pooling works against program participation because limited participation could limit who can take advantage of it

Implementation Actions

- Further analysis of potential models for pooled environmental insurance

- Discussion with insurers on feasibility and interest in the program

- Discussion with property owners and businesses to inform them of the concept and survey interest level

- Refine program framework to craft into legislative proposal

Lead and Support

State, Metro, or Local Government could each lead

MANAGING RISK

Targeted Typologies

Type 1—Small Commercial

Type 2—Industrial Conversion

Type 3—On-going Industrial

Type 4—Rural Industrial

M2. Model Purchase and Sale Agreement

Challenge—Purchase and sale agreements between buyers and sellers of contaminated properties can be a time-intense and variable process.

Solution—Create a model agreement with indemnification language and distinctions between upland and in-land water liabilities along with standard transfer issues such as due diligence period, timing of cleanup, warranties, and inspection period.

Mechanics—A model purchase and sale agreement could include:

- A menu of available government incentives that could apply to offset environmental remediation and infrastructure improvements, and implementation of green building and sustainability initiatives
- Provide practical indemnification language for addressing past and future liabilities
- Provide language that differentiates and addresses upland and in-water environmental liability and cleanup
- Provide language that will address standard transfer issues (e.g. price, inspection period, down payment, due diligence period, reps and warranties, timing of cleanup and closing)

Considerations

Appropriate lead agency to develop model document

- Need for appropriate legal review of the model agreement
- Distribution and accessibility of the model agreement

Implementation Actions

- Determine lead agency to develop the model agreement
- Convene workgroup of appropriate experts (environmental, real estate, legal) to prepare model agreement

Lead and Support

State, Metro, or Local Government could each lead

M3. Public Land Bank

Challenge—Brownfield properties often remain vacant, underutilized, or even abandoned because there is no buyer with patient capital and long-term vision. Local governments are typically reluctant to step in and acquire these properties because of the potential legal liability and financial implications.

Solution—Establish a regional or statewide land bank to acquire brownfield properties and position them for redevelopment

Mechanics—Land banks can provide an entity with the resources and long-term perspective to acquire and reposition constrained properties. Land banks are usually created to manage the orderly disposition of property that has come under local government ownership, most often through tax delinquency. The disposition process is governed by community plans rather than the short-sighted tendency of local agencies to try to "get the properties off our books." The orientation toward community planning means that many land banks also selectively acquire properties in order to address blight or to assemble properties that can be redeveloped under the unified plan.

Brownfields are a sub-set of these vacant properties. However the brownfields-land bank connection is not necessarily an easy one. Land banks may be reluctant to acquire brownfields for several reasons:

- Some land banks have a mission to address vacant housing and have little experience in brownfields or in commercial redevelopment;
- There may be liability concerns;
- There may be concerns that the agency will not be able finance cleanup costs.

There are successful examples of land banks addressing brownfields, particularly in Michigan and Cleveland, (both areas where the prevalence of abandoned manufacturing facilities combined with weak markets has probably led to significant tax foreclosure acquisition of brownfields).

Michigan land banks have made use of a state authority to use tax increment financing for brownfields. That is, all land bank properties were, in effect, designated as brownfields in order to qualify for tax increment financing.[9] Then, large batches of properties were included in non-contiguous TIF districts, and the sale of the most marketable properties created a revenue source to finance improvements to the more difficult properties.

[9] Michigan land banks are sometimes cited as "brownfields success stories." Readers should understand that Michigan land banks are primarily addressing vacant residential property that got branded as "brownfields" in order to qualify for TIF.

Suffolk County, New York recently announced a plan to address brownfields through a newly enacted state land bank authority. The key change that facilitated the brownfields-land bank connection was the ability to sell properties for less than the tax lien.

Other observers working on making the brownfields-land bank connection have concentrated on eliminating the liability concerns and on providing a funding source for remediation.

Considerations

- Potential legal limitations on the special powers of land banks in Oregon
- Local capacity and opportunities for land banks to be successful
- Identifying the proper agency to take a lead role

Implementation Actions

- Further analysis of the legal framework for land banks in Oregon
- Refine proposal of special authorities and powers of a land bank
- Identify appropriate level of government under which to operate
- Prepare proposal for legislation to enable land bank authority for local governments in Oregon

Lead and Support

State, Metro, or Local Government could each lead

LINKING CLEANUP & DEVELOPMENT

Typologies Targeted

Type 1—Small Commercial

Type 2—Industrial Conversion

Type 3—On-going Industrial

Type 4—Rural Industrial

L1. Regulatory Flexibility

Challenge—Contaminated or potentially contaminated properties face difficult redevelopment barriers and must be particularly profitable to off-set incurred cleanup costs. Development regulations may add additional land use limitations on already constricted sites.

Solution—Provide increased flexibility in allowing broader land uses for underutilized sites so that alternate uses can be considered if the cost of achieving a given use is an impediment to revitalization.

Mechanics—Local governments could apply a zoning code overlay to contaminated sites or create a brownfield inventory list for priority sites that would allow developers and property owners to develop the site with greater regulatory flexibility. The flexibility would allow a greater scope of outcomes and increase the changes that a site could be developed profitably.

Local planning staff could coordinate with DEQ to implement strategies to achieve regulatory flexibility and remedial actions that are cost effective and balance a project pro forma. Regulatory flexibility measures could waive permit and impact fees and provide: streamlined permitting, wider ranges of approved uses, development standard exemptions, and /or density bonuses on brownfield properties.

Considerations

- Regulatory considerations would need to still meet broader land use policies for an area while providing leniency with more detailed requirements
- Potential perception of unfairness from other property owners

Implementation Actions

- Further analysis of regulatory implications of this policy change
- Prepare model ordinance language that could be adopted by local jurisdictions

Lead and Support

Metro could draft model ordinances.

Local Governments would lead on implementation.

LINKING CLEANUP & DEVELOPMENT

Typologies Targeted

Type 1—Small Commercial

Type 2—Industrial Conversion

Type 3—On-going Industrial

Type 4—Rural Industrial

L2. Brownfield Guidebook/Toolkit

Challenge—Landowners and developers are often unaware of resources available to support brownfield redevelopment and are typically wary of speaking openly with regulatory agencies for fear of liability.

Solution—Provide more effective resources to educate land owners and prospective buyers about the kinds of contaminants associated with different land uses, the costs of cleaning them up, and the redevelopment process and the resources available to assist these projects.

Mechanics—The Metro Brownfield Program, City of Portland Brownfield Program, and DEQ Brownfield Program are all engaged in education and outreach activities. One identified challenge to their efforts is the lack of a toolkit or manual that provides a concise but comprehensive guide to the cleanup and redevelopment process and the resources available to support these projects. Several models exist for this type of resource guide including one recently produced by the American Planning Association that provides a national perspective, and one published by the Washington State Department of Ecology in partnership with the Tacoma-Pierce County Health Department that is more locally focused.

Considerations

- Target audience(s) and level of detail of the guidebook(s)
- Engagement of stakeholders in guiding content
- Level of focus (statewide or Metro region)

Implementation Actions

- Identify appropriate agency to lead effort (potentially conduct as a joint effort between State, Metro, and City of Portland)
- Identify funding sources to develop the guidebook such as EPA State and Tribal Response Program funds
- Convene workgroup of various stakeholders to inform development of the guidebook

Lead and Support

State, Metro, or Local Governments could each lead

L3. Build Market Demand/Eliminate Stigma

Challenge—Brownfields represent a perceived higher risk real estate investment. They tend to be attractive to investors with higher risk tolerance.

Solution—Develop programs to link more risk tolerant investors and developers with brownfield properties.

Mechanics—A program to build market demand could function like an extension of Oregon's Industrial Site Certification program and Prospector site database. Metro and/or Business Oregon could develop a listing service that targets brownfield sites with development potential. The New Jersey Site Mart[10] and Pennsylvania Site Search[11] websites provide useful examples. The government agency would maintain the listing and actively market and promote these sites to prospective investors and business site selectors. Brownfields could be one subset of sites currently in the Industrial Site Certification and Prospector programs, or it could be a stand-alone initiative.

Specialized workshops or events could be held with developers that have experience with brownfields to introduce them to available brownfield properties that are considered to have strong market potential or that may be catalyst sites that support neighborhood revitalization efforts.

One special focus of this effort could be creating an easily accessible compilation of existing environmental information on properties in the Portland Harbor. The perception of potential contamination in this area often exceeds the reality of known issues. Providing access to environmental studies may help dispel stigma and misperceptions and provide potential purchasers with enough confidence to invest in this area.

Considerations

- Providing easily accessible information on incentives and tools available to assist with cleanup and redevelopment of brownfields together with the inventory of sites.
- Screening for eligibility to be on the list
- Level and types of background information to provide on the sites.
- To encourage property owners to list their sites, provide additional incentives available only to sites on the inventory, such as tax incentives, regulatory flexibility, or eligibility for environmental insurance.

[10] See http://www.njbrownfieldsproperties.com/Default.aspx

[11] See http://pabrownfields.pasitesearch.com/

- Assistance to address the legal risks and stigma associated with listing of a property.

- Capacity for active marketing of the sites

Implementation Actions

- Coordinate with Business Oregon to link this proposal with the Industrial Site Certification program and Prospector site database

- Conduct outreach to property owners, real estate brokers, developers, and business site selectors to survey interest and willingness to participate in the program

- Identify funding sources to support the program

Lead and Support

Business Oregon or Metro could each lead

LINKING CLEANUP & DEVELOPMENT

Typologies Targeted

Type 1—Small Commercial

Type 2—Industrial Conversion

Type 3—On-going Industrial

Type 4—Rural Industrial

L4. Universal Database

Challenge—Fully understanding the environmental issues at a brownfield property often requires collection and analysis of data around a larger area beyond the parcel boundary. Dynamics of groundwater flow in particular often demands study of a catch basin or larger area. While several projects in an area may collect groundwater data, it is challenging to access and share the information.

Solution—Create an open system to share environmental information across projects. This system could include analytical data on groundwater flow, contaminant concentrations, along with beneficial use determinations. Sharing this information across projects could result in a more refined understanding of complex systems and greater cost effectiveness.

Mechanics—Parties are required to submit data to the DEQ when conducting a site investigation or cleanup project under their jurisdiction. The database of information could be opened to limited access for retrieval of information. The City of Tacoma, Washington may be a model for the Portland area. To address area-wide groundwater concerns, the City is working with the State Department of Ecology to compile data from multiple cleanup projects and other sources into a central and accessible database.

The Regional Brownfield Scoping project has created the structure for such a database for the Portland metro region. Due to limitations of the study and available data, not all fields are populated. Additional resources would be needed to conduct research throughout the region as it was completed in this project's Study Areas, and to find other sources to fill remaining data gaps. Universal access issues and how to overcome participation and listing barriers would also need to be addressed. This database can also serve as an example for other regions throughout the state.

