Draft Environmental Impact Statement

for the

Comprehensive Growth Management Plans

of

Clark County,
Battle Ground, Camas, La Center, Ridgefield, Vancouver, Washougal, and Yacolt

March 2003

FACT SHEET

(a) Title	Clark County Comprehensive Growth Management Plan City of Camas Comprehensive Plan City of La Center Comprehensive Growth Management Plan City of Ridgefield Comprehensive Plan City of Vancouver Growth Management Plan City of Washougal Comprehensive Plan for Growth Management Act Compliance Town of Yacolt Comprehensive Growth Management Plan
Purpose:	Adopt revised comprehensive plans which meet the requirements of RCW 36.70A regarding growth management.
(b) Proponents:	Clark County Department of Community Development City of Camas City of La Center City of Ridgefield City of Vancouver Washougal Public Works Department Town of Yacolt
(c) Lead Agency:	Clark County, Washington
Responsible Official:	Patrick C. Lee, Long Range Planning Manager Clark County Department of Community Development P.O. Box 9810 1300 Franklin Street, Floor 3 Vancouver, Washington 98668-9810
(d) Licenses Required:	Adoption by each city council and the Board of County Commissioners
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(f) Draft EIS Date of Issue: March 19, 2003

(g) Time and Place of Public Hearings: No hearings are planned for the DEIS. The County Board of Commissioners will consider comments in selecting a Preferred Alternative. This selection may be preceded by either public meetings or public hearings. Hearings will be held on the Final EIS and the Clark County Comprehensive Plan based on the Preferred Alternative.

Hearings will be held to consider the cities' comprehensive plans before the City of Camas Planning Commission and City Council, City of La Center Planning Commission and City Council, City of Ridgefield Planning Commission and City Council, City of Vancouver Planning Commission and City Council, City of Washougal Planning Commission and City Council; and Town of Yacolt Planning Commission and Town Council at times and places to be announced later.

(h) Anticipated Date of Final Action: December 2003

(i) Nature of Final Action: Adoption of comprehensive plans and related programs

(j) Type and Timing of any Subsequent Environmental Review: December 2003

(k) Documents Incorporated by Reference:

1) Resource Document (1993), Clark County Community Development Department
2) Buildable Lands Report (2001), Clark County Department of Community Development
3) Metropolitan Transportation Plan (2002), Southwest Washington Regional Transportation Council

These documents are available for review at the Clark County Community Development Department, 1300 Franklin Street, Vancouver, Washington.

(l) Cost per Copy: Cost of reproduction

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SUMMARY

I. PURPOSE OF AND NEED FOR THE PROJECT

In 1990, passage of the Growth Management Act (GMA) (RCW 36.70A) significantly changed the requirements for local planning. The GMA requires rapidly growing counties and cities in the state to plan to manage growth in a way that allows for the efficient use of land and resources. Counties and cities planning under the GMA must adopt comprehensive plans that address land use, housing, public facilities and services, utilities, rural development, and transportation. Clark County and local cities adopted their current plans in 1994.

The GMA requires regular review and update of comprehensive plans. The comprehensive plans and development regulations of counties and cities that plan under the GMA are to be reviewed and revised, if necessary, every five years to ensure that the plan and regulations still comply. Any changes that are made to a comprehensive plan during the review process must be consistent with the GMA, including any amendments that have been made since the adoption of the comprehensive plan. Each county that designates urban growth areas (UGA) is required to review those areas at least every ten years to ensure that there is an adequate amount of land to accommodate the 20-year growth projections for population, jobs, and housing.

Clark County (the County) and local cities are not required to review their UGA and plan for a new 20-year period until 2004. However, the County has chosen to review both its plan and UGA for the full 20-year planning horizon. The County identified five alternatives for accommodating growth from 2003 to 2023, four of which involve expanding the UGA.

Since the County plans were adopted in 1994, conditions in the county as well as state and federal laws have changed, requiring corresponding changes to the comprehensive plan. Two important changes include a growth rate during the late 1990s that was more rapid than anticipated and the listing of Lower Columbia River runs of steelhead and chinook salmon as threatened under the Endangered Species Act (ESA), requiring special protection for their habitat in the streams of Clark County.

Clark County began reviewing its *20-Year Comprehensive Growth Management Plan* in 1999, in accordance with the review cycle adopted by the Board of Clark County Commissioners (BOCC). As a result of this Phase 1 review, the BOCC decided that this update will meet the requirements of a 10-year review under GMA by evaluating the UGA for the cities, as well as plan policies and projects.

Under Washington's State Environmental Policy Act (SEPA), local governments must evaluate the environmental impacts that may result from actions that they undertake. Proposed actions such as the adoption or revision of plans, programs, policies, and plan maps are known as non-project or programmatic actions, as distinguished from project-level or site-specific actions. The following section discusses how comprehensive plans are evaluated under SEPA.

II. PURPOSE OF NON-PROJECT EIS

The review of the comprehensive plans of Clark County and its cities is a programmatic action under SEPA. Clark County determined that the revision of the 1994 comprehensive plan and the UGA could have a significant impact on the environment. That determination of significance automatically requires that an Environmental Impact Statement (EIS) be prepared to assess the possible impacts of different alternatives. Since programmatic actions are broader and less specific than project actions, analysis of their environmental impacts under SEPA is also broader and is framed as a discussion of the alternative courses of action that can accomplish a stated objective. Sometimes agencies identify a Preferred Alternative among the alternatives being examined. In other instances, the EIS can be used to help decision-makers and the

public to choose a Preferred Alternative. Clark County is using this EIS to review and compare potential impacts from different alternatives and, in light of those potential impacts, to solicit public and agency input on which land use alternative should become the County's Preferred Alternative and basis of the revised comprehensive plan.

SEPA states that an EIS discussion of alternatives for comprehensive plans should be limited to a general discussion of the impacts of alternative policies. The lead agency is not required to examine all conceivable policies, designations, or implementation measures but should cover a range of topics (WAC 197-11-442). This Draft EIS (DEIS) offers an analysis of the environmental impacts of the alternative concepts that have been developed for managing growth over the next twenty years. The DEIS is meant to provide information to the public, governmental agencies, and elected officials as they determine the long-term growth patterns for Clark County and the cities of Battle Ground, Camas, La Center, Ridgefield, Vancouver, Washougal, and Yacolt. The five alternatives under consideration are described below. They include two No Action Alternatives and three Action Alternatives, each of which would have different potential beneficial and adverse impacts on the natural environment, community infrastructure, public services, and public health.

The process for determining a Preferred Alternative for long-term growth requires that the public and public officials consider a very broad and complex range of issues, such as the balance between jobs and housing and the coordination of land use and transportation. As part of identifying the trade-offs between different choices, the DEIS identifies policies and related implementation actions that can be used to mitigate adverse environmental impacts or that result in beneficial impacts.

III. SUMMARY OF ALTERNATIVES

Working with the public in two series of public meetings and the Growth Management Steering Committee, which represents the incorporated cities, Clark County has identified five alternative ways that growth could be accommodated over the next 20 years. Table 1 compares the alternatives and Figures 2 through 7 illustrate them.

A. Alternatives Development

To comply with the GMA, Clark County and the cities of Battle Ground, Camas, La Center, Ridgefield, Vancouver, Washougal and Yacolt must update their comprehensive plans to accommodate 20 years of growth in population, households, and employment, as well as the infrastructure—roads, schools, and parks—to support this growth. The County works with the statewide population projections provided by the Office of Financial Management (OFM) (RCW 36.70A.070). OFM only prepares forecasts of population growth, and each county planning under the GMA must decide what the average household size will be and how much employment will grow over the 20-year period.

In 2000, OFM indicated that Clark County could expect to grow at an annual rate between 1 percent and 2.5 percent, or 419,188 to 587,622 people, over the next 20 years. The BOCC considered historic growth trends in the county and region, other locally approved growth assumptions, and the condition of the regional economy and decided to plan for an average annual population growth rate of 1.5 percent and an average household size of 2.66 persons per single-family household and 1.9 persons per multi-family household. Projecting from OFM's End of Year 2002 Population estimate for the county of 370,463, a 1.5 percent growth rate means 115,762 new people (38,587 new urban households) over the next 20 years. (The Population, Housing and Land Use section discusses historic and projected growth trends in the county and cities.)

Table 1. Summary of Alternatives

	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
Total population in 2002: 370,463 Additional people accommodated (2002 to 2023):	160,499	115,762	115,762	115,762	115,762
	Rural: 30,495	Rural: 21,995	Rural: 21,995	Rural: 21,995	Rural: 21,995
	Urban: 130,004	Urban: 93,767	Urban: 93,767	Urban: 93,767	Urban: 93,767
Total number of jobs in 2001: 118,000 Additional jobs accommodated (2002 to 2023):	54,882	44,615	44,615	70,000	70,000
Land added for new homes (acres)	23,271	7,276	0	2,387	6,970
Target areas for new development	Expanded UGAs, especially around Vancouver and Battle Ground	Inside existing and expanded UGAs focusing on Vancouver and Battle Ground	Vacant or underused land within current UGA	Expanded UGA mostly in Battle Ground UGA with some around Camas and Vancouver	North Vancouver to southwest Battle Ground
Land added for new jobs (acres)	6,903 (1,328 rezoned acres inside UGAs)*	3,670 (1,196 rezoned acres inside UGAs)	0 (901 rezoned acres inside UGAs)	10,167	5,333
Target areas for new development	Expanded UGAs especially around Vancouver, Battle Ground, and La Center/I-5	Inside existing and expanded UGAs focusing on Vancouver and Battle Ground	Vacant or underused land within current UGAs	Expanded UGAs mostly between Vancouver and Battle Ground with some around Camas	I-5 corridor from Salmon Creek to La Center
Total UGA expansion (acres)	28,845	9,749	0	12,554	12,303
Key differences from other alternatives	• Higher growth rate of 1.83% versus 1.5%. • Current employment patterns continue. • New housing consists of 60% single-family and 40% multi-family. Other alternatives reflect 75/25% target. • Average density of 8 homes per acre, compared with about 7.5 in other alternatives • Uses 1994 growth assumptions	• Growth assumptions similar to Alternatives 5, but planning for jobs is more reflective of current patterns. • Reflects policy and growth direction from BOCC.	• Focuses on land already targeted for urban development. • This alternative includes the "trigger" but not the "market factor." The other alternatives include a 25% "market factor" to increase the supply and choice of land for development. They also include a "trigger" to consider urban area expansion when 75% of commercial or residential, or 50% of industrial land, is developed.	• Most aggressive approach to planning for jobs, equal to Alternative 5. • New jobs concentrated in expanded urban areas noted above. • Uses cities' growth proposals.	• Most aggressive approach to planning for jobs, equal to Alternative 4. • New jobs mostly concentrated along I-5 corridor.

** Alternatives 1 and 2: rezoned land is currently within the UGA mainly industrial land rezoned to Office/Business Park; Alternative 3: industrial land rezoned to Office/Business Park*

Employment growth forecasts were developed with the help of the Washington Employment Security Department (ESD) and the Columbia River Economic Development Council (CREDC). To reduce traffic congestion in the region and improve the county tax base, the BOCC decided that the County should plan to increase the ratio of jobs to population within the county and bring the jobs-to-population ratio more in line with what is found in the Portland-Vancouver metropolitan area. Currently, the jobs-to-population ratio in Clark County is 1 to 2.9; the jobs to population ratio in the Portland Vancouver Metropolitan area is about 1 to 2.

The amount of land needed to accommodate projected growth in housing and employment depends on the gross density at which development occurs, that is, the number of housing units or jobs per acre. Gross density includes estimates of the percent of land used for roads and other infrastructure needs and how much is unlikely to develop for other reasons. The alternatives under consideration reflect a range of assumptions about residential, commercial, and industrial development, as well as the locations where it is most likely to occur. The alternatives reflect the result of an extensive public process (described in the next chapter), as well as input from the cities and other organizations and interest groups. Each alternative is described below.

The GMA plans adopted by the County and cities in 1994 provided land within the UGAs sufficient to accommodate 20 years of growth. Although seven years have passed since the adoption of the plans, a substantial amount of vacant and underutilized land remains within UGA. Regardless of the alternative selected, the majority of growth over the next 20 years is expected to occur within currently designated UGA boundaries.

B. Alternative 1 – The 1994 Plan

Alternative 1 is one of the No Action Alternatives under consideration. (SEPA requires that the implications of not changing the comprehensive plan be considered.) If the County were to choose this alternative, the policies and growth assumptions contained in the *20-Year Clark County Comprehensive Growth Management Plan* would remain in effect and, as a result, UGA would be expanded. This alternative represents the continuation of current trends in the ratio of population growth to employment growth and the higher density development assumptions of the 1994 plan.

The key aspects of Alternative 1 are:

- Use of an average annual population growth rate of 1.83 percent, which would add a population of 160,499 residents (30,495 rural residents and 130,004 urban residents) by 2023, bringing the county's total population to 530,962.
- Expansion of UGAs by a total of 28,845 acres with most of the new growth occurring in an area between Vancouver and Battle Ground.
- Assumption of an average of nine jobs per acre in industrial areas and 12 jobs per acre in commercial areas. An additional 54,882 jobs have been projected by 2023.
- Assumption of 2.12 people per household.
- Continuation of the 1994 plan policy that new housing should consist of 60 percent single-family and 40 percent multi-family residential units.
- Use of a market factor of 25 percent for commercial and residential land and 50 percent for industrial land. (The market factor adds additional land to the amount needed to accommodate growth in order to provide a buffer or cushion should some of the vacant land not be available for development.)
- Use of a factor of 38 percent (the same factor as in the 1994 plan) to add land above that needed for development to account for infrastructure (roads, utilities, schools, parks, fire stations, etc.) to support that development.

C. Alternative 2 – The Commissioners' 2001 Approach

Alternative 2 reflects the GMA planning decisions made by the BOCC in April 2001. The key aspects of Alternative 2 are:

- Use of an annual average growth rate of 1.5 percent over the next 20 years, resulting in 115,762 additional residents (21,995 rural residents and 93,767 urban residents). The total population would be 486,225 in 2023.
- Expansion of UGAs by 9,749 acres.
- Use of an employment growth rate close to historical rates in Clark County, which would create 44,615 new jobs at an employment density of nine employees per acre for industrial development, 20 employees per acre for business park development, and 12 employees per acre for commercial development.
- Assumption of 2.43 persons per household; 38,587 new urban households would be created over the next 20 years.
- Assumption of a mix of 75 percent single-family and 25 percent multi-family residences for new development, consistent with the BOCC direction to plan for no more than 75 percent of new housing units of any one product type.
- Use of varying density targets for residential development in the cities as follows: Camas, Ridgefield, Washougal, and Battle Ground—a target of 6 residential dwelling units per acre; La Center—4 units per acre; and Vancouver—8 units per acre. (No density target was set for Yacolt, due to its lack of a public wastewater treatment system.)
- Use of a market factor of 25 percent for residential and commercial land and 50 percent for industrial land.
- Use of an infrastructure factor of 38 percent.

D. Alternative 3 – No Expansion to Existing Urban Areas

Alternative 3 is the second No Action Alternative. In this alternative, there would be no UGA boundary expansion. To accommodate expected growth, some of the policies and growth assumptions adopted in the 1994 plan would have to be changed.

The key aspects of Alternative 3 are:

- Use of an annual average growth rate of 1.5 percent over the next 20 years, resulting in 115,762 additional residents (21,995 rural residents and 93,767 urban residents). The total population would be 486,225 in 2023.
- Assumption that no expansion of UGAs is required to accommodate growth; all new growth would occur within existing UGAs. Land already identified for residential development would develop at densities that have been achieved over the past five years.
- Assumption that industrial and business park development would occur on existing lands zoned for industrial uses within urban areas. Rezoning is proposed to convert 900 acres of industrial land to a business park district, which typically have higher employment densities than industrial areas.
- Creation of an additional 44,615 jobs at a commercial employment density of 20 employees per acre and industrial employment density of nine employees per acre.
- Assumption of an average household size of 2.4 persons, which translates into 39,070 urban households.

- Assumption of a residential density target of 6 single-family dwelling units per acre and an average density of 16 dwelling units per acre for multi-family development.
- Use a projected future development split of 71 percent single-family and 29 percent multi-family.
- No market factor.
- Use of an infrastructure factor of 27.5 percent.

E. Alternative 4 – The Cities' Perspective

Alternative 4 represents a composite of the proposals from the cities of Battle Ground, Camas, La Center, Ridgefield, Vancouver, Washougal, and Yacolt for how they want to manage their growth. Some jurisdictions have not asked to expand their UGA (Washougal, Ridgefield, Yacolt) while others have asked for large expansions (Battle Ground and Vancouver).

The key aspects of Alternative 4 are:

- Assumption of an annual average population growth rate of 1.5 percent, adding 115,762 new residents by 2023.
- Expansion of UGAs by 12,554 acres. Most new growth would occur around Battle Ground. Vancouver would expand its UGA, almost exclusively for jobs, and there would be a minor expansion of La Center's and Camas' UGAs.
- Creation of at least 70,000 new jobs at a commercial employment density of 12 employees per acre for commercial land and nine employees per acre for industrial land.
- Setting the housing-type mix at a maximum of 75 percent single-family and a minimum of 25 percent multi-family.
- Assumption of residential densities at the targets of six residential units per acre for Camas, Battle Ground, Ridgefield, and Washougal, four units per acre for La Center, and eight units per acre for Vancouver.
- Use of a market factor of 25 percent for residential and commercial land and 50 percent for industrial land.
- Use of an infrastructure factor of 38 percent.

F. Alternative 5 – The "Discovery Corridor" Strategy

Alternative 5 reflects economic development strategies proposed by the Columbia River Economic Development Council (CREDC) to make large tracts of land available for employment development along I-5 to provide access to and from those areas. This alternative seeks to create a new center of economic activity by increasing the number of businesses and family-wage jobs near the I-5 corridor, from Salmon Creek to La Center. The job growth rate would be much higher than under other alternatives. The key aspects of Alternative 5 are:

- Use of an annual average growth rate of 1.5 percent over the next 20 years, resulting in 115,762 additional residents (21,995 rural residents and 93,767 urban residents). The total population would be 486,225 in 2023.
- Expansion of UGAs of 12,303 acres, with 6,970 acres added for residential development and 5,333 acres added for new jobs. Most of the expansion of UGA for residential development would occur north of Vancouver and southwest of Battle Ground.
- Creation of at least 70,000 new jobs with employment density of 12 employees per acre for commercial development, 9 employees per acre for industrial development, and 20 employees per acre for Business Park development.

- Assumption of a housing type mix of a maximum of 75 percent single-family and a minimum of 25 percent multi-family units. Residential densities would be targeted at an average of four dwelling units per acre for La Center, six units for Camas, Battle Ground, and Ridgefield, and Washougal, and eight units per acre for Vancouver.
- Use of a market factor of 25 percent for residential and commercial land and 50 percent for industrial land. It also assumes an infrastructure factor of 38 percent.

Table 2. Summary of Impacts

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Earth					
Soils and Geology Criteria: acres of ag or forest soil converted	8,648 acres of ag land 145 acres of forest land	2,207 acres of ag land	No conversion of ag or forest land	3,178 acres of ag land 68 acres of forest land	3,589 acres of ag land
Topography Criteria: Earthquake zone A: highest hazard Acres of land over 40% slope Acres of landslide hazard areas	214 acres in Zone A 194 acres of steep slopes 1410 acres of landslide hazard	88 ac in Zone A 46 acres of steep slopes 469 acres of landslide hazard	No changes to existing lands designated for development.	149 acres in Zone A 75 acres of steep slopes 483 acres of landslide hazard	54 acres of Zone A 11 acres of steep slopes 329 acres of landslide hazard
Air					
Climate & air quality	All alternatives have the potential to affect the air quality and climate. Impacts can be related to the balance between emissions from automobile use (vehicle miles traveled or VMT), emissions from unregulated private sources (e.g. gas lawnmowers), federal regulations through the Clean Air Act, and conversion of rural and resource land to urban land with less vegetative cover. For differences in VMT (full build-out capacity, not planned growth) see Transportation Impacts. For conversion of rural to urban land see the Rural and Resource land impacts.				
Water					
Surface waters Criteria: miles of streams added to UGAs	100 miles of streams Creeks: Gee, Lacamas, Whipple, Salmon, Mill & Fifth Plain	28 miles of streams Creeks: Gee, Whipple, Weaver, Salmon, & Mill	No additional miles of streams	33 miles of streams Creeks: Lacamas, Gee, Curtin, Mill, Salmon, Weaver, and Whipple	32 miles of streams Creeks: Gee, Mill, Salmon and Whipple
Stormwater Criteria: new impervious surface	7,800 acres of new impervious surface	3,200 acres of new impervious surface	No additional acres	3,098 acres of new impervious surface	3,355 acres of new impervious surface
Shorelines Criteria: acres of environment affected	737 acres of shorelines	191 acres of shorelines	No additional acres	480 acres of shorelines	119 acres of shorelines
Floodplains Criteria: flood fringe area added to UGAs	1,385 acres of floodway fringe	269 acres of floodway fringe	No additional acres	589 acres of floodway fringe	230 acres of floodway fringe
Groundwater & Aquifer Recharge					
Criteria: New impervious surface in new UGAs	7,800 acres of new impervious surface	3,200 acres of new impervious surface	No additional acres	3,098 acres of new impervious surface	3,355 acres of new impervious surface
Acres of wellhead protection areas in new UGAs	28,841 acres of wellhead protection area	9,745 acres of wellhead protection areas	No additional acres	12,552 acres of wellhead protection areas	12,300 acres of wellhead protection areas

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Plants and animals					
Habitat Criteria: Identification of priority habitat within expansion areas and miles of priority habitat creeks added to UGAs (does not include all affected creeks)	Habitats identified: riparian zones, oak woodlands, urban natural open space, and wetlands; associated with Salmon, Mill, Gee, Woodin, Weaver, and Lacamas creeks, Columbia River shoreline, Lacamas Lake, and the East Fork Lewis River - 3.8 miles of Salmon Creek, 4.7 miles of Gee Creek, 4.1 miles of Lacamas Creek added	Habitats identified: riparian zones, oak woodlands, urban natural open space, and wetlands associated with Gee & Salmon creeks and Columbia River shoreline - 1.2 miles of Salmon Creek and 1.8 miles of Gee Creek added	No UGA expansion; no new habitat areas added to UGAs	Habitats identified: riparian zones, urban natural open space, wetlands, caves, and oak woodlands; associated with Salmon, Lacamas, Mill, and Gee creeks, Lacamas Lake, the Columbia River shoreline, and the Green Mountain Cave - 5.1 miles of Salmon Creek and 2.2 miles of Lacamas Creek added	Habitat identified: riparian zones, urban natural open space, wetlands, and oak woodlands; associated with Salmon, Gee, and Mill creeks - 2.8 miles of Gee Creek, and 2.2 miles of Mill Creek added
Sensitive, Threatened and Endangered Species (includes migration routes) Criteria: Miles of stream supporting anadromous salmon to be brought into new UGAs	34 miles of salmon-supporting streams	23 miles of salmon-supporting streams	0 miles of salmon-supporting streams	34 miles of salmon-supporting streams	8 miles of salmon-supporting streams
Species found in new UGAs	7 species: Bald eagle (federal threatened) Purple martin (state candidate) Reticulate sculpin (state monitor) Coho salmon, steelhead, chinook, and chum salmon (federal threatened)	5 species: Purple martin Osprey (state monitor) Sand roller (state monitor) Coho salmon and steelhead	No new habitat added to UGAs.	3 species: Purple martin Osprey Sand roller (Industrial development within 500 feet of East Fork Lewis River could impact habitat for steelhead, coho, chinook, and chum salmon)	3 species: Bald eagle Coho salmon and steelhead
Wetlands Criteria: Acres of wetland added to new UGAs	1,195 acres of wetlands	329 acres of wetlands	0 acres of wetlands	749 acres of wetlands	729 acres of wetlands
Energy	Impacts on energy and natural resources are not quantitatively comparable. Total energy impacts are more from overall growth and types of uses, less so from patterns of expansion. Impacts from growth based on potential land capacity (as opposed to planned growth) would likely result in greater impacts than planned. Growth based on capacity would be greatest under Alternative 1, followed by Alternatives 5, 2, 4, and 3. Impacts from VMT on energy (petroleum) use based on capacity for growth (full build-out) can be found in Transportation Impacts.				

	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
Scenic resources Criteria: Conversion of rural land to urban land	All alternatives except Alternative 3 would convert rural and resource land to urban uses. Alternative 1 would convert most acres (28,845), followed by Alternative 4 (12,554), Alternative 5 (12,303) and Alternative 2 (9,749).				
Noise	Impacts from noise not quantitatively compared. Higher noise impacts expected from increased traffic (see Transportation), from expansion of diverse urban uses into formerly rural areas (see Land Use, and Rural and Resource land comparisons).				
Land Use, Population, and Housing					
Criteria: Urban residential land capacity[1] (Difference between the number of planned households and number of households at build-out; actual land capacity)	Planned # of households would occupy **68%** of actual land capacity Households: build-out capacity: 90,155 planned: 61,323	Planned # of households would occupy **68%** of actual land capacity Households: build-out capacity: 57,048 planned: 38,587	Planned # of households would occupy **87%** of actual land capacity (capacity shortfall) Households: build-out capacity: 44,933 planned: 39,070	Planned # of households would occupy **80%** of actual land capacity Households: build-out capacity: 48,536 planned: 38,587	Planned # of households would occupy **68%** of actual land capacity Households: build-out capacity: 57,103 planned: 38,587
Rural residential land capacity[1] (Difference between the number of planned households and number of households at build-out; actual land capacity)	Planned # of households would occupy **130%** of actual rural land capacity (shortfall) Households: build-out capacity: 11,056 planned: 14,384	Planned # of households would occupy **72%** of actual rural land capacity Households: build-out capacity: 12,379 planned: 9,051	Planned # of rural households would occupy **69%** of actual land capacity Households: build-out capacity: 13,299 planned: 9,164	Planned # of rural households would occupy **75%** of actual land capacity Households: build-out capacity: 11,996 planned: 9,051	Planned # of rural households would occupy **75%** of actual land capacity Households: build-out capacity: 12,056 planned: 9,051
Rural Lands Criteria: Acres of rural land brought into new UGAs	12,088 rural acres converted to urban	2,106 rural acres converted to urban	0 rural acres converted to urban	4,775 rural acres converted to urban	4,046 rural acres converted to urban
Resource Lands Criteria: Total acres into new UGAs	9,086 acres of resource land converted	2,500 acres of resource land converted	0 acres of resource land converted	3,459 acres of resource land converted	3,780 acres of resource land converted
Agricultural land	8,648 acres of ag land	2,207 acres of ag land	0 acres of ag land	3,178 acres of ag land	3,589 acres of ag land
Forest land	145 acres of forest land	0 acres of forest land	0 acres of forest land	68 acres of forest land	0 acres of forest land
Mineral land	375 acres of mineral land	286 acres of mineral land	0 acres of mineral land	189 acres of mineral land	189 acres of mineral land
Economy					
Criteria: Average jobs to population ratio:[2] Planned jobs to population Actual capacity for jobs to actual capacity for population	1 to 2.53 1 to 2.1	1 to 2.3 1 to 1.8	1 to 2.3 1 to 1.6	1 to 1.5 1 to 1.0	1 to 1.5 1 to 1.4
New industrial land	1,550 acres	0 acres	0 acres	4,773 acres	603 acres
New Office/Bus. Park land	2,458 acres	3,581 acres	901 acres	197 acres	3,353 acres

	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
New commercial land	2,403 acres	88 acres	0 acres	2,816 acres	897 acres
Employment capacity[1] (% of land used for planned jobs)	59% planned new jobs: 54,882 potential new jobs: 93,075 (based on actual land capacity)	61% planned new jobs: 44,615 potential new jobs: 78,579 (based on actual land capacity)	72% planned new jobs: 44,615 potential new jobs: 66,502 (based on actual land capacity)	57% planned new jobs: 70,000 potential new jobs: 129,674 (based on actual land capacity)	74% planned new jobs: 70,000 potential new jobs: 99,078 (based on actual land capacity)
FPIAs[3]	All of 14 and portions of 2	All of 11 and portions of 3	All or a portion of 11	All of 11 and portions of 4	All of 12 and portions of 4
Historic and Cultural Resources	Much of the county has been identified as having a high probability for archaeological resources, in part because of the area's rich history and its importance as a settlement location. Many of the high probability areas are located along streams, rivers, and other water bodies. (See stream miles, above.) Each of the action alternatives would include areas identified as having a high probability for archaeological resources. Only Alternative 3, which accommodates growth within existing UGAs, would not increase the likelihood of impacts on high probability areas.				
Transportation					
Criteria: Vehicle hours of delay	9,510 hours of delay	2,838 hours of delay	2,024 hours of delay	2,208 hours of delay	2,065 hours of delay
Lane miles at LOS E/F	273 lane miles at LOS E/F	127 lane miles at LOS E/F	85 lane miles at LOS E/F	124 lane miles at LOS E/F	105 lane miles at LOS E/F
Total project mitigation costs to maintain LOS D	$2.3 billion	$2.1 billion	$1.8 billion	$2.2 billion	$2.2 billion
Public Facilities & Utilities					
Fire Protection Criteria: Acres in new UGAs to be served	14,500 additional acres to be served	4,900 additional acres to be served	0 acres	7,100 additional acres to be served	5,000 additional acres to be served
Police Protection Criteria: Additional law enforcement needed	391 officers	322 officers	254 officers	280 officers	326 officers
Public Schools Criteria: Household Increase (for all school districts)	85,180 new households	54,057 new households	37,225 new households	44,822 new households	48,521 new households
Parks and Recreational Facilities Criteria: New park land needed	2,524 acres for additional parks	1,926 acres for additional parks	1,590 acres for additional parks	1,612 acres for additional parks	1,932 acres for additional parks
Libraries	Demand for library services increases with population growth and access to facilities is affected by the location of the growth. Alternative 1 would have greater population growth and wider dispersal than the other alternatives. Residential growth is the least dispersed under Alternatives 3 and 4.				
Sewer Criteria: Additional capacity at build-out	30,833,259 gallons per day	27,797,653 gallons per day	14,639,207 gallons per day	17,835,751 gallons per day	32,288,115 gallons per day
Cost to upgrade facilities	$104 million	$61 million	$33 million	$67.9 million	$128.1 million

	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
Solid waste	Facilities have capacity to handle growth beyond 20-year plan period.				
Public water supplies Criteria: Additional water demand at capacity build-out	30,833,259 gallons per day	27,797,653 gallons per day	14,639,207 gallons per day	17,835,751 gallons per day	32,288,115 gallons per day
Cost to build facilities to meet demand	$56.8 million	$29.7 million	$21.3 million	$32.5 million	$38.7 million
Other Public Buildings/Facilities	Alternatives 1, 4, and 5 would likely require additional government building space for the City of Battle Ground. The cities of Camas and Washougal will expand or remodel existing facilities to accommodate growth under all alternatives.				
Electricity	Electrical service is a "pay as you go" service and system upgrades are paid for by new development directly (in the form of system connection fees) and by utility rates paid by CPU customers. Clark Public Utilities expects to be able to expand the electrical system to serve development, regardless of alternative. Availability of electricity is not expected to be a limiting factor for new development.				

Notes:

1. GMA requires sufficient land to be available to accommodate projected population and employment. Having insufficient land to accommodate projected population or employment would not be consistent with the requirements of GMA. Having a large amount of urban land that exceeds the amount needed to accommodate projected urban population and employment would not be consistent with the intent of GMA to limit inappropriate conversion of rural land to urban land and to prevent inefficient land use patterns.

2. Having a good balance of jobs to population is one of the goals adopted by the Board of County Commissioners. There are two numbers because the projected or planned population and job numbers are lower than the number of people and jobs that could actually be accommodated by the land capacity under each alternative (full build-out).

3. Focused Public Investment Areas. These areas are targeted for public investment based on cost-effectiveness of the investment in potentially attracting new employers (see text of Economy section of DEIS for explanation).

