

MACKENZIE

January 29, 2009

Metro
Reserves Steering Committee
Kathryn Harrington, Metro Councilor
Charlotte Lehan, Clackamas County Commissioner
Jeff Cogen, Multnomah County Commissioner
Tom Brian, Washington County Chair
600 NE Grand Avenue
Portland, OR 97232-2736

Re: **Metro Urban and Rural Reserves Study**
Regional Land Use Business Advisory Group Mapping Series

Dear Reserves Steering Committee

At the request of the undersigned members of the Reserves Steering Committee, Group Mackenzie has produced a series of maps with the intent of showing development constraints and opportunities within the Metro Urban and Rural Reserve study area. These maps have been used in approximately a dozen presentations around the region to County Advisory committees, economic development organizations, elected officials, and others. Additionally, Greg Manning presented the maps at the September 10, 2008 meeting of the Reserves Steering Committee. The maps have been placed on Metro's Reserves Committee web site. This letter offers a summary of the map series, including its objective, production, display, and analysis.

MAP SERIES OBJECTIVE

Maps displaying forest lands, agriculture lands, and natural landscapes had been prepared for the land included in the Urban Reserve study area. However, a similar effort had not been made to map potential areas for economic and job development to serve the Metro area's anticipated 1 million person influx during the next 40 to 50 years (the period for which the Urban Reserves process is focusing). As such, we sought to analyze the study area from the perspective of employment and industrial development through visual representation of existing and available Metro GIS data.

MAP SERIES PRODUCTION

Group Mackenzie reviewed the data available through its RLIS (Regional Land Information System) Lite subscription for relevance to potential employment growth areas. Relevant data sets applicable to development considerations were: tax lots, slopes greater than 10%, FEMA 100-year flood plain, National Wetland Inventory wetlands, and Metro's Title 4 mapping. The tax lot, flood plain, wetland, and slope layers were used to display "development constraints" that exist on land in the study area, outside the current Urban Growth Boundary (UGB). They do not represent every development constraint, but do represent constraints easily mapped and quantified.

Metro provided the study area GIS layer. This boundary approximately encompasses a 5-mile radius of the existing UGB. It excludes Yamhill and Marion Counties, but extends beyond 5 miles in a southeasterly direction to include an area around and south of Canby.

The tax lot layer was used to represent parcelization. We evaluated the need to represent parcelization after reviewing aerial photography and noticing a large amount of residential development within the Urban and Rural Reserves study area, particularly in Clackamas County. As such, we assumed, for the purposes of this mapping exercise, that parcels 5 acres or smaller were either currently residentially developed or residentially intended and identified them as a development constraint.

The slope criterion was identified as a development constraint because industrial and office development is best suited to land with approximately 7% or less slope. Metro's available slope data is 10% or greater. Therefore, this is the layer utilized for the map series although it understates the slope constraint. While slopes in the range of 7% to 10% are too great to accommodate industrial and office development, the readily available 10% data does provide a visual understanding of the development constraints with which the study area is encumbered. Metro had created the slopes layer for their Nature in Neighborhoods program mapping needs. The layer does not cover the full extent of the Urban and Rural Reserves study area. Group Mackenzie explored a few other data sources, but complete coverage was not available. Since the objective of this mapping exercise was to evaluate the study area based upon existing and available data, Group Mackenzie did not pursue this issue further. However, we did discuss with Metro staff this "missing data" and stressed the constraints slopes create for employment development. Metro noted the issue and stated they had the data necessary to extend the slope coverage within the entire study area.

Flood plain and wetlands are constraints to development that may be able to be mitigated on a site by site basis, however for the purposes of this mapping exercise, mitigation opportunities were not explored. Metro does not have complete study area coverage for the FEMA 100-year flood plain or the National Wetlands Inventory wetlands layer. Group Mackenzie was able to utilize a data set available online from FEMA to complete the vast majority of study area coverage. A small portion near Banks is still not covered. The wetland data set does not cover the study area's southern portion. Useable data sets were not available through the resources reviewed by Group Mackenzie.