Considerations

- Liability issues related to making contamination data on a specific property publicly available
- Professional liability reservations about use of data collected by another investigator
- Potential to provide incentives to encourage parties to enter the database

Implementation Actions

- Determine appropriate agency to build and maintain this database (DEQ, Metro, or City of Portland)
- Identify funding source to support development of the database
- Coordinate with DEQ to structure and populate the database

Lead and Support

State, Metro, or Local Government could each lead

LINKING CLEANUP & DEVELOPMENT

Typologies Targeted

Type 1—Small Commercial

Type 2—Industrial Conversion

Type 3—On-going Industrial

Type 4—Rural Industrial

L5. One Stop Shop

Challenge—Successful redevelopment of brownfields requires navigation of state regulatory processes for cleanup along with permitting processes for construction. The multiple regulatory agencies involved may have different or competing interests. All of these regulatory processes occur within a time sensitive financing framework.

Solution—Create a system for inter-agency coordination for permitting and funding brownfield projects.

Mechanics—This proposal is an internal policy change and does not involve changes to laws or regulations. Create a Brownfield "team" with representatives from Metro, Cities, DEQ, and Business Oregon that coordinates permitting and funding activities for eligible projects. Pennsylvania's Brownfield Action Team program provides a useful model. The team would meet with the project proponent at an early stage of the process to outline the permit requirements, potential financial incentives, and a schedule for a project. The team would then meet periodically through the planning and permitting process to resolve any conflicting requirements and expedite review of the project. These types of meetings currently do occur opportunistically. This policy would formalize and advertise this system to make it a common practice.

Considerations

- Establishing a system of coordination without creating significant administrative burden
- Eligibility criteria. Could include:
    - Location in urban renewal area or similar special districts
    - Readiness of project to proceed
    - Project consistency with local planning and zoning

Implementation Actions

- Initiate coordination with staff from different agencies to explore feasibility of the proposal
- Refine operational framework and seek agreement from executive leadership of agencies

Lead and Support

State, Metro, or Local Government could each lead. Success of the program will depend on coordination among different agencies.

REGULATORY

Typologies Targeted

Type 1—Small Commercial

Type 2—Industrial Conversion

Type 3—On-going Industrial

Type 4—Rural Industrial

R1. Formalize Presumptive Remedies and Standards

Challenge—There is an opportunity for routine cleanup projects to be expedited through using standardized remedies and standards. DEQ often takes an expedited approach to common types of sites, but these guidelines and methods are not formalized.

Solution—Establish guideline documents for simple cleanup sites with common redevelopment uses.

Mechanics—DEQ staff with guidance from a stakeholder committee could develop these guidance documents, building on existing technical manuals. The guidance documents should provide enough certainty of expectations to allow routine cleanup projects to more expediently move through the administrative process. Note, these sites would still be required to meet all appropriate regulations and cleanup standards.

Considerations

- Degree to which existing technical guidance already addresses this issue
- Potential for standardized remedies to lead inadvertently to inflexibility
- Potential need for administrative rule-making to fully implement the policy.

Implementation Actions

- Review existing technical guidance documents to identify areas where standards are most developed and areas that may lack guidance
- Convene stakeholder group to provide perspective to the agency on where presumptive remedies and standards may be the most useful

Lead and Support

Oregon DEQ lead with support from Metro and other stakeholders

REGULATORY

Typologies Targeted

Type 1—Small Commercial

Type 2—Industry in Cities and Town Centers

Type 3—Industry in Employment Areas

Type 4—Heritage Sites

R2. Licensed Site Remediation Professional (LSRP)

Challenge—The number of contaminated properties and the length of the cleanup process are major challenges to brownfield redevelopment. Research of statewide case studies completed as part of this research study found that typical sites most often take at least two years to complete, and commonly take four to five years. In addition, more sites are entering the cleanup program each year than those finishing the remediation process.

Solution— In response to these same challenges, several states have created a program that gives licensed professionals authority to certify cleanups, decreasing the role of the state and the administrative process on every site. These programs are proving highly successful in increasing the number of cleanups conducted, decreasing the length of the cleanup process, and providing effective remedial actions.

Mechanics—Implementation in Oregon would require changes to state law, administrative codes, and internal agency policies.

The three primary elements (and an optional fourth element) of LSRP programs are described below. These represent the common elements of LSRP programs in Ohio, Massachusetts, Connecticut, and New Jersey:

- Licensing Program—Establish a licensing program to ensure that cleanups are managed by qualified professionals. Most states that have adopted the LSRP approach have established a licensing board and have detailed qualifications in the areas of education (including continuing education), experience, and written tests.

- Certification of Cleanups—Devolve cleanup authority for low- and medium-risk sites to licensed professionals. Such professionals would have the authority to certify cleanup and would also bear the liability for any issues arising from that certification should future related issues arise. The experience of other states is that the vast majority of site assessments and cleanups are conducted by LSRPs. The state audits a percentage (usually 10 to 20 percent) of the cleanup sites. One state (Ohio) requires the state to audit all sites that rely on institutional and engineering controls.

- Liability Release—Grant a liability release to innocent parties that employ qualified professional to remediate sites, contingent on state review of cleanup results. All states using the LSRP model offer a liability release or covenant not to sue. In three states the covenant is contingent on the state reviewing or auditing the site cleanup record. One state (New Jersey) has an automatic covenant based on certification of the cleanup by the LSRP.

- Mandatory Reporting of Known Contamination—An optional element adopted by two states (New Jersey and Massachusetts) is mandatory reporting and cleanup of known contamination. When property owners become aware of contamination, they are required to notify the state and hire an LSRP to conduct cleanup actions.

Considerations

- Requires shift in responsibilities of state Cleanup Program staff.
- Requires re-training of staff to conduct audits of cleanups.
- Potential perception that private consulting firms will not provide as high a level of cleanup work as state regulators; however, the experience of other states indicates that corporate liability concerns have made private firms take an even more conservative approach to site assessment and cleanup.
- The LSRP program has proven controversial both in states that adopted and attempted to adopt the program. Additional research and political outreach to stakeholder groups, from government, professional associations, labor groups, and local communities would be strongly recommended before this concept is considered further.

Implementation Actions

- Draft enabling statute for adoption through state legislation.
- Convene stakeholder group from government, professional associations, labor groups, and local communities to define standards and requirements for accreditation.

Lead and Support

State Legislature; Support from DEQ and local agencies

REGULATORY

Typologies Targeted

Type 3—On-going Industrial

R3. CERCLA Prospective Purchaser Agreements

Challenge—Liability issues are often ranked near the top of concerns when developers and other professionals are asked about the various impediments to brownfield redevelopment[12,13]. The risk of assuming strict, joint, and several liability discourages potential developers of brownfield properties.

Solution—EPA could provide Prospective Purchaser Agreements, jointly with Oregon DEQ to provide certainty and liability protection to innocent purchasers of contaminated properties under federal Superfund Law. Proactive use of this tool could be encouraged around Portland Harbor to promote property transactions in the face of the Superfund designation.

Mechanics—EPA has the authority under CERCLA to execute Prospective Purchaser Agreements. The 2002 Brownfield Amendments included a Bona Fide Prospective Purchaser (BFPP) defense tool with the purpose of providing a legal liability defense based on an innocent party conducting adequate due diligence and taking appropriate care and precautions on a property. EPA intended that the BFPP defense would serve the same role as Prospective Purchaser Agreements without requiring significant agency involvement. However, the BFPP defense has been challenged in court and appears to have limitations rooted in the subjective definition of the due care provisions[14].

In recognition of the special circumstances around the Portland Harbor, EPA could make a policy decision to enter into prospective purchaser agreements in this area. Eligibility for a prospective purchaser agreement could be limited to properties not located immediately adjacent to areas of contaminated sediments. To make implementation of this tool efficient, EPA and DEQ could establish a model prospective purchaser agreement for properties in the Harbor area based on existing state templates. The prospective purchaser agreement would need to be executed by both EPA and DEQ to provide sufficient liability protection.

Considerations

- This change in policy may need to be made at the highest levels of EPA and require a significant effort to make the case to policy makers

[12] U.S. Conference of Mayors. Recycling America's land: a national report on brownfields redevelopment. Vols. I-IX. 1993–2010.
[13] Wernstedt, K., P. B. Meyer, A. Alberini, and L. Heberle. Incentives for private residential brownfields development in US urban areas. Journal of Environmental Planning and Management 49(1):101-119. 2006.
[14] See Ashley II of Charleston, LLC vs. PCS Nitrogen. That decision sets a high bar for compliance with the due diligence and due care requirements that are connected to the BFPP defense.

- Commitment of EPA staff resources to execute the agreements in a timely manner

Implementation Actions

- Coordinate with stakeholders to assess interest in making this policy change

- Develop strategy to promote policy change at EPA

Lead and Support

EPA and DEQ lead with support from Metro and Local Governments

REGULATORY

Typologies Targeted

Type 3—On-Going Industrial

R4. CERCLA De Minimis Protection

Challenge—The designation of the Portland Harbor as a Superfund Site has added a significant layer of complexity and uncertainty to redevelopment of properties on the waterfront and properties that contribute stormwater runoff to the harbor. There is uncertainty regarding remedial actions that may be required and assignments of liability.

Solution—EPA provides expedited settlement agreements for owners of properties that likely cause minor impacts to the Harbor.

Mechanics— The EPA can provide de minimis settlements for parties that have a small share of cleanup liability. To date, EPA has been reluctant to provide these settlements in the Portland harbor. Broader use of this existing tool could expedite cleanup and redevelopment of a large number of properties that are located within the contributing area to the Superfund site, but that have had small impacts are only linked to the harbor through the municipal stormwater system.

Considerations

- This change in policy may need to be made at the highest levels of EPA and require a significant effort to make the case to policy makers
- Commitment of EPA staff resources to execute the agreements in a timely manner

Implementation Actions

- Coordinate with stakeholders to assess interest in making this policy change
- Develop strategy to promote policy change at EPA

Lead and Support

EPA and DEQ lead with support from Metro and Local Governments

APPENDIX F

RETURN ON INVESTMENT

ECONorthwest
ECONOMICS • FINANCE • PLANNING

Phone • (503) 222-6060
FAX • (503) 222-1504
info@econw.com

Suite 1600
222 SW Columbia
Portland, Oregon 97201-6616

Other Offices
Eugene • (541) 687-0051
Seattle • (206) 622-2403

October 15, 2012 Project #: 20870

TO: **Seth Otto**
FROM: **Lorelei Juntunen, Abe Farkas, Anne Fifield**
SUBJECT: **"RETURN ON INVESTMENT" FOR VARIOUS POLICY OPTIONS: METHODS, ASSUMPTIONS, AND RESULTS SUMMARY**

ECONorthwest (ECO) is teamed with Maul, Foster, Alongi (MFA) and Redevelopment Economics on Metro's Brownfield Scoping Project, which: (1) estimates the total number of brownfields (contaminated redevelopment sites) in the Portland Metro area, and (2) evaluates various policy approaches to addressing the challenge of redeveloping brownfields. This memorandum documents a portion of the analysis that ECO completed with Redevelopment Economics. It provides details on the methods, assumptions, and results of an analysis of the potential redevelopment and other outcomes that a set of policy options might achieve, if implemented. The Portland area's regional government, Metro, funded the study.