Table 3. Summary of Mitigation Measures by Environmental Element

Element	Mitigation Measures
Soils	Comprehensive plan policies and ordinances of Clark County and the cities protect resource land soils and restrict development where there are soil limitations. (The La Center comprehensive plan does not specifically address soil limitations on construction.)
Geology and Topography	Comprehensive plans of Clark County and the cities have policies for regulating development within geologically hazardous areas, which are implemented through local geological hazard ordinances.
Climate	Clark County and the cities do not have policies that directly relate to the mitigation of those parameters that contribute to climate change. Climate change is indirectly addressed and mitigated through air quality and environmental regulations.
Air Quality	Protection of air quality occurs through federal and state regulations on automobiles, fireplaces, and wood stoves. Most comprehensive plans recognize the link between air quality, traffic congestion, and vehicle emissions and establish policies in their Transportation, Economic Development, and/or Environmental Element to mitigate impacts to air quality from vehicle use. Policies note the importance of maintaining air quality for future economic development.
Surface Water	Comprehensive plan policies and development regulations provide for the protection of surface water quality throughout the county. Generally, mitigation consists of the identification and protection of critical areas and floodplains through local ordinances, protection of shorelines through Shoreline Master Programs, and through stormwater management ordinances.
Groundwater and Aquifer Recharge Areas	As required by the GMA, the county and each city have identified critical environmental areas, including critical aquifer recharge areas. Protection of groundwater resources is addressed in critical areas ordinances (CAOs) that regulate development within recharge areas and in the regulation of septic systems.
Fish and Wildlife Habitat	The protection of fish and wildlife habitat conservation areas is addressed in comprehensive plan policies and implemented through local ordinances. The county and each city have identified critical environmental areas, which include fish and wildlife habitat conservation areas. CAOs, stormwater management programs and regulations, erosion control regulations, and tree protection ordinances are the mechanisms for mitigating adverse impacts to these areas.
Sensitive, Threatened, and Endangered (STE) Species	Mitigation of impacts to STE species is the same as for fish and wildlife habitat, above. Clark County, Battle Ground, Camas, and Vancouver are updating their CAOs, in part to provide greater protection for ESA-listed salmon and steelhead.
Migratory Species/Migration Routes	Mitigation for impacts to migratory species and habitat is the same as for fish and wildlife habitat, above.
Wetlands	The protection of wetlands is accomplished primarily by federal Clean Water Act, Section 404 regulations. State regulations that provide for the mitigation of impacts to wetlands include the Shoreline Management Act, Hydraulic Project Approval, State Environmental Policy Act, and the Floodplain Management Program. The county and the cities have adopted wetland protection ordinances.
Renewable and Non-Renewable Energy Sources	The primary energy conservation measure available to local jurisdictions is to adopt a compact urban form that supports alternative, energy efficient transportation. Most comprehensive plans and local ordinances do not directly address energy conservation, but some have provisions for protecting access to solar energy.
Scenic Resources	Clark County has designated 2 scenic routes and implements the provisions of the Columbia River Gorge National Scenic Area Act in its code requirements. Battle Ground has adopted interim policies to protect and promote significant views. Camas' municipal code also allows for the protection of scenic resources. Other local codes do not directly address scenic resources.
Noise	Federal and state regulations that limit noise exposure in different classes of land use provide for some mitigation of noise impacts. Noise impacts are also considered in SEPA environmental review. Vancouver proposes to adopt a modification of the state noise ordinance.
Land Use, Population, and	Primary mitigation would be the selection of an alternative that minimizes adverse impacts by using land efficiently. Alternatives can be

Element	Mitigation Measures
Housing	modified by changing assumptions to reduce projected impacts.
Rural Lands	Clark County's comprehensive plan has policies that protect rural lands. Development on rural lands is also regulated by the county's zoning code, which establishes rural districts and permitted uses.
Resource Lands	Clark County's comprehensive plan policies protect resource lands from incompatible uses and from conversion to urban land. The zoning code regulates the intensity and nature of development that can occur on and adjacent to resource lands. City comprehensive plans contain policies that direct development away from productive forest and farm land.
Historic and Cultural Resources	Clark County and the cities of Battle Ground, Camas, La Center, Ridgefield, and Vancouver have policies and/or ordinances that require these jurisdictions to identify and protect historic and cultural resources. Washougal's comprehensive plan does not directly discuss historic and cultural resources.
Transportation	All alternatives would require significant transportation improvements to reduce congestion and achieve a system-wide level-of-service D. Other mitigation could consist of : • Seeking out local option transportation funding and increased funding through the state legislature or referenda. • Lowering the LOS standards on corridors where appropriate funding levels are not available or where multimodal transportation use is to be encouraged. • Reducing the amount of UGA expansion or the intensity of growth in outlying urban growth areas. • Amending the County's comprehensive plan to allow rural major collectors to become multi-lane, non-state highways on specific routes that connect urban areas. • Implementing a regional traffic impact fee structure whereby rural and outlying urban area development contributes toward the cost of rural corridor capacity improvements.
Emergency Services and Fire Protection	To maintain levels of service, Alternative 4 would require additional facilities in Battle Ground. Alternatives 1 and 5 would need expanded emergency services facilities in the Ridgefield area. No additional facilities needed (excepting possible upgrades to existing) for Camas, La Center, Vancouver, and Washougal.
Police Protection	To maintain standards for minimum officers per 1,000 population, population growth will require additional staff under each alternative. Each jurisdiction (except Camas and Washougal) has identified a need for expanded police facilities.
Public Schools	Local jurisdictions have adopted school impact fees on new development. Local comprehensive plan policies address the siting of new school facilities. Balancing land uses within school districts helps to ensure adequate tax base for schools. Battle Ground anticipates expanding school facilities. La Center and Vancouver will expand facilities as needed.
Parks and Recreation	Clark County and its cities have established policies for the provision of parks and open space to accommodate new development and enhance the quality of life in urban areas. Mitigation in the form of additional parks would be expected in Battle Ground, Camas, and Vancouver.
Libraries	Mitigation measures to meet additional demand for library services consists of upgrading old or establishing new facilities where needed, purchase of materials, and increasing staff and other services.
General Government	No mitigation needed.
Solid Waste	No mitigation needed.
Sanitary Sewer	Concurrency requirements extend to sanitary sewer provision. Each jurisdiction has established policies for providing sanitary sewer service concurrent with new development.
Public Water Systems	Concurrency requirements extend to water provision. Each jurisdiction has established policies for the provision of public water concurrent with new development.

PROJECT DESCRIPTION

I. BACKGROUND

This Draft Environmental Impact Statement (DEIS) evaluates alternatives for growth management in Clark County and its cities in accordance with the regulations of the SEPA. The proposed revised Comprehensive Growth Management Plans for Clark County and the cities and towns of Battle Ground, Camas, La Center, Ridgefield, Vancouver, Washougal, and Yacolt (the GMA plans) have been prepared to comply with the requirements of the GMA. Under the GMA, as discussed in the previous chapter, counties and cities must plan for the expected 20-year population growth as forecast by the OFM. The plans for the cities and the county must be consistent and must address, at a minimum, land use, transportation, housing, capital facilities, utilities, critical areas, and resource lands. The County must also include policies guiding the future use and development of rural lands and annexation. In addition, several cities and the County have elected to prepare plan elements covering economic development, historic preservation, community design, annexation, and parks and open space.

A. Environmental Review

The review of the comprehensive plans of Clark County and its cities is a programmatic action under SEPA.

Clark County determined that the revision of the 1994 comprehensive plan and the UGA could have a significant impact on the environment. That determination of significance automatically requires that an EIS be prepared to assess the possible impacts of different alternatives. Since programmatic actions are broader and less specific than project actions, analysis of their environmental impacts under SEPA is also broader and is framed as a discussion of the alternative courses of action that can accomplish a stated objective. Sometimes agencies identify a Preferred Alternative among the alternatives being examined. In other instances, the EIS can be used to help decision makers and the public to choose a Preferred Alternative. Clark County is using this EIS to review and compare potential impacts from different alternatives and, in light of those potential impacts, to solicit public and agency input on which land use alternative should become the county's Preferred Alternative and the basis for revising GMA plans.

SEPA states that an EIS discussion of alternatives for comprehensive plans should be limited to a general discussion of the impacts of alternative policies. The lead agency is not required to examine all conceivable policies, designations, or implementation measures but should cover a range of topics (WAC 197-11-442). This DEIS offers an analysis of the environmental impacts of the revised Clark County *20-Year Comprehensive Growth Management Plan* and the alternative concepts that have been developed for managing growth over the next twenty years. The DEIS is meant to provide information to the public, governmental agencies, and elected officials as they determine the long-term growth patterns for Clark County and the cities of Battle Ground, Camas, La Center, Ridgefield, Vancouver, Washougal, and the town of Yacolt. The five alternatives under consideration are described in this section. They include two No Action Alternatives and three Action Alternatives, each of which would have different potential positive and adverse impacts on the natural environment, community infrastructure, public services, and public health.

The process of determining a Preferred Alternative for long-term growth requires that the public and public officials consider a very broad and complex range of issues, such as the balance between jobs and housing and the coordination of land use and transportation. As part of identifying the trade-offs between different choices, the DEIS identifies policies and related implementation actions that can be used to mitigate adverse environmental impacts or that result in beneficial impacts.

A Final EIS (FEIS) will be prepared following the 45-day public comment period on the DEIS. The FEIS will incorporate comments and responses to the comments.

B. Proponents

The draft GMA plans evaluated in this DEIS were prepared by Clark County and the cities of Camas, La Center, Ridgefield, Vancouver, Washougal, and the town of Yacolt, working in cooperation with each other and the special districts and state agencies required to coordinate their actions under the GMA. The final plans will be reviewed by the Planning Commissions of each jurisdiction and adopted by their respective City or Town Councils or BOCC. In addition, the BOCC must review the adopted plans of the cities and towns for consistency with each other and the adopted County plan and relay their findings to the state's Office of Community Development. In light of the requirement for consistency among the plans, the County, cities, and towns have elected to join together to prepare this DEIS.

C. Location

Clark County is located at the southern edge of Washington State on the Columbia River. Figure 1 shows the regional location of the county and the cities and towns. Clark County is the northernmost county in the four-county Portland-Vancouver Consolidated Metropolitan Statistical Area, and its economy, transportation system, and cultural life are affected by this larger region. The urban core of the Portland-Vancouver area lies near the confluence of the Columbia and Willamette Rivers, approximately 110 miles inland from the Pacific Ocean. This is the easternmost location of deep water ports on the Columbia River system, and it serves southern Washington, part of Idaho, and most of Oregon. It is the largest urban area on the west coast of the United States between Seattle and San Francisco.

II. SCHEDULE

To complete the planning for Clark County in conformance with the GMA (described above), the following schedule in Table 4 has been adopted by the County.

Table 4. Schedule for Clark County Planning

2000	Initiate public involvement efforts
2001	Review and decisions on fundamental policy issues.
2002	Develop Focused Public Investment Areas Initiate environmental review process
March 19, 2003	Distribute Draft Environmental Impact Statement
May 5, 2003	Deadline for comments on DEIS (45 days)
June 23, 2003	BOCC Decision on Preferred Alternative
Early Fall 2003	Issuance of Final EIS
Fall 2003	Deadline for comments on FEIS
End of 2003	Public hearings on draft Clark County Comprehensive Plan and FEIS

III. DESCRIPTION OF PUBLIC INVOLVEMENT

From the outset of the comprehensive plan update process, Clark County and local cities have made a substantial effort to engage and involve the public in key decisions. The public involvement program for the comprehensive plan was divided into three phases. The publication of the DEIS is occurring in Phase 3 of the program.

Major activities prior to Phase 3 included:

- informational mailers to all county households and property owners
- media coverage—news stories and advertising

- in-depth information on Clark County's web site
- interviews on Clark-Vancouver Television
- dissemination of information to a mailing list of interested citizens
- presentations to community groups
- two countywide public forums/assemblies called CitizenSpeak as well as smaller local meetings

In response to citizen input during Phases 1 and 2, the Board of Clark County Commissioners (BOCC) established policy direction that guided development of the initial draft land-use alternatives that lie at the heart of Phase 3. Building on the previous outreach activities, Phase 3 continues with the theme "Checking in on our future: Where do we grow from here?" as the basis for the County's efforts to provide information to the public and solicit its input. This program is intended to continue throughout the remainder of the process. To date, the County's own activities to raise the visibility of the planning process have been augmented by extensive media coverage; there is every expectation that this level of publicity will continue through the final adoption of the updated plan.

In March 2002, the County sent a letter from the BOCC to every mailbox in the county as well as to owners of county property who live elsewhere. The letter explained the update process and invited residents to offer their insights, suggestions, and comments as the County explored land-use alternatives. The letter also underscored the availability of additional information on the County's web site and informational phone line. The primary purpose of the letter was to promote a series of five meetings, held throughout the county in April 2002, at which growth management issues would be discussed and input from citizens would be sought.

In addition to a large contingent of County staff, planners from each of the cities attended the meetings held in their particular areas. They brought information about their cities' planning processes and were available to respond to questions and to hear the comments from local residents.

The cities also conducted public processes to develop their plans within city limits and for UGA change proposals. The City of Vancouver convened a 10-member Vancouver Plan Oversight Committee from 2000 through 2003 to provide development recommendations, and it has held public open houses, focus groups, and Planning Commission and City Council worksessions on the comprehensive plan update in 2001 and 2002. During this time, Vancouver has also developed a Transportation System Plan involving extensive public involvement.

More than 800 people attended the April meetings. Preceding each meeting, an open house session featured informational displays, maps, and handouts; staff were at each "station" to respond to questions and elaborate on the available materials.

During the actual meetings, participants were asked to rank land use alternative evaluation criteria developed by County staff and to add additional criteria of their own. They were also asked to comment on whether the draft land-use alternatives represented an appropriate range of choices on how to manage Clark County's growth and what the most important considerations should be when ranking focused public investment areas. The criteria for ranking that were rated highest were: providing more jobs, reducing traffic congestion, being supported by community input, and protecting the environment.

A survey comprising the same questions and issues was placed on the County's web site so that people who were not able to attend the meetings could provide their input.

In addition to the countywide meetings, extensive information on the County's web site, and the web survey, County staff provided information and encouraged public involvement through interviews on Clark-Vancouver Television and made presentations to a variety of community groups and neighborhood associations. An e-mail list of 470 receive announcements of Steering Committee meetings.

A second series of five meetings was held throughout the county in September 2002. They were designed to inform the public about the progress of the update process and to gather participants' thoughts about the strengths and weaknesses of the proposed land use alternatives being considered in the draft Environmental Impact Statement. The alternatives incorporated the criteria that county residents and representatives from cities and agencies said were important.

The meetings were publicized in a variety of ways. A letter from the BOCC was mailed to a database of interested citizens, including everyone who had attended the April 2002 meetings. Other methods of publicity included interview segments on Clark-Vancouver Television, meetings with community groups and neighborhood organizations, news releases, newspaper advertisements, the County's web site, and displays at libraries throughout the county.

Approximately 300 people attended the five meetings, some of whom were completely new to the planning process. During the open house periods that preceded the actual meetings, people were invited to attend GMA 101, an informal "class" about the comprehensive plan and the update underway. As with the earlier round of meetings, the open house periods included displays, maps, and handouts; staff were at each "station" to respond to questions and to expand on the available information.

Following the open house periods, participants were divided into small groups. Each group was given a presentation focusing on each of the five draft land-use alternatives, followed by a brief discussion period. Participants were asked to evaluate the five alternatives according to how well each one met the criteria identified as most important at the previous round of meetings. They were also given the opportunity to add other criteria and to provide open-ended comments.

Overall responses at the meetings demonstrated a wide diversity of opinion about how growth should be managed in Clark County and some common themes emerged. A majority of people preferred UGA expansion if it accommodated job growth, not just housing. They liked to see the job growth being concentrated along major transportation corridors. There was a desire for people to be able to live close to where they work to reduce traffic and environmental problems. There was a widespread concern that traffic may get worse with any UGA expansion and that the plans under consideration did not adequately address traffic issues. Many people questioned the type of new jobs being considered, how they would be recruited, and whether they would be for existing county residents or new residents. There was also some concern about the ability to pay for the infrastructure that new growth will require.

IV. PLANNING AND ANALYSIS FRAMEWORK

Since the Clark County *20-year Comprehensive Growth Management Plan* was adopted in 1994, conditions in the county as well as state and federal laws have changed, requiring corresponding changes to the County's comprehensive plan. These changes include:

- A growth rate more rapid than anticipated. The 1994 plan projected that Clark County would have a population of approximately 290,000 in 2000, but the census found a population of 345,238, close to the original projection for 2012.
- Listing of Lower Columbia River runs of steelhead and Chinook salmon as threatened under the Endangered Species Act, requiring special protection for their habitat in the streams of Clark County.
- Reductions in revenue affecting the funding of services and capital facilities.
- Changes in state law requirements for the comprehensive plan:
  - Analysis and policies to protect the operation of general aviation airports from encroachment by incompatible uses.

- Protection of critical areas functions and values using "best available science" to develop policies and development regulations. Special consideration must be given to preserving or enhancing anadromous fisheries.
- Shoreline Master Program as an element of the comprehensive plan.
- Procedures for identification of and siting "transportation facilities of statewide or regional significance" as essential public facilities.
- Procedures for siting "secure community transition facilities" as essential public facilities.
- Assessment of the impacts of proposed land use patterns on the level of service on state highways.

A. Growth Management Act

Passage of the GMA of 1990 (RCW 36.70A) significantly changed the requirements for local planning. The GMA requires rapidly-growing counties and cities in the state to plan to manage growth in a way that allows for the efficient use of land and resources. Counties and cities planning under the GMA must adopt comprehensive plans that address land use, housing, public facilities and services, utilities, rural development, and transportation. Planning includes the designation of UGAs, resource lands, and critical areas. UGAs establish future urban lands, separate urban from rural areas, and provide a land supply adequate to accommodate at least the projected 20-year population growth, as forecast by the Office of Financial Management. Resource lands include forests, farmland, and mineral resource areas. Critical areas are defined as floodplains, wetlands, steep-sloped hillsides, aquifer recharge zones, and fish and wildlife habitat. Optional elements of the comprehensive plan include economic development, conservation, property rights, historic and cultural resources, and parks, recreation, and open space.

In 1991, the GMA was amended to require the adoption of "countywide" planning policies (CWPPs) to ensure coordination and consistency among the plans of the GMA counties and the cities within them. The plans of counties and their cities must comply with the adopted CWPPs.

B. Changes to State Law

Since 1997, the GMA was also amended to include a requirement for counties with populations greater than 150,000 to establish a review and evaluation program. The main purpose of the review and evaluation program is to determine whether a county and its cities are achieving urban densities within UGAs by comparing growth and development assumptions, targets, and objectives contained in the countywide planning policies and the county and city comprehensive plans with actual growth and development that has occurred. In addition, the review should identify reasonable measures, other than adjusting UGAs, that can be taken to comply with the GMA requirements. The results of Clark County's program was the *Clark County Plan Monitoring Report (1995-1999)* and the *Clark County Buildable Lands Report* (2001).

The GMA requires regular review and update of comprehensive plans. The comprehensive plans and development regulations of counties and cities that plan under the GMA are to be reviewed and revised (if necessary) every five years to ensure that the plan and regulations still comply. Any changes that are made to a comprehensive plan during the review process must be consistent with the GMA, including any amendments that have been made since the adoption of the comprehensive plan. Table 5 lists the non-procedural amendments that have been made to the GMA since 1995 (the County and its cities generally completed and adopted their comprehensive plans in 1994).

Each county that designates UGAs is required to review those areas at least every ten years to ensure that there is an adequate amount of land to accommodate the 20-year growth projections for population, jobs, and housing. Clark County is not required to review its UGAs and plan for a new 20-year period until 2004. The County could have chosen to review and evaluate its comprehensive plan policies according to

the process outlined in RCW 36.70A.215, a process that requires jurisdictions to (1) determine whether a county and its cities are achieving urban densities within UGAs by comparing growth and development assumptions, targets, and objectives found in comprehensive plans with actual growth and development that has occurred and (2) identify reasonable measures, other than adjusting UGAs, that would allow for density goals to be met. However, Clark County has chosen to review both its plan and UGAs for the full 20-year planning horizon. The County identified five alternatives for accommodating growth from 2003 to 2023, four of which involve expanding the UGAs.

Although the GMA established a deadline of September 1, 2002 (RCW 36.701.130) for the first full review of comprehensive plans and development regulations, in summer 2002 the deadline for revised plans was extended to 2004.

1. Changes in Countywide Planning Policies (CWPP)

Proposed changes to CWPPs consist of procedural policies. The new policies call for completion of the plan monitoring requirements every five years and for the cities to submit annual reports to the County on residential, commercial, and industrial growth, in accordance with the guidelines in the *Plan Monitoring Procedures Report*. Reviews of plan, population, forecasts and UGAs will occur every 10 years (CWPP 1.1). Another stipulation in revised policy 1.1 states that the County and its cities will use the result of the Buildable Lands Capacity Report (completed every five years) to determine the most appropriate means to address inconsistencies between land capacity and projected needs. Reasonable measures other than expanding UGA will be identified.

The other changes to CWPPs chiefly concern salmon recovery efforts in Clark County. Land Use CWPP 1.1 states that resource protection and Endangered Species Act concerns regarding salmonids should be applied similarly in urban and rural areas (paragraph (i.4)). CWPP 6.1 also addresses salmonids under paragraph “m,” affirming that the County shall consider salmonids and their needs as defined by Best Available Science when siting and modifying county or municipal capital facilities. A stormwater policy under Utilities (CWPP 7.1) calls for a stormwater treatment plan for existing and future developments that complies with salmon recovery objectives.

Table 5. Non-Procedural Amendments to the Growth Management Act, 1995-2001

Title, Chapter, and Section	Year	Content
RCW 36.70A.030 Definitions	1995	A definition of "wetlands" added to the Shoreline Management Act (SMA) that is identical to the definition under the Growth Management Act (GMA). Excluded from the wetlands definitions under both acts are wetlands created after July 1, 1990, that were unintentionally created as the result of road construction.
RCW 36.70A.070 Comprehensive Plans – Mandatory elements	1995	• Added the following underlined text in subsection (5): The rural element shall permit <u>appropriate</u> land uses that are compatible with the rural character of such lands and provide for a variety of rural densities <u>and uses and may also provide for clustering, density transfer, design guidelines, conservation easements, and other innovative techniques that will accommodate rural uses not characterized by urban growth.</u> • Changed the word "recognizing" to "ensuring" for what the housing element must do as noted in the act "…ensuring the vitality and character of established residential neighborhoods." Added "mandatory provisions" and "single-family residences" to the following: "…include a statement of goals, policies, objectives, and mandatory provisions for the preservation, improvement, and development of housing, including single-family residences.
RCW 36.70A.110 Comprehensive Plans – UGA	1995	Changed to allow counties to designate UGA (UGAs) outside of cities. A UGA determination may include a reasonable land market supply factor and shall permit a range of urban densities. The term "in general" was added to the GMA statement that indicates urban services are to be provided by cities.
RCW 36.70A.172 Critical areas – Designation and protection – Best available science to be used	1995	New section added to the GMA that clarified the state's goals and policies for protecting critical areas functions and values. Local governments are required to include the "best available science" in developing policies and development regulations to protect the functions and values of critical areas as defined in the GMA and must give special consideration to preserving or enhancing anadromous fisheries. (ESHB 1724 amendments.)
RCW 36.70A.175 Wetlands to be delineated in accordance with manual	1995	Washington Department of Ecology (Ecology) directed to adopt by a rule a manual for the delineation of wetlands regulated under the SMA and GMA. The manual is based on the 1987 U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency manual as amended through January 1, 1995.
RCW 36.70A.365 Major industrial developments	1995	Counties planning under the GMA allowed to establish, in consultation with cities, a process for authorizing the siting of major industrial developments outside UGAs. Such a development may be approved if certain criteria are met.
RCW 36.70A.470 Project review – Amendment suggestion procedure – Definitions	1995	Added a new section to the GMA that integrated project and environmental review to be conducted under the newly created provisions of Chapter 36.70B RCW.
RCW 36.70A.480 Shorelines of the state	1995	Added a new section to the GMA, which states that: (1) the goals and policies of the SMA become one of the goals of the GMA under 36.70A.020, and (2) the goals and policies of a Shoreline Master Program for a county/city are required to become an element of the jurisdiction's comprehensive plan. All other portions of the Shoreline Master Program including regulations are required to become part of the county's or city's development regulations. Additionally, Shoreline Master Programs are to continue to be amended/adopted under the procedures of the SMA (Chapter 90.58 RCW).

Title, Chapter, and Section	Year	Content
RCW 36.70A.481 Construction – Chapter 347, Laws of 1995	1995	Added the above new section to the GMA, which states that nothing in RCW 36.70A.480 (shorelines of the state) shall be construed to authorize a county or city to adopt regulations applicable to shorelands as defined in RCW 90.58.030 that are inconsistent with the provisions of Chapter 90.58 RCW. (ESHB 1724 amendments.)
RCW 36.70A.070 Comprehensive plans – Mandatory elements	1996	Added "general aviation airports" to subsection (6)(i) relating to required sub-elements of a transportation element as defined by this section.
RCW 36.70A.510 General aviation airports.	1996	General aviation airports were added to the list of items that all local governments must include in the land use elements of their comprehensive plans. General aviation airports include all airports in the state (i.e., public use facilities). There are currently a total of 129 airports that are classified as "general aviation." Adoption and amendment of comprehensive plan provisions and development regulations under this chapter affecting general aviation airports are subject to RCW 36.70.547.
RCW 36.70A.030 Definitions	1997	• Definition of "urban growth" was amended to expand listed incompatible primary uses of land to include the following: rural uses, rural development, and natural resource lands designated pursuant to RCW 36.70A.170. Additionally, the following was added: A pattern of more intense rural development, as provided in RCW 36.70A.070(5)(d), is not urban growth. • The following terms "rural character," "rural development," and "rural governmental services" are defined.
RCW 36.70A.070 Comprehensive plans – Mandatory elements	1997	Provisions that shall apply to the rural element are specified. (ESB 6094 amendments.)
RCW 36.70A.110 Comprehensive plans – UGA	1997	Deleted the following text from subsection (2): "UGA" and added "and each city within the county" to the following: based on OFM projections, "…the county and each city within the county shall include areas and densities sufficient to permit the urban growth that is projected…" (ESB 6094 amendments.)
RCW 36.70A.165 Property designated as greenbelt or open space – Not subject to "adverse possession"	1997	Added a new section to the GMA. "Adverse possession" is prohibited on property designated as open space to a public agency or homeowner's association. (ESB 6094 amendments.)
RCW 36.70A.177 Agricultural lands – Innovative zoning techniques	1997	Added a new section to the GMA. It allows a variety of innovative zoning techniques in designated agriculture lands of long-term commercial significance. (ESB 6094 amendments.)
RCW 36.70A.215 Review and evaluation program	1997	Created the Buildable Lands Program. Six Western Washington counties and the cities located within their boundaries are to establish a monitoring and evaluation program to determine if the actual growth and development is consistent with what was planned for in the countywide planning policies and comprehensive plans. Measures, other than expanding UGAs, must be taken to correct any inconsistencies. (ESB 6094 amendments.)
RCW 36.70A.362 Master planned resorts – Existing resort may be included	1997	Added a new section to the GMA. Counties planning under the GMA may include some existing resorts as master planned resorts under a GMA provision that allows counties to permit master planned resorts as urban growth outside of UGAs. An "existing resort" is defined as a resort that was in existence on July 1, 1990, and developed as a significantly self-contained and integrated development that includes various types of accommodations and facilities.

Title, Chapter, and Section	Year	Content
RCW 36.70A.040 Who must plan – Summary of requirements – Development regulations must implement comprehensive plans	1998	Added the requirement for cities or counties to amend the transportation element to be in compliance with Chapter 47.80 RCW no later than December 31, 2000.
RCW 36.70A.060 Natural resource lands and critical areas – Development regulations	1998	The requirement for notice on plats and permits issued for development activities near designated resource lands expanded to activities within 500 feet, instead of 300 feet, of the resource lands. The notice for mineral lands is required to include information that an application might be made for mining-relating activities. (From the Land Use Study Commission recommendations bill.)
RCW 36.70A.070 Comprehensive plans – Mandatory elements	1998	Required cities or counties to include level of service standards for state highways in local comprehensive plans, in order to monitor the performance of the system, to evaluate improvement strategies, and to facilitate coordination between the county's or city's six-year street, road, or transit program and the Washington State Department of Transportation's (WSDOT) six-year investment program. Inventories of transportation are required to include state-owned transportation facilities.
RCW 36.70A.131 Mineral resource lands – Review of related designations and development regulations	1998	Added a new section to the GMA. A county or city is required to take into consideration new information available since the adoption of its designations/development regulations, including new or modified model development regulations for mineral resource lands prepared by the Washington Department of Natural Resources (DNR), CTED, or the Washington Association of Counties.
RCW 36.70A.200 Siting of essential public facilities	1998	Added state or regional facilities and services of state-wide significance as defined in subsection (7) of HB 1487 (definition located in Chapter 47.06 RCW per this amendment). Includes among others, are high speed rail, inter-city high speed ground transportation, the Columbia/Snake navigable river system, etc.
RCW 36.70A.210 Countywide planning policies	1998	Added "transportation facilities of state-wide significance" to the minimums that countywide planning policies shall address.
RCW 36.70A.360 Master planned resorts	1998	Master planned resorts expressly authorized to use capital facilities, utilities, and services (including sewer, water, stormwater, security, fire suppression, and emergency medical) from outside service providers. Any capital facilities, utilities, and services provided on-site are limited to those meeting the needs of master planned resorts. Master planned resorts are required to bear the full costs related to service extensions and capacity increases directly attributable to the resorts.
	1999	No substantive, non-procedural amendments were made during 1999.
RCW 36.70A.520	2000	Allows counties planning under RCW 36.70A.040 to authorize and designate national historic towns that may constitute urban growth outside UGAs, if specified conditions are satisfied. A GMA county may allocate a portion of its 20-year population projection to the national historic town to correspond to the projected number of permanent town residents.
RCW 36.70A.040 Who must plan – Summary of requirements – Development regulations must implement comprehensive plans	2000	Added language stating that for the purposes of being required to conform to the requirements of the GMA, no county is required to include in its population count those persons confined in a correctional facility under the jurisdiction of the state Department of Corrections that is located in the county.

Title, Chapter, and Section	Year	Content
RCW 36.70A.200 Siting of essential public facilities	2001	Added "secure community transition facilities" (as defined in RCW 71.09.020) to the list of essential public facilities typically difficult to site. Each city and county planning under RCW 36.70A.040 is required to establish a process, or amend its existing process, for identifying and siting essential public facilities, and to adopt and amend its development regulations as necessary to provide for the siting of secure community transition facilities. Local governments are required to complete this no later than the deadline set in RCW 36.70A.130.

2. Recent Decisions and Changes to the Community Framework Plan

Prior to development of the *20-year Comprehensive Growth Management Plan* in 1994, the County conducted a visioning process beginning in 1991. The result was the *Community Framework Plan (CFP),* which was subsequently included as the first chapter of the *20-year Comprehensive Growth Management Plan.* The intent was to lay policy groundwork by soliciting public input on the overall vision for the county beyond the 20 years planned for in the comprehensive plan. Some of those Framework Plan Policies were amended by decisions made by the BOCC in 2001.

The BOCC issued its first major decisions related to the review of the County's growth management plan in late April and early May 2001. GMA requires that planning be based on preliminary population forecasts from the OFM. After hearing extensive public testimony, the BOCC directed staff to update the *20-year Comprehensive Growth Management Plan* based on a medium-low annual population growth rate of 1.5 percent, which is between the medium (1.83 percent) and low (1.06 percent) projections from the state's OFM. At this rate, the county will have an estimated population of 486,225 people by the year 2023, the planning horizon of the comprehensive plan.

Another policy decision relevant to the comprehensive planning process was adoption of new average density targets. Vancouver's UGA target is eight dwelling units an acre, La Center's is four units an acre, and all other cities have six units/acre targets. Yacolt was excluded from this tiered standard due to its lack of wastewater treatment.

The BOCC also directed staff to retain the use of market factors to determine the size of urban growth areas. Market factors when incorporated on the demand side help to balance the uncertainty of growth rates and patterns by providing a buffer of additional land so the urban growth boundaries do not turn out to be too tight. An insufficient land supply that cannot meet demand can put upward pressure on the price of land. Clark County's 1994 plan used a market factor of 25 percent for residential and commercial lands and 50 percent for industrial land.