Metro's Title 4 mapping was used to represent "development opportunities." Existing Title 4 areas were mapped inside the UGB. Metro's Title 4 areas represent lands designated by Metro as Regionally Significant Industrial, Industrial, and Employment areas. They are areas where existing concentrations, or economic clusters, exist and where existing and/or available infrastructure and utilities are generally available. Group Mackenzie has shown them to represent potential nexus locations for urban reserve areas.

With the data discussed above, Group Mackenzie produced a series of 6 maps displaying the development constraints and opportunities. All maps show the same extent area, county boundaries, major arterials, and rivers, as well as the existing Metro UGB and the Urban and Rural Reserves study area.

Map 1 is a vicinity map showing the existing Metro UGB and the Urban and Rural Reserves study area. Map 2 shows the tax lot layer with lots 5 acres or smaller excluded. Map 3 shows the FEMA 100-year flood plain and National Wetlands Inventory layers. Map 4 shows slopes greater than or equal to 10%. Map 5 shows Metro's Title 4 inventory, as well as a 1.5-mile radius where this radius extends from Employment, Industrial, or Regionally Significant designated lands into the study area. Map 6 is a composite map of maps 1 through 5. Its intent is to show all potential constraints and Title 4 lands adjacent to the study area (the 1.5-mile radius around Title 4 lands is not included). Areas within the study area that are "unconstrained" are not represented by any of the identified constraints and are shown as white.

MAP SERIES ANALYSIS

The objective of this mapping exercise was to provide a tool to assist in visualizing patterns of constraints and opportunities for future development. Initial calculations were completed to show the acreage of constrained versus unconstrained lands on a study area wide scale:

Map 1 – Metro's Urban Reserves Study Area
Total area = 632 square miles (404,482 acres).

Map 2 – Parcelized Lands
Total area of parcelized lands = 73 square miles (46,758 acres) or 11.6% of study area.

Map 3 – Flood Plain and Wetlands
Total area of flood plain = 97 square miles (62,077 acres) or 15% of study area.
Total area of wetlands = 16.9 square miles (10,823 acres) or 0.03% of study area.

Map 4 – Slopes Greater Than or Equal to 10%
Map 4 shows slopes greater than or equal to 10% within the study area. Metro available slope data is limited to an area created for their Nature in Neighborhood program. The slope data limits are particularly noticeable in the study area's southern portion.
Total slope area = 212 square miles (135,382 acres) or 34% of study area.
Of the study area where slope data is available, 38% has slopes of 10% or greater.

Map 5 – Metro Title 4 Lands
Map 5 shows Metro's Title 4 Regional Significant Industrial, Industrial, and Employment designated lands. For those lands adjacent to the existing Metro UGB, a 1.5-mile radius is shown. The purpose is to present potential nexuses of development and available utilities. This could also be a stand-in, or proxy, for the "clustering" of employment sectors. The 1.5-mile radius was an arbitrarily defined limit for visual purposes only. As such, we did not calculate area for this map.

Map 6 – Development Constraints
Map 6 is a composite map of maps 1 through 5. Therefore, it shows the study area boundary, FEMA 100-year floodplain, National Inventory Wetlands, and slopes greater than or equal to 10%, as well as Metro Title 4 lands and Rural Industrial zoned lands with a 1.5-mile radius.

For the purposes of further understanding the development constraints on a smaller scale, we calculated development constraints within the study area on a county-by-county basis. The table below provides a break down of development constraints acreage per county. Please note, we have indicated where Metro does not have complete data coverage for the entire study area and provided acreages and percentages accordingly. Minor differences in acreages may be due to rounding deviations.