The analysis provides some context for comparing the various policy approaches, given certain desired outcomes (tax revenues, redeveloped square feet, etc.) that can be quantified and measured. These results are just one input into Metro's discussion as it determines which policies are most worthy of further evaluation and development. There are many other important considerations that will influence implementation that are not evaluated in this memorandum (though some are addressed in other parts of the larger project): legal or political barriers, administrative costs or program development hurdles, stakeholder opposition, etc. However, the findings of this analysis are a critical piece of the overall conversation, which may lead to the implementation of one or more of the policies evaluated here.

This memorandum is organized into six sections:

1. The research question: policies and metrics evaluated
2. Methods and limitations
3. Current market feasibility findings
4. Evaluation of financial incentives
5. Evaluation of non-financial incentives
6. Summary and key findings

1 THE RESEARCH QUESTION: POLICIES AND METRICS EVALUATED

Fundamentally, Metro is interested in an evaluation of the Return on Investment for various policy approaches that might be used to incent the remediation of brownfield contamination, so that contaminated properties are more likely to be redeveloped in support of Metro's growth management goals. Metro wants to know which policy tools provide the biggest "bang for the buck," or monetary return, relative to the investment in the program or policy itself.

Through a process that involved stakeholder, staff, and Council feedback as well as analysis of the results of implementation in other states and regions, the project's Technical Review Team prioritized a set of policies that would potentially be viable for implementation in the region, and for which more detailed analysis of likely outcomes was desired. These policies are described in detail in the Policy Options report, included as Appendix D of the final report. All of the policies are intended to support brownfield remediation and result in redevelopment of the contaminated properties. In summary, the policies selected for evaluation in this memorandum are:

1. **Brownfield Remediation Tax Credit:** Provide an income tax credit for the costs of conducting site investigation and environmental cleanup.
2. **Property Tax Abatement:** Abate property taxes for redeveloped brownfield sites, to improve the financial viability of reinvesting in the property.
3. **Dedicated Cleanup Fund (for integrated planning, site assessment, and clean up):** Oregon State or local governments could establish a publically funded grant to conduct environmental site assessments and fund site-specific redevelopment strategies (market assessment, architectural drawings, site planning, etc).
4. **Public Land Bank:** Establish a regional or statewide land bank to acquire brownfield properties and position them for redevelopment.
5. **Regulatory Flexibility:** Provide increased flexibility in allowing broader land uses for underutilized sites. This might involve waiving or reducing set back requirements, providing a density bonus, or allowing a change in use for a site so that it may be developed in a more financially viable way.
6. **One Stop Shop**: Create a system for inter-agency coordination for permitting and funding brownfields projects to reduce the complexity and time associated with navigation of the regulatory process.
7. **Tax Assessment Reform**: Statutes currently allow for property taxes on contaminated properties to be reduced to reflect their lower fair market value. Some feel that this creates a disincentive to investing in cleaning up contamination. Reforming the assessment methodology could remove that disincentive.

Metro is interested in evaluating these policies against a series of metrics in a Return on Investment Analysis (ROI) analysis.[1] The concept of ROI does not always transfer well to a public policy context, primarily because the public sector typically invests in policies and programs that are intended to achieve multiple desired outcomes, some of which are not easily monetized without complex modeling (environmental justice and equity; improved quality of life), and amongst which profit, in the business sense, is not typically prominently featured. To address this challenge, these policies are evaluated based on rough estimates of their potential cost for implementation, relative to their potential performance against a series of metrics that the project team has identified and is interested in maximizing with potential policy interventions in the area of brownfields:

- Acres of brownfields redeveloped and square footage of new development in various uses
- Amount of space for new jobs that could be created
- Incremental property and personal income tax generation
- Potential for new housing units

2 METHODS AND LIMITATIONS

Because the policies are so different from each other in their approach to addressing the brownfields problem, a single methodology could not be applied to an evaluation of all of them. In this memorandum, we have grouped them into the categories based roughly on the degree to which we could reasonably connect program costs to measures of the metrics.

2.1 FINANCIAL INCENTIVE POLICIES

This group of policies incents brownfield remediation and / or property redevelopment directly with additional dollars in some form or another. The following policies comprise this category: brownfield remediation tax credit; property tax abatement; dedicated cleanup fund; and public land bank.

The methodology for evaluating these policies builds from ECO's analysis of the redevelopment capacity and typologies, described in a separate memorandum (see Appendix B of the full report). The redevelopment capacity analysis resulted in an

[1] Return on Investment (ROI) is a concept most often used in the private sector to evaluate the performance of some business venture or operation. The objective of the venture is to make money (return); running the operation requires money (investment). Thus, ROI is fundamentally an efficiency ratio. Embedded in the ROI calculation is a *cash-flow analysis* that shows income and expenses year by year, typically for a 10- or 20-year period. Of importance to this project are the facts that ROI (1) has a clear, measurable, and singular measure of benefits, i.e., profit; (2) has clear methods of accounting for monetary costs; and (3) assumes that only monetary costs matter.

estimate of the *total amount of redevelopment* that might occur on all potential brownfields in the Portland metropolitan area, *the jobs* that could be supported in that new space, and the *property and personal income taxes* that could be generated there. This analysis of the return on investment relies on the same assumptions for square footage of redeveloped structures, new assessed value, property taxes, and personal income taxes. Please refer to that analysis for a description of assumptions.

To evaluate these policies, we began with those total figures, and used the following method to consider how the various policies might affect these totals:

1. ECO categorized the individual parcels in the sample of suspect sites based on the likelihood of the property to redevelop based on indicators of market feasibility, as follows:
   - Upside down: addressing brownfield costs will not make a difference in project feasibility
   - Close to tipping point: projects that are within 15% of feasibility once brownfield costs are addressed
   - Already feasible: properties that do not require assistance/incentives to achieve feasibility. This is a de facto indicator of development that may occur if no new policy is implemented

   This step provides a snapshot of current (pre-policy investment) conditions.

2. Redevelopment Economics conducted national research on similar policies to create assumptions regarding "penetration rate", or the upper bound on the portion of properties that are likely to be both eligible for and interested in participating in a particular financial incentive program, and roughly estimated the costs of each program based on available financial data, national best practices, and estimates of administration costs expected. These penetration rate assumptions are described in more detail in later sections of this memorandum.

3. ECO applied the penetration rate to each of the parcels in the sample of suspect sites and then we sorted the parcels into the categories of redevelopment likelihood, as follows:
   - Upside down: Policy will not result in redevelopment feasibility, 0% of properties in this category are redeveloped.
   - Close to tipping point: Remediation of brownfields will incent a portion of eligible properties to redevelop. For each typology, a specified portion of the properties deemed eligible based on the penetration rate are assumed to redevelop.
   - Already feasible: These properties redevelop without incentives because of favorable market and other conditions. These properties are not assumed to

require or be eligible for assistance from new policy initiatives, and, as such, if they redevelop, it is not because of policy intervention. 0% of these redeveloped properties are counted.

Using parcel-specific data in the sample of suspect sites, ECO determined the portion of acres of each typology[2] in the sample that could potentially redevelop (that is, those that are close to the tipping point or where remediation equals feasibility). We then extrapolated that portion to the full universe of suspect sites and known DEQ sites.

The outcome of these calculations are the upper bound amounts of acreage redeveloped, jobs resulting, and tax benefits that might be attributed to each policy's implementation. The results will provide a basis for comparison among the policies under consideration, and will help to identify those policies that rise to the top as having lowest costs relative to outcomes achieved.

2.2 NON-FINANCIAL INCENTIVES

This group of policies incents brownfield remediation and / or property redevelopment *without* a direct investment of dollars into a redevelopment or cleanup action. As such, it is much more difficult to quantify the outcome of these policy interventions relative to their costs. This category includes the following policies: regulatory flexibility, one stop shop, and reform contaminated property tax assessment.

Each of these policies was evaluated using a slightly different approach, as described in the remainder of this memorandum. In most cases, it was not possible to evaluate them directly against the metrics that Metro defined for this analysis.

2.3 LIMITATIONS

The purpose of the analysis is to inform policy discussions with some information about how certain policies might incent redevelopment and create financial outcomes that are of concern to policy makers. As is appropriate to this purpose, the analysis is intentionally order of magnitude, with results averaged across the entire region, rather than precise and site specific. Further, policies have not been fully developed for implementation; questions around eligibility, funding, timing of implementation, and

[2] **Type 1—Small Commercial Sites**. Common historical uses were gas stations, repair shops, and dry cleaners, characterized by small parcel size and located along highways, arterials, and commercial centers.

Type 2—Industrial Conversion Sites. These properties range in size and historically housed various uses in areas that have transitioned from industrial to office, retail, and mixed use centers.

Type 3—Ongoing Industrial. These properties are located in areas with an industrial past that continues today.

Type 4—Rural Industry Sites. Properties associated with rural natural resource extraction industries and agriculture. These properties are typically large and located on the edge of urban growth boundary, especially within urban and rural reserves.

other policy objectives have not yet been addressed. This has led to the following limitations of analysis:

- Because the policies have not been fully developed and vetted through a political process, ECO has made assumptions about how the programs might function to complete this analysis. These assumptions are described in this memorandum, but may not accurately reflect the way programs would be implemented if Metro chose to move forward.

- ECO's analysis of the feasibility of redevelopment considered a number of different development scenarios that reflect the range of costs and revenues that normally affect any development project. To complete the analysis in this memorandum, however, it was necessary to narrow to just one scenario that most closely reflects the average market across the whole region. In essence, the mid-point scenario that underlies the analysis in this memorandum smoothes the real world variation in feasibility from site to site that results from market differences associated with locational advantages and disadvantages and costs of remediation. While this provides a good proxy for average conditions, this approach cannot be considered accurate for any specific single site.

- The analysis assumes the same penetration rate for all typologies, and provides an upper bound on return.

- The analysis does not show the potential cumulative effect of implementing multiple policy tools. All tools were analyzed in isolation and their benefits should not be considered additive.

- In many cases, the individual policy tools are most effective only when a particular development project is already close to the tipping point. In these situations, the policy investment may be a very important contributing factor in achieving feasibility, but other variables (achievable rents, development costs, etc.) were responsible for the bringing the project close to feasibility. This analysis shows that all of the positive impacts are a result of the program or policy, but in truth, a host of factors are involved in creating the conditions for success.

These limitations mean that results of the analysis are not a precise measure of ROI resulting from site remediation, but rather a means by which to compare policies to each other given certain measurable outcomes desired.

3 CURRENT MARKET FEASIBILITY FINDINGS

The feasibility of development under current conditions provides the foundation for the evaluation of financial incentive policies. (See the ECONorthwest memorandum

"Fiscal and financial feasibility study: Methods, assumptions, and results summary" dated September 20, 2012).