The BOCC also adopted the approach that no more than 75 percent of new development within a city can be of any one type, such as detached single-family housing. This decision is reflected in the narrative of the *Community Framework Plan.*

The BOCC directed that several current planning guidelines be retained:

- 81 percent of growth should occur in urban areas, as a measurement tool rather than as a mandate.
- The current thresholds for expanding UGAs were reaffirmed. That is, UGAs must be reviewed if development has occurred on 75 percent of buildable residential or commercial land or 50 percent of industrial land.

These decisions by the BOCC affect the comprehensive planning process. The growth rate and rural/urban split determines the number of people that the cities and rural areas are expected to accommodate within the next 20 years. Average density targets create a picture of how many people each acre of residential land is expected to accommodate, which then affects how much land in total is needed and also where and how services can be provided to that residential land.

V. ALTERNATIVES

Working with the public in two series of public meetings and the Growth Management Steering Committee, which represents the incorporated cities, Clark County has identified five alternative ways that growth could be accommodated over the next 20 years. Table 6 compares the alternatives and Figures 2 through 7 illustrate them. Table 6, following the description of the alternatives, shows the relative allocations to each city for different land uses under each of the alternatives.

A. Alternatives Development: Population and Employment Forecasts

To comply with the GMA, Clark County and the cities of Battle Ground, Camas, La Center, Ridgefield, Vancouver, Washougal and Yacolt must update their comprehensive plans to accommodate 20 years of growth in population, households, and employment, as well as the infrastructure—roads, schools, and parks—to support this growth. The County works with the statewide population projections provided by the OFM (RCW 36.70A.070). OFM only prepares forecasts of population growth, and each county planning under the GMA must decide what the average household size will be and how much employment will grow over the 20-year period.

In 2000, OFM indicated that Clark County could expect to grow at an annual rate between 1 percent and 2.5 percent, or 419,188 to 587,622 people over the next 20 years. The BOCC considered historic growth trends in the county and region, other locally approved growth assumptions, and the condition of the regional economy and decided to plan for an average annual population growth rate of 1.5 percent and an average household size of 2.66 persons per single-family household and 1.9 persons per multi-family household. Projecting from OFM's End of Year 2002 Population estimate for the county of 370,463, a 1.5 percent growth rate means a total of 115,762 new people (38,587 new urban households) over the next 20 years. (The Population, Housing and Land Use section discusses historic and projected growth trends in the county and cities.)

Employment growth forecasts were developed with the help of the Washington Employment Security Department (ESD) and the Columbia River Economic Development Council (CREDC). To reduce traffic congestion in the region and improve the county tax base, the BOCC decided that the County should plan to increase the ratio of jobs to population within the county and bring the population-to-jobs ratio more in line with what is found in the Portland metropolitan area. Currently, the jobs-to-population ratio in Clark County is 1 to 2.9 while that in the region is 1 to 2.0.

The amount of land needed to accommodate projected growth in housing and employment depends on the density at which development occurs (that is, the number of housing units or jobs per acre) and other factors. The alternatives under consideration reflect a range of assumptions about residential, commercial, and industrial development, as well as the locations where it is most likely to occur. The alternatives reflect the result of an extensive public process (described above in Section III), as well as input from the cities and other organizations and interest groups. Each alternative is described below.

The GMA plans adopted by the County and cities in 1994 provided land sufficient to accommodate 20 years of growth. Although seven years have passed since the adoption of the plans, a substantial amount of vacant and underutilized land remains within UGAs. Regardless of the alternative selected, the majority of growth over the next 20 years is expected to occur within currently designated UGA boundaries.

B. Description of Alternatives

1. Alternative 1 – The 1994 Plan

Alternative 1 is one of the No-Action alternatives under consideration. (SEPA requires that the County consider the implications of not changing the comprehensive plan.) If the County were to choose this alternative, the policies and growth assumptions contained in the *20-Year Clark County Comprehensive Growth Management Plan* (1994) would remain in effect and, as a result, UGAs would be expanded. This alternative represents the continuation of current trends in the ratio of population growth to employment growth, and the higher density development assumptions of the 1994 plan.

Alternative 1 uses an average annual population growth rate of 1.83 percent, instead of 1.5 percent growth rate adopted by the BOCC. With this growth rate, the county's population would increase by 160,499

residents (30,495 rural residents and 130,004 urban residents) by 2023, bringing the county's total population to 530,962.

Alternative 1 would also result in the largest expansion of UGAs, adding 28,845 acres, or about two and a half times the amount added by the second largest expansion under Alternative 4. While all the cities' UGAs would expand under this alternative, most of the new growth would occur in an area between Vancouver and Battle Ground. Around 80 percent of the land that would be added to UGAs would be for residential development, more than any of the other alternatives.

Under Alternative 1, employment density patterns would be similar to those of the 1980s, with an average of nine jobs per acre in industrial areas and 12 jobs per acre in commercial areas. Employment density of new development has been higher over the past five years (*Clark County Buildable Lands Report*). Under Alternative 1, an additional 54,882 jobs have been projected by 2023.

Alternative 1 reflects a continuation of the policy contained in Clark County's *20-year Comprehensive Growth Management Plan* that new housing should consist of 60 percent single-family and 40 percent multi-family residential units. Other alternatives under consideration, with the exception of Alternative 3, reflect a 75/25 percent target. Average single-family residential density under Alternative 1 would be 6 six units per acre, the same residential density as proposed under Alternative 3.

Alternative 1 includes a market factor to assure an adequate supply of land to accommodate new growth. The market factor adds additional land to the amount needed to accommodate growth in order to provide a buffer or cushion should some of the vacant land not be available for development. Alternative 1 sets a market factor of 25 percent for commercial and residential land and 50 percent for industrial land; that is, 25 percent more land than is estimated as needed for commercial and residential growth, and 50 percent more land than is estimated to be needed for industrial growth, is included within the proposed UGA expansions.

Additional land is also added in order to ensure that land is available for infrastructure (roads, utilities, schools, parks, fire stations, etc.) to support that development. In Alternative 1, a factor of 38 percent is added for these uses, the factor included in the 1994 plan. However, in recent years less than 28 percent has been used for infrastructure. The *Plan Monitoring Report* (2002) indicates that only 27.5 percent has been needed for infrastructure since 1995. Alternative 3 uses the lower factor.

2. Alternative 2 - The Commissioners' 2001 Approach

Alternative 2 reflects the GMA planning decisions made by the BOCC in April 2001. This alternative assumes an annual average growth rate of 1.5 percent for the county over the next 20 years, resulting in 115,762 additional residents (21,995 rural residents and 93,767 urban residents). The total population would be 486,225 in 2023. At 2.43 persons per household, 38,587 new urban households would be created over the next 20 years.

The total UGA expansion under Alternative 2 would add 9,749 acres, which, with the exception of Alternative 3, adds the least amount of land to UGAs. Approximately 73 percent of urban growth would be located in existing UGAs, while 27 percent would occur in new UGAs, primarily around Vancouver and Battle Ground.

Alternative 2 plans for at least 44,615 new jobs at densities similar to those achieved in the 1980s. This represents an employment growth rate that is close to what has historically occurred within Clark County. Under this alternative, business park employment would increase by 40 percent, retail employment by 22 percent, industrial employment by 29 percent, and government employment by 9 percent. Employment

density under this alternative would be 9 employees per acre for industrial development, 20 employees per acre for business park development, and 12 employees per acre for commercial development.

Alternative 2 also assumes that new residential development within the county should be a mix of 75 percent single-family and 25 percent multi-family residences, in keeping with the Commissioners' direction to plan for no more than 75 percent of new housing units of any one product type. Further, this alternative establishes varying density targets for residential development among the various cities, with Camas, Ridgefield, Washougal, and Battle Ground targeted for 6 residential dwelling units per acre, La Center for 4 units per acre, and Vancouver for 8 units per acre. These density figures represent an average of single-family and multi-family residences across the cities. No density target was set for Yacolt, due to its lack of a public sanitary sewer system.

Alternative 2 uses a market factor of 25 percent for residential and commercial land and 50 percent for industrial land. It also assumes that the average amount of land required for infrastructure by new development is 38 percent.

3. Alternative 3 – No Expansion to Existing Urban Areas

Alternative 3 is the second No-Action alternative. In this alternative, there would be no UGA boundary expansion. To accommodate expected growth, some of the policies and growth assumptions adopted in the 1994 plan would have to be changed.

Under Alternative 3, Clark County would grow at an average rate of 1.5 percent per year for the next 20 years. This would mean that the county would add 115,762 residents (21,995 rural residents and 96,767 urban residents) during this period, bringing the total population to 486,225 in 2023. That translates into 39,070 urban households at an average household size of 2.4 persons.

The distinctive feature of Alternative 3 is that it would accommodate all new growth within existing UGAs; no additional land outside of existing UGAs would be required. Land already identified for residential development would develop at densities that have been achieved over the past 5 years. No additional urban land would need to be designated and higher density zoning would not need to occur. Urban services are already planned for or are in place for these areas.

Industrial and business park development would occur on existing lands zoned for industrial uses within urban areas. The only rezoning that is proposed under this alternative is the conversion of about 900 acres of industrial land to a business park district. Business parks typically have higher employment densities than industrial areas, and there has been a greater demand for business park development over the past five years. No change to zoning to permit a higher intensity of development (high rises or greater lot coverage) would be needed.

At least an additional 44,615 jobs could be added under Alternative 3 at employment densities achieved since 1995. This means that commercial employment density would be 29 employees per gross acre and industrial employment density would be 13 employees per gross acre. These employment density figures are closer to the observations in the *Clark County Buildable Lands Report*—22 employees per gross acre for commercial development and 10 employees per gross acre for industrial uses—than the assumptions of the other alternatives.

The residential density target of six single-family dwelling units per acre for all cities would apply under Alternative 3. An average density of 16 dwelling units per acre is set for multi-family development. Under Alternative 3, new housing is expected to consist of 71 percent single-family development and 29 percent multi-family development. This housing type split differs from those set by the other four alternatives, but reflects development patterns within the Vancouver UGA since 1995.

Under Alternative 3, no land would be available above that estimated as needed for 20 years of growth to provide a cushion in case some vacant land is not developed. In other words, this alternative does not include a market factor. However, County policy requires reconsideration of the UGA when 75 percent of residential and commercial land or 50 percent of industrial land has been developed within an existing UGA. The GMA also requires that the County provide sufficient land within UGAs to accommodate growth that is projected to occur over the next 20 years and that the adequacy of the UGAs be evaluated every 10 years.

Alternative 3 also differs from the other alternatives under consideration in assuming an infrastructure factor of 27.5 percent. The 1994 *20-Year Comprehensive Growth Management Plan* uses the assumption that the average percentage of land dedicated to infrastructure for new development is 38 percent. However, data from the *Clark County Buildable Lands Report* show that the average percentage is 27.5 percent, the percentage assumed under this alternative.

4. Alternative 4 – The Cities' Perspective

Alternative 4 represents a composite of the proposals from the cities of Battle Ground, Camas, La Center, Ridgefield, Vancouver, Washougal, and Yacolt for how they want to manage their growth. Some jurisdictions have not asked to expand their UGAs (Washougal, Ridgefield, Yacolt) while others have asked for large expansions (Battle Ground and Vancouver). This alternative also assumes that the county's annual average population growth rate over the next 20 years would be 1.5 percent, adding 115,762 new residents by 2023.

Under Alternative 4, most new growth would occur around the city of Battle Ground. Vancouver would also see its UGA expand, almost exclusively for jobs, and there would be a minor expansion of La Center's and Camas' UGA. Total urban area expansion under this alternative would be 12,554 acres.

Alternative 4, like Alternative 5, takes a more aggressive approach to job creation. It would accommodate at least 70,000 new jobs and, of the different alternatives, adds the most land for these new jobs (10,167 acres). Most of the newly designated urban commercial and industrial land would be between Vancouver and Battle Ground in the SR 500 corridor, or in the Fisher Swale area between Camas and Vancouver. Land has been included to accommodate development at an employment density of 12 employees per acre for commercial land and 9 employees per acre for industrial land, lower densities than observed in the *Clark County Buildable Lands Report.*

Other features of this alternative include setting the housing-type mix at a maximum of 75 percent single-family and a minimum of 25 percent multi-family. Residential densities under this alternative would vary among the cities, with a target of six residential units per acre for Camas, Battle Ground, Ridgefield, and Washougal, four units per acre for La Center, and eight units per acre for Vancouver.

Alternative 4 includes a market factor of 25 percent for residential and commercial land and 50 percent for industrial land. As with Alternatives 1, 2, and 5, an infrastructure factor of 38 percent is added to the land supply.

5. Alternative 5 – The "Discovery Corridor" Strategy

Alternative 5 assumes that Clark County's average annual population growth rate over the next 20 years will be 1.5 percent, which would add 115,762 new residents (21,995 rural residents and 93,767 urban residents) and bring the county's population to 486,225 by 2023. However, the job growth rate would be much higher. A distinctive feature of this alternative is that it seeks to create a new center of economic activity by increasing the number of businesses and family-wage jobs near the Interstate 5 corridor, from Salmon Creek to La Center.

Total UGA expansion under Alternative 5 would be 12,303 acres, with 6,970 acres being added for residential development and 5,333 acres being added for new jobs. Most of the expansion of UGAs for residential development would occur north of Vancouver and southwest of Battle Ground.

By providing more land and adopting other incentives, the County intends to encourage the creation of at least 70,000 new jobs under this alternative. Employment density would be 12 employees per acre for commercial development and nine employees per acre for industrial development, which is less density than was observed in the *Clark County Buildable Lands Report.* As with Alternatives 2, 3, and 4, retail job growth would total 22 percent of total job growth within the county; industrial job growth would total 29 percent.

As with Alternatives 2 and 4, this alternative assumes a housing type mix of a maximum of 75 percent single-family and a minimum of 25 percent multi-family units. Residential densities under this alternative vary among the different jurisdictions, with an average of four dwelling units per acre for La Center, six units for Camas, Battle Ground, and Ridgefield, and Washougal, and eight units per acre for Vancouver. These densities represent an average of both single-family and multi-family residences. Single-family and multi-family residential densities under this alternative are the same as in Alternatives 2, 3, and 4.

Alternative 5 reflects strategies by the CREDC because of the large tracts of land that would be made available for employment development and the availability of I-5 to provide access to and from those areas. However, much of this land is outside the area identified for long term growth in the Community Framework Plan adopted in 1992. As a result, many of these areas currently lack the infrastructure and facilities (roads, transit, sewer, water, and electricity) that are necessary to support industrial and business park development, and service providers have not planned for this growth.

Alternative 5 uses a market factor of 25 percent for residential and commercial land and 50 percent for industrial land. It also assumes an infrastructure factor of 38 percent.

6. Land Area Calculations

Calculations of existing and projected land use acreages, including the analysis of vacant and buildable lands, came from the *Plan Monitoring Report* (July 2000) and the County Assessor's GIS system data. Table 6 shows the percentage of rural land added to each city UGA and the percentage of land added to each city UGA by the proposed land use designation.

Table 6. Summary of Alternatives

Rural Land → **Urban Land**

Existing County Comprehensive Plan Designations

	County					Battle Ground					Camas				
	Alt 1	**Alt 2**	**Alt 3**	**Alt 4**	**Alt 5**	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**	**Alt 5**	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**	**Alt 5**
Existing Land Use Designation	Acres of existing Comprehensive Plan designations added to UGAs					Percent of rural acreage designated to City UGA					Percent of county acreage designated to City				
Rural Residential	11,931	2,094	-	4,762	4,007	34%	95%		81%	64%	4%			6%	7%
Urban Reserve	6,281	4,561	-	3,560	3,997	7%	1%		12%	10%	6%	4%		10%	5%
Commercial	159	15	-	15	45	80%	100%		100%	33%					
Office Park/Business Park	3	1	-	1	1	4%			14%	11%					
Industrial	44	23	-	24	13	59%	35%		35%	62%	34%	10%		57%	12%
Industrial Urban Reserve	357	62	-	238	294						67%			100%	60%
Mining Lands	195	195	-	195	193						99%	1%		100%	99%
Agriculture	8,648	2,207	-	3,179	3,589	10%	26%		32%	24%	8%	7%		10%	
Forest land	146	-	-	69	-									100%	
Other	185	70	-	70	77						38%			100%	1%
Parks/Open Space	361	76	-	52	37						14%	1%		100%	
Public Facility	97	50	-	1	50									4%	
Water	439	393	-	388	-						86%			98%	
Total acres	**28,845**	**9,749**	**-**	**12,554**	**12,303**	**19%**	**27%**	**0%**	**43%**	**31%**	**9%**	**4%**	**0%**	**16%**	**7%**

	La Center					Ridgefield					Vancouver					Washougal				
	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Existing Land Use Designation	Percent of county acreage designated to City					Percent of rural acreage designated to City UGA					Percent of county acreage designated to City					Percent of county acreage designated to City				
Rural Residential	2%			1%							59%	5%		12%	29%	1%				
Urban Reserve						4%	5%				81%	86%		78%	84%	3%	5%			
Commercial	6%				21%						14%				45%					
Office Park/Business Park											96%	100%		86%	89%					
Industrial											7%	55%		9%	26%					
Industrial Urban Reserve	33%				40%							100%								
Mining Lands											1%	99%			1%					
Agriculture	5%			1%	8%	3%				11%	72%	49%		57%	54%	1%	18%			4%
Forest land	100%																			
Other	54%				74%					26%	8%	100%								
Parks/Open Space											86%	99%			100%					
Public Facility				32%							100%	100%		64%	100%					
Water											13%	100%		2%						
Total acres	**4%**	**0%**	**0%**	**1%**	**4%**	**2%**	**2%**	**0%**	**0%**	**3%**	**65%**	**61%**	**0%**	**41%**	**53%**	**1%**	**6%**	**0%**	**0%**	**1%**

2023 Projected Population	**530,962**	**486,225**	**486,225**	**486,225**	**486,225**
Planned New Jobs	**54,882**	**44,615**	**44,615**	**70,000**	**70,000**

Table 6. Summary of Alternatives (continued)

New Land Use Designations Rural Land → Urban Land

	County					Battle Ground					Camas				
	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
New Land Use Designation	Proposed Urban Land Use Designations added to UGAs					Percent of rural acreage designated to City UGA					Percent of county acreage designated to City				
Urban Low Density Residential	**18,945**	**5,325**		**1,682**	**5,360**	15%	12%		75%	43%	6%			17%	5%
Urban Medium Density Residential	**3,819**	**1,822**		**383**	**1,609**	45%	57%		100%	26%	14%	6%			8%
Urban High Density Residential	**507**	**129**		**321**		80%			100%		20%	100%			
Total new residential acres	**23,271**	**7,276**	**0**	**2,387**	**6,970**	21%	23%	0%	83%	39%	7%	3%	0%	12%	6%
Mixed Use	**492**			**1,971**	**481**				85%	84%				15%	
Commercial	**2,403**	**88**		**2,816**	**897**	20%	86%				20%			33%	14%
Office/Business Park	**2,458**	**3,581**	**901**	**197**	**3,353**	5%	28%	15%		22%		3%		100%	11%
Industrial	**1,550**			**4,773**	**603**	6%			32%		18%				
Public Facilities				**204**					67%					26%	
Parks/Open Space				**206**										100%	
Total employment acres	**6,903**	**3,670**	**901**	**10,167**	**5,333**	10%	29%	15%	33%	21%	11%	3%	0%	17%	9%
Total acres	**30,173**	**10,945**	**901**	**12,554**	**12,303**	19%	25%	15%	43%	31%	8%	3%	0%	16%	7%
Minus rezoned land already within UGA	**1,328**	**1,196**	**901**			10%	11%	15%				0%			
Total acres	**28,845**	**9,749**	**0**	**12,554**	**12,303**	19%	27%	61%	43%	31%	9%	4%	0%	16%	7%

	La Center					Ridgefield					Vancouver					Washougal				
	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
New Land Use Designation	Percent of county acreage designated to City					Percent of county acreage designated to City					Percent of county acreage designated to City					Percent of county acreage designated to City				
Urban Low Density Residential	3%			4%			4%				75%	72%		4%	52%	2%	12%			
Urban Medium Density Residential						4%					36%	36%			66%					
Urban High Density Residential																				
Total new residential acres	2%	0%	0%	3%	0%	1%	3%	0%	0%	0%	67%	62%	0%	3%	56%	2%	8%	0%	0%	0%
Mixed Use											100%				16%					
Commercial	9%					3%					49%	14%		67%	86%					
Office/Business Park	13%				14%	11%				13%	71%	70%	85%		37%					4%
Industrial						1%					75%			67%	100%					
Public Facilities																			7%	
Parks/Open Space																				
Total employment acres	8%	0%	0%	0%	9%	5%	0%	0%	0%	8%	66%	68%	85%	50%	50%	0%	0%	0%	0%	3%
Total acres	4%	0%	0%	1%	4%	2%	2%	0%	0%	3%	67%	64%	85%	41%	53%	1%	6%	0%	0%	1%
Minus rezoned land already within UGA											90%	89%	85%							
Total acres	4%	0%	0%	1%	4%	2%	2%	0%	0%	3%	66%	61%	39%	41%	53%	1%	6%	0%	0%	1%

EXISTING CONDITIONS, SIGNIFICANT IMPACTS, AND MITIGATION MEASURES

This DEIS evaluates the potential environmental impacts of proposed changes to the comprehensive plans and UGAs of Clark County and the cities of Battle Ground, Camas, La Center, Ridgefield, Vancouver, Washougal, and the Town of Yacolt. As noted in previous sections, the County and its cities must demonstrate compliance with the provisions of the GMA and provide sufficient land in designated UGAs to accommodate growth over the next 20 years.

The key decision to be made by county and city officials as a result of this analysis is the best means of accommodating growth and providing services, while protecting the natural environment and the lifestyle valued by residents. The plans must also be consistent with the Countywide Planning Policies (adopted in July 1992) and the Community Framework Plan (adopted in May 1993). In 2000, the Countywide Planning Policies were amended to implement buildable lands legislation and to require annual monitoring of development and a buildable lands report every five years that details growth, development, capacity, needs, and consistency between comprehensive plan goals and actual densities for Clark County and the municipalities within it.

I. METHODOLOGY OF DETERMINING IMPACTS

Since the county cannot stop growing, it is impossible to entirely avoid the adverse impacts associated with growth. These impacts will occur across many aspects of the environment. Each of the major elements of the environment listed in SEPA has been analyzed in this DEIS. The difference in impacts between the alternatives is based primarily on the location and size of UGAs proposed to accommodate the residential, commercial, and industrial growth.

In the case of the natural environment, determining the relative impacts depended on knowing where the natural resources are and how much of them would be impacted by each proposed expansion area. Analysis therefore relied on GIS mapping to establish the location and size of the natural resources, such as streams, wetlands, shorelines, or mineral and agricultural resource land. Each alternative UGA was overlaid on those resources, and the GIS system was able to calculate how much of the resource would be converted to urban use. For example, the number of miles of streams and the number of acres of wetlands that currently are in rural areas and would be added to expanded UGAs under each alternative was calculated.

With respect to the built environment, acreages of land converted from one type of rural or resource designation to an urban designation was calculated for each UGA under each alternative. The same type of analysis was used to determine the expanded urban areas that would need to be served by each type of urban facility and service. Whether each service provider would be able to accommodate the additional UGA was also determined from the capital facilities plans or conversations with the providers.

It is important to note that the impacts analysis looks at the overall capacity of the proposed UGA expansions rather than just the housing and jobs targets. The focus of each alternative is on providing sufficient land to accommodate growth, in accordance with decisions made by the BOCC. By establishing a specific growth rate, population and jobs can be accommodated in various locations and to different densities and types of uses by each alternative. The population and jobs are essentially targets established by policy. However, by adding more land for the market “cushion” and infrastructure needs and by changing the assumptions about housing and job density, the overall capacity of the UGAs is expanded.

Here is an example. If a city decides it will accommodate 500 more households and decides it wants those households to live at a density of five units per acre, it would need 100 more acres of land for that growth. However, if it also decides that infrastructure takes 25 percent of developed land and that a 50 percent market factor makes the real estate market more fluid, then it would need to add 75 more acres to a proposed

UGA expansion. Now the expansion is 175 acres and the city has to plan to provide services to the entire 175 acres. If full build-out were to occur, even with 25 percent in infrastructure, the impact is that 131 acres (1.75 x 0.75) have houses, and at five per acre, that is 655 households, not 500 and the impacts from that development are 175 acres of build-out, not 100. Therefore, assessing impacts must be on the total capacity of the land, not just the planned-for growth target.

In this DEIS, assessment of impacts is based on the total geographical expansion of UGAs and the total capacity, since that will determine both the impacts and the cost of mitigation. Since Yacolt is not proposing any expansion of its UGA, no impacts or mitigation measures are discussed. The Town is proposing new policies addressing historic preservation and capital facilities to update its 1994 comprehensive plan. The recommended policy update to capital facilities would require level of service standards to look at water distribution, and in particular, fire flow. Policy 8-14 would seek funding assistance to establish and advance a wastewater management program for the town, including the design and construction of a public sanitary sewer system.

II. EARTH

A. Soils

1. Setting

Soil characteristics are important in the management of urban development for two reasons: (1) soil characteristics may constrain development, and (2) soil characteristics determine whether an area is particularly suited to agriculture or timber production. The GMA requires local jurisdictions to identify and protect agricultural and timber lands of long-term commercial significance. The Washington State Department of Community Development (DCD) recommends using the soil classification system developed by the Natural Resource Conservation Service (NRCS) and establishing larger minimum lot sizes to ensure the commercial viability of resource industries. The most recent comprehensive soil survey of Clark County was completed by the Soil Conservation Service (now NRCS) in 1972. Since soil does not change rapidly, information from the 1972 survey can still be considered reliable.

The NRCS has classified the soils of Clark County into eight major soil associations:

- Sauvie-Puyallup, found in the bottomlands and flood plains;
- Hillsboro-Gee-Odne, Hillsboro-Dollar-Cove, and Lauren-Sifton-Wind River, found in terraces;
- Hesson-Olequa and Hesson-Olympic, found in uplands; and
- Cinebar-Yacolt and Olympic-Kinney, found in the foothills.

These soil associations have been further classified according to their ability to support different types of land uses, including agriculture, silviculture, and urban development. Figure 8 shows soils with characteristics that restrict the placement of foundations for structures. As indicated, the majority of the county has moderate to severe soil limitations to foundations. The major restriction is related to slope. Figure 9 shows areas with soils that limit the use of septic systems. Again, it is apparent that most of the county has some type of soil limitation to septic systems. This map is based largely on soil drainage characteristics, including the risk of groundwater contamination in areas that readily percolate septic system effluent and stormwater runoff. All septic systems within the county are reviewed prior to permitting by Clark County to ensure that they will function appropriately an that no contamination of surface or ground water is likely to occur.

Figure 10 shows agricultural soil capability in the county and Figure 11 shows forest soil capability. The best soils for a wide range of agricultural uses are located in the lowlands along rivers, areas that have already received substantial urban development. Special crops, such as vineyards, may be grown on land with other than prime agricultural soils.

2. Impacts

As with geologic features, the evaluation of soil-related impacts primarily involves assessing the suitability of soils to support a proposed activity or project, or the suitability of the proposed project or action given the soil characteristics of the location. As mentioned above, soils can pose limitations to the construction of building foundations and septic systems. Soils without the strength to support foundations can require special engineering to remedy problems. Consequently, construction costs tend to be higher, which can affect the affordability of those structures, particularly homes. With respect to soils unsuitable for septic systems, typically the regulations require alternative engineering or connection to a public sewer if soil on an individual lot does not allow percolation to occur at an acceptable rate. Consequently, the issue of soils not supporting septic systems is less of an issue than conversion of resource lands and weak support for foundations.

This impact analysis looks at what soils underlie proposed expansion areas and to what extent soils that can support agriculture or timber production are found within new UGAs. An assessment of impacts to agriculture and forest lands is found in the Resource Lands section of this document. Under the GMA, resource lands (lands designated for agricultural, forest, or mineral resource uses) are not to be included within UGAs. They are, by definition, inconsistent with urban development. The size of the UGA will therefore affect the amount of prime agricultural and forest soils that are preserved.

a. Alternative 1

Under Alternative 1, Battle Ground's UGA would expand primarily south of the city and would include mostly land that places moderate limitations on the construction of building foundations. The new UGA also includes some areas in which there are severe soil limitations. Camas' new UGA would include predominately soils with severe limitations to foundations. These areas occur near the Columbia River and Lacamas Lake. La Center's UGA would expand in an area that presents moderate soil limitations. Ridgefield's urban growth boundary expansion includes lands with both moderate and severe soil limitations. Under Alternative 1, Vancouver's expanded UGA would include a range of soil limitations, from slight, located mostly east of the city, to severe, in areas located near waterways such as Salmon Creek and Whipple Creek. The expanded UGA of Washougal would include land with predominately severe soil limitations.

Each new UGA under Alternative 1 contains land on which soils place limitations to septic systems. These limitations can result from soil porosity, slope, or structure. Most of the expanded UGAs under this alternative are designated for residential development, and these residential areas would be connected to public sewer systems.

Around 8,648 acres of agricultural land and 145 acres of forest land would be added to UGAs under Alternative 1, leaving approximately 33,660 acres of farmland and 157,947 acres of forest land. This alternative preserves the least amount of agricultural and forest land of any of the alternatives.

b. Alternative 2

Under Alternative 2, Battle Ground's UGA would expand southwest of the city in an area with mostly severe soil limitations to foundations. Camas' expanded UGA would include land near the Columbia River, an area identified as having severe soil limitations to foundations. This area is currently used for rock quarries. For a discussion of impacts to mineral resource lands, refer to the Resource Lands discussion. Ridgefield would see a small expansion of its UGA onto land with moderate soil limitations to foundations. Vancouver's UGA would expand primarily into areas that are designated urban reserve. In comparison to Alternative 1, less of the Salmon Creek and Whipple Creek area would be brought into the city's UGA. These areas place severe limitations to foundations. Under this alternative, Washougal's expanded UGA shows primarily severe soil limitations to foundations.

Alternative 2 would preserve more resource land than Alternative 1, since 2,207 acres of agricultural land and agricultural soils would be converted to urban uses and no forest land would be added to UGAs.

c. Alternative 3

Alternative 3 would not expand UGAs. All new growth and development would occur within existing UGAs and would be served by existing municipal sewer systems. Most of the population growth in the county would occur within the existing UGAs of Battle Ground and Vancouver. Much of the existing Vancouver urban area, with the exception of land along the Columbia River, has soils that place slight limitations to the construction of foundations. Most of the area outside the municipal boundary but inside the UGA shows moderate limitations to foundations. Most of the land within Battle Ground's UGA shows moderate soil limitations to foundations.

Alternative 3, because it accommodates new growth within existing UGAs, would preserve the most resource land and resource land soils of any of the alternatives. Under this alternative, 42,308 acres are designated as agricultural land and 158,092 acres are designated as forest land.

d. Alternative 4

Alternative 4 is a composite of the UGA expansion requests from each city. It would see UGAs expand by about 12,554 acres. Most of this growth would occur around Battle Ground and Vancouver, with a smaller expansion of the UGAs of La Center and Camas. Battle Ground's UGA expansion would be similar to the expansion that occurs for the city under the other action alternatives—primarily south of the city in the Meadow Glade area. However, this alternative also includes the greatest northerly expansion of the Battle Ground's UGA, an expansion that would bring the new UGA to within 500 feet of the East Fork Lewis River. This area is defined largely by soils with moderate and severe soil limitations to foundations. Camas' UGA expansion includes an area north of Lacamas Lake defined by moderate and severe soil limitations to foundations. Vancouver's UGA expansion includes mostly land with moderate soil limitations to foundations, except that land near Salmon Creek is identified as having severe soil limitations to foundations.

Alternative 4 designates 39,130 acres as agricultural resource land and 158,024 acres as forest resource land. This alternative would not preserve as much resource land and resource land soils as Alternatives 2 and 3. Alternative 4 brings around 68 acres of forest land into the UGA of Camas. Around 3,178 acres of agricultural land are added to UGAs, primarily land between Vancouver and Battle Ground.

e. Alternative 5

This alternative includes the third largest expansion of UGAs—12,303 acres. Most of this growth would occur around Battle Ground and Vancouver. Battle Ground's new UGA would include predominately soils that have moderate limitations to foundations, except that the area around Salmon Creek shows severe soil limitations. Camas' UGA would not expand as much as under Alternative 4, and would not include the area north of Lacamas Lake. Most urban growth would occur in the western portion of the city, an area defined by both moderate and severe soil limitations to foundations. La Center would see its UGA expand onto lands with predominately moderate soil limitations. The UGA of Ridgefield would expand under Alternative 5 to include an area north of the existing UGA. This area is shown as having moderate soil limitations to foundations. Under Alternative 5, Vancouver's UGA expansion would include mostly land with moderate soil limitations to foundations. Areas along streams and tributaries show severe soil limitations.