The last column, "Total per Development Constraint," is a cumulative acreage for each development constraint. The row "Independent Total of all Constraints per County" totals all development constraints per county, and provides a percentage of total county area within the study area. The row "Total Merged Constraints per County" provides total acreage of the development constraints as a merged layer. The purpose of the last row is to accommodate for layering and overlapping of constraints. For instance, a wetland and flood plain and 5-acre lot may all overlap. This row represents the total acreage covered, not the acreage of each independent constraint. Obviously, the merged layers will present a lower acreage and percentage of constrained lands. Again, the Metro data we used does not have complete data sets available for the entire study area. The total merged constraints numbers were calculated with the data available and the entire study area. If complete study area data sets are obtained, these constraint percentages would increase, particularly for slope.

	Clackamas (acres)	Multnomah (acres)	Washington (acres)	Total per Development Constraint (acres)
Acres within Study Area	168,938	63,906	171,426	404,270
Development Constraint				
Parcelization (parcels 5 acres or less)	29,684 (18%)	5,718 (9%)	11,351 (7%)	46,753 (12%)
Flood Plain	16,883 (10%)	15,043 (24%)	30,151 (18%*)	62,077 (15%)
Wetlands	1,948 (1.5% *)	4,373 (6.8%)	4,486 (2.6%)	10,807 (3%)
Slopes	49,634 (38.6%*)	23,919 (45%*)	61,671 (18%*)	135,224 (34%)
Independent Total of all Constraints per County	98,149 (58%)	49,053 (77%)	107,659 (63%)	254,861 (63%)
Total Merged Constraints per County	77,973 (46%)	42,096 (66%)	96,403 (56%)	216,656 (54%)
Total Unconstrained Lands per County	90,965 (54%)	21,810 (34%)	75,023 (44%)	187,614 (46%)

* Denotes incomplete data coverage for the entire reserves study area. Where complete data coverage was not available, only that portion of the study area covered by data (i.e., slopes layer) was used to calculate percentages.

The table above offers an approximation of the area of unconstrained lands, per county, within the Urban and Rural Reserves study area. A review of the mapped constraints versus the area calculations provides an interesting perspective of future developable lands.

Clackamas County has the highest amount of unconstrained land. We must stress that the merged acreage is based upon the total study area and, therefore slightly under-represents the amount of total unconstrained lands. With complete slope, flood plain, and wetland coverage, the amount of constrained lands will increase. The map does show substantial

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natural constraints along the UGB in Clackamas County, potentially limiting future development at the nexus of the UGB and the study area.

On the contrary, while the maps show greater percentage of development constraints for Washington County, these constraints are further away from the existing UGB. This creates a nexus opportunity for future development. Based on the unconstrained lands adjacent to the UGB, designated Title 4 lands and existing employment concentration within the UGB, an apparent Urban Reserve area is north and west of Hillsboro.

Regarding Multnomah County, only 34% of the County within the study area is unconstrained. By referring to Map 6, we conclude that the majority of this land is actually Sauvie Island, which we doubt will be identified for Urban Reserve. The remaining land is constrained by slope or parcelization. As such, Multnomah County realistically has very limited Urban Reserve area opportunities. Therefore, we presume that the majority of development must be directed elsewhere.

Group Mackenzie has evaluated development constraints and opportunities for the business representatives of the Metro Urban and Rural Reserves steering committee. While the initial purpose of this mapping exercise was to provide a visual representation of potential Urban Reserve constraints and opportunities based upon existing GIS data sources, we have provided a preliminary quantification of potential employment land. We anticipate that this information will contribute to more detailed Urban Reserve area analysis.