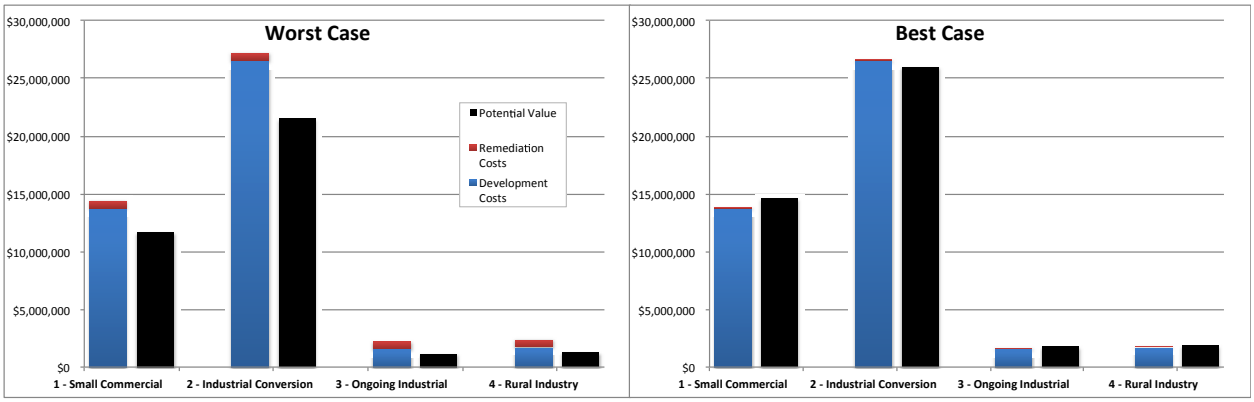
The analysis of financial feasibility found that, overall and on average, the majority of sites cost more to develop *even if remediation costs are not included* than the estimated market value, an indicator that the sites are not likely to redevelop without market intervention. Those development types with the highest per-acre development costs (mid-rise mixed use, neighborhood mixed use) are the most strongly affected by overall market conditions.

Figure 1 shows the per-acre development costs, remediation costs, and the potential market value. The left chart shows the worst-case scenario and the right chart shows the best-case scenario.

The blue bar shows the development costs, with the red portion representing remediation costs. The black bar shows the potential market value. The two charts highlight some factors that affect how important remediation costs are to development and how those costs can vary.

- In Types 1 and 2, remediation costs make up a small portion of total development costs, even if the remediation costs are at the high end of the cost spectrum (worst case). Dense building prototypes dominate Types 1 and 2, leading to high per-acre development costs. If remediation costs are at the low end of the cost spectrum, the account for a very small portion of overall costs.
- In Types 3 and 4, remediation costs can make up a large portion of overall costs. If the remediation costs are high and market rents are low, the cost of remediation equals about one-third of all development costs. If, however, remediation costs fall at the low end of the cost spectrum and market rents are high, remediation costs are a small portion of total development costs.

Figure 1. Per-acre costs and potential development value, suspect brownfield sites, by brownfield typology, Portland Metro Area



Source: ECONorthwest, 2012.

For this analysis, we narrowed the range of 'best case' and 'worst case' financial gaps to a single scenario. The single mid-range scenario is based on a middle estimate of brownfield remediation costs[3] and the mid-point for each potential development's fair market value.

Table 1 shows the percent of sites in each typology and the market-feasibility category. The data show that about a third of the sample is upside down. A large portion, 40%, is close to the tipping point (project costs are within 15% of final market value) and about a third are feasible even if remediation costs are included in the development costs. Under this set of assumptions, no parcels turned from being infeasible to feasible if remediation costs were covered.

Table 1. Percent of sample in categories of market feasibility, Portland Metro Area

Typology	Upside down	Close to tipping point	Already feasible	Sum by Typology
1	3%	54%	44%	100%
2	0%	100%	0%	100%
3	33%	67%	0%	100%
4	100%	0%	0%	100%
Total	**24%**	**47%**	**29%**	**100%**

Source: ECONorthwest, 2012.

The data show that Type 1-Small Commercial was the only typology that has parcels that are feasible even if the cost of remediation is included. Within that typology, the "Low Density Commercial" prototype was the only one in the 'already feasible' category. All parcels with that building prototype were Type 1-Small Commercial. Type 4 performs poorly for a variety of reasons. These parcels are all outside of the UGB, and even if they redevelop at some future date when policy more clearly supports it, because of their location on the urban fringe, they are likely to develop at lower densities that have lower price points.

4 EVALUATION OF FINANCIAL INCENTIVES

4.1 BROWNFIELD REMEDIATION TAX CREDIT

Program Description

The State of Oregon could provide an income tax credit connected to the costs of conducting site investigation and environmental cleanup. This program would directly reduce the financial impacts of remediation and improve the balance sheet for brownfield projects.

[3] As measured by Maul, Foster and Alongi.

A brownfield remediation tax credit for Oregon could be modeled off the existing programs operating in 13 other states. Based on the experience of those states, the key features that make the tax credit program effective are:

1. Minimize administrative burden. Some states make the incentive fully automatic, so that participants simply document and claim the credit when they prepare their taxes.
2. Make credits transferable. Allow participants, including tax-exempt non-profits to generate upfront cash to support cleanup by selling the credits to a third party.
3. No project limit. Allow the tax credit to apply to the full cost of remediation, without setting a ceiling (such as $500,000 per project).

For the purposes of conducting the return on investment analysis, ECO made the following assumptions regarding the structure of the brownfield remediation tax credit:

- The tax credit amount was set as 50% of remediation costs;
- There was no cap for individual projects or the entire program;
- There was no needs testing—fully automatic based on qualifying expenditures; and
- The credits can be transferable, enabling it to work for projects led by non-profits.

We calculated the new financial gap after reducing remediation costs by 50%—the amount of the tax credit. We then identified those parcels that became close to the tipping point or where remediation equals feasibility. However, no parcels flipped from infeasible to feasible after the tax credit, so our analysis focused on the parcels close to the tipping point. We did not apply the tax credit to upside-down parcels or those that are feasible even if remediation costs are included in the development costs.

The cost of the program is the tax revenue that is foregone as a result of allowing the tax credit.

Penetration rate

To estimate potential impacts, we made the following assumptions, which are based on a model remediation tax credit program that has been successfully employed in Massachusetts:

- Isolate projects that become feasible or nearly feasible as a result of the credit.
- Assume that 50% of those sites proceed.
- Assume that 50% of those proceeding will claim the credit (a total of 25%).

Although this program could take a while to start making an impact, especially if credits are not initially transferable, we estimate the total potential impacts associated with all sites meeting the described criteria. Participation of smaller sites would be impacted by legal and other costs associated with selling and transferring the credits. Thus this analysis identifies an upper bound of participating properties.

Outcome

Table 2 shows the estimated outcomes for total acres, square feet of redeveloped buildings, new jobs, property tax and personal income tax for the suspect and known DEQ sites in the Portland region. The analysis estimates that the tax credit would support about 450 acres of new development. The redeveloped sites could provide workspace for about 9,200 jobs and 35,000 new dwelling units.

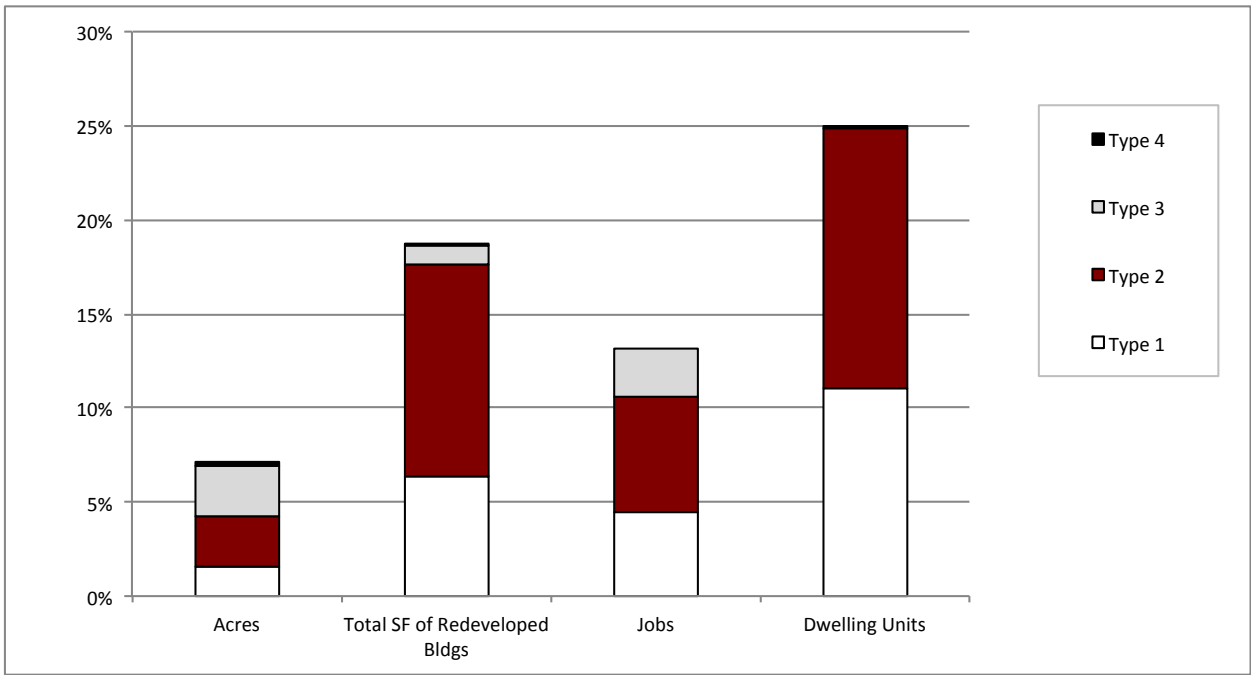
Table 2. Estimated outcomes incented by tax credit within suspect and known sites, Portland Metro Area

					Annual Tax Revenue ($)	
Typology	Acres	Total SF of Redeveloped Bldgs	Jobs	Dwelling Units	Property Tax	Personal Income Tax
1	96	14,852,000	3,100	15,300	25,849,000	6,170,000
2	173	26,364,000	4,200	19,200	39,657,000	5,522,000
3	163	2,308,000	1,800	0	3,807,000	7,061,000
4	17	315,000	0	100	653,000	0
Total	449	43,839,000	9,200	34,600	69,966,000	18,753,000

Source: ECONorthwest, 2012.

For each measured outcome, ECO estimated the total that could be developed if 100% of the suspect and known DEQ sites in the region were redeveloped. Figure 2 shows the portion of that total that the tax credit could incent towards development. The chart shows that most of the incented redevelopment occurs in Types 1 and 2. Because those types are dominated by a mixed use and residential development, the tax credit is more likely to incent residential uses than employment-only uses. The chart shows that we estimate the tax credit could incent about 12% of all brownfield acres to redevelopment.