Other than Alternative 1, this alternative would convert the most agricultural resource land to urban use (3,589 acres). As with Alternatives 2 and 3, it would not bring any forest resource land into new UGAs.

However, because it involves the conversion of agricultural land to urban uses there would be the loss of agricultural soils.

3. Mitigation

Mitigation for impacts of each alternative on soils would involve protecting soils that support agriculture and forest uses and preventing development on unsuitable soils. Protection of lands that have soils suitable for agriculture and forest uses is primarily the County's responsibility through protection of resource lands, which is discussed in the Resource Lands section of this report. Drawing UGAs to avoid lands with high quality soils for agriculture and forest uses is the primary method of protecting those areas. Soils that are unstable or hazardous for building on, such as landslide-prone areas, are classified as geologically hazardous critical areas by state law, and each jurisdiction is responsible for restricting development in those areas through its comprehensive plan and zoning districts, critical areas ordinances, and building codes.

a. Plans and ordinances

Countywide planning policies require urban-type growth to be directed to urban areas as designated by urban growth boundaries and provide for the protection of resource lands and critical areas.

Clark County: The County's existing comprehensive plan elements for land use, rural and natural resources, a proposed new environment element (proposed "Chapter Z"), and annexation contain policies that together reinforce protection of resource lands and critical areas. Policies 2.1.1 and 2.1.2 contain provisions for restricting urban growth to urbanizing areas, protecting environmentally sensitive areas, and excluding lands with the potential for long-term agriculture or forestry resource uses from UGAs. The plan also contains policies for areas of special environmental concern within specific UGAs, such as the Mt. Tukes area near Battle Ground and Salmon Creek.

New Goal Z.1 directs the County to protect and conserve environmentally critical areas, to map critical areas (Z.1.1), and to reduce risk to life and property (Z.1.9) from development in geologically hazardous areas by requiring geotechnical studies to determine construction methods and technologies appropriate to soil limitations on individual sites. Many proposed goals and policies in the environment element ("Chapter Z") of the comprehensive plan are carried over from the existing Land Use chapter.

As discussed in the Rural and Natural Resources element (Chapter 4 of the comprehensive plan), Clark County has mapped agricultural and forest lands using criteria established by the state. Although soils are a factor in designating both forest and farm lands, soils are more critical in establishing farm lands of long-term commercial significance, as viable forest lands depend more on other factors. The maps were used to identify the most productive farm land. Goal 4.4 and its policies call for protecting productive agricultural lands and discouraging incompatible uses. These policies are implemented by CCC Chapter 18.302. For further discussion of the policies proposed for designating Resource Lands, see Resource Lands section.

Clark County maps geologically hazardous areas on its GIS system. A geohazard ordinance (CCC Chapter 13.60) was enacted in 1997. Geologic hazard area protective measures required by Chapter 13.60 are considered adequate mitigation of potential impacts related to geologic hazards.

Cities: City plans and ordinances do not generally deal with soils in terms of resource lands, since by definition these lands are outside city limits. Construction on soils with structural limitations are typically dealt with by the requirements of building codes. Other than geotechnical studies and implementation of appropriate construction practices, prohibition of development on unsuitable soils is the typical mitigation measure.

Battle Ground: The City of Battle Ground is located in a flat area with a high water table. As a result, soils drain poorly and wetlands are common. Soils issues identified in Battle Ground's 1995 comprehensive plan consist primarily of infiltration problems associated with wetland soils. Goal 2 and Policy 2-C provide for directing development to areas where hazards from development on unsuitable soils will not occur. Draft adopted interim goals and objectives under Goal 5 (Environment) adopted in December 2001 include protection of critical areas (EG4) and the creation of a critical areas ordinance that will protect geologic hazard areas.

Camas: Camas has mapped soils in the area and identified those that are unsuitable for development or require geotechnical engineering. The Camas zoning code (Chapter 18.31) identifies unstable soils as environmentally sensitive areas and requires special studies for development in these areas. Goal EN7 and related policies in the new, proposed Environmental Element deal specifically with protecting soil stability and topographic features. Policy EN19 would prohibit development on unstable land.

La Center: Soil limitations for construction are not referenced in the comprehensive plan or municipal code. The comprehensive plan does have a policy to confine urban growth to UGAs and incorporated areas. The plan defines urban growth as intensive land uses incompatible with the primary use of land for agricultural products or the extraction of mineral resources.

Ridgefield: Policy 11.4 under Goal 11 (Rural to Urban Land Conversion) establishes criteria for amendments to the UGA, one of which is avoidance of agricultural and forest resource land.

Vancouver: Vancouver's Sensitive Lands element of the existing comprehensive plan contains policy P19 that calls for the protection of public health and safety with respect to development proposed in areas of unconsolidated sediments and fill deposits. Implementation measure IM31 provides for adoption of ordinances to regulate development in those areas as well. The zoning ordinance protects agricultural lands with the Agricultural/Open Space (AO) and Agricultural/Open Space/Wildlife districts. Minimum lot sizes and restricted uses implement the comprehensive plan provisions.

Vancouver has adopted a Geological Hazards ordinance to manage development in areas of landslide hazard, steep slopes, earthquake hazard and fill areas. The City also has adopted a Greenway District to protect open space in the Lettuce Fields subarea.

Washougal: Goal 2 of the Critical Areas section of the comprehensive plan requires new development to recognize sensitive areas and natural constraints. Policy 2-A protects land quality from erosion and other soil-related natural hazards. Although there are no agricultural or forest lands of long-term commercial significance in Washougal, the plan notes the importance of preserving native vegetation.

b. Additional Mitigation

The primary mitigation for impacts to soils is to carefully design UGA expansion to avoid (1) areas of prime agricultural soils or forest suitability and (2) areas where soil characteristics are not suitable for construction. When these areas cannot be avoided, it is important to ensure that each city has policies and ordinances that address special construction requirements.

B. Geology and Topography

1. Setting

Clark County exhibits traces of its geologic history, including repeated inundation by fluctuating seas during the glacial epochs, sedimentary processes of the Columbia River, volcanic activity, and periodic earthquakes. These processes are on-going—rivers are eroding and transporting material to create new land areas, land is changing by slumping and downwarping, the weathering of rocks is creating soil, and

landslides, earthquakes, and volcanic events can occur at any time. The geology of the county affects all land uses. The abundance of sand and gravel deposited by the historic floods of the Columbia River are major sources for gravel extraction in the county. Additionally, lava flows near the Columbia River are primary sources for Columbia River basalt, which is quarried for jetty rock.

The geologic units of Clark County can be placed in two general categories. The first is made up of older consolidated and primarily volcanic rock consisting of Columbia River basalt and Skamania or Goble volcanic series. These rocks form the foothills in the eastern part of the county. Boring Lava is classified as young consolidated rock that appears in isolated sections of the county, often overlaying sedimentary rocks. One significant deposit west of Camas near the Columbia River is currently being mined and provides much of the jetty rock used along the Oregon and Washington coastline. The second category consists of sedimentary rock containing unconsolidated gravels, sand, silt, and clay created by river and stream action. These can be further divided into three types of rock units: the Troutdale formation, glacial drift, and alluvial deposits. Alluvial deposits form the plains and terraces that underlay the southwestern third of Clark County. Glacial drift deposits are found primarily in the northeastern section of the county. The sedimentary deposits comprise the principal aquifers supplying water to virtually all the county.

Bog deposits, sometimes referred to as beaver dam soils, underlie the upper and central sections of Burnt Bridge Creek, south of Orchards, and extend eastward to Lacamas Creek. These areas have an estimated thickness of 10 feet and consist of muck composed of muds with organic matter. In the Lettuce Fields subarea, deposits have been reported to vary from one foot to 40 feet deep.

Figure 12 shows the surface geology of Clark County. Figure 13 shows its topographic contours. The topographic features of the county are largely defined by its mountain province—the foothills of the county—which are characterized by steep slopes, and the plains province—plains and terraces—which are flatlands and gently sloping areas.

Geological hazard areas are those that, because of their susceptibility to erosion, sliding, earthquakes, or other geological events, are not suited to siting residential, commercial, or industrial development. Potential geologic hazards in Clark County include landslides—often in steep-sloped areas around stream corridors—ground settling, flooding related to volcanic activity, and earthquakes.

a. Slope Stability and Landslide Hazard

The two physiographic regions of Clark County—the plains province and the mountains province—present different slope stability problems. The eastern part of the county (the mountains province) has the most varied topography, and slopes represent a major constraint on all land uses, including urban development. Slopes in the southwestern portion of the county are generally associated with streambeds draining toward the Columbia River. These slopes may be steep in places: portions of the Salmon Creek drainage have slopes that range from 26 to 40 percent; slopes along parts of Burnt Bridge Creek also range from 26 to 40 percent; and some areas in the Vancouver Lake Lowlands have slopes greater than 40 percent. Figure 14 shows slope gradients for the county.

Few recent landslides (those within the last 200 years) have occurred in either region. Most that have occurred have been caused by rivers and streams (in the plains province) and by logging activities (in the mountain province). A study conducted by the Department of Natural Resources (DNR) in 1975 identified four classes of slope stability within the county: older landslides, recent landslides, areas susceptible to landslides or that are potentially unstable, and stable areas. Figure 15 shows slope hazard areas within the county. The first three of these classes require special action. Older and potentially unstable landslides should have detailed geologic and engineering studies conducted prior to any development. Recent and active landslide areas should be avoided. In areas susceptible to landslides, activities such as septic system construction, the watering of lawns, and the redirection of stormwater

runoff could lead to the saturation of otherwise stable soils and may cause the loss of internal slope stability, resulting in landslides. In the mountain region of the county, most development is related to logging, and logging roads are a primary cause of most landslides.

b. Earthquake Hazards

Scientists predict that the St. Helens Seismic Zone in the Southern Washington Cascade Mountains is capable of producing an earthquake with a magnitude of 7 or greater on the Richter scale. The Uniform Building Code (UBC) classified Clark County as being in zone 2B until 1993. This zone meant that there is a probability of a major earthquake. Recent studies indicate a greater potential for seismic activity in the region than was previously thought, and the State of Washington has adopted a requirement that construction meet Zone 3B seismic safety requirements.

An earthquake in Clark County could result in damage from the following:

- Landsliding—the perceptible downward movement of masses of rock and soil.
- Shaking—the actual shaking of the ground by the transmission of earthquake energy waves.
- Differential settlement—the uneven settling of parts of a structure by different rates, due to inconsistencies in the material on which the structure is built. This may be by the compression of the material or its liquefaction.
- Liquefaction—loosely packed, water-logged sediments at or near the ground surface lose their strength because of ground shaking, resulting in ground failure.

There is the possibility of damage from one of the earthquake faults in Clark County. Figure 16 shows those faults within the county that have been mapped. There is also the possibility of damage from seiche—the action of water in lakes, ponds, reservoirs, and other water bodies due to earthquake shaking.

Nothing can be done to control the magnitude or location of earthquakes. However, structures can be properly sited away from areas of greatest risk and designed to withstand shaking and settlement. Areas of greatest risk (those immediately adjacent to fault lines or on unstable slopes) should not be intensely developed. The greatest potential for earthquake damage in Clark County exists in areas of unconsolidated sediment. Such soils are found along the Columbia River, at Steigerwald Wildlife Refuge and in the Vancouver Lake Lowlands. In urbanized areas, the greatest earthquake-related damage is often caused by secondary events, such as fires that result from ruptured natural gas lines or flooding caused by ruptured water lines or storage tanks.

c. Erosion Hazard

Accelerated erosion from water results in a rill, a steep-sided channel typically a few inches deep. Rill erosion is most likely to occur on sparsely vegetated, steep slopes. The Natural Resource Conservation Service (NRCS) describes potential erosion hazard as slight, moderate, and severe. Soils with severe erosion hazard usually have slopes of 30 percent or greater, but can be relatively flat when the probability of flooding is high. The *Perspectives Resource Document* lists soils in Clark County with moderate to severe erosion hazard, as classified by the NRCS. Figure 17 shows erosion hazard areas. Erosion from urban development can carry soil into nearby streams and lakes, degrading water quality and endangering fish and wildlife that are dependent on those water bodies.

d. Volcanic Activity

Future volcanic activity that may affect Clark County is confined to Mount St. Helens, located some 40 miles to the northeast of the county. Mount Rainier is considered the most volatile of the Cascade peaks. Impacts from its eruption on Clark County would probably be limited to ash, although ash from past eruptions of Mount Rainier and Mount Hood have not been found within the county.

Throughout its 50,000-year history, Mount St. Helens has deposited large quantities of volcanic debris into the Lewis River valley and its tributaries. Eruption periods have been traced as far back as 2500 B.C. The peak's dormant intervals have lasted anywhere from 100 to 500 years. However, during the past 500 years eruptions have been more frequent and dormancy intervals have decreased to between 100 and 150 years. The last major eruption of the mountain occurred on May 18, 1980, causing regional flooding, spreading ash over much of the region, and profoundly changing the landscape around the mountain.

2. Impacts

The discussion of potential impacts related to geology and topography is closely related to other areas of impact assessment, such as groundwater quality and soils. Geology effects may differ from other areas of impact assessment because many proposed projects or actions will not actually cause direct effects *on* the geology of a site or an area. Rather, effects are normally *associated with* geology, as opposed to causing any physical or chemical changes in the characteristics of the actual geology. The same can be said for topography, where the primary consideration is the constraints that are placed on development because of topographical features, such as steep slopes. In considering the impacts of different growth alternatives on the geology of the region, the evaluation is essentially one of land use compatibility. The area for proposed urban area expansion is overlaid on the relevant geologic data, most often geologically hazardous areas, to determine the compatibility of development with the existing features of the geology.

Under all of the alternatives, Clark County and its cities would limit development in geologically hazardous areas, consistent with the requirements of the GMA and each jurisdiction's critical areas ordinance. These regulated areas include those with steep slopes—generally more than 40 percent—landslide hazard areas, and seismic hazard areas.

a. Alternative 1

Under Alternative 1, around 214 acres of land that are classified as Zone A—areas with the greatest earthquake hazard—would be brought into new UGAs. The majority of land within expanded UGAs under this alternative—around 6,478 acres—is designated Zone B, an area with less severe earthquake hazard. About 2,397 acres fall within Zone C, and 515 acres are classified as Zone D, an area with the least earthquake hazard.

Under Alternative 1, there are approximately 194 acres of steep-sloped areas, generally areas where the slope exceeds 40 percent. These areas are usually found along streams. Within the expanded UGAs of Alternative 1, this includes primarily land along Salmon Creek and its tributaries.

Similarly, most areas that are identified as having active, historic, or potentially unstable slopes are located along Salmon Creek and its tributaries. Alternative 1 would include a total of 1,410 acres that are identified as landslide hazard areas.

b. Alternative 2

Alternative 2, because it does not expand UGAs as much as Alternative 1, would designate less land with severe earthquake hazard for urban use. Approximately 88 acres of Zone A land would be included in new UGAs. As with Alternative 1, most land—2,485 acres—is within Zone B. Around 605 acres is within Zone C, and 304 acres is Zone D.

Whereas Alternative 1 included around 194 acres of steep-sloped land in the expanded UGAs, Alternative 2 includes around 46 acres. Less of the Salmon Creek area would be impacted under Alternative 2 than under Alternative 1, which accounts for much of the decrease in steep-sloped areas affected.

Under Alternative 2, unstable slope areas include land along parts of Salmon Creek and its tributaries, Gee Creek, the Columbia River (within an area currently used for surface mining), and Lacamas Lake.

Around 469 acres—roughly one third of the area included under Alternative 1—are identified as landslide hazard areas.

c. Alternative 3

Under Alternative 3, all growth over the next 20 years would be accommodated within existing UGAs. There are steep slopes and potentially unstable slopes within the current UGAs of Vancouver, La Center, Ridgefield, Camas, and Washougal. While Alternative 3 would decrease the likelihood of development occurring in geologically hazardous areas on rural lands and other areas outside of UGAs, it may increase pressure to develop steep or potentially unstable areas within existing UGAs.

Local ordinances include policies that discourage development in potentially hazardous areas. In cases where development cannot be avoided (for example, roads crossing steep slopes), appropriate design and construction technology would be required to protect against impacts. This would include limiting vegetation removal to reduce runoff and erosion and requiring geotechnical studies to determine the best construction time and techniques to ensure public safety, particularly in landslide areas and on steep slopes.

d. Alternative 4

Under Alternative 4, approximately 149 acres of land designated as Zone A would designated for urban growth. Most of the land to be brought into new UGAs is shown as Zone B, around 3,820 acres. Around 1,094 acres are within Zone C and 318 acres are within Zone D, areas with the least earthquake hazard.

Other than Alternative 1, Alternative 4 would include the most steep-sloped area of any of the alternatives, around 75 acres. Almost all of these areas are located along stream corridors, most notably Salmon Creek and its tributaries and Lacamas Creek.

Areas with historic, active, or potentially unstable slopes that would be included in new UGAs occur predominately along Salmon Creek and the Columbia River shoreline. Under this alternative, around 482 acres identified as landslide hazard area would be designated for urbanization. Other than Alternative 1, this is more than any other alternative.

e. Alternative 5

Alternative 5 would bring about 54 acres of Zone A land within new UGAs. This is the least amount of Zone A land—land with the greatest earthquake hazard—of any of the alternatives. As with each of the other alternatives, most land, around 2,951 acres, is designated Zone B, land with less earthquake risk. Around 734 acres is Zone C land and 266 acres is Zone D, land with the least earthquake hazard.

Alternative 5 would include about 11 acres of land with slopes greater than 40 percent. This is much less than the 194 acres under Alternative 1. It is also less than the other alternatives. Approximately 329 acres of landslide hazard area would be included within new UGAs under Alternative 5. This is less than each of the other alternatives and is about one-quarter the amount of landslide hazard area that would be added to UGA under Alternative 1.

Table 7. Acres within Geological Hazard Areas by Alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Earthquake Hazard Areas:			[No New UGAs]		
Zone A (greatest hazard)	214	88		149	54
Zone B	6,478	2,485		3,820	2,951
Zone C	2,397	605		1,094	734
Zone D (least hazard)	515	304		318	266
Steep Slope Areas (≥ 40%)	194	46		75	11
Landslide Hazard Areas	1,410	469		482	329

Source: Clark County Department of Assessment and GIS

3. Mitigation

a. Plans and Ordinances

To be consistent with the GMA, Clark County and its cities have developed policies that identify geologic hazardous areas and that ensure development within these areas will minimize risk to life and property. The discussion below outlines these policies, which show considerable overlap, and additional mitigation measures that could be adopted to protect geologically hazardous areas from unsafe development.

Clark County: Clark County has mapped areas that have earthquake potential and steep slopes with a susceptibility to landslides and erosion. Seismic hazard vulnerabilities throughout the county are currently being mapped and updated, and more stringent and relevant seismic codes will be incorporated into the permitting and building ordinances. Clark County's geological hazard ordinance was enacted in 1997 (CCC Chapter 13.60). The purpose of the ordinance is to safeguard public health, safety, and welfare by placing limitations on development in geologically hazardous areas, which is in keeping with the requirements placed on jurisdictions by the GMA. CCC Chapter 13.60 applies to all development activities within or adjacent to (within 100 feet) geologically hazardous areas, which are defined as steep slopes, landslide hazard area, and seismic hazard areas. All activities on hillsides subject to severe erosion hazard must minimize erosion by following management practices prescribed by the erosion control ordinances of Chapter 13.29. Development on steep slopes is regulated to prevent potential landslide damage by placing improvements away from steep slopes and leaving steep slopes with natural vegetation. Although it is often recommended that development on slopes greater than 40 percent be avoided, the County's ordinance regulates this development rather than prohibiting it. Development in landslide hazard areas is generally not allowed, and requires buffers that keep vegetation in a natural state on and around the landslide hazard area. Development within seismic hazard areas requires a detailed site analysis in order to determine how soils and structures will respond at a particular site.

Clark County has mapped areas that have earthquake potential and steep slopes with a susceptibility to landslides and erosion. Seismic hazard vulnerabilities throughout the county are currently being mapped and updated, and more stringent and relevant seismic codes will be incorporated into the permitting and building ordinances. Clark County's geological hazard ordinance was enacted in 1997 (CCC Chapter 13.60). The purpose of the ordinance is to safeguard public health, safety, and welfare by placing limitations on development in geologically hazardous areas, which is in keeping with the requirements placed on jurisdictions by the GMA.

The County is also pursuing other federal and state programs to enhance its ordinances and codes for natural hazard mitigation. Policy Z.1.1 calls for updating the mapping of hazardous areas. Policy Z.1.9 calls for reducing risks to life and property by several measures, such as limiting development and vegetation removal, and requiring geotechnical studies prior to development approvals.

Battle Ground: Few geologically hazardous areas occur within the Battle Ground planning area. Designated areas include the land bordering Weaver/Woodin Creek, Salmon Creek, the East Fork Lewis River, and Morgan Creek and the slopes of Tukes Mountain in the northeastern portion of the city.

Battle Ground classifies slopes greater than 25 percent and unstable slopes (designated by the US SCS) geologically hazardous, which are generally found bordering creeks and approaching Tukes Mountain. The City has policies under Goal 2 of the 1995 comprehensive plan to protect from erosion and other soil-related natural hazards and protect life and property from mass movement hazards (Policy 2-B) to insure public safety and prevent loss of private property. Goal 4 aims to establish consistent development standards for steep or unstable slopes and to restrict development on steep slopes (Policy 4-B).

Draft goals and objectives under Goal 5 (Environment) adopted in December 2001 include protection of critical areas (EG4) and creation of an ordinance to protect geologically hazard areas. Several action items include restriction of development on steep and unstable slopes and future funding to prioritize and purchase critical areas.

Camas: Camas' zoning ordinance Chapter 18.31 establishes regulations for Environmentally Sensitive Areas and Open Space, which includes a designation of "Natural Open Space" for sensitive lands. GIS mapping identifies steep slopes between 15% and 40% and those over 40%. Development on all slopes over 40 percent and potentially unstable slopes—which includes the bluffs overlooking the Columbia River and the steep slopes associated with the Lacamas and Washougal River drainages—is restricted. Geotechnical reports are required prior to development approvals on land within the steep slope areas. Fifty-foot buffers from geologically sensitive areas are also required. Policy EN6 in the new, proposed Environmental Element is to protect environmentally sensitive areas that are not suitable for intensive use, such as unstable bluffs and steep slopes.

La Center: The La Center Comprehensive Plan incorporates the guidelines for designating critical areas in state law by reference (RCW 36.70A.170(d) and RCW 36.70A.030). The plan policy states that geologically hazardous areas are to be adequately protected from development. A Critical Areas Ordinance was adopted in 2001, that defines geologically hazardous areas as having susceptibility to erosion, sliding, earthquake or other geological events that make them unsuitable to the siting of development. La Center has mapped critical areas in the city and UGA. Steep slopes are defined as those over 25%. Development near geologically hazardous areas must have a 75-foot buffer.

Ridgefield: Land designated as "unbuildable" due to topographic constraints in the city's buildable lands inventory are designated as Open Space. Ridgefield's portion of the UGA which is potentially geologically hazardous due to steep slopes (defined as greater than 25 percent) and unstable soils is designated as Open Space with a Density Transfer overlay. Development on steep slopes generally must be avoided but residential development is allowed on slopes over 15 percent through the PUD process, and as long as geologically hazardous areas are avoided (Policy 8.2). Chapter 18.280 of the Ridgefield Municipal code regulates sensitive lands, including steep slopes. Development is generally not allowed on slopes over 25 percent. Development proposed for slopes between 15 and 25 percent are regulated by the sensitive lands provisions. The ordinance establishes buffers and provides for density transfers.

Vancouver: Policy P19 of the Policy Document (Volume 2) ensures that land use patterns preserve natural features and avoid hazard areas. Public health is to be protected with respect to development proposed in areas of steep slopes, unconsolidated sediments, and fill deposits. Areas with slopes over 40 percent have been mapped. Protections are implemented through the Geological Hazards Combining District overlying areas with landslide hazards, steep slopes (over 40 percent), earthquake hazard areas, and fill. Regulations require development to demonstrate through geotechnical analysis that the design and engineering are safe. Fifty-foot buffers from geologically sensitive areas are also established.

Proposed revisions to the comprehensive plan include a policy for hazard areas which calls for the City to manage development in geologically hazardous areas to protect public health and safety.

Washougal: Washougal defines steep slopes as those over 25 percent slope. Development in these areas will be restricted in order to ensure public safety and prevent the loss of private property (Policy 4-B of the Critical Areas section). Policy 2-C also mandates protection from landslide hazard. Both of these policies will require the development of ordinance language to implement them.

b. Additional Mitigation

The County and cities could add policies to:

- Expand designated open space areas to include slopes greater than 25 percent, not just slopes greater than 40 percent.
- Require the developer to consider alternative locations; development would only be allowed in these areas if it can be shown to be the only feasible alternative.
- Require review of the design of all development on steep slopes to identify and mitigate not only safety but also potential drainage, habitat, and visual impacts of the development.
- Support and participate in a program to fund the acquisition of sensitive lands, including geologically hazardous areas. The GMA permits the adoption of a real estate excise tax for this purpose, but other mechanisms should also be investigated.

III. AIR

A. Climate

1. Setting

The climate of Clark County is influenced by the Coast Range to the west and the Cascade Range to the east. The Coast Range provides limited shelter from the Pacific Ocean. As moist, heavy air from the west rises up the steep slopes of the Cascade Range, the air is cooled, which creates moderate rainfall in the lower-lying areas and more significant rainfall on the west slope of the Cascades. The Cascades also form an eastern barrier from continental air masses originating over the Columbia River Basin.

Clark County has wet, mild winters and warm, dry summers. Precipitation ranges from a low of 41 inches annually in Vancouver to a high of 114 inches annually in the northeastern corner of the county. Approximately 80 to 85 percent of the precipitation occurs from October to May.

Temperatures in the county, as recorded at four reporting stations, average 37 degrees in January and 65 degrees in July. Temperatures may vary from one location to another, depending on the direction of the wind, type of vegetation, and topography. Generally, temperatures are higher in the urbanized areas than in the surrounding rural areas. This is often due to (1) increased human activities that occur within urban areas (2) less evaporation because there is less water retention in the developed areas, and (3) less heat loss at night in urban areas because of heat retention in buildings and paved areas.

The prevailing surface winds are generally from the northwest in the months of April through September and from the east/southeast from October through March. There are occasional winds from the east that are a part of extremes in either cold or hot weather. Winter storm tracks are generally from the southwest, with infrequent snow storms dropping down from the Gulf of Alaska. Major wind events in Clark County occur infrequently. Two of the more famous were the Columbia Day storm in 1962 and the Peter Ogden tornado in 1972.

Fog often occurs in the valleys and low-lying areas of the county. Fog is either the result of clear skies and still air that allows large heat losses at night or from warm, moist air masses moving over cooler ground. In either case, when the lower air is cooled to below the dew point, fog occurs. Fog as a result of clear skies and still air is most common in the county during the spring and fall months.

According to the United Nations Intergovernmental Panel on Climate Change (IPCC) and the U.S. Environmental Protection Agency (EPA), temperatures in Washington State could increase by about 5 degrees Fahrenheit in winter and summer and by about 4 degrees Fahrenheit in spring and fall over the next 100 years. Precipitation is projected to change little in the spring, summer, and fall and to increase by about 10 percent in winter. The frequency of extreme hot days in summer is expected to increase along with the general warming trend. A recent study issued by the US Department of Energy predicts similar climatic changes for the region.

While it is difficult to predict the exact impacts of climate change on the region, these impacts could be severe, affecting human health, the health of aquatic and terrestrial ecosystems, and economic resources such as agriculture, forestry, fisheries, and water resources.

2. Impacts

None of the alternatives under consideration would have a direct impact on the climate of the region in the short-term. All the alternatives envision an accommodation of population growth over a 20-year period, and the changes that each alternative would bring about in land use, transportation, the environment, and the economy would take place gradually over that period. It is possible that, over time, the different alternatives could impact microclimates, at least in terms of temperature. Because urban areas generally have slightly higher temperatures and each alternative involves a greater level of urbanization, either within existing or expanded UGAs, it is possible that temperatures could increase somewhat in these areas, although any increase in temperature would be slight.

The growth management decisions reflected in the different alternatives—the amount of land that is urbanized, the extent to which resource, rural, and open space areas are preserved, the efficiency of the transportation system reflected in the number of vehicle miles traveled—do have the potential to make an incremental contribution to climate change on a larger scale over a longer period of time. Human-induced climate change is influenced by a multitude of decisions about growth and urban form made at local and regional levels. The efficiency with which resources, most notably fossil fuels, are used is directly related to development patterns. Growth management decisions that promote the development of a compact urban form and that reduce vehicle miles traveled generally result in a reduction in per capita fossil fuel consumption and greenhouse gases emitted and, as a result, contribute less to global climate change. (For further analysis of potential impacts on air quality from transportation, refer to the following section on Air Quality.)

Assessing how each alternative may contribute to climate change is difficult, made so by the interaction of many variables. However, this assessment can begin by looking at how each alternative impacts two of the parameters known to play an important role in climate change, fossil fuel consumption, measured by vehicle miles traveled (VMT) and levels of traffic congestion, and the amount of resource land converted to urban uses.

While the link between fossil fuel consumption and climate change is fairly well known, the role of farmland, forest land, soils, and other environmentally significant areas in climate regulation may be less so. Generally, these areas function as “carbon sinks,” absorbing the carbon dioxide that is released with the burning of hydrocarbons through the process of photosynthesis. While some lands, most notably mature forests, are more efficient at sequestering carbon dioxide, all biomass (vegetation and soils) to some degree functions as a carbon sink. It is estimated that land-based vegetation and soils currently

absorb about 40 percent of global carbon dioxide emissions from human activities. The more farmland, forest land, and soils that are converted to urban uses—roads, infrastructure, residential, commercial, and industrial development—and the more vehicle miles that are traveled, the greater the "carbon footprint" of a city or region is likely to be.

a. Alternative 1

Alternative 1, which includes the largest expansion of UGAs, would also result in the most vehicle miles (1,077,000 VMT). It also has the highest amount of traffic congestion and delay of any of the alternatives. Most trips, around 93 percent, would be by auto, the most of any alternative. Around one percent of trips would be by transit and just over five percent of all trips would be non-motorized. The modal split of each of the alternatives is very similar and shows no significant differences.

Alternative 1 would see the largest conversion of farm, forest, and rural land to urban uses of any of the alternatives. Approximately 12,088 acres of rural land would be added to UGAs; around 8,648 acres of agricultural resource land and 145 acres of forest resource land would be added to UGAs.

Because Alternative 1 would see the largest expansion of urbanized areas, would convert the most resource and rural land to urban uses, and would result in the most vehicle miles traveled and the greatest congestion, it is likely that this alternative would make the most significant contribution to climate change; that is, it would result in the greatest emission of greenhouse gases. However, as mentioned above, assessing the precise relationship between land use, travel patterns, and climate change is made difficult by the interaction of numerous variables. For instance, the contribution of transportation to climate change is not only a matter of vehicle miles traveled. It is also a matter of the fuel efficiency of vehicles and the life cycle carbon content of fuels. On the whole, however, the more vehicle miles that are traveled, the more carbon dioxide is released.

b. Alternative 2

Alternative 2 would not see as large an expansion of UGAs as other alternatives. Whereas Alternative 1 would add approximately 28,845 acres to existing UGAs, Alternative 2 would add around 9,750 acres. Alternative 2 would have 963,000 VMT which would be about 11 percent less than under Alternative 1 and somewhat less than Alternatives 4 and 5.

Alternative 2 would add 2,106 acres of rural land to new UGAs, roughly one-sixth the amount of rural land added under Alternative 1. While approximately 2,207 acres of agricultural land would be added to new UGAs under this alternative (about 75 percent less agricultural land than under Alternative 1), no forest resource land would be added. Because Alternative 2 would result in fewer vehicle miles traveled and less of a loss of resource and rural land, its contribution to climate change would likely be less significant than Alternative 1 but more significant than Alternative 3.

c. Alternative 3

Alternative 3 would result in the most compact urban form of any of the alternatives. It would not include the expansion of UGAs. Projected growth and development over the next 20 years would be accommodated within existing UGAs. Alternative 3 would see the lowest VMT—around 923,000. This is about 15 percent lower than Alternative 1 and about 5 percent lower than Alternative 2 (having the next highest VMT).