Sincerely,



Greg Manning
Metro Urban and Rural Reserves Steering Committee



Greg Specht

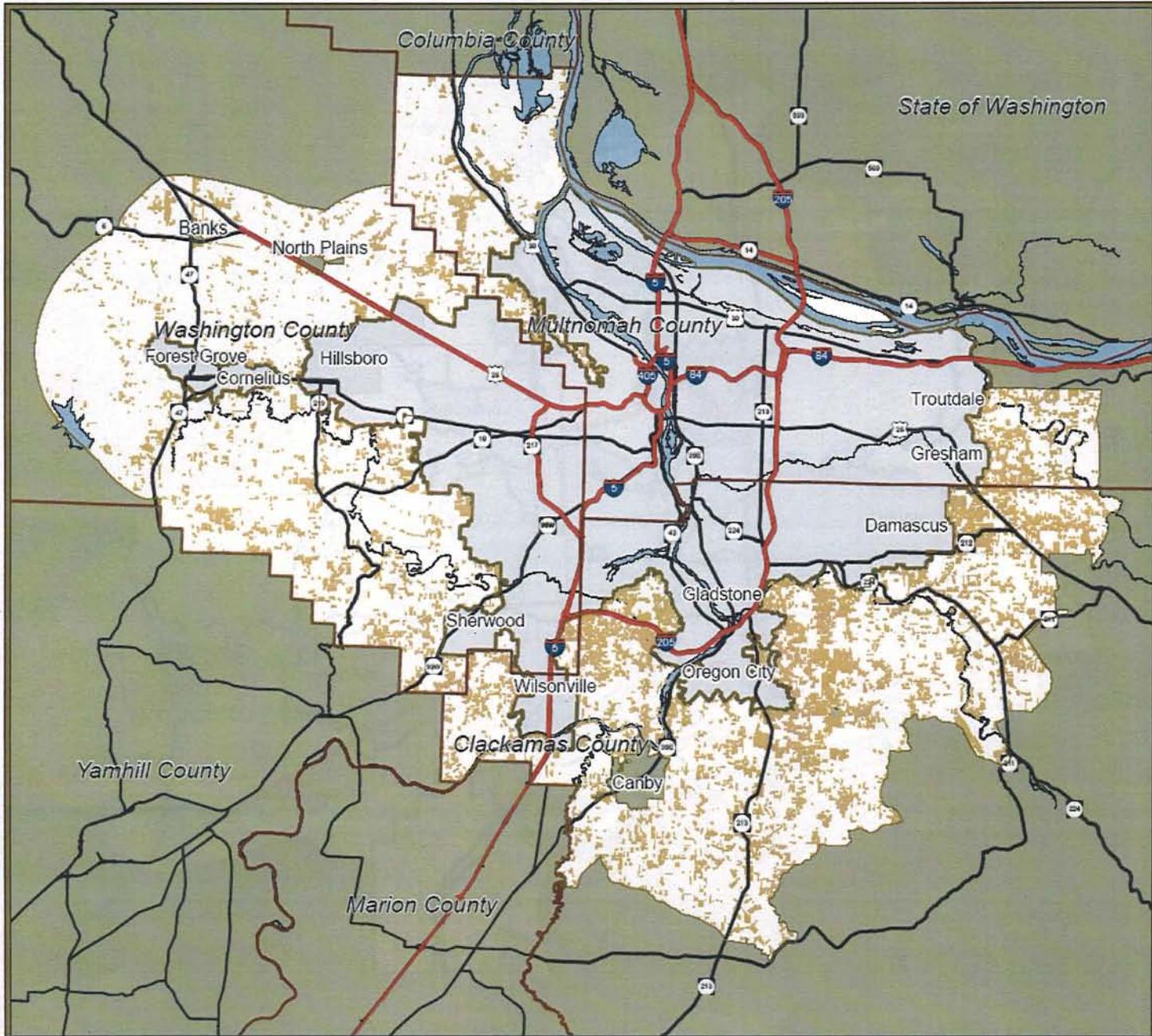


Craig Brown



Mark Clemons
Group Mackenzie Director of Project Development

Enclosures: Maps 1 - 6



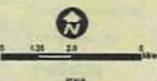
Metro Reserves Study Area

**Map 2
Development Constraints:
Parcels 5 Acres
or Less**

- Legend**
- Metro Reserves Boundary
 - Existing Metro UGB
 - Parcels less than 5 acres
 - County Boundary
 - Freeway
 - Highway