Figure 2. Portion of potential development outcomes for all suspect and known DEQ sites incented by tax credit, by brownfield typology, Portland Metro Area



Source: ECONorthwest, 2012.

Table 3 shows the estimated total cost of implementing the tax credit for the portion of combined suspect and known DEQ sites, taking advantage of the tax credit, by typology. The total cost for all sites would be about $57 million. The data show that the potential annual revenue for property and personal income taxes is roughly equal to one and half times the total cost of the credit.

Table 3. Estimated total cost of tax credit and return on investment from annual tax revenues, suspect and known DEQ sites, Portland Metro Area

Typology	Cost of Tax Credit	Property Tax Revenue/Cost	Income Tax/Cost	Total Tax Revenue/Cost
1	$12,297,000	2.1	0.5	2.6
2	$22,123,000	1.8	0.2	2.0
3	$20,807,000	0.2	0.3	0.5
4	$2,194,000	-	-	-
Total	**$57,420,000**	**1.2**	**0.3**	**1.5**

Source: ECONorthwest, 2012.

4.2 PROPERTY TAX ABATEMENT

Program description

This program would utilize some of the key criteria for the rural enterprise zone (EZ) tax abatement and apply these to brownfields throughout Oregon. The length of the tax

abatement would be based on criteria that have yet to be identified (e.g., amount of investment, job creation and/or retention, etc.). Localities may authorize a brownfield property tax abatement in or outside of enterprise zones if the remediation costs exceed 10% of the pre-development assessed value and the site cleanup is certified by the State.

- The abatement would be three years for any use outside of an EZ
- Within EZ's, the re-use categories that are eligible would expand and the time period would extend if the site meets the brownfields qualifications

For the purposes of conducting the return on investment analysis, ECO made the following assumptions regarding the structure of the property tax abatement, which was based on a review of a range of tax abatement programs used across the country:

- Properties are eligible for the abatement if the remediation costs are greater than 10% of the property's current assessed value
- The tax abatement applies to new assessed value generated by the capital improvements to the property
- The tax abatement continues for the three years
- The cost of the abatement is equal to the net present value of the abatement over three years
- Individual projects are capped at the cost of remediation, otherwise there is no cap for individual projects or the entire program
- There is no needs testing—it is fully automatic based on qualifying expenditures

We calculated the new financial gap after reducing remediation costs by the net present value of the tax abatement.[4] We then identified those parcels that became close to the tipping point or where remediation equals feasibility. However, no parcels flipped from infeasible to feasible after the tax credit, so our analysis focused on the parcels close to the tipping point. We did not apply the tax credit to upside-down parcels or those that are feasible even if remediation costs are included in the development costs.

Penetration Rate

To estimate potential impacts, we made the following assumptions:

- Isolate projects that become feasible or nearly feasible as a result of the credit;
- 50% of those sites proceed;
- Assume that 90% of those proceeding will claim the credit.[5]

[4] the net present value assumed a 3% discount rate, equal to the allowed rate of growth for assessed value.

[5] The take-up rate for abatement was assumed to be higher than for the remediation tax credit because experience in other areas show a higher participation rate for that tool.

Outcome

Table 4 shows the estimated outcomes for total acres, square feet of redeveloped buildings, new jobs, property tax and personal income tax for the suspect and known DEQ sites in the Portland region. The analysis estimates that the tax credit would support about 810 acres of new development. The redeveloped sites could provide workspace for about 16,500 jobs and 62,000 new dwelling units.

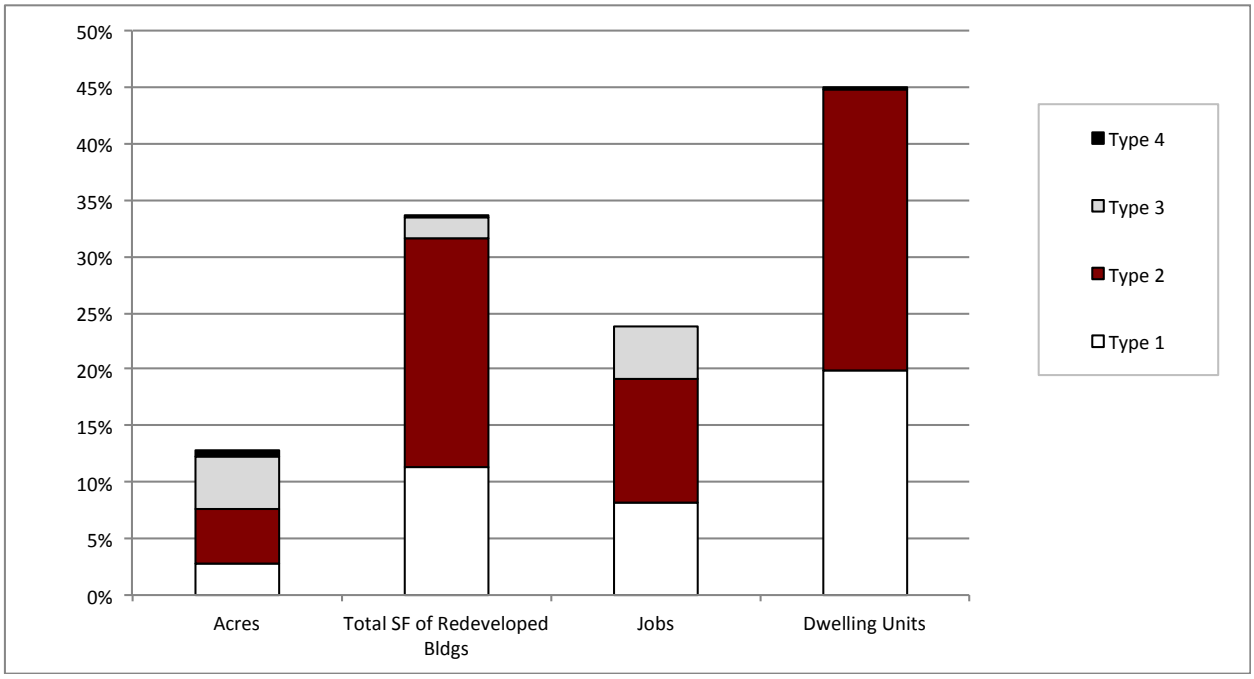
Table 4. Estimated outcomes incented by tax abatement within suspect and known DEQ sites, Portland Metro Area

					Annual Tax Revenue ($)	
Typology	Acres	Total SF of Redeveloped Bldgs	Jobs	Dwelling Units	Property Tax	Personal Income Tax
1	173	26,734,000	5,600	27,600	46,528,000	11,106,000
2	311	47,454,000	7,600	34,500	71,382,000	9,939,000
3	293	4,155,000	3,300	0	6,853,000	12,709,000
4	31	567,000	0	200	1,176,000	0
Total	**808**	**78,909,000**	**16,500**	**62,300**	**125,940,000**	**33,755,000**

Source: ECONorthwest, 2012.

For each measured outcome, ECO estimated the total that could be developed if 100% of the suspect and known DEQ sites in the region were redeveloped. Figure 3 shows the portion of that total that the tax abatement could incent towards development.

Figure 3. Portion of potential development outcomes for all suspect and known DEQ sites incented by property tax abatement, by brownfield typology, Portland Metro Area



Source: ECONorthwest, 2012.

Table 5 shows the estimated cost of implementing the property tax abatement for suspect sites and combined suspect and known DEQ sites, by typology. The net present value of the total cost for all eligible sites would be about $145 million. The data show that the total annual tax revenue is roughly equal to 110% of the net present value cost of the credit. The bulk of the tax revenue comes from property tax revenue.

Table 5. Estimated cost of tax abatement and return of investment from tax revenues, suspect and known DEQ sites, Portland Metro Area

Typology	Cost of Incentive	Property Tax Revenue/Cost	Income Tax/Cost	Total Tax Revenue/Cost
1	$41,202,000	1.13	0.27	1.40
2	$79,642,000	0.90	0.12	1.02
3	$20,559,000	-	-	-
4	$3,529,000	-	-	-
Total	**$144,932,000**	**0.87**	**0.23**	**1.10**

Source: ECONorthwest, 2012.

4.3 DEDICATED FUND FOR PLANNING, ASSESSMENT, AND CLEANUP / INTEGRATED PLANNING AND ASSESSMENT GRANTS

Program description

Oregon could establish a dedicated state fund for cleanup of contaminated sites where local governments are liable parties. The revenues should be generated from a source that has both a nexus with contamination and the potential to generate a substantial revenue stream. Large cleanup funds are typically approved and managed at the state level. The dedicated fund should produce a revenue stream sufficient to capitalize a revolving loan fund of $50 million and create a grant program of $25 million in annual outlays. Private, non-profit, and public entities would be eligible for the loans. Jurisdictions may pledge TIF revenues as re-payment, which would turn the loan into a grant for the developer. The state would decide public benefit criteria such as job creation, affordable housing, sustainable development, transit-oriented development, or investment in distressed areas.

For the purposes of conducting the return on investment analysis, ECO made the following assumptions regarding the structure of the dedicated fund, based on a review of similar programs in other states (Michigan, New York, Washington, and Minnesota):

- All properties are eligible for the funds
- Eligible costs are limited to remediation costs[6]

[6] It is possible that a more fully-developed grant program could cover more than just remediation costs, which could be beneficial for projects where market variables, together with brownfield costs, are also affecting feasibility.

- There is no cap for individual projects or the entire program
- There is no needs testing—it is fully automatic based on qualifying expenditures
- The impacts are projected over a 10-year time period

The revolving loan fund activities are assumed to generate a revenue stream equivalent to $25 million per year. The net present value of that figure, over a 10-year period is $213 million.[7] This level of cash flow would be sufficient to support an ongoing investment in brownfields around the region.

Based on these assumptions, the potential funds available for each parcel would be the cost of remediation. We calculated the new financial gap after reducing total remediation costs. We then identified those parcels that became close to the tipping point or where remediation equals feasibility. No parcels flipped from infeasible to feasible after the fund is employed, so our analysis focused on the parcels close to the tipping point. We did not apply the fund to upside-down parcels or those that are feasible even if remediation costs are included in the development costs.

Penetration rate

Based on the work of Redevelopment Economics, we assumed that a fund would be established with the purpose of maximizing the outcomes measured in this analysis, rather than to target particular types of properties or to achieve other potential goals. To estimate potential impacts of such a program, we made the following assumptions regarding penetration, based on the successes of the similar programs that we reviewed:

- Isolate projects that become feasible or nearly feasible as a result of the fund
- 50% of those sites proceed
- Assume that 50% of those proceeding will use the dedicated fund

After narrowing the potential total acres and remediation costs, total demand from suspect and known DEQ sites equaled $370 million, well in excess of the available $213 million. We assigned the funds to the typologies based on the financial gap ratio (the financial gap divided by the potential market value) for whole typology. The ratios for the four typologies are:

- Type 1-Small Commercial: 8.1%
- Type 2-Industrial Conversion: 12.0%
- Type 3-Ongoing Industrial: 10.9%
- Type 4-Rural Industry: 12.3%

[7] Assuming a 3% discount rate.