This alternative would conserve the most farm and forest resource land and rural land. No additional resource or rural land would be added to urban areas. It can be assumed that, because these lands would be conserved and less vegetation and soils would be lost, they would continue to function to some degree as carbon sinks.

Because this alternative would see the fewest vehicle miles traveled and result in the greatest conservation of resource and rural lands, it is likely that its contribution to climate change would be less than the other alternatives.

d. Alternative 4

Alternative 4 would add 12,550 acres to UGAs. VMT of 975,000 under this alternative would be more than Alternatives 3 and 2, about the same as Alternative 5, and quite a bit less than Alternative 1. Overall mobility under this alternative is better than under Alternatives 1, 2, and 5.

Under this alternative, 12,303 acres of agricultural land would be added to UGAs, which is about one-quarter of the amount of agricultural land that would be urbanized under Alternative 1. This alternative would see 69 acres of forest land added to the UGA of Camas. Approximately 4,475 acres of rural land would be added to UGAs.

It is likely that the contribution of this alternative to climate change through the emission of greenhouse gases and the loss of resource and rural land would be less significant than Alternative 1 but more significant than Alternative 3.

e. Alternative 5

Alternative 5 would add approximately 12,000 acres to UGAs. VMT of approximately 976,000 would be similar to Alternative 4. Overall mobility would also be similar to Alternative 4.

Alternative 5 would add agricultural land to the UGA of each city. Other than Alternative 1, this alternative adds the most agricultural land to UGAs—approximately 3,589 acres. No forest resource land would be converted to urban uses. Around 4,046 acres or rural land would be brought into expanded UGAs under this alternative, less than Alternatives 1 and 4, but about twice as much as Alternative 2.

3. Mitigation

a. Plans and ordinances

In general, the plans and ordinances of Clark County and the cities do not deal specifically with preventing impacts to climate, except in the context of protecting air quality. The concept of mitigating impacts on climate by preserving vegetative cover (restricting conversion of rural, agricultural or forest uses to urban uses) is not directly addressed. However, restricting conversion of large (i.e., undeveloped) vegetated areas to impervious surfaces and reducing vehicle emissions (through all available means) are forms of mitigating impacts that contribute to climate change. To the extent that air quality impacts from transportation and industry are mitigated, impacts from sources that make an incremental contribution to climate change could also be reduced. Consequently, the transportation and air quality sections of this DEIS provide mitigation for potential impacts to climate.

b. Additional Mitigation

The County and cities could add policies on climate change to their comprehensive plans in those sections that address air quality. Action items could include monitoring the technical literature on climate change, and amending their ordinances as needed to consider climate change when assessing land use decisions that might affect air quality.

B. Air Quality

1. Setting

Clark County is located in an airshed that is bounded on the south by Eugene, Oregon, on the north by Chehalis, Washington, on the west by the Coast Range, and on the east by the Cascade Mountains. This region is susceptible to concentrations of air pollution near human activity centers.

Air pollutants come from a wide variety of sources. Point source pollutants are traditionally stationary facilities like rock quarries, lumber mills, and other manufacturing plants and processes. Area sources, such as dry cleaning chemicals, solvents, and wood stoves come from relatively small, individual sources of pollution usually spread over a broad geographic area. Mobile sources of pollution include such things as trucks, cars, and other vehicles. Mobile sources emit significant quantities of nitrogen oxide (NOx), fine particulate matter, ground-level ozone, carbon monoxide, and other toxic compounds. Motor vehicles are Clark County's largest producer of air pollution.

In 1991, the urban area of the Vancouver portion of the Portland-Vancouver Interstate Air Quality Maintenance Area was designated as a non-attainment area for ozone (O_3) and carbon monoxide (CO). Since the 1994 comprehensive planning process, an Air Quality Maintenance Plan was developed and approved for Clark County. A maintenance plan is a 10-year plan for the implementation of transportation and other control strategies to ensure that National Ambient Air Quality Standards (NAAQS), once they can be attained for the region, can be maintained for a period of ten years.

The Maintenance Plan identified and implemented transportation control measures based on the land use assumptions of the 1994 comprehensive plans and demonstrated that there was no violation of the national clean air standards. The Portland metropolitan airshed has since been designated a maintenance area.

Recently, the Metropolitan Transportation Plan (MTP) for Clark County has been found to contribute to emission reductions and to be in conformity with the Federal Clean Air Act (CAA) as amended in 1990 and the Washington Clean Air Act (RCW chapter 70.94). All regionally significant transportation improvement projects are included in the regional travel forecasting model for purposes of air quality conformity analysis. RTC is responsible for assisting in the development of programs and policies to reduce pollutant emissions from mobile sources. The Southwest Washington Clean Air Agency (SWCAA) is responsible for monitoring and developing programs to reduce pollution from area and point sources.

Under existing air quality regulations, new industry locating in the county is required to use the best available control technology to reduce its own emissions.

2. Impacts

Despite major increases in motor vehicle use and the attraction of new industries under all alternatives, it is unlikely that emissions from motor vehicle and major industrial sources will increase dramatically in the future with projects under the current MTP. Major reductions in these emissions have been achieved through stringent federal controls on automobiles and major industries. The passage of the Clean Air Act Amendments in 1990 requires even greater air quality controls on new development. This, combined with fines, monitoring programs, and the retirement of older vehicles and industrial plants (the major motor and stationary emission violators), should help to maintain air quality at current levels even with significant growth. However, pending administrative rule changes may release new firms from upgrading facilities to limit new impacts on air quality. Consequently, while progress has been made in improving air quality, it is not clear what impact the administrative rule changes may have on the continuation of that progress. In addition, the fastest growing source of pollution is expected to be non-road mobile

sources such as lawn mowers, tractors, etc. These sources are currently uncontrolled, and as such their impact on air quality will continue to increase as the population grows. Significant decreases in motor vehicle emissions can, however, be achieved by mitigating congestion through roadway maintenance and management and by developing strategies which reduce trips or encourage the use of alternatives to the automobile.

Air quality modeling was not performed for this plan level of analysis. The implications of each land use alternative for air quality is assessed qualitatively in this section by measuring vehicle hours traveled (VHT), vehicle hours of delay, congestion on regional facilities (in lane miles), and a combination of SOV (single occupant vehicle) mode share with vehicle miles traveled (VMT). Potential "hot spot" areas of specific locations where the high level of congestion may carry with it a potential for ambient air quality standards violations were also identified by examining the resultant LOS by corridor of each alternative.

a. Alternative 1

Alternative 1 has the highest VHT, delay, and LOS E/F on regional facilities of any alternative, as well as the highest VMT and SOV percentages of any alternative. VMT for Alternative 1 is 1,077,000 and it would have 273 congested lane miles. It would likely have the highest negative impact on air quality of any alternative. Potential hot spots include: I-5 corridor from 134th Street to the Interstate Bridge, I-205 from I-5 to the Glenn Jackson Bridge, the Mill Plain/I-205/Chkalov area and Mill Plain from I-205 to 162nd Avenue, SR-500 from I-205 to SR-503, SR-503 from Battle Ground to Fourth Plain/SR-500, the area bounded by I-205, Mill Plain, NE Burton Road/28th Street, and 112th Avenue, Andresen/Padden Parkway/NE 88th Street area, La Center Road at I-5, I-5 at the Ridgefield interchange, and I-5/I-205 at 134th Street.

b. Alternative 2

Alternatives 2, 4, and 5 have similar VHT, delay, LOS E/F, and VMT /SOV results and thus similar impacts on air quality. VMT for Alternative 2 is about 963,000 and it would have 127 congested lane miles. Because Alternative 2 does have a higher level of delay (2,838 vehicle hours) than Alternatives 4 and 5, its air quality impacts will be slightly more negative than the other two alternatives. Alternative 2 will have less negative air quality impacts than Alternative 1 but higher impacts than Alternative 3. Impacts to I-5 and I-205 are less than for Alternative 1. Potential hot spots include: I-5 corridor from 78th Street to the Interstate Bridge, I-205 from Mill Plain to the Glenn Jackson Bridge, the Mill Plain/I-205/Chkalov area and Mill Plain from I-205 to 162nd Avenue, SR-500 from I-205 to SR-503, SR-503 from NE 119th Street to Fourth Plain/SR-500, the area bounded by I-205, Mill Plain, NE Burton Road/28th Street, and 112th Avenue, Andresen/Padden Parkway/NE 88th Street area (Alternatives 4 and 5 only), La Center Road at I-5, I-5 at the Ridgefield interchange, and I-5/I-205 at 134th Street.

c. Alternative 3

Alternative 3's air quality impacts are for the most part limited to the Vancouver UGA, with similar impacts as Alternatives 2, 4, and 5. It has the lowest VHT and delay of all alternatives, and the second highest transit and non-motorized mode share next to Alternative 3A. Alternative 3 would have about 923,000 VMT and 85 congested lane miles. Outside of the Vancouver UGA, its air quality impacts are less negative than for all other alternatives. Potential hot spots include: I-5 corridor from Main Street to the Interstate Bridge, I-205 from Mill Plain to the Glenn Jackson Bridge, the Mill Plain/I-205/Chkalov area and Mill Plain from I-205 to 136th Avenue, SR-500 from I-205 to SR-503, SR-503 from NE 119th Street to Fourth Plain/SR-500, the area bounded by I-205, Mill Plain, NE Burton Road/28th Street, and 112th Avenue, La Center Road at I-5, I-5 at the Ridgefield interchange, and I-5/I-205 at 134th Street.

d. Alternative 4

Alternative 4 has similar impacts on air quality from VHT, delay, LOS E/F, and VMT/SOV as Alternatives 2 and 5. Alternative 4 would have VMT of about 974,000 and 124 miles of congested lanes. Alternative 4 has a lower level of delay than Alternative 2 and therefore a slightly less negative impact. Impacts to I-5 and I-205 are less than for Alternative 1. This alternative would have the same hot-spots as identified for Alternative 2.

e. Alternative 5

Alternative 5 has similar impacts on air quality from VHT, delay, LOS E/F, and VMT/SOV as Alternatives 2 and 4. Alternative 5 would have VMT of about 976,000 and 105 congested lane miles. Alternative 5 serves to attract work trips on the north end of I-5 in the opposite direction of peak travel, thus reducing congestion and improving air quality in that corridor compared to Alternatives 2 and 4. Impacts to I-5 and I-205 are less than for Alternative 1. This alternative would have the same hot-spots as identified for Alternative 2.

3. Mitigation

a. Plans and Ordinances

Most of the cities' plans recognize the link between air quality, traffic congestion, and vehicle emissions, primarily in the transportation elements. The plans contain policies to encourage the use of alternative modes of transportation, such as bicycling, walking, and transit, which can reduce the total amount of air emissions. Level of service standards and transportation concurrency contribute to the reduction of congestion which can improve air quality. Many of the plans also have policies citing the importance of preserving air quality as part of their economic development strategies, since new industrial development cannot occur if the regional air quality does not meet federal standards.

The state requires private automobiles in designated urban sections of the state to meet air emissions standards every year. State and federal regulations require limitations on open burning of brush, and using wood stoves or fireplaces for heating. Where wood stoves and fireplaces are permitted, they must be fitted with filters to reduce emissions. With the designation as a maintenance area, controls on burning, vehicle pollution inspections, and requirements for industry to use the best available technology to control emissions continue.

Clark County: As noted above, policies in the Transportation Element of the County's comprehensive plan address air quality. Policy 3.1.8 calls for the pursuit of transit-related options to reduce congestion and improve and maintain air quality. Policies directly related to preserving or improving air quality are found primarily in the Economic Development element of the comprehensive plan. Goal 7.5 promotes long-term economic development that will improve air quality to attainment status and preserve air shed capacity to accommodate job generating activities. Policies 7.51 through 7.53 discuss assigning priority to cleaner industries or those that can operate within and preserve the airshed capacity.

Clark County proposes to add a new element to the comprehensive plan to address environmental issues, including air quality Goal Z.9 and three policies that call for air resources to be managed to preserve and enhance air quality, for maintaining good air quality for citizen's health and the health of the local economy, and for incorporating air quality impacts as an additional land use planning decision criteria.

Battle Ground: Goal 1 of the 1995 comprehensive plan includes the protection and improvement of quality of life through the protection of air quality. Policy 1-I requires the city to guard against the degradation of air quality while Policy 1-J would locate new business and industry so that the impact on air quality is minimized.

Draft goals and objectives (Goal 5 Environment) adopted in December 2001 include protection and improvement of air quality (EG8), including development of a transportation plan that promotes and encourages the use of alternative travel modes (EA8.1.1). Another policy would have the city seek to attract clean industries that do not adversely impact air quality and the City's economic development policy will be developed to consider air quality when encouraging industries to locate in Battle Ground (EO8.2 and EA8.2.1). Air quality will become a criteria for siting new business and industries and when developing specific area plans and other land use actions (EO8.3 and EA8.3.1). Further policies state that the city will work with property owners to lessen air quality impacts and explore ways through incentives and new regulations to reduce the negative impacts on air quality.

Camas: Policy EN3 of the new, proposed Environmental Element of the comprehensive plan calls for minimizing and eliminating (where feasible) the release of substances into the air that may degrade air quality. Proposed Goal EC10 of the new Economic Development Element supports a multi-modal transportation system that helps to reduces air pollution. Proposed Goal EC12 calls for improving air quality and preserving airshed capacity to accommodate new employment opportunities. A new policy and strategy for implementation are associated with this goal.

La Center: The La Center comprehensive plan incorporates CWPPs relating to the UGA, which requires that the boundary be established consistent with the goal of protecting the environment, including enhancing air quality.

Ridgefield: Under Goal 5 (Industrial Growth), Ridgefield requires that industry adequately mitigate environmental impacts (policy 5.4(d)). Ridgefield's policies under Goal 9 for Transportation state that the City will coordinate with Clark County to develop and implement transportation improvement programs that reduce reliance on single-occupant vehicles and minimize environmental and neighborhood impacts that result from transportation systems.

Vancouver: Vancouver's comprehensive plan policy P23 requires the City to use all available means to maintain and enhance air quality. Implementation measure IM23 calls for interlocal agreements and a master program for the protection and enhancement of regional air and water quality. It also calls for total compliance with the requirements of the Clean Air Act.

Proposed revisions to the comprehensive plan include a policy for air quality which calls for the City to protect and enhance air quality, in coordination with local and regional agencies and organizations.

Washougal: Goal 1 of the Critical Areas section of the comprehensive plan includes the protection and improvement of the quality of life through the protection of air quality. Policy 1-H requires the city to guard against the degradation of air quality while Policy 1-J would locate new business and industry so that the impact on air quality is minimized.

b. Additional Mitigation

Additional mitigation measures which could be adopted by the County and/or cities include:

1. Select or modify another alternative to have lower impacts on air quality.
2. Continue to work with the CREDC to give priority to non-polluting industries that may locate in Clark County.
3. Encourage the use of energy from alternative non-polluting sources, energy-efficient heating in all new development, including adoption of solar access ordinances.
4. Encourage energy conservation.
5. Encourage an aggressive alternative fuels program.

IV. WATER

A. Surface Waters

1. Setting

a. Surface Waters

Clark County has an abundance of rivers and streams. The county is bounded on the south and west by the Columbia River and on the north by the Lewis River. The Columbia River is the most important river in the county. It controls the movement of surface water, all surface streams ultimately discharge into the Columbia, and groundwater that leaves the county does so by discharging into the river or its tributaries. The major tributaries of the Columbia River in Clark County are the Lewis River, Washougal River, and Lake River. Important streams that are tributaries to these rivers are Siouxon Creek, Canyon Creek, Cedar Creek, East Fork Lewis River, Little Washougal River, Salmon Creek, and Burnt Bridge Creek. Figure 18 shows major rivers, streams, and drainage basin boundaries.

Major lakes in the county include Vancouver Lake and Battle Ground Lake, which are naturally occurring lakes, and Lacamas Lake, Lake Merwin, and Yale Lake, which are man-made.

Rapid population growth and development pressures within Clark County over the past decade have made it increasingly difficult to maintain water quality. Currently, the water management programs of Clark County and its cities are focused on water quality issues and those factors that negatively influence water quality, such as erosion, stormwater runoff, and the loss of key environmental elements—namely, wetlands, floodplains, and riparian areas.

As required by the Clean Water Act (CWA), the State of Washington has established standards for water quality that reflect the present and potential uses of surface waters throughout the state (WAC 173-201A). Water quality has been categorized as Class AA (extraordinary), Class A (excellent), Class B (good), Class C (fair), and Lake Class. Section 303(d) of the CWA requires states to identify and list all surface waters that do not meet their water quality standards and that do not support their identified beneficial uses. These beneficial uses include surface water supply for industrial, agricultural, and domestic uses, fish and wildlife habitat protection, recreation, and commerce and navigation. In Clark County, the function of fish and wildlife protection is very important given the listing of salmon and steelhead under the ESA. Table 8 shows those stream segments and lakes within Clark County that are identified as impaired under Section 303(d), along with the parameters that are the basis for the listing. This list was most recently updated in 1998, so conditions may have changed.

Table 8. 303(d) Surface Waters in Clark County (1998)

Water Body	Parameter
Burnt Bridge Creek	dissolved oxygen, fecal coliform, pH, temperature
China Ditch	fecal coliform, temperature
China Lateral	temperature
Columbia River	dioxin, arsenic, temperature, fecal coliform, pH, total dissolved gas
Cougar Canyon Creek	fecal coliform
Curtin Creek	fecal coliform
Cowpie Creek	dissolved oxygen
Dwyer Creek	dissolved oxygen, pH, temperature
Fifth Plain Creek	dissolved oxygen, fecal coliform, pH, temperature
Gibbons Creek	fecal coliform
Lacamas Creek	dissolved oxygen, pH, fecal coliform, temperature
Lacamas Lake	total phosphorous

Water Body	Parameter
Lake River	fecal coliform, sediment bioassay, temperature, pH
Lewis River-East Fork	fecal coliform, temperature
Lockwood Creek	fecal coliform
McCormick Creek	fecal coliform, temperature
Mill Creek	fecal coliform
Mill Ditch	pH, dissolved oxygen, temperature
Rock Creek (north)	fecal coliform
Rock Creek (south)	fecal coliform
Salmon Creek	fecal coliform, temperature, turbidity
Shanghai Creek	dissolved oxygen, pH, temperature, fecal coliform
Vancouver Lake	fecal coliform, total phosphorous
Washougal River	temperature
Weaver (Woodin) Creek	fecal coliform, ammonia-N, dissolved oxygen, chlorine
Yacolt Creek	fecal coliform

Source: Washington State Department of Ecology

Most of the problems that lead to listing a stream as water quality limited are due to human activity or development in the area. Fecal coliform bacteria come from malfunctioning septic systems and animal waste from wild and domestic animals. Increased temperature can result from removing vegetation that shades the stream or withdrawing so much water that the remainder is more subject to solar heating or from industries discharging warm water to the stream. Increased impervious area also decreases the amount of cold groundwater-feeding streams.

Section 305(b) of the CWA requires states to prepare a written water quality assessment every five years. Washington State's 1997 305(b) Report showed that, for the Clark County area, the water quality of most rivers, streams, and lakes was fair to poor. Water quality tended to be better in rural areas and poorer in urban areas, although runoff from agriculture has negatively impacted many waterways in the county. The most common causes of water quality impairment were temperature, pH, and presence of fecal coliform bacteria.

b. Stormwater

Inadequately controlled stormwater runoff results in increased runoff volumes, peak flow rates, and duration of peak flows in streams. This can cause flooding and safety hazards, erosion, scouring, and discharge of sediment into surface waters. Untreated stormwater runoff discharges nutrients, metals, oil and grease and other forms of pollution to surface and groundwater resources, thereby threatening the use of these resources for drinking water, support of aquatic life, and recreation. Clark County's stormwater management program addresses the problem of surface water quality from non-point source pollution. Under Section 402 of the CWA, Clark County is required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for all county-owned storm sewers that empty to surface waters or to groundwater.

The current approach to managing stormwater quality is to require new development to retain stormwater on site and treat it (generally by running it through vegetated areas where the plants filter out and absorb pollutants) prior to releasing the water into the ground or to nearby surface waters. This approach also reduces the risk of flooding along streams in the county by regulating flow into the stream during storms.

Clark County's stormwater management program consists of five elements:

- Operation and maintenance of the county's storm sewers.
- Regulation of stormwater runoff to reduce pollutants entering stormwater.

- Construct stormwater controls for existing development, rehabilitating streams and wetlands, and possible purchasing of development rights within floodplains.
- Monitoring and evaluation to provide information needed to make management decisions.
- Public outreach and education programs.

c. Shorelines

Washington State's Shoreline Management Act (SMA) was passed by the Legislature in 1971 and adopted by the public in a 1972 referendum. The goal of the SMA is "to prevent the inherent harm in an uncoordinated and piecemeal development of the state's shorelines." The Act establishes a broad policy giving preference to uses that protect the quality of water and the natural environment, that depend on proximity to the shoreline, and that preserve and enhance public access or increase recreational opportunities for the public along shorelines. The SMA establishes a balance of authority between local and state government. Counties and cities are the primary regulators, but the state, through the Department of Ecology, reviews local programs and permit decisions.

Most shorelines regulated by the SMA are defined as "shorelines of the state." The SMA applies to all marine waters, streams with a mean annual flow greater that 20 cubic feet per second, water areas of the state larger than 20 acres, upland areas called "shorelands" 200 feet landward from the edge of shoreline waters, and the wetlands and floodplains associated with these water bodies. Lake shorelines within Clark County that are subject to the provisions of the SMA include Round Lake, Lacamas Lake, Battle Ground Lake, Horseshoe Lake, and Mud Lake.

The SMA also designates "shorelines of statewide significance." Shorelines of statewide significance within Clark County include those of the Lewis River, Lake Merwin, Yale Lake, East Fork Lewis River (downstream from the mouth of Mason Creek), Washougal River (downstream from the mouth of the Little Washougal River), Columbia River, Vancouver Lake, and Lacamas Lake. Clark County, Camas, Ridgefield, Vancouver, Washougal, and Woodland have adopted shoreline master programs.

d. Floodplains

The GMA requires counties and cities to designate and protect critical areas, which include floodplains. Floodplains are adjacent to rivers, streams, and lakes and are subject to periodic inundation where the river rises due to storm flows. They are particularly important for their functional values, which include the maintenance of water quality, the regulation of life-threatening flood waters, and the provision of wildlife habitat.

Floodplains along rivers and streams are divided into two areas: the *regulated floodway*, which includes the stream or river channel and any adjacent floodplain area that must be kept free from encroachments so that the 100-year flood may be discharged without any substantial increase in flood height; and the *flood fringe*, which is the area between the floodway and the boundary of the 100-year floodplain. A 100-year flood, which is normally considered the base flood, is a flood having a one percent chance of being exceeded in any given year. The definition of a floodplain encompasses areas along most of the rivers in Clark County. Figure 19 shows the major floodplains within the county, those associated with the Columbia River, the Lewis River, the Washougal River, the East Fork of the Lewis River, Salmon Creek, Burnt Bridge Creek, and Lacamas Creek. Tributaries of these major waterways are also subject to flooding, although, historically, the impacts of this flooding have been minor. More detailed information on the floodplains of major and minor waterways and tributaries within the county can be found in the *Perspectives Resource Document*.

Flood hazard areas are delineated by the Federal Emergency Management Agency (FEMA) maps and these maps generally adopted by local jurisdictions and regulated by development codes. In addition, the

critical areas ordinances of the County and cities define and regulate flood hazard areas in accordance with GMA requirements.

Each city has a floodplain ordinance similar to the County's ordinance, imposing restrictions on development within regulated floodway areas of rivers and streams. Local jurisdictions must adopt and enforce regulations in order for federal flood insurance to be made available to local property owners.

2. Impacts

Increased urbanization, either in existing UGAs or new UGAs, would pose numerous challenges to water quality management programs and make more difficult the goal of no net loss in surface water quality. An increase in impervious surfaces from roadways, parking lots, driveways, and sidewalks produces a proportionate increase in the volume of runoff and the potential for that volume to be carrying pollutants from erosion or chemical contamination to surface waters. Increased sedimentation and turbidity loading degrades streams and lake waters with silt, which can eliminate food supplies for aquatic species and alter the balance of the aquatic ecosystem. Stormwater runoff can also impact surface water levels, flow patterns, and temperature. Consequently, increased urbanization near or within floodplain areas can accelerate runoff and increase erosion, increase transport and loading of chemical and organic contaminants, increase flood peaks due to accelerated runoff, and decrease groundwater recharge. Very high water tables can make urban development very challenging and costly. So too can building on top of poorly draining soils because they exacerbate runoff potential. Figure 20 shows the hydrologic soil classifications for the area of the county within which urban expansions are being considered. Soils in Classification A, shown in a peach color, are best suited for new construction. Soils in Classification B and C are not as suitable. The "other" classification is the least appropriate place for new construction.

Table 9 compares the miles of streams that would be brought into new UGAs. Table 10 compares the acres of floodplains and shoreline environments that would be incorporated into new UGAs. Table 11 compares amounts of new impervious surfaces (based on build-out) that would likely result under each alternative. Table 12 shows the percentage of watersheds that are covered by impervious surfaces and the acres of impervious surfaces that are found within new UGAs by watershed. Generally, the health of surface waters within a watershed is related to the percentage of that watershed that is covered by impervious surfaces. The greater the percentage of impervious surface coverage, the more likely it is that surface water quality will be degraded and the more difficult it becomes to implement watershed recovery plans.

Although the amount of new impervious surface under the different alternatives would vary according to density and the size of the urban area expansion, they would all (except for Alternative 3) bring urban development to rural agricultural areas, with an accompanying increase in runoff from new development. Under all of the alternatives, new development would be subject to federal, state, and local laws and regulations that are meant to protect surface water quality. This includes local stormwater and erosion control ordinances, as well as critical areas ordinances that provide some protection to flood hazard and riparian areas.

Table 9. Comparison of Impacts on Streams

	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
Miles of streams added to urban areas:			No new urban areas		
(NO NAME)	66.0	17.5		18.9	22.8
Allen Creek					0.7
Brezee Creek	0.5				
Campen Creek	0.5				
Columbia River	1.8	1.8		1.8	
Curtin Creek	1.3			0.9	0.5
East Fork Lewis River	0.1				
Fifth Plain Creek	3.1			0.2	
Flume Creek	0.7				
Gee Creek	4.7	1.8		1.1	2.8
Lacamas Creek	4.1			2.2	
McCormick Creek	0.2				0.1
Mill Creek	3.5	1.6		0.6	2.2
Packard Creek	2.2				0.2
Salmon Creek	3.8	1.3		5.1	0.8
Shanghai Creek	0.8				
Spring Branch	0.8	0.3		0.3	0.3
Weaver Creek	1.7	1.4		1.7	0.6
Whipple Creek	4.0	1.8		0.3	0.9
Total Miles of Streams	99.9	27.5		33.0	31.8

Table 10. Comparison of Impacts on Floodplains and Shoreline Environments

Acres of floodplain and shoreline areas added to new UGAs:	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
Floodway fringe (acres)	1385	269	No new urban areas	589	230
Floodway (acres)	873	495		673	35
Shorelines (acres)	737	191		480	119

5 *Table 11. Comparison of Impacts from New Impervious Surfaces*

Projected new impervious surface:	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
In proposed new UGAs	7,730	3,190	0	3,098	3,355
In existing UGAs	9,604	9,604	9,604	9,604	9,604
Total potential new impervious surface	17,334	12,794	9,604	12,702	12,959

Source: Impervious surface estimates based on vacant lands analysis: representing the amount of potential impervious surface that would be created if the expanded UGAs were fully developed at a similar pattern as today. For Alternative 3, the amount represents projected impervious surface from full build out within the existing UGA.

Table 12. Percentage of Watersheds Covered by Impervious Surfaces and Acres of Impervious Surfaces within New UGAs by Watershed

	Alternative 1		**Alternative 2**		**Alternative 3**		**Alternative 4**		**Alternative 5**	
Watershed	Percentage	Acres	Percentage	Acres	Percentage	Acres	Percentage	Acres	Percentage	Acres
Allen Canyon Creek	7.7	.14	7.7	0	7.7	0	7.7	0	7.4	192.2
Burnt Bridge Creek	10.8	0	10.8	0	10.8	0	10.8	0	10.8	0
Camas	6.2	4.3	6.1	51.7	6.1	0	4.9	4.5	4.7	0
East Fork Lewis River	7.6	649.0	1.6	0	1.6	0	2.8	141.2	5.9	468.7
Flume Creek	3.4	60.3	1.6	0	1.6	0	1.6	0	1.6	0
Gee Creek	8.8	946.5	5.0	165.1	4.8	0	6.1	143.0	8.3	394.9
Gibbons Creek	1.5	16.2	1.3	0	1.3	0	1.3	0	1.3	0
Lacamas Creek	5.3	1,244.8	4.5	553.0	3.2	0	5.4	959.1	4.6	571.9
Lakeshore	12.3	0	12.3	0	12.3	0	12.3	0	12.3	0
Salmon Creek	10.6	3,473.2	7.2	1,779.1	4.1	0	7.4	1,611.3	7.1	1,482.2
Vancouver Lake	1.06	0	1.0	0	1.0	0	1.0	0	1.0	0
Vancouver South Slope	7.3	129.6	7.3	135.1	6.4	0	7.1	33.2	7.1	97.1
Washougal River	1.3	53.2	1.6	133.6	1.2	0	1.2	0	1.2	9.3
Whipple Creek	20.1	1,152.3	10.2	372.0	5.2	0	7.0	134.7	7.0	138.6

Source: DEA calculations from Clark County Department of Assessment and GIS data, 2003.

a. Alternative 1

Of the alternatives under consideration, Alternative 1 would have the greatest potential to impact surface waters. It would add 100 miles of streams (66 miles of unnamed streams and tributaries) to new urban areas, triple the amount under other expansion alternatives. It would also add the most floodway fringe and floodway areas and shorelines, at double or triple the amount of the build alternatives. Other than unnamed tributaries, the creeks with the most stream length brought into urban areas would be (in descending order): Gee Creek, Lacamas Creek, Whipple Creek, Salmon Creek, Mill Creek, and Fifth Plain Creek. Approximately two miles of the Columbia River would be affected in the UGA between Camas and Vancouver, the same length of shoreline as under Alternatives 2 and 4 (no impact on Columbia River under Alternative 5). Areas surrounding these streams are currently designated primarily urban reserve, rural, and agricultural, and would see conversion to mostly residential uses. Under Alternative 1, potential impacts on surface waters would result from urban development and runoff where Gee Creek traverses a portion of Ridgefield's new UGA; where Salmon Creek and Mill Creek cross the expanded UGAs of Battle Ground and Vancouver; where Lacamas Creek would be within Camas' expanded UGA; and where Fifth Plain Creek would be within Vancouver's new UGA.

Nearly 7,800 acres of impervious surface could result from the new UGAs. Approximately 50 percent of this new impervious area would be from residential development in the Vancouver urban area, with single family residential development in Vancouver contributing approximately 41 percent of total impervious surface in this alternative. Industrial and commercial development in Vancouver's expanded UGA would contribute another 12 percent of the total. The next highest contributor would be Battle Ground, with 25 percent of the total impervious surface projected to come from residential development; however, multi-family development would create more impervious area than single-family development. The remainder would be spread between the new UGAs of Camas, La Center, Ridgefield, and Washougal.

b. Alternative 2

Alternative 2 would have similar impacts on surface waters as Alternatives 4, and 5, approximately one-third the potential impacts of Alternative 1. Approximately 28 miles of streams (18 miles of unnamed streams and tributaries) would be surrounded by urban growth, about one-quarter of the amount that would be included in new UGAs under Alternative 1. Gee Creek, Whipple Creek, Weaver Creek, Salmon Creek, and Mill Creek would each have nearly two miles of stream corridor in urban areas, primarily the new UGAs of Vancouver, Battle Ground, and Ridgefield. Alternative 2 would impact 269 acres of floodway fringe and 495 acres of floodway, similar to impacts under Alternative 5, but markedly less than under Alternatives 1 and 4. This alternative would also bring less shoreline area into new urban areas than Alternatives 1 and 4. Most of the land surrounding these surface waters is currently rural or agricultural.