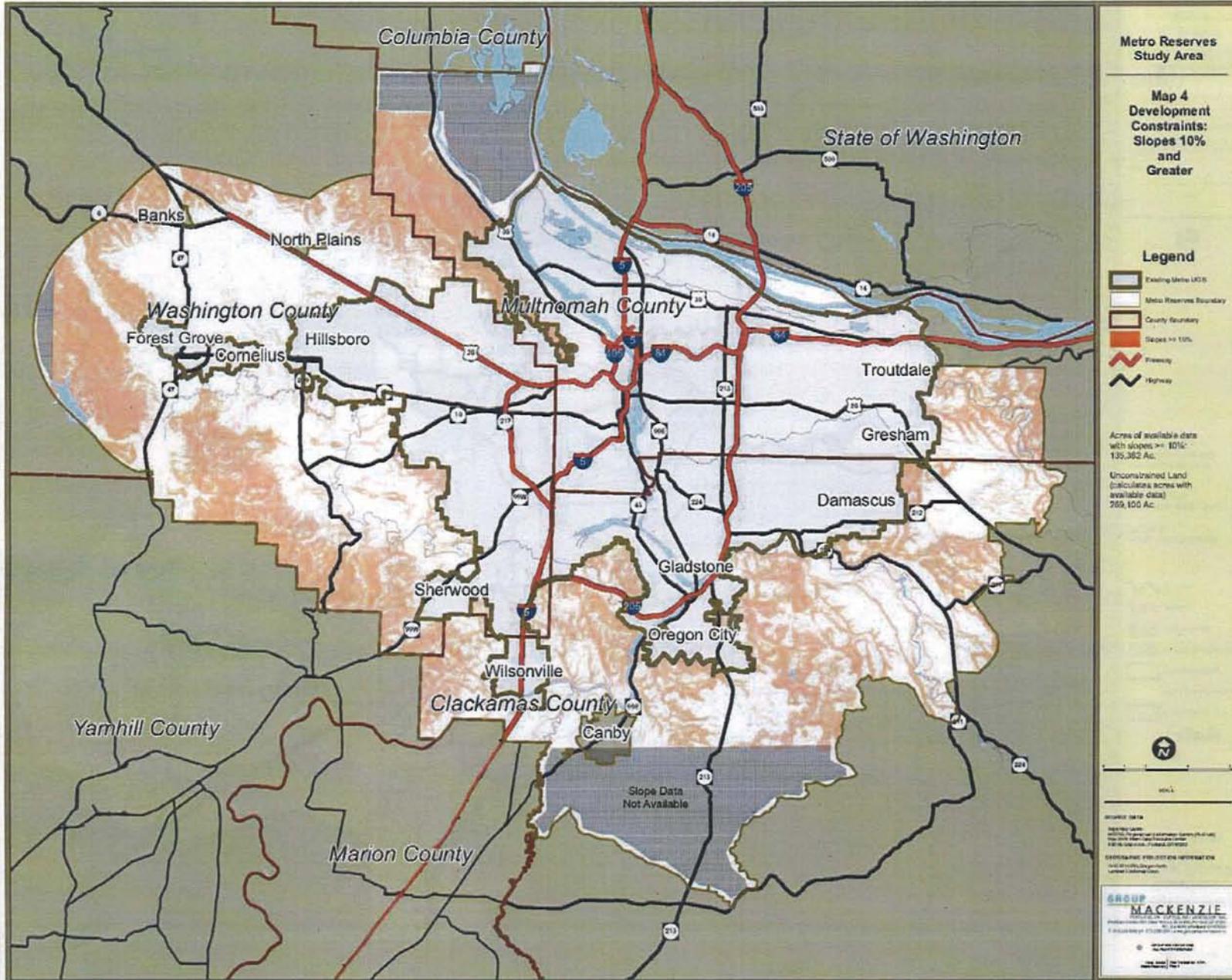
Constrained Land
(Parcels 5 acres or less which
may be residential in nature)
46,788 Ac.