Based on the financial gap ratio, we assigned dedicated cleanup fund dollars first to Type 1-Small Commercial, second to Type 3-Ongoing Industrial, third to Type 2-Industrial Conversion, and last to Type 4-Rural Industry. The $213 million from the dedicated fund was sufficient funds to support all the Type 1-Small Commercial and about three-quarters of the Type 3-Ongoing Industrial acres that proceeded to redevelopment based on the assumptions and penetration described above.

Outcome

Table 6 shows the estimated outcomes for total acres, square feet of redeveloped buildings, new jobs, property tax and personal income tax for the suspect and known DEQ sites in the Portland region. The analysis estimates that the cleanup fund would support about 830 acres of new development. The redeveloped sites could provide workspace for about 9,000 jobs and 20,000 new dwelling units.

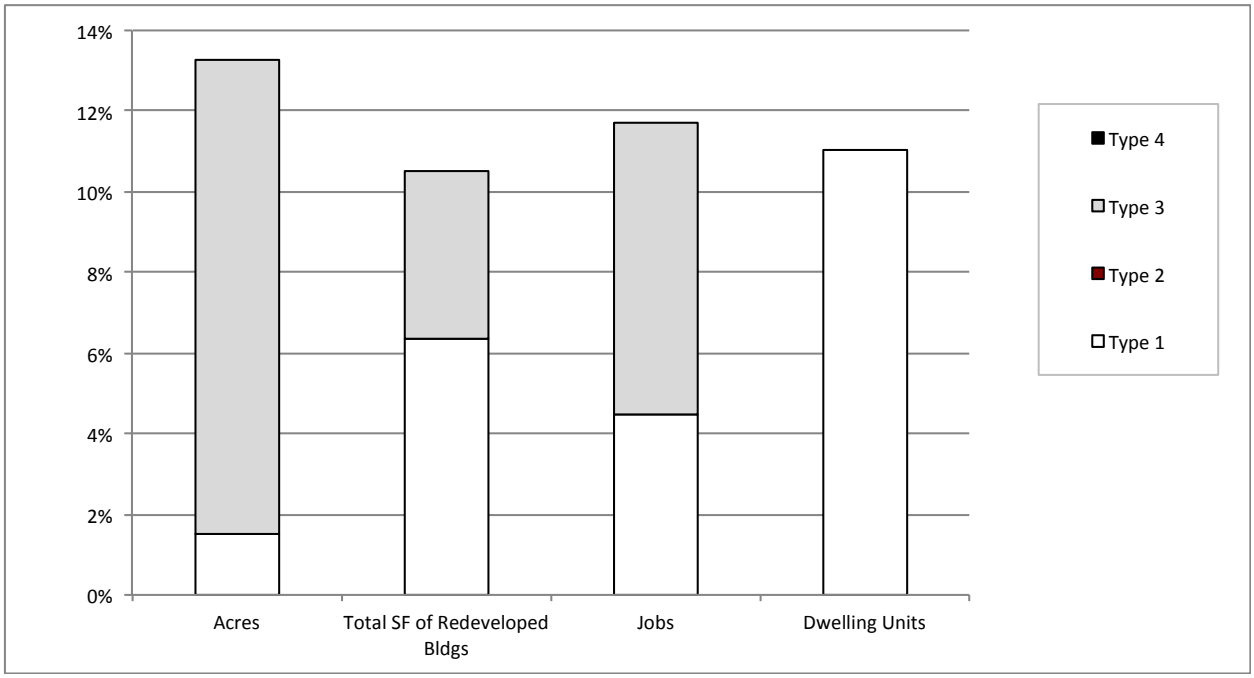
Table 6. Estimated outcomes incented by dedicated cleanup fund within suspect and known DEQ sites, Portland Metro Area

					Annual Tax Revenue ($)	
Typology	Acres	Total SF of Redeveloped Bldgs	Jobs	Dwelling Units	Property Tax	Personal Income Tax
1	96	14,852,000	3,100	15,300	25,849,000	6,170,000
2	0	0	0	0	0	0
3	737	9,727,000	5,000	0	15,448,000	19,514,000
4	0	0	0	0	0	0
Total	**833**	**32,728,000**	**8,700**	**19,900**	**51,945,000**	**24,169,000**

Source: ECONorthwest, 2012.

For each measured outcome, ECO estimated the total that could be developed if 100% of the suspect and known DEQ sites in the region were redeveloped. Figure 4 shows the portion of that total that the cleanup fund could incent towards development. The chart shows that all of the incented redevelopment occurs in Types 1 and 3. Type 3 is all employment-only development types, so the incentive incents a relatively high portion of total potential jobs.

Figure 4. Portion of potential development outcomes for all suspect and known DEQ sites incented by dedicated cleanup fund, by brownfield typology, Portland Metro Area



Source: ECONorthwest, 2012.

Table 7 shows the estimated cost of implementing the dedicated cleanup fund for the combined suspect and known DEQ sites taking advantage of the grant program, by typology. The total cost for all eligible sites would be about $213 million. The data show that the total annual tax revenue is roughly three times the net present value of the total cost of the grant program and the bulk of the tax revenue comes from property tax revenue.

Table 7. Estimated cost of dedicated cleanup fund and return of investment from tax revenues. suspect and known DEQ sites, Portland Metro Area

Typology	Cost of Incentive	Property Tax Revenue/Cost	Income Tax/Cost	Total Tax Revenue/Cost
1	$24,594,000	1.05	0.25	1.30
2	$0	-	-	-
3	$188,661,000	0.08	0.10	0.19
4	$0	-	-	-
Total	**$213,255,000**	**0.24**	**0.11**	**0.36**

Source: ECONorthwest, 2012.

Type 1-Small Commercial has a higher return on investment as that typology generates large property tax revenue relative to the cost of the tax credit.

4.4 PUBLIC LAND BANK

Program description

A public land bank creates an entity with the resources and long-term perspective to acquire and reposition brownfield properties without putting additional liabilities on the jurisdictional balance sheet. The land bank would operate with a clear mission and long-term plan for community revitalization. To be effective in repositioning contaminated lands, it should have special powers, such as protection from environmental liability, authority to clear title, ability to issue bonds and use tax increment financing. The land bank would require initial capitalization to acquire a portfolio of properties and financial support for the initial years, but should achieve financial self-sufficiency in a period of 5 to 10 years through sale of properties to the private market.

Key assumptions for this analysis about how a land bank could operate in the Metro area include:

- Initial capitalization of a $25 million acquisition-redevelopment fund (assumed funds put directly into acquisition and redevelopment without administrative costs)
- Declining annual appropriated for the first five years of operation (such as $10 million for year one declining to $2 million through year 5)
- The land bank would rely on other revenue sources to fund 50% of remediation costs. Other sources could include federal grants or tax increment financing.

A land bank would focus acquisition in challenging areas, where achievable rents are low and market feasibility is more difficult to achieve. To model broad impacts, we applied the revenue to average land values across the sample of suspect and DEQ sites.

Estimate cost of program

The assumptions provide a high level of initial investment targeted at properties with relatively low land value. The initial investment through the first five years would total $55 million of public funds that could potentially support acquisition and cleanup of 195 acres of property. These are subject to wide changes based on the portfolio of properties that could be acquired, the ability to purchase property at a discount and sell at a premium, and to obtain outside sources such as EPA grants to support cleanup. The land bank would likely operate like a private developer and focus on properties with the smallest financial gap and greatest redevelopment potential first. This approach could allow the land bank to use proceeds from early successes to subsidize investment in more challenging properties in the future.

Outcome

Table 8 shows the estimated outcomes for total acres, square feet of redeveloped buildings, new jobs, property tax and personal income tax for the suspect and known DEQ sites in the Portland region. The table only shows the total results, not by typology. Actual impacts would vary based on the type of land purchased and sold. Typologies with higher residential densities would yield more dwelling units, and typologies with more employment-based developments would yield more jobs.

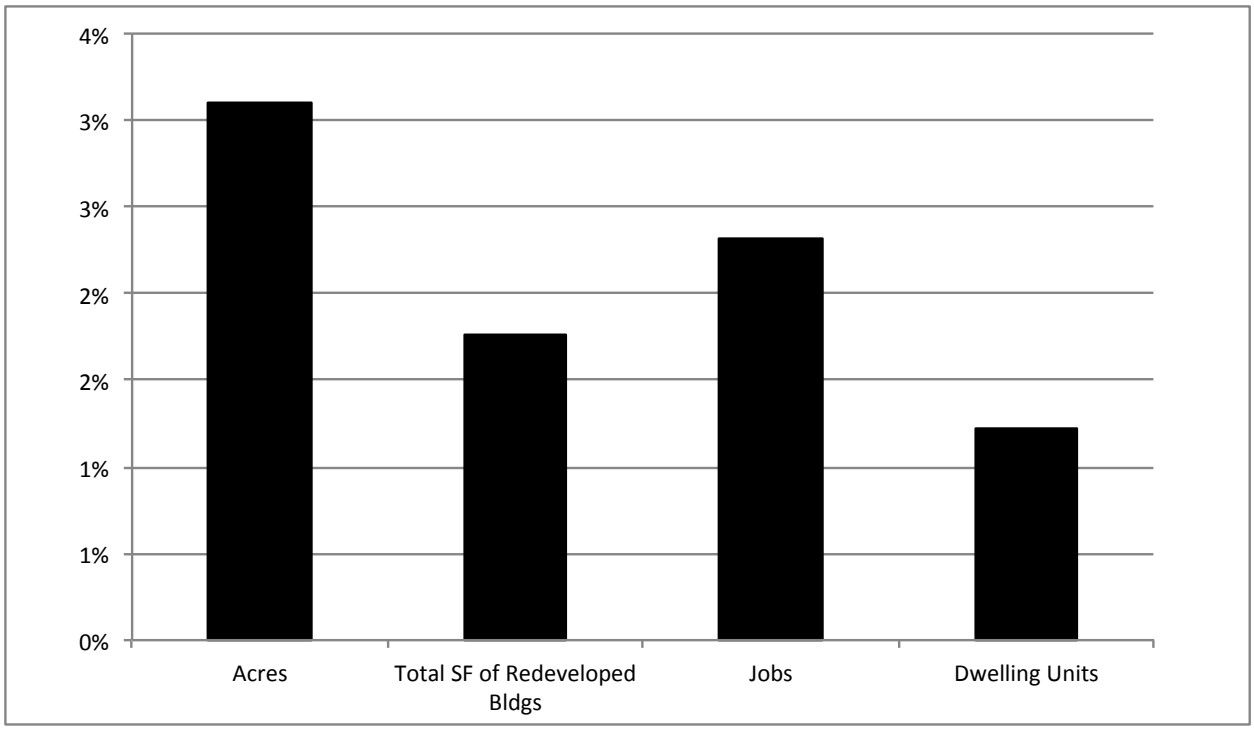
Table 8. Estimated outcomes incented by a land bank within suspect and known DEQ sites, Portland Metro Area

					Annual Tax Revenue ($)	
	Acres	Total SF of Redeveloped Bldgs	Jobs	Dwelling Units	Property Tax	Personal Income Tax
Total	**195**	**4,116,000**	**1,600**	**1,700**	**6,809,000**	**5,195,000**

Source: ECONorthwest, 2012.