Nearly 3,200 acres of impervious surface result from development of the new UGAs. Approximately 47 percent of this new impervious area would be from residential development in the Vancouver UGA, with single family residential in Vancouver contributing most of the impervious surface under this alternative. Industrial development in Vancouver's new UGA would contribute another 16 percent of the total. The next highest contributor would be Battle Ground, with 16 percent projected to come from residential development; most of which would come from multi-family development. Another 9 percent would come from industrial development. Residential development in Washougal's expanded UGA would contribute about 7 percent to the total of new impervious surface in this alternative.

c. Alternative 3

Under Alternative 3, all new growth and development over the next 20 years would be accommodated within existing UGAs. This would result in less overall impact on surface waters because there would be less total new impervious surface: 9,600 acres from new development versus 13,000 to 17,000 under the other alternatives. No additional miles of streams or floodplain and shoreline areas would be surrounded

by urban growth. However, this does not mean that there would not continue to be potential impacts on surface waters within current UGAs from future development and re-development (as described above under general impacts), but this would occur under all other alternatives. Development outside of UGAs would be consistent with existing ordinances that regulate the scale and type of development appropriate for rural and resource lands, similar to the other alternatives.

d. Alternative 4

Alternative 4 would likely have the second-highest impact of all the alternatives on surface waters by surrounding them with urban growth. It would have the least impact of all alternatives except Alternative 3, in terms of projected new impervious surface. Most growth would occur around Vancouver and Battle Ground. Approximately 33 miles of streams (19 miles of unnamed streams and tributaries) would be added to UGAs, one-third the impacts under Alternative 1 but slightly greater than stream impacts under Alternatives 2 and 5. Major streams and their floodplains that would be urban streams under this alternative include Lacamas Creek, Gee Creek, Curtin Creek, Mill Creek, Salmon Creek, Weaver Creek, and Whipple Creek. Salmon Creek would be most affected under this alternative, with around five miles of this stream being brought into the new UGAs of Battle Ground and Vancouver. In addition, the City of Battle Ground UGA would extend to 500 feet from the East Fork Lewis River, with industrial uses in the area. About two miles of Lacamas Creek would be added to the UGA of Camas. As would be expected, the acreage of floodway and flood fringe areas brought into new UGAs would also be the second-highest compared to other alternatives, at over 1,000 acres. This alternative also has the second-highest potential to affect shorelines, with 480 acres of shoreline added to new UGAs. Land surrounding these streams is primarily rural and would be converted to commercial, industrial, mixed use, and residential development.

Nearly 3,100 acres of impervious surface would result from full development of the new UGAs, similar to impacts under Alternatives 2 and 5. Approximately 49 percent of this new impervious area would be from industrial development and 10 percent from commercial development in the Vancouver urban area. Residential development in Battle Ground would contribute the second largest amount—around 21 percent—to the total new impervious surface under this alternative, with the bulk of it coming from multi-family development. Industrial development in Battle Ground's new UGA would contribute another 11 percent, while industrial development within Camas' expanded urban area would constitute 6 percent of the total. Another 9 percent would come from industrial development there. Residential development in Washougal's expanded UGA would contribute about 7 percent to the total of new impervious surface in this alternative.

e. Alternative 5

In terms of surface waters brought into new UGAs, Alternative 5 would have the least impact of all the alternatives except Alternative 3. Its impacts in terms of projected new impervious surface would be second-highest after Alternative 1, but would be about half the impact of that alternative. Under Alternative 5, approximately 32 miles of streams (23 miles of unnamed streams and tributaries) would be included in new UGAs. New UGAs under Alternative 5 would include the least amount of floodplain area of any of the expansion alternatives. This alternative would add about 35 acres of floodway and 230 acres of flood fringe to these new UGAs. Major streams and their floodplains that occur within new UGAs under Alternative 5 include Gee Creek, Mill Creek, Salmon Creek, and Whipple Creek, with Gee and Mill creeks being the most affected, with about three miles and two miles brought into urban areas, respectively.

Nearly 3,400 acres of impervious surface would be added to UGAs, similar to impacts under Alternatives 2 and 4. Most of the new impervious area—around 47 percent—would be from industrial development in Vancouver (14 percent), Battle Ground (11 percent), Ridgefield and La Center (7 percent each), and

Camas (6 percent). Commercial development in the Vancouver urban area would contribute another 2 percent. The other half of new impervious surface would result from residential development in Vancouver and Battle Ground (23 percent each). New residential development in Camas would contribute about 5 percent.

3. Mitigation

Concern for mitigating the impacts to surface waters has been a part of the SEPA and GMA regulations since their adoption. Consequently, all jurisdictions in the county have policies and ordinances that address these impacts. Clark County and the cities have adopted wetland protection ordinances and/or critical areas ordinances to comply with the GMA mandate to protect environmentally critical areas, including wetlands, fish and wildlife habitat (streams and lakes), and floodplains. Vancouver, Clark County, Camas, La Center, Ridgefield and Washougal have also adopted Shoreline Master Programs to protect shorelines. As WDOE is currently revising its regulations for shorelines in light of recent ESA requirements, many jurisdictions are in the process of reviewing or revising their shoreline master programs but have taken a cautious approach, as interpretations of the new rules are being tested in the courts and through regulatory review by WDOE.

Stormwater and erosion control regulations that reduce impacts to surface waters from stormwater runoff are implemented in all jurisdictions as well. Recent listings of threatened fish species have required all jurisdictions with fish-bearing streams to re-evaluate water quality protection and habitat restoration for those streams. Revisions of existing ordinances to comply with ESA, such as incorporating measures for using "best available science" as required by recent amendments to the GMA, are currently underway for most jurisdictions.

a. Plans and Ordinances

Clark County: County measures to mitigate the impacts of development to surface waters consist of existing and proposed comprehensive plan policies and implementation ordinances. Goal 6.4 from the County's comprehensive plan provides for the development of a long-range stormwater management program to minimize impacts to surface waters and groundwater. Policies 6.4.3 and 6.4.6 call for planning at the stormwater basin level. The County's erosion control ordinance (CCC 13.27) and stormwater ordinance (CCC 13.29) reduce potential impacts on surface waters from sedimentation and runoff from new impervious surfaces. The new standards contained in the *Stormwater Management Manual for Western Washington*, introduced by DOE in 2001, will require updating of the standards in CCC 13.29 to maintain equivalency. In proposed Chapter "Z" (Environment), the County has indicated that it will do this. Most of the relevant policies in the existing comprehensive plan have been incorporated into the proposed new environment element of its comprehensive plan. Policy Z.1.8 protects surface and groundwater quality for all uses. Policy Z.1.9 reduces the risk to life and property by prohibiting development in the floodway and protecting floodplain functions. Goal Z.5 provides for a long-range stormwater management program to minimize impacts. In particular, Policies Z.5.1 through Z.5.3 call for stormwater basin planning, adoption of standards similar to those in the *Stormwater Management Manual for Western Washington*, and review standards for controlling the quality and quantity of runoff. Goal Z.7 deals with shorelines and policy Z.7.1 requires the County to reevaluate its master program for consistency with GMA and the revised Growth Management Plan to ensure consistency.

Clark County's water quality ordinance (CCC Chapter 13.26A) protects the county's surface and groundwater quality by establishing requirements for reducing and controlling the discharge of contaminants and stormwater flows. The ordinance prohibits the discharge of contaminants to surface water and groundwater and requires the use of best management practices.

Clark County's stormwater and erosion control ordinance (CCC Chapter 13.29) seeks to do the following: prevent surface and groundwater degradation; minimize erosion and control sediment; protect the quality of waters; maintain existing groundwater levels, in-stream flows, and available water supply volumes; and further the County's goals of no net negative impact caused by the quantity of runoff entering streams and no net negative change in the quality of runoff entering streams through the implementation of best management practices (BMPs). The ordinance establishes design standards of stormwater facilities, prescribes specific best management practices that are to be used, and lists development requirements.

The County's Flood Plain Combining District (CCC 18.327) establishes standards and a review process for proposed development within the floodplain. This overlay zone is applied to all 100-year floodplains identified on the Flood Insurance Rate Maps. The construction or reconstruction of residential structures is prohibited in the floodway under this ordinance. Flood Insurance Study maps are being updated with input from DOE. The County has developed policies for critical areas to preserve wetlands and flood plains and protect against floods, but they do not prohibit all development in flood hazard areas.

Clark County's new Clean Water Program, which went into effect on January 1, 2000, allows Clark County to carry out additional work to control and treat stormwater to meet state and federal standards for clean water, particularly the requirements of the County's NPDES permit.

Battle Ground: Chapter II of Battle Ground's 1995 comprehensive plan addresses natural resources, including critical areas. Goal 1 of Chapter II includes the protection of surface water quality as part of protecting and improving the quality of life. Policies 1-A through 1-H address different aspects of water quality, including minimizing erosion, classifying wetlands, establishing a wetlands/watershed management program, and using water efficiently. Goal 4 establishes regulations for development in the 100-year floodplain. Policy 4-A sets standards for floodplains consistent with FEMA.

Draft goals and objectives under Goal 5 (Environment) adopted in December 2001 include the protection of critical areas (EG4) and the creation of a critical areas ordinance to meet state and federal requirements. New goal EG6 states that the city will enhance and protect water quality. Policies to reduce stormwater runoff with improved development practices and code requirements that reduce the amount of impervious surface in new developments. Other policies call for the on-site treatment of stormwater, where feasible, to reduce impacts from erosion.

Chapter 18 of Battle Ground's municipal code establishes the following goals: (1) No net negative impact caused by quantity of runoff entering streams, and (2) No net negative change in stream quality as a result of runoff entering streams through the implementation of best management practices. Chapter 13.137 from the city's municipal code regulates discharge of runoff into the city's stormwater system, ensuring that an adequate amount of pre-treatment occurs prior to water entering the city's treatment facilities. Protection of wetlands and regulation of stormwater runoff are contained in Chapter 18, Environmental Protection.

Camas: The Camas comprehensive plan identifies critical areas in its "Background" section and protects critical areas such as surface waters through its Open Space designation of wetlands. Land use regulations to protect wetlands, streams, and watercourses are included in Chapter 18.31 of the Camas zoning code. Camas' zoning ordinance protects streams with a classification system and standard buffers. Wetlands are also protected by a buffer system. Chapters 15.28 and 15.32 of the zoning code regulate development in flood hazard areas and erosion control, respectively. Permits for construction are required in flood hazard areas as identified on FEMA maps for Camas. Chapter 15.32 adopts by reference the *Stormwater Management Manual for Western Washington*. Camas also has an approved Shoreline Master Program, as adopted by Chapter 18.88 of the zoning code.

A proposed new Environmental Element contains several goals and policies aimed at preserving and enhancing water resources, including wetlands, shorelines, watersheds, and waterways (Goal EN3, EN4, EN5). Goal EN6 calls for reclaiming and restoring shoreline areas that are degraded. Policies EN8 through EN13 deal with protecting surface water quality; restoring and maintaining the health of the watershed; maintaining the water storage capacity of 100-year floodplains; conserving high quality wetlands; and preserving aquatic and riparian habitats in a natural state.

La Center: The La Center comprehensive plan generally protects critical areas with a policy requiring the city to ensure that those areas are adequately protected from development. A second policy states that land use designations and development activities are compatible with the city's Shoreline Master Program. Title 14 of the La Center Municipal Code, Land Use and Environmental Regulation, contains regulations for the protection of wetlands (14.05), and stormwater and erosion control (14.10). The municipal code also has a Flood Hazard Area section in Title 17 (Zoning) that uses a combining district to require permits for development in flood hazard areas.

Ridgefield: Goal 10 from Ridgefield's comprehensive plan provides for key public utilities, including storm drainage. Policy 10.9 calls for new development to be consistent with the city's and County's long-range stormwater management plans and programs, including the *Stormwater Management Manual for Western Washington*. Off-site water quality and quantity impacts are to be controlled through appropriate design and best management practices. Stream channels and wetlands are to be protected and erosion and sediment controls are required. Chapter 18.280 of the Ridgefield Municipal Code regulates sensitive lands, including wetlands, riparian areas, and frequently flooded areas. The ordinance establishes buffers based on water body features and requirements for delineating those features. It also provides for density transfers to avoid development in those areas.

Vancouver: Vancouver's Policy P19 calls for planning land uses to avoid hazard areas, including floodplains. Policy P20 states that all shoreline developments, uses, and activities should avoid or minimize impacts on the environment. Policy P21 preserves or enhances water quality. Policy P22 calls for protecting and enhancing wetland areas within the UGA in conformance both the city and County wetlands ordinances. Implementation measure IM 24 calls for establishing management programs for surface water resources. IM 26 requires the review and revision of the Shoreline Management Master Program. The new program was revised and became effective in 1997. The city's zoning code also implements the comprehensive plan policies through Chapter 20.50 (Wetland Protection), which sets a wetland rating system and buffer widths and requires wetland permits. Chapter 20.51 contains regulations for mapped floodplains and regulates development in areas of special flood hazards under the Floodplain Combining District designation. The city also has erosion control regulations that protect surface water quality. In 2003, Vancouver adopted a new Water Resources Protection Ordinance (VMC 14.26) that provides protection for both surface and groundwater.

Proposed revisions to the comprehensive plan include policies for sustaining healthy ecosystems, protecting riparian areas, wetlands and other fish and wildlife habitat, protecting and enhancing surface, storm, and ground water quality. Other Vancouver code sections that help manage stormwater quality and quantity include the Stormwater and Groundwater Protection sections of Title 14, Tree Preservation (20.96), and SEPA policies related to ESA.

Washougal: Chapter II of Washougal's comprehensive plan, Natural Resources and Critical Areas, contains policies for protecting surface water. Goal 1 of the Critical Areas section of Chapter II includes the protection of surface water quality as part of protecting and improving the quality of life. Policies 1-A through 1-G address different aspects of water quality, including minimizing erosion, classifying wetlands, establishing a wetlands/watershed management program, and using water efficiently. Goal 4 establishes regulations for development in the 100-year floodplain. Policy 4-A sets standards for development within

floodplains that is consistent with FEMA. Development within high value wetlands is managed in accordance with the city's wetland protection ordinance.

b. Additional Mitigation

Additional measures that could be adopted include the following:

1. Select a growth pattern that minimizes the urban footprint and directs growth away from wetlands, stream corridors, and shorelines.

2. Prohibit development involving impermeable surfaces in flood hazard zones unless required for a water-related use, resource land management (consistent with the Forest Practices Act), or development beneficial to the public which could be appropriately mitigated.

3. Acquire undeveloped flood plain areas (particularly wetlands) as open space. Other jurisdictions could consider adoption of funding mechanisms permitted by the GMA for this purpose.

4. Permit filling of flood plain areas only when it can be shown to be beneficial to the public (e.g., trails) and is mitigated in an appropriate manner.

5. Establish stormwater management districts to fund and implement stormwater collection and treatment programs in each watershed or basin.

6. Establish development standards for flood plains which preserve the functional values of the flood plain and minimize impacts to properties upstream and downstream of the development. Development in flood prone areas should be clustered and located away from the floodway.

B. Groundwater and Aquifer Recharge Areas

1. Setting

Groundwater is the source of over 95 percent of the water used by businesses and residents within Clark County. Although most of the county's groundwater is of good quality, there are areas where it has been degraded or contaminated due to human activities. Groundwater contamination often occurs where water demand and consumption are greatest.

The GMA requires jurisdictions to identify and protect critical aquifer recharge areas, which are "areas with a critical recharging effect on aquifers used for potable water." Groundwater quality protection is crucial because, once contaminated, aquifers are almost impossible to restore and the costs associated with restoration can be prohibitive. Counties and cities must regulate development to preclude incompatible uses in critical recharge areas. The GMA also suggests that jurisdictions consider the availability of groundwater when planning for growth management.

Clark County, working with the US Geological Survey, has gathered and analyzed information describing groundwater conditions in the county in "Geology and Groundwater Resources of Clark County, Washington" (Water Supply Bulletin No. 9, M.J. Mundorff, USGS, 1960). The results of their analysis showed the following:

- All of Clark County can be considered an aquifer recharge area, as groundwater lies beneath virtually all populated areas and is used as drinking water.
- Many of the urban portions of Clark County are moderately to highly vulnerable to groundwater contamination. Areas of special concern are urban, residential, industrial, and commercial land uses; developed urban areas without sanitary sewers; urban areas with stormwater disposal wells

(drywells); areas near sites of known groundwater contamination; and areas where shallow aquifers underlie urban development.

- Areas that require protection include drinking water supply areas for public supply wells (wellhead protection areas), critical aquifers, and 50-year recharge areas for critical aquifers and wellhead protection areas.

a. Recharge Areas

Shallow aquifers provide drinking water in most of the county. These shallow aquifers receive recharge directly from the land surface as rainfall and snow melt infiltration, and as infiltration from rivers and other surface water bodies. Urban areas, such as southern Clark County, afford little opportunity for recharge because most surfaces are impervious and therefore prevent precipitation from entering the soil. A significant part of recharge in urban areas is from drywells and septic systems. Deeper aquifers are primarily recharged by groundwater moving downward from more shallow aquifers. The risk that aquifers will be degraded by contaminants released at the land surface is greatest in areas, such as Clark County, where water moves downward from the land surface to the more shallow aquifers.

The significance of an aquifer as a drinking water source increases as the number of people using the aquifer increases. Aquifers used as potable water sources have been mapped by the County by comparing the distribution of wells with aquifer extent.

The principal aquifers in Clark County are the Troutdale gravel aquifer (upper Troutdale Formation) and the unconsolidated sedimentary aquifer. Most of the wells in Clark County are in the Troutdale Formation. A deeper sedimentary unit, about which less is known, is also a significant water source in some areas and supplies water to several wells owned by Clark Public Utilities (CPU) and the City of Vancouver.

b. Vulnerability Assessment

Areas most likely to have existing or future groundwater contamination are described as highly vulnerable. Activities in highly vulnerable areas should be managed to minimize the risk of groundwater contamination. Clark County has performed a vulnerability assessment of its groundwater resources. Vulnerability was determined by compiling weighted rating values for each vulnerability factor (susceptibility, land use, and artificial recharge). Figure 21 shows areas with high, medium, and low susceptibility to groundwater contamination.

Several methods of assessing susceptibility have been applied in Clark County. The DRASTIC method of assessment considers factors such as the depth to water, net recharge, aquifer media, soil media, topography, impact of the vadose zone media, and hydraulic conductivity of the aquifer.

A number of factors are considered when assessing contaminant loading potential. They include land use, population density, transportation corridors, known sites of contamination, solid waste disposal sites, underground storage tanks, and potentially contaminated recharge sources, such as areas with drywells, septic systems, and land application of animal waste. Table 13 summarizes contaminant loading potentials for land uses.

Table 13. Contaminant Loading Potential Ratings for Existing Land Use

Land Use	Urban/Industrial Rating	Agricultural/Nutrient Rating	General Rating
Forest	Low	Low	Low
Agriculture	Low	High	Medium
Commercial Service	High	Medium	High
Commercial Retail	Medium	Medium	Medium
Commercial Highway	High	Medium	High
Commercial Freeway (motel, hotel, RV, etc.)	Medium	Low	Medium
Heavy Industrial and Mining	High	Medium	High
Light Industrial	High	Medium	High
Public Facilities	Medium	Low	Medium
Parks, Schools, Recreation	Low	Medium	Medium
Institutional	Medium	Medium	Medium
Single-Family Residential	Medium	Medium	Medium
Duplex Residential	Medium	Medium	Medium
Multi-Family Residential	Medium	Medium	Medium
Rural Residential (<2.5 ac. lots)	Low	Low	Low
Roads	Medium	Medium	Medium
Vacant	Low	Low	Low

Source: Clark County Water Division, as cited in *Final Supplemental Environmental Impact Statement for the Growth Management Plans of Clark County, Battle Ground, Camas, La Center, Ridgefield, Vancouver, Washougal and Yacolt, September 1994*.

Point Sources. Point sources are discrete, inventoried, or permitted sites where activities or facilities that pose a risk to groundwater quality exist or may have existed. Clark County has mapped and compiled data for known contamination sites, inventoried storage tanks, and solid waste disposal sites.

Animal Waste Application Areas. Animal waste and wastewater from dairy facilities and other farming operations is routinely sprayed or spread onto fields. These wastes contain plant nutrients and other pathogenic microorganisms that, under optimal conditions, are utilized by field crops or trapped in soil. However, if application rates are higher than crop consumption rates, contaminants such as nitrate can move through the soil into groundwater.

Artificial Recharge. Artificial recharge can occur through irrigation, wastewater disposal, and stormwater disposal. In Clark County, the primary sources of artificial recharge are drywells and septic systems. Other sources include irrigated agriculture, land application of wastewater, and stormwater infiltration ponds.

c. Critical Groundwater Resource Areas

Under the GMA, critical groundwater resource areas are to be designated for special protection through critical areas ordinances. These areas include wellhead protection areas and critical aquifers recharge areas (CARA).

d. Wellhead Protection Areas

Wellhead protection programs protect drinking water quality by managing aquifers critical to public drinking water supplies. There are currently 55 public-supply wells within the county. Figure 22 shows wellhead protection areas.

e. Critical Aquifer Recharge Areas

Because 95 percent of the county's drinking water comes from groundwater sources, it is important that critical aquifer recharge areas be identified, mapped, and protected. Clark County has designated and mapped critical aquifer recharge areas (CARAs) used for potable water to fulfill obligations of state law under the GMA, Washington State Wellhead Protection Program, and the Water Quality Standards for Groundwater of the State of Washington. Lands proximate to public and private water supply wells (well fields) are subject to source control regulations designed to prevent uses that would negatively impact the public water supply. CARAs are defined as either Category I—the highest priority critical aquifer area—or as Category II—unconsolidated sedimentary aquifers and the Troutdale gravel aquifer.

2. Impacts

Assessing impacts to groundwater resources is closely related to other areas of impact analysis, including surface water, geology, and soils. The major water-bearing geologic formations (aquifers) are identified as related to soils and geologic characteristics. Flow and quantity characteristics of groundwater are dependent on local surface and geologic conditions. Sources of groundwater recharge—precipitation, snow melt, subsurface inflow, seepage from rivers and streams—are also related to local surface and geologic characteristics.

Typical impacts on groundwater from development and urbanization include the interception of the water table or other changes brought about through earthwork, blasting, and other activities that alter the flow, recharge, or other hydrological conditions. Substantial new demand and use of groundwater can cause local or regional drawdowns. Another factor affecting groundwater supplies is the creation of impervious surfaces within recharge areas. By covering the recharge area with impermeable surfaces, the total area available for water percolation through the soils to the underlying aquifer is reduced. As a result, the amount of water reaching the aquifer is reduced. Cumulative impacts from impervious surfaces are particularly important to consider. Groundwater recharge areas are seldom lost all at once. Recharge areas are covered by impervious surfaces little by little, until there is a significant overall effect.

An increase in impervious surfaces can contribute not only to impacts on groundwater quantity, but can also impact groundwater quality. Possible water quality effects on groundwater may include increases in suspended solids from erosion or in chemical contaminants through rapid runoff from impervious surfaces.

Each alternative under consideration accommodates projected population growth over the next 20 years. Growth and development will increase the demand for water from existing groundwater sources and new wells will be needed. The increased draw from groundwater will occur regardless of which alternative is selected, because increased demand is related to increased population and employment rather than development patterns. However, development patterns, which do differ under the various alternatives, may influence where new wells are located, how much and where new impervious surfaces will restrict recharge, and the particular groundwater sources that are drawn upon.

The following assessment of impacts to groundwater resources in Clark County looks primarily at the amount of impervious surface area that each alternative would add (Table 14), the occurrence of existing wellhead protection areas within new UGAs (Table 15), and the type of development that is proposed for the new UGAs, since different land uses involve different contaminant loading potentials. All new UGAs would eventually develop as planned and most land proposed for conversion to urban uses is currently in rural residential, agriculture, or urban reserve uses (low densities with low to medium contaminant ratings). Consequently, the ratings for contaminant loading potential under all of the expansion alternatives would generally be from low or medium ratings to medium to high ratings based on proposed urban residential, industrial, commercial, and transportation uses.

Potential impacts to the public water supply are discussed in the Public Facilities and Services section.

Table 14. Acres of New Impervious Surface by Alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Residential			[No new UGA areas; no additional impervious surface]		
Vancouver	3,812	1,513		20	756
Camas	161	63		71	151
Battle Ground	1,911	522		638	756
Washougal	134	220			
Ridgefield	45	36			
La Center	120				
Industrial					
Vancouver	869	494		1,515	479
Camas	198	49		159	212
Battle Ground	25	287		381	371
Ridgefield	147				219
La Center	127				248
Washougal					74
Commercial					
Vancouver	55			300	87
Camas	18			14	2
Battle Ground	103	6			
La Center	6				
Total	7,730	3,190		3,098	3,355

Source: Clark County Department of Assessment and GIS

Table 15. Acres of Wellhead Protection Areas within Expanded UGAs by Alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Battle Ground	5,479	2,611	[No new UGAs]	5,337	3,841
Camas	2,487	344		1,986	873
La Center	1,101	0		63	470
Ridgefield	506	217		0	419
Vancouver	18,893	5,960		5,152	6,553
Washougal	375	613		14	144
Total	28,841	9,745		12,552	12,300

Source: Clark County Department of Assessment and GIS

a. Alternative 1

Alternative 1 would have the greatest potential impact to the county's groundwater resources because it would accommodate the most population growth of any of the alternatives. Alternative 1 assumes an annual growth rate of 1.83 percent (each of the other alternatives assumes a 1.5 percent growth rate), which would add 160,499 residents by 2023. Because this alternative assumes a higher growth rate, demand for groundwater within the county would be greater than under the other alternatives. This alternative would also see the largest expansion of UGAs and would add the most impervious surface area (7,730 acres), which would increase stormwater runoff and the potential for groundwater contamination. Under this alternative, most development within expanded UGAs would be for residential uses. Based on County GIS estimates, there are 28,841 acres of wellhead protection areas that are included in proposed

expanded UGAs under Alternative 1. This area has been calculated by establishing a 1,000-foot buffer around major public supply wells.

b. Alternative 2

Alternative 2 would see the county's population increase by 115,762 residents, 44,737 fewer residents than under Alternative 1. This alternative would add only about one-third of the land area to UGAs—9,749 acres, compared to 28,845 acres under Alternative 1. It would also add less impervious surface, about 3,190 acres. As a result, stormwater runoff and the potential for groundwater contamination from this runoff would be reduced. Alternative 2 would include around 9,745 acres of wellhead protection areas within new urban growth areas. Again this area was determined by establishing 1,000-foot buffers around major public supply wells.

c. Alternative 3

Alternative 3 would not expand UGAs. Projected population growth over the next 20 years—115,762 new residents by 2023, the same as Alternatives 2, 4, and 5—would be accommodated within existing UGAs. Because this alternative would not convert land outside of existing UGAs to urban uses, impacts associated with the addition of impervious surfaces—stormwater runoff, groundwater contamination, and reduced recharge potential—would largely be avoided.

d. Alternative 4

Alternative 4 would see 12,554 acres added to UGAs in order to accommodate the projected 115,762 new residents by 2023. There would be approximately 3,098 acres of new impervious surface within new UGAs, about the same as Alternatives 2 and 5 but substantially less than Alternative 1. Whereas Alternatives 1 and 2 would see primarily residential development in new UGAs, this alternative would include mostly commercial, industrial, and mixed-use development, which differ from residential development in their contaminant loading potential and can have more significant impacts to groundwater resources. Under Alternative 4, expanded urban growth areas would include around 12,552 acres of wellhead protection areas, about the same as Alternative 5 but substantially less than Alternative 1.

e. Alternative 5

Alternative 5 adds around 12,303 acres to UGAs, which is less than half the acreage added under Alternative 1 but about the same as under Alternative 4. Most development within new UGAs would be residential, office/business park, and commercial development. This alternative would result in about 3,355 acres of additional impervious surface, which is similar to Alternatives 2 and 4 but significantly less than Alternative 1. About 12,300 acres of wellhead protection areas (calculated by establishing a 1,000 ft. buffer around major public supply wells) would be added to UGAs.

3. Mitigation

Mitigation for potential impacts to groundwater resources consists of comprehensive plan policies that place a priority on protecting groundwater quality from source and non-source pollutants. Comprehensive plan policies also focus on aquifer recharge areas by requiring infiltration of collected stormwater on-site, where feasible, and protecting open space areas that help to recharge the large aquifers in Clark County. Regulation of septic systems is through the Clark County Department of Health (formerly Southwest Washington Health District).

a. Plans and Ordinances

Clark County: Clark County is proposing a new element in its comprehensive plan to address environmental issues, including the protection of groundwater. Goal Z.1 would address the protection and

conservation of environmentally critical areas. The associated policies call for updating maps of critical areas, updating regulatory and incentive programs for their protection, and protecting ground and surface water quality through the minimization of impervious surface areas and a reduction in the application of animal wastes and toxic pesticides. Goal Z.4 requires sewer service within UGAs and discourages the use of septic systems. Policies under Goal Z.4 require regular inspections of on-site sewage disposal systems in wellhead protection areas, and the establishment of mandatory inspections of existing septic systems.

Clark County's wellhead protection program is implemented by the public works department. The program's goals include education, technical assistance, and incentive programs to protect groundwater; outreach to the business community through the Business Partners for Clean Water Program; and development of funding sources to implement the program.

The protection of critical aquifer recharge areas within Clark County is achieved, in part, through the County's critical aquifer recharge ordinance (CCC Chapter 13.70). The ordinance seeks to protect these areas from contamination through their identification, designation, and mapping and by establishing exempted, prohibited, and permitted activities within these critical areas. The ordinance also establishes a system of incentives—tax reductions for maintaining open space and land exchanges to locate high-use impacts outside of Category I areas—in order to protect critical aquifer recharge areas.

Other programs and ordinances within Clark County address groundwater and aquifer recharge area protection and management. Clark County's stormwater and erosion control ordinance (CCC Chapter 13.29) seeks to prevent ground and surface water quality degradation. The ordinance requires stormwater infiltration wherever soil conditions make it feasible. This preserves groundwater recharge when sites are covered with buildings and pavement. Stormwater regulations also require that this infiltrated stormwater be treated to remove pollutants.

Clark County's water quality ordinance (CCC Chapter 13.26A) seeks to protect the county's surface and groundwater quality by establishing requirements for reducing and controlling the discharge of contaminants and stormwater flows. The ordinance prohibits the discharge of contaminants to surface water and groundwater and requires the use of best management practices. This ordinance recognizes the importance of public awareness about how everyday activities can contribute to the degradation of groundwater and surface water quality. It also establishes a public education program to further this awareness within the county.

Battle Ground: Chapter II of Battle Ground's 1995 comprehensive plan addresses natural resources, including critical areas. Goal 1 of Chapter II includes the protection of groundwater quality and quantity as part of protecting and improving the quality of life. Policies 1-A through 1-H address different aspects of water quality, including the minimization of erosion, the establishment of a wetlands/watershed management program, and the efficient use of water. An implementation measure under Policy 1-B would establish regulatory policies regarding the protection of critical aquifer recharge areas. A second implementation measure under that policy recommends the adoption of the standards in the Stormwater Management Manual for Western Washington to protect groundwater quality.

Draft interim goals and objectives under Goal 5 (Environment) adopted in December 2001 include protection of critical areas (EG4), including aquifer recharge areas, and the creation of a critical areas ordinance to meet state and federal requirements. Protecting and improving the quality and quantity of drinking water resources is the focus of goals and policies in this section (EG5 and EO5.2). The city intends to create a critical aquifer recharge area ordinance (Policy EA5.1.1) and will encourage drinking water conservation.

Camas: Camas' proposed Environmental Element has general policies that protect natural resources and water quality. Goal EN3 is intended to preserve and enhance water resources. Policy EN14 is meant to

conserve and protect groundwater resources. Land use regulations to protect critical areas rely on site reconnaissance and individual site assessment of requirements. A new critical areas ordinance and land use regulations that are currently being drafted will identify and protect aquifer recharge areas.

La Center: The La Center comprehensive plan generally protects critical areas with a policy requiring the city to ensure that those areas are adequately protected from development. Areas with a critical recharging effect on aquifers used for potable water are considered critical areas. Title 14 of the La Center Municipal Code, Land Use and Environmental Regulation, contains regulations for water quality treatment (14.10.210) that protect against groundwater contamination from infiltration of stormwater flows.