Unconstrained Land
(Parcels greater than 5 acres)
357,723 Ac.



SOURCE DATA
 2007 Oregon Statewide Land Use Inventory
 2007 Oregon Statewide Parcel Data
 2007 Oregon Statewide Freeway Data
 2007 Oregon Statewide Highway Data

GROUP
MACKENZIE
 CONSULTING GROUP, INC.
 1000 NE Oregon Street, Suite 200
 Portland, Oregon 97232
 Phone: 503.251.1000
 Fax: 503.251.1001
 www.mackenziegroup.com



Metro Reserves Study Area

Map 4 Development Constraints: Slopes 10% and Greater

Legend

- Existing Metro LRIS
- Metro Reserves Boundary
- County Boundary
- Slopes >= 10%
- Freeway
- Highway

Acres of available data with slopes >= 10%:
135,362 Ac.

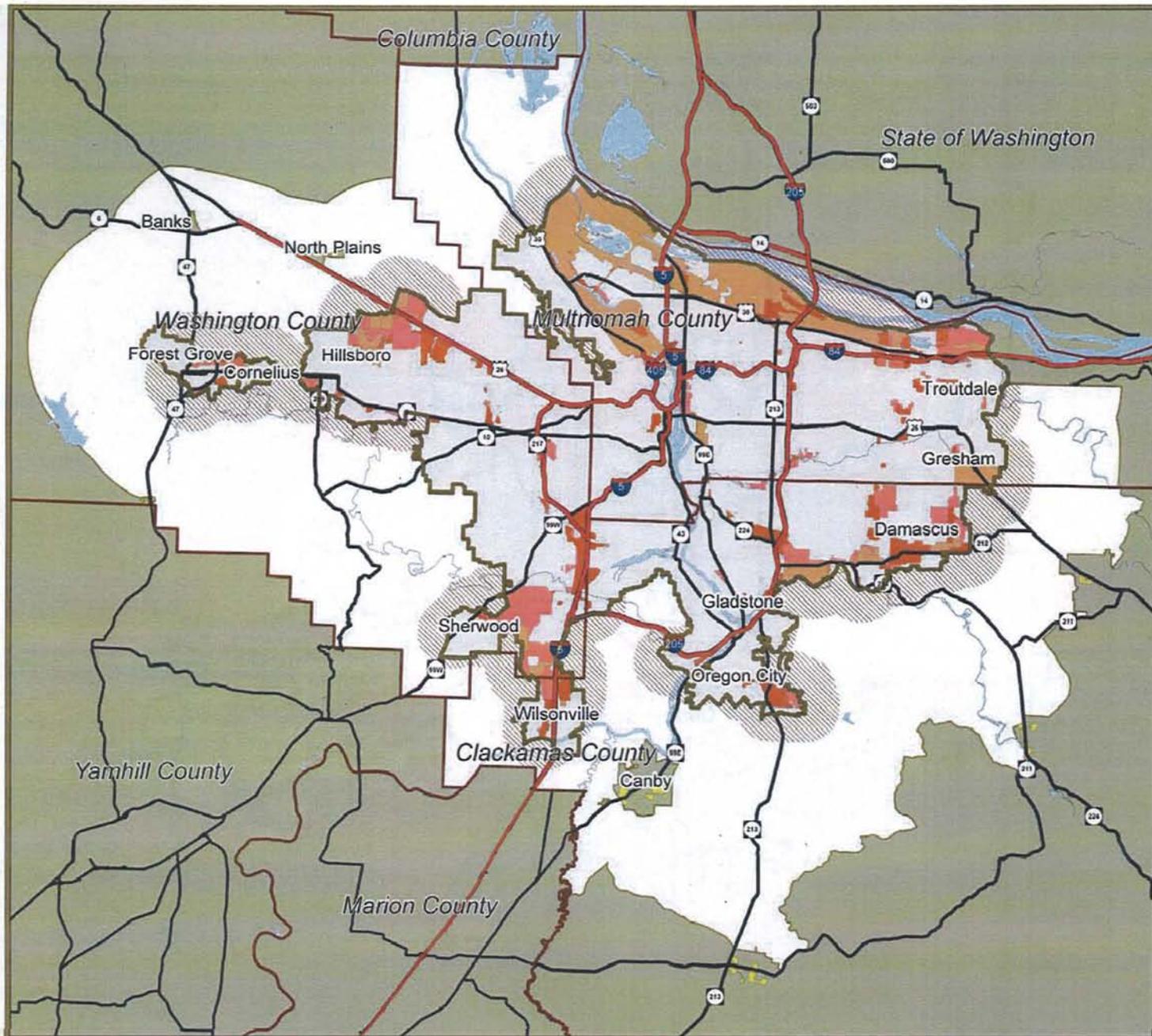
Unconstrained Land (calculates acres with available data):
759,100 Ac.