For each measured outcome, ECO estimated the total that could be developed if 100% of the suspect and known DEQ sites in the region were redeveloped. Figure 5 shows the portion of that total that the Land Bank could incent towards development.

Figure 5. Portion of potential development outcomes for all suspect and known DEQ sites incented by land bank, by brownfield typology, Portland Metro Area



Source: ECONorthwest, 2012.

Table 9 shows the estimated cost of implementing the land bank for suspect sites and combined suspect and known DEQ sites, by typology. The total cost for all sites would be about $55 million—the value of the initial capitalization of the bank. The data show that the cost of the land bank is roughly four times the annual revenue generated by the sites.

Table 9. Estimated cost of land bank and return on investment from tax revenues, suspect and known DEQ sites, Portland Metro Area

	Cost of Incentive	Property Tax Revenue/Cost	Income Tax/Cost	Total Tax Revenue/Cost
Total	**$55,000,000**	**0.12**	**0.09**	**0.22**

Source: ECONorthwest, 2012.

The outcomes of a land bank, however, would be directly tied to how the land bank was managed. A land bank manager can make decisions to target specific types of land. The land bank could focus on large industrial sites, small industrial sites, or some other type of land that met policy goals. The targeted land type determines what kind of outcomes the land bank yields, and the target is a policy choice.

5 EVALUATION OF NON-FINANCIAL INCENTIVES

5.1 REGULATORY FLEXIBILITY

Program description

Existing zoning and land use regulations and entitlement processes may discourage redevelopment on brownfields. These may include strict development standards and lower density requirements that would reduce a potential project's financial feasibility. The Oregon Cleanup Law (Oregon Revised Statute 465) is the primary law regulating remediation of brownfields in the state. It establishes the procedural and technical requirements for remediation of contaminated properties. The Cleanup Law incorporates several fundamental policies designed to promote

For context, some examples of approaches to regulatory flexibility might include some of these examples from other cities:

Parking requirements. By reducing parking requirements for brownfield projects when practical, communities can make it easier and less expensive for developers to redevelop brownfield parcels. This also gives developers greater flexibility in project design and can support redevelopment that meets community goals. For example, the 80-unit Buckman Heights Apartments and Buckman Terrace is an affordable housing and retail development located in a walkable area of Portland. The project took advantage of the City's low minimum parking requirement (0.5 spaces per unit) to realize additional affordable housing on the parcel. Because of the low parking requirement, developer costs were reduced by $875,000.

Waiving development fees. Waiving development fees in special cases can make developers more comfortable taking on a higher risk brownfield project. This tool can be used to direct development toward target areas and to support specific development types, such as compact, mixed use development. As discussed in Heberle (2006). "The City of Austin, TX waives development fees (zoning, subdivision, and site plan application fees and water and wastewater capital recovery fees) for projects that occur within the Desired Development Zone (DDZ) and meets criteria under the city's Smart Growth Matrix. Fees are reduced on a sliding scale depending on where a project is located within the DDZ. Desired Development Zone's include downtown, transit centers and corridors, and neighborhoods within the urban core. By waiving development fees, the City of Austin is able to reduce development costs and further support redevelopment of brownfield properties within the DDZ."

Allowing land use flexibility. Redevelopment on industrial land is usually lower value than its higher-density counterparts on land zoned for mixed uses or commercial redevelopment. In some cases, allowing for a change in use or density can create higher value redevelopment outcomes that increase the feasibility of a project with higher costs due to site contamination.

cleanup and redevelopment of brownfields. The most important of these are a risk-based approach to cleanup, the VCP, and Prospective Purchaser Agreements. Continuing challenges include:

- **Perception of Cleanup Process.** There is a perception in the private sector that agency decisions are too often unpredictable and slow. Owners of contaminated sites are commonly reluctant to discuss environmental issues with regulatory staff for fear of triggering legal obligations, fines, or liability

- **Duration of the Cleanup Process.** Analysis of the DEQ database of contaminated sites indicates that many sites complete the cleanup process in less than 2 years, but that the average cleanup process in the Northwest region lasts approximately 4.5 years. Across the state, the average time for a site to go through the VCP is slightly under 4 years. These timeframes align with the median duration of 5.5 years for the case study projects. It is challenging for developers to meet the timing demands of market opportunities when cleanups take so long to complete.

- **Incentive to Delay.** There is a perception that there may be a benefit to waiting to cleanup and redevelop a property. Tax structures can create a disincentive to take cleanup actions, and some owners hope that the process may be modified in the future to be easier or less costly. Despite this perception, environmental regulations are continually becoming more rigid.

Estimate cost of program

The cost of the program equals the cost of implementing the various tools. Costs include staff time at various agencies, loss of development fee revenue, and efforts to restructure rules and requirements. Any estimate of the cost of the incentive would be based on conjecture. Therefore, ECO did not attempt to estimate the costs of implementing the program.

Penetration rate

For this analysis, we applied similar penetration rates as used in the remediation tax credit. We assume that 25% of the projects that become feasible or nearly feasible as a result of the decreased remediation cost proceed to redevelopment. To estimate potential impacts, we made the following assumptions:

- Isolate projects that become feasible or nearly feasible as a result of the credit
- Assume that 50% of those sites proceed
- Assume that 50% of those proceeding will claim the credit

Thus this analysis identifies an upper bound of participating properties

Outcome

One major effect of programs that aim to increase regulatory flexibility on development outcomes is in the reduction of the time required to get entitlements and complete development. The pro forma analyses in the feasibility analysis were broad and region-wide, and as such, did not include site-specific cash flow analyses that could account for the time required to address brownfield remediation and entitlements. However, another study that evaluated the redevelopment potential of a limited number of sites[8] and did complete full cash flow analyses found that carrying costs during site investigation are a significant impediment to remediation. Reducing those costs, especially on sites that have otherwise strong market fundamentals, can increase development feasibility.

It is difficult to estimate exactly the outcome of implementing this program or set of programs given the number of program variables that have not yet been determined, but even if it were successful in decreasing the soft costs of development by only 5%, the results are noteworthy. To estimate the effect of a potential 5% reduction, we calculated the new financial gap after reducing development soft costs by 5%. We then identified those parcels that became close to the tipping point or where remediation equals feasibility. We did not apply the cost reduction to upside-down parcels or those that are feasible even if remediation costs are included in the development costs.

Table 10 shows the estimated outcomes for total acres, square feet of redeveloped buildings, new jobs, property tax and personal income tax for the suspect and known DEQ sites in the Portland region.

Table 10. Estimated outcomes incented by regulatory flexibility within suspect and known DEQ sites, Portland Metro Area

					Annual Tax Revenue ($)	
Typology	Acres	Total SF of Redeveloped Bldgs	Jobs	Dwelling Units	Property Tax	Personal Income Tax
1	86	14,662,000	3,100	15,200	25,523,000	6,170,000
2	173	26,364,000	4,200	19,200	39,657,000	5,522,000
3	139	1,975,000	1,600	0	3,250,000	6,047,000
4	0	0	0	0	0	0
Total	397	43,001,000	8,900	34,400	68,430,000	17,738,000

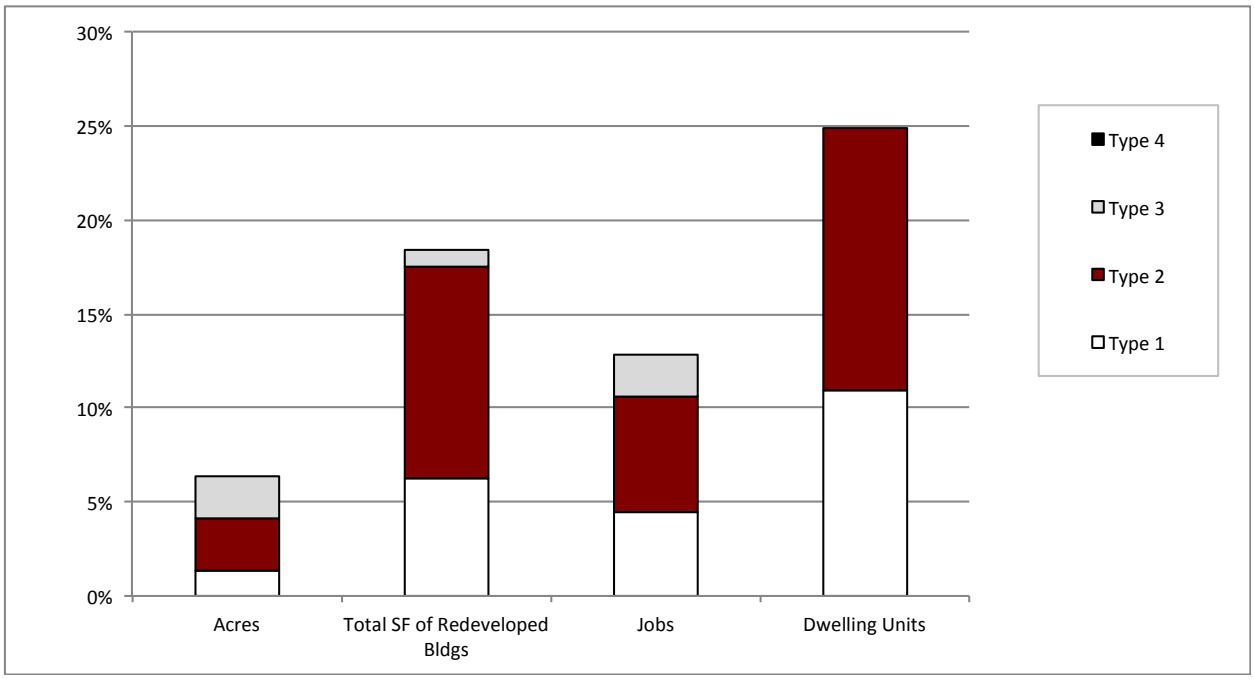
Source: ECONorthwest, 2012.

For each measured outcome, ECO estimated the total that could be developed if 100% of the suspect and known DEQ sites in the region were redeveloped. Figure 6 shows the portion of that total that regulatory flexibility could incent towards development. The chart shows that most of the incented redevelopment occurs in Types 1 and 2. Because

[8] Brownfield / Greenfield Development Cost Comparison Study, December 2004, Group Mackenzie.

those types are dominated by a mixed use and residential development, the regulatory flexibility affects non-remediation development costs, which make up the overwhelming majority of total development costs for those typologies. The incentive tool is more likely to incent residential uses than employment-only uses.

Figure 6. Portion of potential development outcomes for all suspect and known DEQ sites incented by regulatory flexibility, by brownfield typology, Portland Metro Area



Source: ECONorthwest, 2012.