Ridgefield: Ridgefield's comprehensive plan indirectly addresses groundwater quality by seeking to eliminate private sewer systems within the UGA, with the implication that better quality control can be achieved through the city's utility district. Goal 10 is meant to provide key public utilities, including water. Policy 10.3 states that the city will work with the County (and Health District, now under the County's jurisdiction) to eliminate private sewer systems within the UGA. Ridgefield adopts the standards of the Stormwater Management Manual for Western Washington, and the code states a preference for the use of infiltration for groundwater recharge (Policy 10.9(c)).

Ridgefield recently concluded an agreement with CPU to monitor the status of septic systems to prevent or reduce contamination of groundwater by failing systems. Chapter 18.280 of the Ridgefield Municipal Code regulates sensitive lands, including aquifer recharge areas and wellhead protection areas. The ordinance establishes buffers from features, requirements for delineating the features, and provides for density transfers to avoid development in those areas.

Vancouver: Vancouver's comprehensive plan contains several policies relating to water quality and supply. Policy P21 calls for all available means to be used to maintain or enhance groundwater and surface water quality. It also requires groundwater protection during mineral extraction operations and seeks to ensure the retention of enough open space for groundwater to be recharged. Implementation measure IM 24 calls for establishing management programs for surface and groundwater resources. IM 26 requires the city to review and revise ordinances for wellhead and aquifer recharge protection. In 2003, Vancouver adopted a new Water Resources Protection Ordinance (VMC 14.26) that provides protection for both surface and groundwater. It includes a comprehensive Wellhead Protection Program.

Proposed revisions to the comprehensive plan include policies for sustaining healthy ecosystems, protecting riparian areas, wetlands and other fish and wildlife habitat, protecting and enhancing surface, storm, and groundwater quality.

Washougal: Chapter II of Washougal's comprehensive plan, Natural Resources & Critical Areas, addresses natural resources, including groundwater. Goal 1 of the Critical Areas section of Chapter II includes the protection of groundwater quality and quantity as part of protecting and improving the quality of life. Policies 1-A through 1-G address different aspects of water quality, including minimizing erosion, establishing a wetlands/watershed management program, and efficiently using water. An implementation measure under Policy 1-B would establish regulatory policies regarding the protection of aquifer recharge areas. A second implementation measure under that policy recommends the adoption of the standards in the Stormwater Management Manual for Western Washington to protect groundwater quality.

b. Additional Mitigation

Additional measures could include:

1. Adopt a program (possibly including incentives) to identify private wells in the urban area and cap them to reduce the risk of contamination.
2. Revise building codes and design standards to encourage the use of pervious pavement and other technologies to improve on-site treatment and infiltration of stormwater.

V. FISH AND WILDLIFE HABITAT

A. Habitat

1. Setting

Clark County is one of the fastest growing and most heavily populated counties in the state. These conditions have increased impacts on a variety of resources, including fish and wildlife habitat and open space lands. Nevertheless, Clark County continues to support a variety of valuable wildlife habitat that ranges from the Douglas fir forests of the Cascade Mountains to the wetlands and riparian forests of the Columbia River Lowlands.

In recent years, several methods have been used to map and/or designate the county's highest priority habitat and critical/sensitive lands (e.g., high quality wetlands). The Clark County Open Space Commission Report from 2000 represents one effort to identify these areas. The Commission developed a three-tiered system for mapping habitat areas throughout the county:

- Tier 1: All endangered, threatened, and species of concern habitat as identified by WDFW Priority Habitat and Species Program. These include game, nongame, and fish species.
- Tier 2: Approximations for important generalized species habitat, including all wetland areas, areas within the 100-year floodplain, areas within 100 feet of all lakes, rivers, and streams, and big game winter ranges in the northeast corner of the county.
- Tier 3: All other undeveloped areas in Clark County

The maps that resulted from this effort identified priority wildlife habitat and open space areas within the county. These areas included the Vancouver Lake Lowlands, Steigerwald Lake Lowlands, major stream and river systems, including the North Fork Lewis River, East Fork Lewis River, Washougal River, Salmon Creek, Lacamas Creek, and Burnt Bridge Creek systems, and big game winter range in the foothills of the Cascades.

Two other important efforts that identify fish and wildlife habitat within the county include the GMA critical lands designation process and the Washington State Priority Habitat and Species Program (PHS). These efforts are described more fully below. Descriptions of specific significant fish and wildlife habitat areas within the county, such as floodplains, wetlands, and shorelines, can be found in separate sections of this document.

a. Clark County Critical Areas Designations

Wildlife habitat can be found throughout Clark County. However, only certain areas are designated and protected wildlife habitat. The County has identified and mapped priority habitat areas as part of the GMA planning process. Under the GMA, cities and counties are required to designate five types of critical areas: wetlands, frequently flooded areas, aquifer recharge areas, geologically hazardous areas, and fish and wildlife conservation areas (RCW 36.70A.170). In addition, in designating critical areas,

cities and counties must give "special consideration to conservation or protection measures to preserve or enhance anadromous fisheries" (RCW 36.70A.172).

b. Washington State Priority Habitat and Species (PHS) Program

Priority habitat "are those habitat types or elements with unique or significant value to a diverse assemblage of species." Priority habitats "may consist of a unique vegetation type or dominant plant species, a described successional stage, or a specific structural element." In addition, areas identified as priority habitats have one or more of the following attributes:

- Comparatively high fish and wildlife density
- Comparatively high fish and wildlife species diversity
- Important fish and wildlife seasonal ranges
- Important fish and wildlife movement corridors
- Limited availability
- High vulnerability to habitat alteration
- Unique or dependent species

Washington Department of Fish and Wildlife (WDFW) has identified and defined 18 priority habitats in Washington State. Eleven of these priority habitats are believed to occur in Clark County. Table 16 lists priority habitats within the county. WDFW has also identified specific priority habitat areas in Clark County. Table 17 lists these areas.

Table 16. Priority Habitat Found in Clark County

Priority Habitat	Forested/ Urban Area	Justification for Priority
Caves	forested, urban	Caves are defined as being large enough for a human to enter, however, some may have smaller entrances and larger interior areas; important breeding habitat; distribution is limited; susceptible to human disturbance; dependent species include bats, colonial nesting/roosting birds, large mammals.
Grasslands: Meadows	forested	Grasslands contribute to habitat diversity; vulnerable to disturbances such as grazing, road construction. Meadows are used seasonally by game mammals and other wildlife.
Oak Woodlands	forested, urban	Oak woodlands are defined as a minimum 5-acre stands of 20% to 50% oak in a mixed oak-conifer or pure stand with adjacent conifers; small stands acting as corridors or in riparian areas are important. Oak woodlands are being replaced by conifer plantations, grazing, residential development.
Old-Growth/ Mature Forest	forested, urban	Old growth/mature forest stands should be at least 36 acres; these forests provide for numerous and diverse species, but are limited and declining.
Riparian	forested, urban	Riparian areas offer significant species diversity; they provide connection to other habitats and provide travel corridors for many species; vital for breeding, rearing, and migration activities of fish species.
Snag Habitat	forested, urban	Areas defined by surveys, containing high densities of snags, or old burn, wind-damage areas; support a large number of cavity-dependent species.
Talus	forested, urban	Areas of homogenous rock rubble, composed of basalt, andesite, and/or sedimentary rock; they provide unique collection of species, including dependent species, vulnerable to road construction and quarry activities.
Urban Natural Open Space	urban	Areas can act as corridors connecting one habitat with another; areas can also be an isolated remainder of a natural habitat, usually larger than 10 acres, which is surrounded by urban development; these areas are unique and valuable, providing travel corridors and minimizing isolated areas.

Priority Habitat	Forested/ Urban Area	Justification for Priority
Wetlands	forested, urban	Wetland areas support diverse and numerous plant and animal species; dependent species such as waterfowl, the areas are vulnerable to disturbance and are declining.
Rural natural open space		Rural natural open space areas function as corridors connecting to other priority habitats, especially other areas that would be isolated. These areas often provide important nesting and breeding habitat.
Cliffs		Cliff areas provide important breeding habitat, are of limited availability, and are used by dependent species.

Source: State of Washington Department of Fish and Wildlife

Table 17. Priority Habitat Areas in Clark County

Area	Type of Priority Habitat
Lake Merwin and Yale Lake areas	game habitat
Lewis River Area	game, non-game, and fish habitat
Northeast County area, including Siouxon, Canyon, and Fly Creeks	game habitat
Portions of Northeast County, including Siouxon, Canyon, and Cedar Creeks	non-game habitat
Rock Creek area and East Fork of the Lewis River, from Rock Creek to Rogers Creek	game habitat
East Fork of the Lewis River from North Lewis River to Morgan Creek	non-game habitat
Gifford Pinchot National Forest including Cougar Creek and Boulder Creek areas	game habitat
Hogan Creek area	game habitat
Lacamas Creek from Lacamas Lake north to SR 500	game habitat
Lacamas Lake and portion of Lacamas Creek	non-game habitat
Steigerwald Lake area	game habitat
Salmon Creek from Lake River to Cougar Creek	game and non-game habitat
Post Office Lake area	game habitat
North Lancaster Lake area	game habitat
Portions of Columbia River area from Vancouver city limits to Lady Island, and from Camas/Washougal city limits to the east boundary of Clark County	non-game habitat
Vancouver Lake area north to Ridgefield Wildlife Refuge	non-game habitat
Columbia River	fish habitat
Washougal and Little Washougal Rivers	fish habitat
Gibbons Creek	fish habitat
Lake River	fish habitat
East Fork of the Lewis River and its tributaries of Jenny, Lockwood, Mason, Rock, and Cedar Creeks	fish habitat
Cedar Creek and its tributaries of John and Chelatchie Creeks	fish habitat
Salmon Creek and its tributaries of Mill, Woodin, Morgan, and Rock creeks	fish habitat

Source: State of Washington Department of Fish and Wildlife

2. Impacts

Impacts to fish and wildlife habitat are related to the spatial distribution of growth within the county that each alternative would implement. Generally, growth patterns that convert more land to urban uses are more likely to result in the loss and fragmentation of fish and wildlife habitat. Growth patterns that promote more compact development within existing UGAs are more likely to preserve this habitat, although more stress may be placed on terrestrial and aquatic habitat within urban areas as the level and intensity of development increase. Assessing impacts to fish and wildlife habitat primarily involves identifying priority habitat that occurs within the expanded UGAs of the different alternatives. Under any

of the alternatives, existing programs, policies, and regulations that provide protection to priority habitat and species would remain in place.

a. Alternative 1

Alternative 1 would see the greatest expansion of UGAs and the most land converted to urban uses. It can be expected that this alternative would have the greatest impact to fish and wildlife habitat of any of the alternatives. Most of the land that would be urbanized occurs around Battle Ground and Vancouver. Priority habitats that have been identified within the proposed expanded UGAs under this alternative include riparian zones, oak woodlands, urban natural open spaces, and wetlands. (Refer to Table 16 for an explanation of priority habitat types). Portions of Salmon Creek and its tributaries Mill Creek, Woodin Creek, and Weaver Creek would be brought into the UGAs of Battle Ground and Vancouver. These streams and the areas surrounding them provide fish, game, and non-game habitat. Other priority habitat areas that would be included in new UGAs include the Columbia River shoreline, Lacamas Creek and Lacamas Lake (Camas), the East Fork Lewis River (La Center), and Gee Creek (Ridgefield).

b. Alternative 2

Alternative 2 would see less land area converted to urban uses than Alternative 1, although most of this growth would occur, as with Alternative 1, around Battle Ground and Vancouver. As with Alternative 1, identified priority habitat types within the expanded UGAs of Alternative 2 include riparian zones, urban natural open space, wetlands, and oak woodlands. This alternative would include less of the Salmon Creek watershed in UGAs. Alternative 1 includes around 3.7 miles of this watershed within the expanded UGAs of Battle Ground and Vancouver. Under Alternative 2, this is reduced to approximately 1.2 miles. Priority habitat around Lacamas Lake and Lacamas Creek would not be included in the new UGA of Camas under this alternative. However, a portion of the Columbia River shoreline (approximately 1.8 miles) would be included. Whereas Alternative 1 includes around 4.7 miles of Gee Creek, which provides critical habitat to coho salmon and steelhead, under Alternative 2 only about 1.8 miles of stream would be brought into new UGAs.

c. Alternative 3

Alternative 3 would see no expansion of UGAs. All growth and development over the next 20 years would occur within current UGAs. This would result in fewer impacts to priority habitats in areas that, under each of the other alternatives, would be converted to urban uses. There would be fewer impacts to priority habitat areas under this alternative. Alternative 3 would also preserve the most agricultural, forest, and rural land. These lands often provide important habitat for wildlife, in addition to their other environmental functions and services.

d. Alternative 4

Alternative 4 would expand the UGAs of Battle Ground, Camas, La Center, and Vancouver to accommodate projected growth over the next 20 years. There would be no expansion of the UGAs of Ridgefield, Washougal, and Yacolt.

Priority habitats within expanded UGAs include riparian zones, urban natural open space, wetlands, and oak woodlands. This alternative would include the most linear feet of Salmon Creek (27,091 feet, or 5.1 miles) within new UGAs. Salmon Creek provides habitat for threatened salmon and game and non-game species. Alternative 4 would also see the urbanization of priority habitat around Lacamas Creek, Lacamas Lake, Mill Creek, Gee Creek, and the Columbia River. The expansion of Battle Ground's UGA would bring industrial development within 500 feet of the East Fork Lewis River, a priority watershed that supports steelhead and chinook, chum, and coho salmon. Industrial development within 500 feet of this stream could impact aquatic habitat by increasing stormwater runoff and reducing groundwater

infiltration and vegetative cover. Cumulative effects could be especially significant, since aquatic and terrestrial habitat areas within this river basin have already been negatively impacted by development.

Under Alternative 4, waterfowl concentration areas also occur within proposed UGAs. Priority habitat areas include caves, which can provide important nesting and breeding habitat. Alternative 4 includes the Green Mountain Cave, which is located on the southwest side of Green Mountain.

e. Alternative 5

Alternative 5 would direct much of the new growth over the next 20 years along the I-5 corridor, primarily for office/business park development. There would also be a significant expansion of Battle Ground's UGA. Priority habitat types within the expanded UGAs include riparian zones, urban natural open space, wetlands, and oak woodlands. Under Alternative 5, priority habitat within the Salmon Creek, Gee Creek, and Mill Creek areas would be included in new UGAs. However, this alternative, unlike Alternatives 1, 2, and 4, does not involve UGA expansion within the priority habitat areas of Lacamas Creek, Lacamas Lake, and the Columbia River shoreline.

3. Mitigation

a. Plans and ordinances

Mitigation for increased development in habitat areas consists primarily of the protection that is afforded by local regulations. Requirements for protecting critical habitats are found in the GMA, ESA, and the SMA. All Clark County jurisdictions have implemented requirements to protect critical areas, which include fish and wildlife habitat, but most are currently revising their ordinances to address the ESA listing of salmon and steelhead. Protection of shorelines and surface waters is discussed under the Surface Water section of this document. Compliance with GMA requirements is discussed in the GMA Conformance section. Most jurisdictions are in the process of complying with the ESA requirements, principally through amendments to the critical areas ordinances.

Clark County: Clark County is proposing to add a new chapter to its comprehensive plan that addresses fish and wildlife habitat and other critical areas. Goal Z.1 would protect and conserve environmentally critical areas. Policy Z.1.2 calls for incorporating watershed management and Priority Habitat Species data into local planning processes. Policy Z.1.3 would update the County's regulatory and incentive programs for the protection and conservation of critical areas, including wildlife habitat. Policy Z.1.4 encourages consistency among Clark County and its cities for critical areas mapping, mitigation strategies, and policy treatment. Goal Z.2 seeks to protect and recover endangered species in the county. Associated policies relate to updating and implementing the Habitat Conservation Ordinance with regard to the preservation of listed species. Goal Z.3 and its policies address the protection and recovery of salmonids.

Clark County and several cities are working with a consultant to develop a baseline of best available science prior to updating their critical areas ordinances. Other proposed amendments to the comprehensive plan include Goal 2.7, which outlines ways to protect, conserve, and recover salmonids within the county. Policies under this goal call for restoring and maintaining ecosystem conditions to support salmon and updating regulations to achieve the County's salmon-friendly vision, for example, by reviewing impervious surface limits, developing clustering provisions, conducting concurrent riparian and transportation corridor planning, and integrating water quality concerns into the planning process. Where appropriate, other chapters of the plan have been updated to reflect salmon habitat issues.

Chapter 13.51 of the Clark County Code (Habitat Conservation Ordinance) defines and provides a mapping framework for fish and wildlife habitat to be protected as GMA Fish and Wildlife Conservation Areas. Habitat areas include priority habitat and species sites as defined and mapped under the PHS

program and locally important habitat sites as defined and mapped under the code. CCC Chapter 13.51 also plays a role in the conservation of listed species. The ordinance establishes regulations for clearing and development activities within designated habitat areas. These areas include riparian areas, non-riparian areas, primarily within the eastern portion of the county, that support deer, elk, and bald eagle, and priority species point sites, which indicate individual threatened or endangered species locations, such as wildlife colonies and nesting areas. Policies in the Regional and Urban Parks Master Plan authorize purchase of sensitive lands, particularly habitat.

Battle Ground: Draft goals and objectives include Goal 5 (Environment), adopted in December 2001, to protect critical areas (EG4) and create a critical areas ordinance that meets state and federal requirements. Under goal EG7 (protection of endangered and threatened species), several policies detail the city's intentions to work with federal agencies to ensure future compliance with regulations. Actions include the following: inventorying streams for barriers to fish migration and developing a strategy to address the problems; identifying habitat areas where improvements can be made, and reviewing development codes and programs for compliance with ESA. Developing a critical areas ordinance to deal with ESA issues is ongoing at this time.

Camas: Fish and wildlife habitat would be addressed in Camas' new Environmental Element. Goals EN8 and EN9 protect critical areas, including fish and wildlife habitat conservation areas. Proposed Policy EN22 would preserve endangered, threatened, sensitive species and species of local importance. Aquatic and riparian habitats are to be protected in Policies EN23 and EN24. Camas's zoning ordinance, Chapter 18.31, establishes regulations for Environmentally Sensitive Areas and Open Space, which includes a designation of "Natural Open Space" for sensitive lands, including wildlife habitat. Project applicants submit studies from biologists that are used to determine what species are present, what impacts could occur, and what mitigation and conditions of approval should be implemented.

La Center: The La Center comprehensive plan generally protects critical areas, including fish and wildlife habitat conservation areas, with a policy requiring the city to ensure that those areas are adequately protected from development. In 2001, La Center adopted a critical areas ordinance that identifies fish and wildlife habitat conservation areas and requires conservation and/or enhancement while allowing density transfers to encourage urban densities. The regulations are applied through an overlay district.

Ridgefield: Chapter 18.280 of the Ridgefield Municipal Code regulates sensitive lands, including fish and wildlife habitat conservation areas. Under this ordinance, development is required to avoid critical areas unless certain criteria are met. Mitigation of impacts is required. The ordinance establishes buffers and building setbacks and provides for density transfers.

Vancouver: Vancouver modified its SEPA policies to include the 4(d) rule guidelines for protecting salmon habitat during development. Vancouver is working on a new fish and wildlife habitat ordinance in response to recent GMA and ESA requirements. The overall goal of the ordinance is to protect and provide properly functioning conditions for fish and wildlife, particularly threatened or endangered species. The ordinance will incorporate references to sources for "best available science." Hearings are anticipated for 2003. The city zoning code establishes a Fish and Wildlife Habitat Combining District that currently applies to areas in the Vancouver Lake Lowlands. Proposed development and mitigation of impacts in those areas must be approved by the city in consultation with other state and federal resource management agencies.

Proposed revisions to Vancouver's comprehensive plan include policies for sustaining healthy ecosystems, protecting riparian areas, wetlands, and other fish and wildlife habitat, protecting habitat for salmonids and other listed species and facilitating their recovery.

Washougal: Goal 5, Critical Areas, from the city's comprehensive plan addresses the protection of fish and wildlife habitat areas. It provides for the optimum number of game and nongame fish and animals by protecting through resource management those resource and open space areas that serve as habitat. Policy 5-B calls for protecting habitat to provide for optimum numbers of nongame wildlife for recreational and aesthetic opportunities, while keeping land use conflicts at a minimum. Policy 5-C identifies and protects special habitat areas. Goal 6 states the city will assist in the enhancement of the Steigerwald Lake National Wildlife Refuge.

b. Additional Mitigation

1. Federal, state, and local regulations for protecting habitat for threatened and endangered species and for the preservation of water quality will provide increasing protection for habitat that supports other species. Consistency of regulations among jurisdictions, connectivity of ecosystems, and limits on growth will continue to be important goals that provide additional mitigation.

2. Cities could establish a regional program to identify and protect priority habitat areas. This program could include transfer of development rights (TDR), purchase of the land using funds earmarked for that purpose, and property taxation, which recognizes the restrictions on development.

3. Most of the mitigation measures implemented for sensitive, threatened, and endangered species are in the form of regulatory requirements. Additional mitigation could be in the form of incentive programs, education, and taxation policies (in addition to the County's current use assessment program) that encourage the conservation of these species and the habitat upon which they depend.

B. Threatened and Endangered Species

1. Setting

Population growth and development within Clark County, particularly over the past decade, have resulted in the loss, degradation, and fragmentation of fish and wildlife habitat. The loss of habitat is particularly significant for some species, whose numbers have decreased precipitously during the past decade. Table 18 shows those plant species listed by the state and/or federal government as threatened or endangered. Table 19 shows fish and wildlife species that have been listed by the state and/or federal government as threatened or endangered.

In addition, numerous species that may be found in Clark County have been listed by the federal government as sensitive or candidate species. Sensitive species are those that are in decline and potentially eligible as candidates for listing. Candidate species have been proposed for listing as threatened or endangered. Table 20 lists sensitive and candidate species.

The Endangered Species Act (ESA) of 1973 provides the primary framework within which Clark County and its cities must work to address the conservation of federally listed threatened and endangered species. The County must comply with the ESA by ensuring that its policies, programs, and regulations do not result in harm to listed species, including harm to designated critical habitat. Of particular concern because of their dramatic decline is the listing of several species of salmon and steelhead. Table 21 shows fish species that have been listed as threatened and where these species are found within the county. The National Marine Fisheries Service (NMFS), now called NOAA Fisheries, issued its final 4(d) rules for these species in 2000 (steelhead) and 2001 (salmon). Section 4(d) of the ESA allows the U.S. Fish and Wildlife Service (FWS) or NOAA Fisheries to promulgate any regulation deemed necessary for the conservation of a threatened species. The "take" prohibitions of the ESA, which automatically extend to endangered species, do not apply to threatened species unless the FWS or NOAA Fisheries adopts a rule

under Section 4(d) of the Act. To "take" a listed species means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in such conduct." It also extends to the degradation of critical habitat upon which listed species depend. The 4(d) rules apply to new development and redevelopment in both rural and urban portions of the county.

Clark County's approach to salmon recovery has four main elements: a regulatory approach, which ultimately seeks 4(d) certification; an operational approach in which different County operations, such as road and park maintenance, are reviewed for their impact on salmon; an educational approach that raises awareness about how everyday activities can affect salmon and how the public can participate in salmon recovery efforts; and a regional approach in which the County joins with other jurisdictions to develop a comprehensive, coordinated salmon recovery strategy.

Clark County's program to obtain 4(d) certification under the municipal, residential, commercial, and industrial (MRCI) development limit involves several steps. MRCI development (and redevelopment) can have a significant impact on salmonid habitat and can injure or kill salmonids in a variety of ways. With appropriate safeguards, MRCI development can be specifically tailored to minimize impacts on listed salmonids and make additional federal protections under the ESA unnecessary. Under this particular limit, NOAA Fisheries can ensure that MRCI development and redevelopment are consistent with ESA requirements. The County's program to obtain 4(d) compliance certification includes the following elements:

- A review of its codes for ESA consistency and compliance.
- An analysis of the environmental baseline condition of all sub-basins in order to assess the effects of environmental ordinances and projected build-out on these areas and their continued ability to support salmonid populations.
- The development of specific remedies, such as overlay zones and implementing guidelines, which address any potentially significant impacts to listed species.
- A review of the 4(d) compliance program for its consistency with state and federal laws and permits.

At the state level there are various policies that indirectly work to provide some protection to threatened and endangered species. SEPA is the primary tool for assessing and mitigating the environmental impacts of a proposed action. The GMA includes a requirement to designate critical areas and adopt development regulations that protect these areas. Three of the five critical areas that local jurisdictions must identify are important for salmon survival: wetlands, fish and wildlife habitat conservation areas, and frequently flooded areas. Figure 23 shows fish and wildlife habitat conservation areas. The SMA provides a policy basis for addressing salmon habitat issues as a part of a management system for shoreline development. The local shoreline master program is considered to be an element of the comprehensive plan and development regulations and should be consistent with them. Finally, in 1999 the Joint Natural Resources Cabinet issued its report entitled *Extinction Is Not An Option: A Statewide Strategy to Recover Salmon*, which provides a general framework and guidelines for state agencies to follow in their salmon recovery efforts.

Vancouver's salmon recovery strategy is broad-based. Activities include modifying land use regulations, participating in regional salmon recovery, gaining support for restoration and preservation, modifying city operations to minimize negative impacts on salmon, and protecting habitat through easements and acquisition and education. Vancouver modified its SEPA policies to include the 4(d) rule guidelines for protecting salmon habitat.

Also important to the conservation of listed species within the county is the Priority Habitats and Species (PHS) list and the Species of Concern (SOC) list. A description of the PHS list is found in the previous

section, Fish and Wildlife habitat. The SOC list includes species listed as state endangered, threatened, sensitive, or candidate, as well as species listed or proposed for listing by FWS or NOAA Fisheries.

Table 18. Threatened and Endangered Plant Species within Clark County

Common Name	Botanical Name	Status
Golden Paintbrush	*Castilleja levisecta*	state endangered, federal threatened
Tall Bugbane	*Cimicifuga elata*	state threatened
Clackamas corydalis	*Corydalis aquae-gelidae*	state threatened
Oregon coyote-thistle	*Eryngium petiolatum*	state threatened
Western wahoo	*Euonymus occidentalis*	state sensitive
Howellia	*Howellia aquatilis*	state and federal threatened
Torrey's peavine	*Lathyrus torreyi*	state threatened
Great polemonium	*Polemonium carneum*	state threatened
Idaho gooseberry	*Ribes oxyacanthoides ssp irriguum*	state sensitive
Hairy-stemmed checker-mallow	*Sidalcea hirtipes*	state endangered
Bradshaw's lomatium	*Lomatium bradshawii*	state endangered, federal endangered

Source: Washington Natural Heritage Program, 2002.

Table 19. Threatened and Endangered Fish and Wildlife within Clark County

Common Name		Status
Gray wolf	*Canis lupus*	state endangered, federal endangered
Sandhill crane	*Grus Canadensis*	state endangered
Bald Eagle	*Haliaeetus Leucocephalus*	state threatened, federal threatened
Western grey squirrel	*Sciurus griseus*	state threatened
Chinook salmon	*Oncorhynchus tshawytscha*	federal threatened
Chum salmon	*Oncorhynchus keta*	federal threatened
Steelhead	*Oncorhynchus mykiss*	federal threatened

Source: Washington State Department of Fish and Wildlife, 2002.

Table 20. Sensitive and Candidate Fish and Wildlife Species within Clark County

Common Name		Status
Peregrine falcon	*Falco peregrinus*	state sensitive, federal candidate
Leopard dace	*Rhinichthys falcatus*	state candidate
Purple martin	*Progne subis*	state candidate
Cascade torrent salamander	*Rhyacotriton cascadae*	state candidate
Larch Mountain salamander	*Plethodon larselli*	federal candidate, state sensitive
Tailed frog	*Ascaphus truei*	federal candidate
Northern goshawk	*Accipiter gentilis*	state candidate, federal candidate
Pacific Townsend's big-eared bat	*Coryhorhinus townseddii*	state candidate, federal candidate
Coho salmon	*Oncorhynchus kisutch*	federal candidate
River lamprey	*Lampetra ayresi*	state candidate
Margined sculpin	*Cottus marginatus*	state sensitive

Source: Washington State Department of Fish and Wildlife, 2002.

Table 21. Distribution of Salmonid Fish Stocks within Clark County

Species	Location
Fall Chinook	Washougal River, East Fork Lewis River, North Fork Lewis River
Spring Chinook	North Fork Lewis River
Coho Salmon	North Fork Lewis River, East Fork Lewis River, Whipple Creek, Salmon Creek, Burnt Bridge Creek, Washougal River, Gibbons Creek, Lake River
Chum Salmon	East Fork Lewis River, North Fork Lewis River, Washougal River, Gibbons Creek, Columbia River, Columbia Slope streams
Summer Steelhead	East Fork Lewis River, Washougal River, North Fork Lewis River
Winter Steelhead	East Fork Lewis River, North Fork Lewis River, Washougal River, Burnt Bridge Creek, Salmon Creek, Whipple Creek Gibbons Creek, Lake River
Bull Trout	North Fork Lewis River, East Fork Lewis River, Lake River, Washougal River

Source: Washington State Department of Fish and Wildlife, 2002.

2. Impacts

The primary impact to fish and wildlife, including sensitive, threatened, and endangered (STE) species, would result from the conversion of habitat to urban uses in order to accommodate anticipated growth. This impact assessment looks at those listed species that have been found within areas that would be added to existing UGAs under each of the alternatives. For this assessment the Wildlife Heritage (HRTG) and Priority Habitats and Species (PHS) databases were consulted. Together these databases provide locational information on non-game species of concern and state- and federal-listed species, which include those designated as endangered, threatened, candidate, and monitor. Priority species include those state endangered, threatened, candidate, and sensitive species, animal aggregations considered vulnerable, and species of recreational, commercial, or tribal importance that are vulnerable. Under all of the alternatives, policies and regulations that preserve critical habitat and provide protection to listed species would remain in place.

a. Alternative 1

Alternative 1 would result in the largest expansion of UGAs of all the alternatives, adding 28,845 acres. Because this alternative would convert the most land to urban uses, it would likely have the most significant impacts on fish and wildlife habitat. Within the proposed expanded UGAs, two priority species have been identified: bald eagles and purple martins. Bald eagles, a state and federal threatened species, were identified in the Salmon Creek/Lewis River area. Purple martins, a state candidate species, were identified within an area that would include Camas' expanded UGA. Reticulate sculpins, a state monitor species, were identified in Lacamas Creek.

In addition to these terrestrial species, several species of threatened salmon and steelhead are found in waterways that either cross or are adjacent to new UGAs. Under Alternative 1 these waterways include Salmon Creek (coho salmon and steelhead), Whipple Creek (coho salmon and steelhead), East Fork Lewis River (chinook, coho, and chum salmon and steelhead), Gee Creek (coho salmon and steelhead), and Weaver Creek (coho salmon and steelhead). Under Alternative 1, approximately 34 miles of streams that support anadromous salmon would be brought into new UGAs. This is about the same amount as Alternative 4, even though Alternative 1 would add over twice as much land area.

b. Alternative 2

Alternative 2 would convert less land to urban uses than Alternative 1. This alternative would add 9,749 acres to UGAs. Most of this growth would occur between Battle Ground and Vancouver. Purple martins, a state candidate species, were identified within the proposed expanded UGA of Camas. State monitor species were also identified in areas that would see eventual urbanization. These species include osprey

and sand rollers (a small, range-restricted fish within the Columbia River), which were identified in areas that would be included within or adjacent to Camas' expanded UGA.

Less stream area would be included in expanded UGAs under Alternative 2. Nevertheless, some waterways that support threatened salmon would be included within these expanded UGAs. These include Gee Creek, Salmon Creek, Weaver Creek, and Whipple Creek, all of which support coho salmon and steelhead. Under Alternative 2, approximately 23 miles of streams that support anadromous salmon would be added to new UGAs.

c. Alternative 3

Alternative 3 would not expand UGAs. All growth and development over the next 20 years would be accommodated within existing UGAs. Because less land would be urbanized under this alternative, impacts to listed species would likely be reduced. However, confining growth within existing urban areas could intensify development within these areas and make the conservation of urban fish and wildlife habitat more difficult in the short term. Especially important habitat areas include the Vancouver Lake Lowlands, Columbia River shoreline, and Burnt Bridge Creek. Cumulative impacts to fish and wildlife habitat from further development in these areas could be particularly important, since these urban areas are already characterized by significant habitat modification from development.

d. Alternative 4

Alternative 4 represents a composite of the proposals from the cities of Battle Ground, Camas, La Center, Ridgefield, Vancouver, Washougal, and Yacolt for how they want to manage their growth. Some jurisdictions have requested an expansion of their UGA (Battle Ground, Camas, La Center, and Vancouver) and some have not (Ridgefield, Washougal, and Yacolt). A total of 12,554 acres would be added to UGAs. Under Alternative 4, the only priority species identified within the proposed expanded UGAs is the purple martin, a state candidate species. Nesting sites for these birds were identified within an area that would be included within Camas' new UGA. Sand rollers and osprey, both state monitor species, were also identified within this area.