SCALE

DATE: 08/10
 BY: [illegible]
 CHECKED: [illegible]
 APPROVED: [illegible]
 PROJECT: Metro Reserves Study Area
 MAP TITLE: Development Constraints: Slopes 10% and Greater

GROUP MACKENZIE
 CONSULTING ENGINEERS AND ARCHITECTS
 1000 NE Oregon Street, Suite 200
 Portland, Oregon 97232
 Phone: 503.251.1000
 Fax: 503.251.1001
 Website: www.groupmckenzie.com



Metro Reserves Study Area

**Map 5
Metro Title 4:
Employment,
Industrial and
Regionally
Significant
Industrial
Designated Lands
and
Generalized
Zoning
Classifications:
Industrial and
Mixed-Use
Employment
Industrial**

- Legend**
- Existing Metro UGB
 - Metro Reserves Boundary
 - County Boundary
 - RID and MUE Classified Parcels
 - Metro Title 4 Designations**
 - Employment
 - Industrial
 - Regionally Significant Industrial
 - 1.5 Mi. Radius of T4, IND, MUE
 - Freeway
 - Highway

SCALE

SOURCE DATA

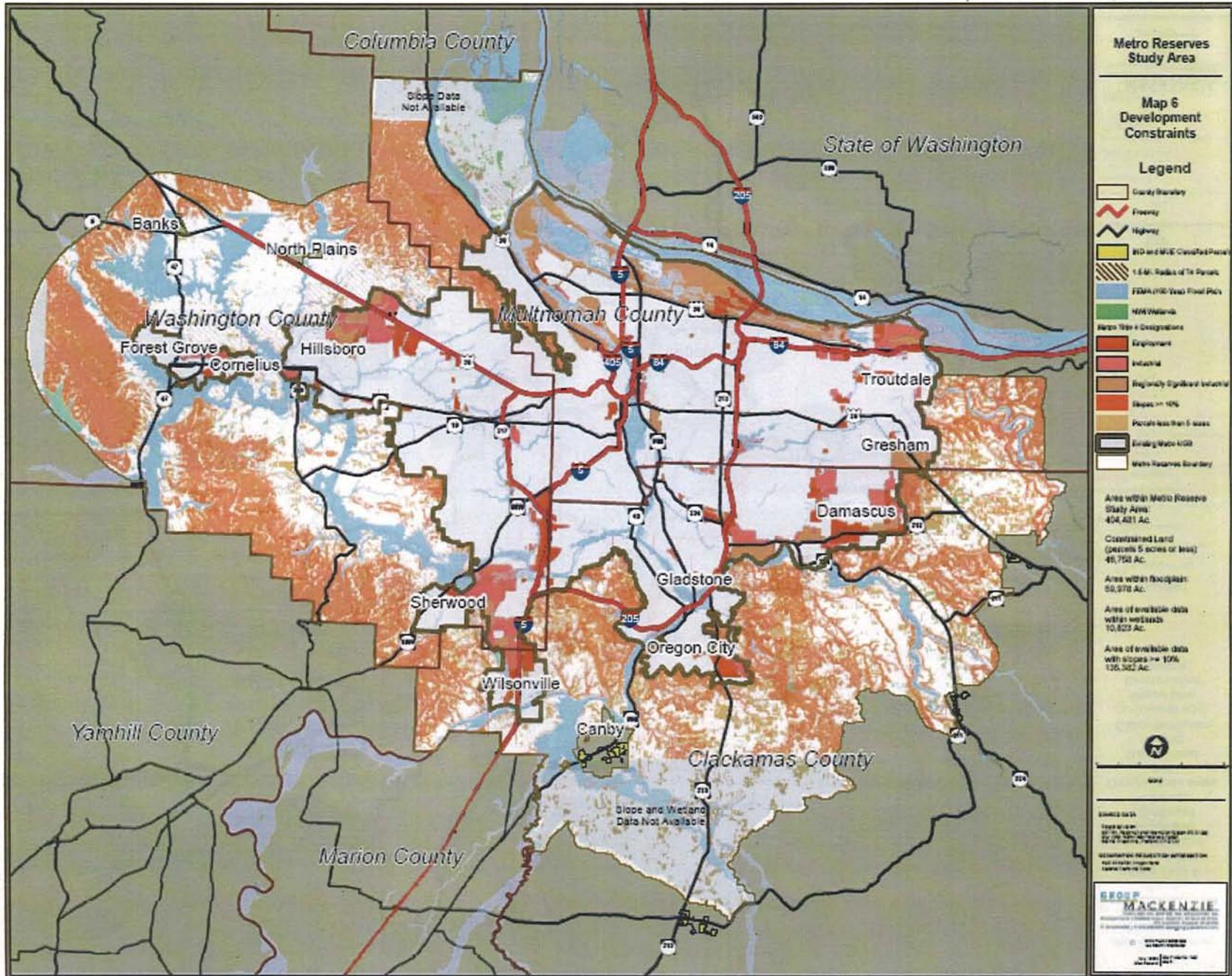
State GIS Library
 METRO Regional Growth Management System (R-GMS) Data
 May 2012, Metro Data Services Center
 2012 GIS Department, Portland, OR, USA

GEOGRAPHIC PROJECTION INFORMATION

NAD 83 Lambert Conformal Conic
 Central Meridian: 122° 30' 00" W
 Standard Parallels: 43° 00' 00" N, 46° 00' 00" N