The analysis shows that the results are very similar to the remediation tax credit discussed above. Under the assumptions used in the model, many sites fall into the 'close to tipping point' category—they are within 15% of becoming feasible if their remediation costs are eliminated. Any reduction in their costs narrows their financial gap, bringing them slightly closer to feasibility.

ECO did not quantify the estimated costs to government to implement the incentive, and did not calculate a return on investment. However, the monetary costs are not likely to be high, in comparison to the estimated tax returns, and would mostly include staff time.

5.2 ONE STOP SHOP

Program description

Successful redevelopment of brownfields requires navigation of state regulatory processes for cleanup along with permitting processes for construction. The multiple regulatory agencies involved may have different or competing interests. All of these regulatory processes occur within a time sensitive financing framework. A one-stop

shop creates a system for interagency coordination for permitting and funding brownfield projects. It can provide technical assistance to property owners to help them navigate state and federal standards guiding the cleanup of brownfield sites. Key features are a lead project manager to serve as a single point of contact for the client, simplified process steps on most projects, and much faster approvals.

This proposal is an internal policy change and does not involve changes to laws or regulations. Create a Brownfield "team" with representatives from Metro, Cities, DEQ, and Business Oregon that coordinates permitting and funding activities for eligible projects. Pennsylvania's Brownfield Action Team program provides a useful model. The team would meet with the project proponent at an early stage of the process to outline the permit requirements, potential financial incentives, and a schedule for a project. The team would then meet periodically through the planning and permitting process to resolve any conflicting requirements and expedite review of the project. These types of meetings currently do occur opportunistically. This policy would formalize and advertise this system to make it a common practice.

Estimate cost of program and outcomes

The program would incent redevelopment of brownfield sites by decreasing the costs of remediation by reducing the soft costs related to redevelopment. The effect of the program would be very similar to the regulatory flexibility program described above. ECO assumed this program would have a similar effect on the cost of remediation—reducing development soft costs by 5%. This figure is a rough estimate of the potential reduction in total costs. Actual impacts of the policy will vary based on individual situations.

Because the program's effect on development costs would be identical to that described in the flexibility program section, the outcomes would also be identical.

5.3 REFORM OF CONTAMINATED PROPERTY TAX ASSESSMENT

Program description

Property tax assessment policy in Oregon is currently considered by some to be a disincentive to cleanup. The state administrative rule regulating assessment for property taxes establishes a method to reduce the value of contaminated land by the cost of the environmental liability. This policy can result in substantial decrease in property tax payments on a brownfield property. While the market value of property is certainly impaired by contamination, a modest reform of this policy could be to include a time limit to encourage owners to address the problem.

While there is some anecdotal information about the impacts of the current policy on individual properties, County records regarding the use of this program were unavailable for this research. ECO suggests that research be undertaken to: 1) ascertain actual fiscal impact of the tax assessment on local governments, 2) clarify the process for

amending the OAR governing this program, and 3) better understand the impacts that changes to the assessment process for brownfields might have on operating businesses, which may need the credit to continue to function and create jobs and income taxes.

6 SUMMARY AND KEY FINDINGS

Table 11 summarizes the outcomes for the analyzed policies. The table shows the total acres, square feet of built space, net new jobs, dwelling units, and new annual tax revenue. Table 12 shows the same data on a per-acre basis.

Table 11. Outcomes incented by policies within suspect and known DEQ sites, Portland Metro Area

					Annual Tax Revenue ($)	
	Acres	Total SF of Redeveloped Bldgs	Net New Jobs	Dwelling Units	Property Tax	Personal Income Tax
Remediation Tax Credit	449	43,839,000	9,200	34,600	69,966,000	18,753,000
Property Tax Abatement	808	78,909,000	16,500	62,300	125,940,000	33,755,000
Cleanup Fund	833	32,728,000	8,700	19,900	51,945,000	24,169,000
Land Bank	195	4,116,000	1,600	1,700	6,809,000	5,195,000
Reg. Flex./One Stop Shop	397	43,001,000	8,900	34,400	68,430,000	17,738,000

Source: ECONorthwest, 2012.

Table 12. Per-acre outcomes incented by policies within suspect and known DEQ sites, Portland Metro Area

				Annual Tax Revenue ($)	
	Total SF of Redeveloped Bldgs	Net New Jobs	Dwelling Units	Property Tax	Personal Income Tax
Remediation Tax Credit	98,000	20	80	156,000	42,000
Property Tax Abatement	98,000	20	80	156,000	42,000
Cleanup Fund	39,000	10	20	62,000	29,000
Land Bank	21,000	10	10	35,000	27,000
Reg. Flex./One Stop Shop	108,000	20	90	172,000	45,000

Source: ECONorthwest, 2012.

The data show that the property tax abatement yields the most new square feet of built space, jobs, dwelling units, and tax revenue. However, on a per-acre basis it is equivalent to the remediation tax credit. Both policies affect the outcomes in a similar manner—they reduce the costs of development that are based on the acres of the parcel, they are directly correlated to the amount of land in a property.

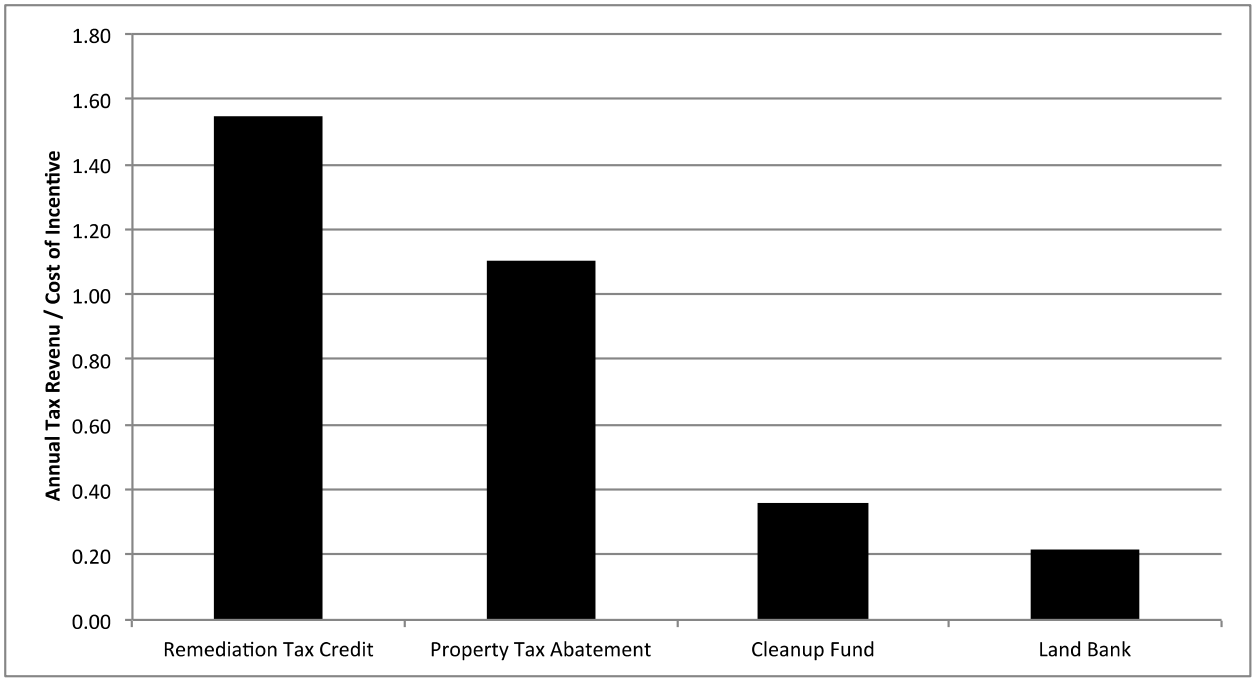
One reason is methodological. This analysis' purpose is to consider the impacts of various policy tools, relative to each other, on average across the entire region; this

purpose requires a mid-point or average scenario that smoothes out the market and cost variables that affect redevelopment feasibility at the site level. In that average scenario, many parcels were close to being within 15% of costs equaling market value, "close to tipping". A small change to the costs of development shifted the parcels into that category. The same set of parcels were close to being in that category before we applied the cost reduction from each policy and they shifted to "close to tipping" with most policies. The model is very sensitive to small changes in assumptions. For example, increasing the cost of remediation by $100,000 shifted all Type 4-Rural Industry parcels to infeasibility.

In the real world, this would not be the case: some parcels would be well located enough to command a strong price, or would have contamination that could be cost-effectively remediated, and redevelopment would occur.

Figure 7 shows the ratio of the annual tax revenue to the estimated costs for the four policies that had cost estimates. The tax credit appears to be the most cost effective. It incented about half as much new development as did the property tax abatement, but for lower costs. The two policies moved a similar set of parcels to feasibility because those parcels were close to feasibility. The property tax abatement is more advantageous for developers of denser developments as it lowers the tax burden associated with new improvements on the site. The tax credit will have a greater impact on parcels where site preparation costs make up a higher portion of total development costs.

Figure 7. Ratio of annual property tax and personal Income to cost of incentive, Portland Metro Area



Source: ECONorthwest, 2012.

The key findings from the analysis are:

- The sites more likely to respond to any policy incentive are those closest to feasibility. This underscores the difficulty of addressing properties that will not or cannot convert. If market conditions limit the financial feasibility, regardless of remediation costs, policies to incent remediation will not be effective.
- The typologies with denser development will yield higher tax returns. The dense building developments generate high levels of property tax revenue on a per-acre basis. Per acre, tall structures generate more property tax revenue than shorter structures. Dense development types, however, should be less sensitive to remediation costs. Costs associated with site preparation (e.g., remediation) make up a smaller portion of total development costs than a single-story building types.
- Certain incentive tools can target certain typologies. For example, a land bank can be structured to target specific land use types.
- Both the tax credit and the property tax abatement achieve similar goals—they reduce development costs and can move individual properties from infeasible to feasible. However, the tax credit is the most direct method to reduce costs and incent development. The cost of the credit is directly associated with the actual cost of remediation. The property tax abatement is tied to the value of the new capital improvements. It is entirely possible that the abatement exceeds what the developer would need to move the parcel from infeasible to feasible—the tool has the potential to provide more incentive than is necessary.
- The different tools have different impacts and revenue outcomes for the different typologies. This is because the different typologies have a different mix of development types. The development mix is a primary driver of differences in revenue impacts:
  - Type 1 and Type 2 include more high-density developments that typically include housing, offices, and retail. Because they are dense, they yield more property tax revenue per acre than the development typical in Type 3 and Type 4.
  - Type 3 and Type 4 include development types intended to offer employment space for industrial activity. Because industrial jobs tend to be relatively high paying, those development types yield more income tax revenue.
- Policies such as regulatory flexibility and one stop shop can be cost effective. The cost of the policies are associated with staff time and efforts to develop systems to implement the policies. But they can reduce the length of time it takes to navigate the remediation process, which reduces a developer's holding costs. Reducing these "soft costs" can tip parcels into feasibility.