 False Easting: 1000000.000
 False Northing: 0.000
 Units: Meter

GROUP
MACKENZIE

1000 NE Oregon Street, Suite 200
 Portland, Oregon 97232
 Phone: 503.255.1234
 Fax: 503.255.1235
 www.mackenziegroup.com



Metro Reserves Study Area

Map 6 Development Constraints

Legend

-  County Boundary
-  Freeway
-  Highway
-  W1 and W2 Classified Wetland
-  1.5-Mi. Radius of 14 Spikes
-  FEMA 100-Year Flood Plain
-  NW Wetland
-  Metro Use Designation
-  Employment
-  Industrial
-  Regionally Significant Industrial
-  Slopes 10%+
-  Slopes less than 10%
-  Existing Water VGB
-  Metro Reserves Boundary

Area within Metro Reserves Study Area: 404,481 Ac.

Coastal Land (greater than 5 acres or less): 49,758 Ac.

Area within floodplain: 59,978 Ac.

Area of available data with wetlands: 10,823 Ac.

Area of available data with slopes 10%+: 126,362 Ac.



Scale

DATE: 04/24/04
 TITLE: Metro Reserves Study Area
 PROJECT: Metro Reserves Study Area
 CLIENT: Metro Reserves Study Area
 DRAWN BY: [Name]
 CHECKED BY: [Name]
 APPROVED BY: [Name]

GROUP MACKENZIE
 1000 NE Oregon Street, Suite 200, Portland, OR 97232
 Phone: 503.255.1234
 Fax: 503.255.1235
 Website: www.groupmackenzie.com