Expanded UGAs under this alternative would include segments of streams that support threatened anadromous salmon and steelhead. These include Gee Creek, Mill Creek, Weaver Creek, and Salmon Creek, all of which support coho salmon and steelhead. Under Alternative 4, approximately 34 miles of stream that support anadromous fish would be included within new UGAs, about the same amount as Alternative 1.

This alternative would also see the most northerly expansion of Battle Ground's UGA, placing industrial development within 500 feet of the East Fork Lewis River. Accelerated runoff, reduced groundwater infiltration, and the removal of vegetation from development in this area could impact the aquatic habitat of the river and the health of threatened fish species—steelhead and coho, chinook, and chum salmon—that depend on this habitat.

e. Alternative 5

Alternative 5 would see UGAs expand by 12,303 acres, about the same as under Alternative 4. Within the proposed expanded UGAs of this alternative, the only species identified on the Priority and Habitat Species and Washington Heritage databases is the bald eagle, a state- and federal-listed threatened species.

However, several streams that support listed anadromous fish are found within areas that would see eventual urbanization. These streams include Whipple Creek, Weaver Creek, Salmon Creek, Mill Creek, and Gee Creek, all of which support coho and steelhead. Approximately 8 miles of streams that provide

habitat to anadromous fish would be added to UGAs under this alternative. This is about one-quarter of the amount of stream length that is included in expanded UGAs under Alternatives 1 and 4.

3. Mitigation

The Land Use Element of each jurisdiction's comprehensive plan contains policies to protect critical areas, including STE species. Plan policies and ordinances generally include STE species in their discussion of fish and wildlife habitat. Therefore, a discussion of mitigation measures for impacts to STE species is contained in the Fish and Wildlife Habitat section, of this document.

C. Migratory Species/Migration Routes

1. Setting

Clark County and the Lower Columbia region provide critical habitat for a variety of migratory fish and wildlife species. These include salmon and steelhead populations that have been listed or proposed for listing as threatened under the ESA, as well as some of the largest populations of migratory waterfowl, neotropical migrant birds, and shorebirds of the Pacific Northwest.

Historically, it is estimated that as many as 15-17 million adult salmon and steelhead returned each year to the Columbia River. Over time, these fish populations have declined drastically. Salmon and steelhead populations are now estimated to be less than 10 percent of their original size. Many individual stocks have been eliminated and others are severely depressed. In recent years, the number of chum salmon returning to the Columbia River have been less than one percent of historic high levels.

The Lower Columbia region now has the largest number of salmon and steelhead runs in the state of Washington listed or proposed for listing under the ESA. These include Lower Columbia chum (federal threatened), chinook (threatened), steelhead (threatened), sea-run cutthroat (proposed threatened), and coho (under review). Bull trout, a resident species, are also listed as federal threatened.

Collectively, Clark County streams support several naturally spawning stocks of listed salmon and steelhead. Streams supporting naturally producing anadromous fish populations include the Lewis River system, the Washougal River system, Salmon Creek, and other small tributaries. These streams provide critical habitat for spawning and rearing, and are essential to the overall recovery of Lower Columbia fish populations. Both the Lower Columbia Steelhead Conservation Initiative (LCSCI) and Washington Conservation Commission Limiting Factors Analysis identify Clark County streams as highly important to salmon recovery. The LCSCI identifies the East Fork Lewis and Washougal Rivers as "Tier II" streams; only the Wind and Kalama are rated higher priorities in terms of steelhead recovery in the Lower Columbia region. The largest Columbia River chum mainstem spawning site between Bonneville Dam and the mouth of the river is along the shore in Vancouver.

Clark County and the Lower Columbia River are located within an extensive migration route known as the Pacific Flyway that extends from the Bering Sea in Alaska along the Pacific Seaboard to South America. In addition, the wetlands and floodplains associated with the Columbia River, lower East Fork Lewis, and other tributaries are a key part of an area known as the Lower Columbia region, which extends downstream from Bonneville Dam to the Pacific Ocean.

The Lower Columbia's floodplain and wetland areas are highly important for migrating and wintering waterfowl, neotropical migrant birds, and shorebirds. These areas support the second largest wintering and migration populations on the Pacific Northwest Coast, the first being the northern bays of Puget Sound. Peak waterfowl numbers exceed 200,000 birds during migration, and the area regularly winters over 150,000 ducks, geese, and swans. The main puddle duck species are mallard, northern shoveler, American wigeon, northern pintail, and green-winged teal. The main diving ducks are canvasback, ring-

necked duck, and lesser scaup. In addition, the area provides important habitat for several sub-species of Canada geese: taverners, lessers, cacklers, duskys, Aleutians, and to a lesser extent Vancouvers. All subspecies listed within the region winter in substantial numbers with the exception of Aleutians and Vancouver Canada geese.

The Ridgefield National Wildlife Refuge and surrounding farm land and open spaces play an especially important role for migrating sandhill cranes, a state endangered species. The region serves as both a staging and wintering area for these birds, which often move between the Ridgefield National Wildlife Refuge and Sauvie Island.

The protected riparian communities of the Lower Columbia region provide excellent habitat for a mixed assemblage of neotropical migratory bird species. Although several species are transients, the Lower Columbia also supports one of the richest nesting neotropical bird communities in the Pacific Northwest. Twenty-six species of land birds utilize the forests for nesting, including several declining species in the Pacific Northwest: western wood pewee, willow flycatcher, purple martin, Swainson's thrush, yellow warbler, yellow-breasted chat, and black-headed grosbeak. In their lowland breeding range, all of these species are dependent on palustrine hardwood forests.

The Lower Columbia region is also seasonally important for migratory shorebirds. Twenty-five species of shorebirds have been recorded in the region. Most of the migratory shorebirds migrate along the coast staging in coastal tidal habitats such as Willapa Bay, Grays Harbor, and the bays of Puget Sound. However, the Vancouver Lake/Shillapoo Bottoms, Ridgefield National Wildlife Refuge, and Sauvie Island also provide important habitat for these bird species; the most common include long-billed dowitchers, dunlin, western sandpiper, common snipe, and yellow legs.

As part of the Pacific Flyway and Lower Columbia River system, Clark County provides critical habitat to a variety of fish and bird species. In addition, the county provides locally important migration corridors for terrestrial wildlife. These migration routes may include areas that are necessary for long-term shifts in wildlife species distributions, or that are used to facilitate movement to and from breeding habitats or summer and winter ranges. Examples include travel corridors that are used by frogs and salamanders moving to and from seasonal wetlands for breeding, or by big-game during movements between summer and winter ranges. It is important to maintain interconnected systems of habitat and open space lands, particularly river and stream corridors, in order to enhance seasonal migrations and the general movement of wildlife populations.

2. Impacts

Direct impacts from the different alternatives to migratory habitat and species would typically be those associated with the conversion of this habitat to urban uses. Those areas within the county that provide habitat suitable to migratory bird species are located primarily along the Columbia River, Vancouver Lake Lowlands, Shillapoo Bottoms, and Ridgefield National Wildlife Refuge. However, many other areas within the county also serve some habitat function for migratory bird species. These areas include rural and agricultural lands, parks and open space, and rural lands that birds use for resting. Waterways within the county that provide important migratory routes for anadromous fish include the Lewis River system, Columbia River, Washougal River, Salmon Creek, and various smaller tributaries.

This impact assessment looks at the extent to which expanded UGAs include land known to provide habitat to migratory species. It also looks at the extent to which each action alternative includes proposed development near waterways that serve as migration routes for salmonids. Development adjacent to streams and rivers can result in the degradation of water quality through erosion, sedimentation, accelerated stormwater runoff, and loss of riparian, wetland, or floodplain habitat. Migratory habitat was identified by using the Wildlife Heritage database.

No matter which alternative is selected, existing policies and regulations that protect water quality and critical environmental areas, which include habitat for migratory species, would remain in place. Many critical area ordinances are currently under review in order to provide greater protection for these areas. Nevertheless, each of the alternatives would likely result in some loss or degradation of habitat for migratory species. It is inevitable that as more land is converted to urban uses, habitat will become increasingly fragmented and migration routes to some degree disrupted.

a. Alternative 1

Alternative 1 would see the largest expansion of UGAs—around 28,850 acres. Proposed UGAs would include waterfowl concentration areas. These areas are identified as providing suitable habitat to migratory bird species over time. Alternative 1 would not directly impact areas identified as providing the most significant habitat to migrating bird species—the Vancouver Lake Lowlands, Shillapoo Bottoms, Ridgefield National Wildlife Refuge. However, Vancouver's UGA would be extended to an area adjacent to Green Lake and land just north of the Shillapoo wildlife area. This new UGA would see eventual residential development and, because of its close proximity to Green Lake and the Salmon Creek/Lake River area, could have some impact on migratory species.

Various streams that support anadromous fish are found within proposed as well. These include Salmon Creek and its tributaries, Whipple Creek, a portion of the Columbia River shoreline, East Fork Lewis River, and Gee Creek. Around 35 miles of streams that support anadromous fish species would be added to new UGAs under Alternative 1.

b. Alternative 2

Alternative 2 would expand UGAs by 9,749 acres, much less than Alternative 1, which expands urban areas by about 28,850 acres. Like Alternative 1, this alternative would include numerous waterfowl concentration areas. New UGAs would not impact those lands identified as providing significant habitat to migratory bird species, namely the Vancouver Lake Lowlands and Ridgefield National Wildlife Refuge.

Segments of streams that support anadromous fish would be added to UGAs under Alternative 2. These streams include Salmon Creek and its tributaries, a portion of the Columbia River shoreline, Gee Creek, and Whipple Creek. Around 23 miles of streams that support anadromous fish would be included within new UGAs under Alternative 2.

c. Alternative 3

Alternative 3 would accommodate all population growth within existing UGAs. This would lessen the impact to migratory waterways in rural areas. However, more intensive development within existing urban areas could place greater stress on urban waterways that support anadromous fish. These waterways include Burnt Bridge Creek, Salmon Creek, Washougal River, Gibbons Creek, Gee Creek, and the East Fork Lewis River. As development is contained within existing urban areas, waterways that either occur within or immediately adjacent to urban areas could see greater impacts, particularly from accelerated runoff from impervious surfaces. The magnitude and severity of environmental impacts from urban infill are generally less than those that result from the conversion of rural land to urban land.

Confining growth to existing UGAs would also preserve rural and agricultural land that would otherwise be converted to urban uses. These areas almost certainly provide some habitat function for terrestrial migratory species, and their conservation would avoid any impacts to migratory species that would result from their loss.

d. Alternative 4

Alternative 4 would add 12,554 acres to UGAs. This alternative, like each of the action alternatives, would include scattered waterfowl concentration areas, areas that provide suitable habitat to migratory species and that have served these species in this way over time. This alternative would not impact the Vancouver Lake Lowlands, Shillapoo Bottoms, or the Ridgefield National Wildlife Refuge, all areas that provide key habitat to migratory bird species.

Under Alternative 4, various segments of streams or rivers that support anadromous fish would be added to UGAs or occur adjacent to these areas. These waterways include the Columbia River shoreline, Gee Creek, Salmon Creek and its tributaries, and Whipple Creek. This alternative would also expand Battle Ground's UGA to include industrial development within 500 feet of the East Fork Lewis River, which supports many anadromous species and is an area designated as priority habitat by WDFW. Increased urbanization and development adjacent to these streams would likely result in some degree of impact to water quality due to the loss of vegetation and an increase in impervious surface area. Even though Alternative 4 would add much less land to UGAs than Alternative 1, it would add approximately 36 miles of streams that support anadromous salmon, more than any other alternative.

e. Alternative 5

Alternative 5 would add 12,303 acres to UGAs. As with each of the other action alternatives, waterfowl concentration areas were identified within areas that would see eventual urbanization. This alternative would not impact the Vancouver Lake Lowlands, Shillapoo Bottoms, or the Ridgefield National Wildlife Refuge.

Streams that support anadromous fish that would be included within expanded UGAs include Gee Creek, Salmon Creek and its tributaries, and Whipple Creek. Around 8 miles of streams that support migratory fish would be added to UGAs. This is less than each of the other alternatives, with the exception of Alternative 3, which does not expand UGAs.

3. Mitigation

Mitigation for impacts to migration routes and migratory species is discussed in the Fish and Wildlife Habitat section, above, since areas that serve an important migratory function are included within habitat conservation areas.

D. Wetlands

1. Setting

The GMA requires counties and cities to identify environmentally critical areas, including wetlands. Wetland areas are among the most productive ecosystems on earth, and are significant for their functional values and the services they provide, which include groundwater recharge, flood protection, water quality maintenance, wildlife habitat provision, recreation, and aesthetic enjoyment. Because wetlands can be located within floodplains and provide important water quality functions and wildlife habitat, this discussion of existing wetland conditions within Clark County is closely related to other sections of this report that discuss water resources, floodplains, vegetation, and wildlife.

Wetland areas are defined and classified by the presence of three factors: wetland hydrology, hydric soils, and hydrophytic vegetation. Hydrology refers to the water characteristics of the area, such as the amount of time an area is wet or flooded. Wetland hydrology exists when areas are permanently inundated or saturated to the surface at some period during the growing season. Hydric soils are those that are wet long enough to periodically produce anaerobic (lacking free oxygen) conditions, thereby influencing the

growth of plants. Hydrophytes are plants growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content.

The US Army Corps of Engineers (USACE) defines wetlands as "areas that are inundated or saturated by surface or groundwater at a frequency or duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Wetlands are also commonly called swamps, marshes, bogs, or fens, although each of these terms has a specific meaning.

Figure 24 shows high value wetlands within the county. Figure 25 shows where hydric soils are found, soils that often indicate the presence of wetlands.

Wetland areas are numerous throughout the region. A significant number of wetlands are found in the Battle Ground area. An estimated 42 percent of the city is mapped as having hydric soils by the Natural Resource Conservation Service (NRCS). Recent wetland delineations conducted in these areas indicate that most of the areas mapped as hydric soils meet the three primary criteria for wetland areas. Forested wetlands line Woodin Creek in the northeastern and southern sections of the city. Scrub/shrub wetlands are located along the creek south of Main Street. To the north, south, and west of the city are emergent wetlands.

In the Camas area, wetlands are primarily found on Lady Island, along the Washougal River, Fallen Leaf Lake, Lacamas Lake, and Round Lake, as well as within Fisher Basin. Wetlands within the UGA of Washougal occur within the floodway of the Washougal River and in the low-lying southeast portion of the UGA adjacent to the Columbia River. The most extensive wetland area occurs in the southeastern portion of the city. The wetlands in this area are predominately distributed between the lands within the Steigerwald Wildlife Refuge and the low-lying areas along the Columbia River, an area owned by the Port of Camas-Washougal, which presently exists as undeveloped park land.

In the Vancouver area, most wetlands are found along Burnt Bridge Creek and Salmon Creek, along the Columbia River, and in the Vancouver Lake Lowlands. There are also wetlands scattered north and south of Walnut Creek and throughout the northernmost portion of the Vancouver urban area.

Most wetlands in the La Center area are found south of the city along the East Fork of the Lewis River. Most of the wetlands in the Ridgefield area are associated with Gee Creek, to the north and east of the city. Palustrine wetlands are also located in the Carty Lake area and along Lake River, to the west of the city.

Many federal, state, and local agencies are involved in the identification and protection of wetlands in Clark County. These include the FWS, NRCS, US Army Corps of Engineers, Washington State Department of Natural Resources, Washington State Department of Fish and Wildlife, and the Washington State Department of Ecology.

2. Impacts

The most common impact to wetlands is from filling or draining to make land available for other uses. Whereas with project-level actions the physical characteristics of the project can be reviewed to determine if any part of a wetland would be impacted, assessing impacts from programmatic actions is necessarily more general. It primarily involves identifying wetlands that occur within each new UGA and the type of development that is proposed for that area. Wetland areas were identified for this analysis using National Wetlands Inventory maps. These maps do not necessarily identify all wetlands within an area.

a. Alternative 1

Under Alternative 1, around 1,195 acres of wetland areas within Clark County would occur within new UGAs. Most of these wetlands would occur within the UGAs of Battle Ground (212 acres), Camas (210 acres), and Vancouver (757 acres). Smaller amounts of wetland areas would be added to the UGAs of Ridgefield (10 acres) and La Center (4 acres). Many of the wetland areas to be brought into Vancouver's UGA are located near Salmon Creek, Packard Creek, and Whipple Creek, where residential development is proposed. Within Battle Ground's new UGA, wetlands are primarily associated with Salmon Creek, Mill Creek, and Weaver Creek, where commercial and residential development are proposed. Wetland areas to be added to Camas' UGA are located primarily in an area northwest of Lacamas Lake, along Lacamas Creek, and in the Fisher Landing area. While the area around Lacamas Creek is proposed for urban low-density residential development, the Fisher Basin area would see primarily industrial and commercial development.

b. Alternative 2

Alternative 2 would see less of an expansion of UGAs than under Alternative 1, and less wetland acreage would be brought into UGAs. Whereas Alternative 1 adds around 1,195 acres of wetlands, Alternative 2 adds about 329 acres, primarily around Vancouver (204 acres) and Battle Ground (117 acres). Much less wetland area would be added to Camas' UGA under this alternative (0.85 acres). Washougal would add around 6 acres of wetlands, located along a tributary of Lacamas Creek.

c. Alternative 3

Under Alternative 3, all population growth over the next 20 years would be accommodated within existing UGAs. This would prevent impacts to wetlands that lie outside of current UGAs but within the proposed UGAs of Alternatives 1, 2, 4, and 5.

d. Alternative 4

Under Alternative 4, approximately 749 acres of wetlands would be added to UGAs, and potential impacts would be limited to Battle Ground, Camas, and Vancouver. Vancouver would add the most wetland area (422 acres), followed by Battle Ground (195 acres), and Camas (131 acres). Most of the wetland areas within Battle Ground's expanded UGA under this alternative are located near Salmon Creek, Weaver Creek, and Mill Creek. Wetland areas that would be included in Vancouver's expanded UGA occur primarily near Salmon Creek and Whipple Creek and smaller tributaries. Under Alternative 4, wetland areas within Camas' expanded UGA are found predominately in the Fisher Basin area and along a portion of Lacamas Creek. The UGAs of Washougal and Ridgefield would not expand under this alternative. La Center's UGA would see a small expansion north of the city, but National Wetlands Inventory maps do not show wetlands within this area.

e. Alternative 5

Alternative 5 would see around 729 acres of wetland areas added to UGAs, about the same amount as Alternative 4 (749 acres) but less than Alternative 1 (1,195 acres). Most of the wetland areas would be added to the UGAs of Vancouver (433 acres), Battle Ground (150 acres), and Camas (116 acres). La Center and Ridgefield would also see some wetlands brought into their UGAs—3 acres and 25 acres, respectively. As with each of the other action alternatives, these areas tend to be located along major streams—Salmon Creek, Whipple Creek, Weaver Creek, and Mill Creek—and their tributaries. New UGAs under this alternative would see primarily office/business park and residential development.

3. Mitigation

a. Plans and Ordinances

Of particular importance in the regulation of wetlands at the federal level is Section 404 of the Clean Water Act, which regulates the discharge of dredged and fill material into the waters of the United States, including wetlands. The Section 404 regulatory permit program is administered jointly by the USACE and the US Environmental Protection Agency (EPA). The EPA has issued guidelines that prohibit the discharge of dredged or fill material (1) if there is a practicable alternative (2) if the discharge would have an unacceptable adverse impact on the aquatic ecosystem (3) if the discharge would violate state water quality standards or jeopardize a species listed under the Endangered Species Act and (4) unless appropriate and practicable steps have been taken that minimize potential adverse impacts of the discharge.

Clark County: Clark County and its cities have adopted wetland protection ordinances in order to comply with the GMA mandate to protect environmentally critical areas. Clark County's ordinance (Chapter 13.36) is intended to ensure no net loss of wetland acreage and functions; encourage restoration and enhancement of degraded and low-quality wetlands; provide a greater level of protection for higher quality wetlands; maintain consistency with federal wetland protective measures; avoid over-regulation by limiting regulatory applicability to those development proposals that significantly impact important wetlands; and minimize impacts of wetland regulation on private property rights.

The ordinance establishes a process and requirements for the identification and delineation of wetland areas. It also specifies five categories of wetlands and the characteristics and criteria that define the categories. For example, Category 1 wetlands are of the highest value, are very rare, provide habitat for threatened or endangered species, and are considered irreplaceable. Category 5 wetlands are of the lowest value and are exempted from the regulations of Chapter 13.36. These wetlands tend to be smaller, isolated, and less diverse in terms of vegetation. The wetland categories are used to determine protective buffer widths around wetlands and mitigation requirements. Category 1 wetlands require a 300-foot buffer and a replacement ratio of 6:1.

Battle Ground: The City of Battle Ground is also updating its critical areas ordinance, which will include new regulations for development within or near wetland areas. The City's current ordinance (Chapter 18.230) recognizes two categories of wetlands. Category 1 wetlands are defined as "exceptional wetlands which require protection beyond that which is provided under current federal law." Category 2 wetlands include all other wetlands. The ordinance establishes buffers for Category 1 wetlands (90 feet) but does not require buffers for Category 2 wetlands. The ordinance also establishes a process for obtaining a wetland buffer permit, which is required for regulated activities within a buffer area.

Camas: The City of Camas is currently updating its critical areas ordinance, which includes new regulations for development that could impact wetland areas. The draft ordinance adopts the four-category Wetland Rating System for Western Washington, which will be used to determine the functions and values of local wetlands and the buffer widths that should be established to protect them. The city's previous wetlands ordinance established buffer widths, but these buffer requirements were not based on the best available science, did not adequately consider the type of wetland being affected, and has not proved effective in wetland protection. The new ordinance will also establish new reporting requirements for projects that impact wetland areas.

La Center: La Center's wetland ordinance (LCMC 14.05) establishes goals and policies for the identification, designation, and protection of wetland areas within the jurisdiction. The ordinance is identical to Clark County's ordinance.

Ridgefield: Measures to protect wetlands and regulate development within these areas are contained in Ridgefield's Sensitive Lands/Density Transfer Overlay District ordinance (RMC 18.280). The ordinance uses the DOE's Wetland Rating System for Western Washington to classify wetlands into one of five categories, and it uses these categories to establish buffer widths. The ordinance establishes a 2:1 replacement ratio for the loss of wetlands or wetland buffers.

Vancouver: The City of Vancouver's wetland protection ordinance (VMC Chapter 20.50) is very similar to Clark County's. It recognizes the important functions of wetlands and the services they provide, it seeks to avoid or minimize damage to wetlands and recommends that activities not dependent on a wetland location be located in upland areas instead, it sets a goal of no net loss of wetlands by requiring restoration or enhancement of degraded wetlands or the creation of new wetlands to offset losses, and it uses the same wetland categories as the County to determine wetland buffer widths and mitigation measures.

Washougal: The City of Washougal's wetland protection ordinance (WMC Chapter 16.20) establishes a process for the identification, delineation, and protection of wetlands within its jurisdiction. The ordinance recognizes three categories of wetlands and establishes base wetland buffer widths based on these categories. These buffer widths are less than those that are found in the DOE's Wetland Rating System for Western Washington.

VI. ENERGY AND NATURAL RESOURCES

A. Renewable and Non-Renewable Energy Sources

1. Setting

The demand for electricity, natural gas, and other natural resources will increase in Clark County as growth occurs. The cost of supplying these services can vary depending on the land use pattern of that growth but most of the increase in consumption will occur with growth in general. The Capital Facilities and Utilities Element of the comprehensive plan contains an inventory of energy-related facilities operated by public agencies. In the case of Clark County, most energy sources are supplied by the private sector. Only Clark Public Utilities (CPU) generates and supplies electricity. Clark County is not a major source of energy; it does not contain oil or natural gas reserves, or wind farms, although solar power and hydro-electric energy is available. Most of the discussion of energy consequently revolves around energy consumption.

Since fossil fuel consumption has an impact on air quality, the impacts of the alternatives on the environment from that fossil fuel use is contained in the Climate section. Electricity supply and demand is discussed in the Public Facilities section of this DEIS as CPU is a consumer-owned utility. The discussion below is confined to an assessment of provisions for energy conservation and solar energy.

Efficient land uses and cost-effective provision of services can often have energy conservation as a by-product. The state requires energy efficient construction of buildings (Washington State Energy Code, WAC 51-11, as amended). Construction of energy efficient buildings is, as a result, provided for in local building codes. Electricity conservation by residents and businesses is encouraged by programs sponsored by providers such as Bonneville Power Administration (BPA) and CPU, sometimes in concert with local jurisdictions. CPU offers financing for insulation, window replacement, sealing leaks and for installation of heat pumps. Vancouver and Clark County have programs to help improve the energy efficiency of homes. The Weatherization Assistance Program works to significantly increase the number of low-income households receiving cost effective and energy efficient improvements.

Solar energy ordinances are often implemented to ensure that residences are oriented on lots in a way that maximizes the collection of passive and active solar energy. Shade point requirements attempt to ensure

that vegetation and structures do not create shade that impairs the collection of solar energy. Clark County's solar access requirements were repealed in 1997.

Countywide Planning Policies for Transportation refer to the creation of a regional transportation system that encourages energy efficiency.

Tree preservation ordinances, such as Vancouver's, can promote energy conservation. Deciduous trees keep buildings cooler in the summer (requiring less energy for air conditioning) while maximizing sun exposure in winter (promoting passive solar energy use).

2. Impacts

Most of the impacts on energy and natural resources will result from the population and employment growth, not the way in which that growth is accommodated. The added people and businesses will require light and heating and energy to operate equipment. In that sense, the greater growth under Alternative 1 will have more impact than the other four alternatives with respect to residential growth. However, more industrial growth under Alternative 4 could consume greater energy resources than residential users. Typical energy usage by industry in Clark County ranges from 100 kVa to 150 kVa per acre, while commercial and residential demand ranges from 20 to 35 kVa per acre.

Nevertheless, the more compact the urban form, generally the greater the efficiencies that can be gained in serving that form with urban services. Those impacts are discussed in the Public Facilities section of the DEIS. The impact on fossil fuel usage for transportation will also vary depending on the land use pattern adopted. Impacts of the proposed transportation systems for each alternative are discussed in the Transportation section.

3. Mitigation

Since none of the jurisdictions is an energy provider, promoting conservation is largely a voluntary task. The primary energy conserving measure available to local jurisdictions is to adopt a compact urban form that supports alternative, energy efficient transportation(walking, bicycling, transit). In general, most comprehensive plan goals do not directly address energy conservation and few raise energy conservation as an issue.

Battle Ground's draft interim policies for Housing state that the City will encourage housing that supports sustainable development patterns, resource-efficient design and construction, and the use of renewable energy resources (HO1.4). Several policy objectives aim to promote sustainable practices in the development code and building code standards, as well as review the City's own practices for opportunities to implement more sustainable purchasing practices. New proposed goals in the Camas plan call for encouraging the wise use of renewable natural resources and conserving nonrenewable ones.

Vancouver's Comprehensive Plan Policy P78 encourages development in a manner that provides access to and uses solar energy. Vancouver's zoning ordinance contains solar access and shade point provisions (Chapters 20.84 and 20.86). Requirements apply to single-family, detached homes; applicants must submit a solar site plan when applying for a building permit.

Beyond participating with providers to promote energy conservation, local jurisdictions could add similar policies to their comprehensive plans that deal in general with "sustainable" practices that support citizen and business efforts to reduce energy consumption and promote recycling. Policies could recognize the link between reducing energy consumption and protecting the environment on a regional, state, and national level. Implementation of tree preservation ordinances and examining building codes to allow more innovative "green" building design ideas would also be helpful.

B. Scenic Resources

1. Setting

Natural features are an integral part of what is often considered a scenic resource. Surface waters, vegetation, and topographic variations are natural features that are often elements of scenic resources. As an area's population increases, there is often an associated deterioration, fragmentation, and loss of these natural features. Scenic resources can also include elements of the built environment, such as views and panoramas of city landscapes, bridges, and dams. These viewpoints are also at risk when an area's population is increasing and development is intense.

Clark County has a variety of landscape settings providing scenic beauty. These include the following:

- Farmland-areas of pastures and intensive agriculture—Orchards, vineyards, row crops, small wooded areas and scattered rural development. Terrain is flat to gently rolling hills. The La Center area, Columbia River lowlands, and isolated areas north of Camas are representative of this type of landscape setting.
- Forested areas—Forested areas with limited timber harvest activities, scattered residences, hilly and mountainous areas. East Clark County represents this landscape setting.
- River bottomlands—Floodplains, wetlands, and riparian areas found along rivers and streams, particularly those areas along the East and North Forks of the Lewis River and its tributaries, and portions of the Columbia River and its lowland areas.
- Rural estate/rural farm—Areas that are partly rural residential in nature but retain a strong rural environment. Composed of small farms and wooded areas, parcels typically range from 5 to 20 acres. Terrain is usually gently rolling hills with good access. These areas are found north of Camas and Washougal, northeast of Ridgefield, near La Center, within the Columbia River Gorge Scenic Area, east of I-5 and west of Battle Ground, and along portions of the East Fork of the Lewis River.

Clark County is located on the western edge of the Columbia River Gorge National Scenic Area, designated by the US Congress in 1987 in recognition of the unique natural beauty of the area. The Scenic Area Management Plan sets policy for land use and development in this area, and County ordinances must be consistent with this policy. Around 250 Clark County residents currently live within the national scenic area. Evergreen Highway and Lucia Falls Road are designated scenic routes by CCC 12.05.070.

The Columbia River Lowlands encompass a large area, extending from the Vancouver Lake area north to the Ridgefield National Wildlife Refuge. During this century the lowlands have been dramatically changed by human activities and intervention. The construction of dams and dikes and the introduction of plant, animal, and fish species have irreversibly altered the natural environment. Use of the lowlands for crop and livestock has provided habitat for wintering migratory waterfowl. A notable value of the lowlands as a scenic natural and recreational area is its close proximity to the Portland/Vancouver metropolitan area, making it accessible to a large population.

No systematic survey of scenic resources has been performed for the county, although visual preference surveys were done in order to determine what visual characteristics are most important to county residents. There are also few policies that directly address the preservation of scenic and visual resources. There are, however, policies that address the preservation and protection of open space and natural resources. Therefore, scenic resources are protected only to the extent that they are associated with natural resources.

2. Impacts

Assessing scenic values and determining visual impacts involves inventorying scenic resources, assessing the visual appeal of those resources, measuring public concern for scenic quality, and determining whether the resource is visible from travel routes or observation points. Assessing impacts from programmatic actions is difficult because specific development patterns are still unknown. This section considers how the growth patterns of the different alternatives impact those areas frequently considered scenic—farmland, areas along streams and rivers, less developed rural land. Because scenic resources are often associated with natural resource areas, impacts to these resources are usually considered negative and result in the conversion of natural environments to non-natural ones; for instance, the conversion of an orchard to a residential subdivision.

Because each of the alternatives, with the exception of Alternative 3, would see an expansion of UGAs and bring land currently designated as rural, agricultural, or parks and open space into these new urban areas, there would be impacts to scenic areas as land is converted to urban uses under all of the action alternatives.

None of the alternatives would directly impact the Columbia River Gorge National Scenic Area, the Columbia River shoreline, the Vancouver Lake Lowlands, the Steigerwald Refuge, or the Ridgefield Wildlife Refuge, all areas with recognized scenic values. However, Alternative 3, because it accommodates growth within existing UGAs, could encourage development to occur sooner than it otherwise would within portions of the Vancouver Lake Lowlands, the Columbia River Shoreline area, and, more generally, within those natural areas that are currently undeveloped although located within existing UGAs.

a. Alternative 1

Alternative 1 would see the greatest conversion of land to urban uses. A total of 28,845 acres would be brought into UGAs. Because this alternative would convert significantly more land to urban uses than the other alternatives, it would likely have the most significant impact on scenic resources. Alternative 1 would see the greatest loss of agricultural, forest, and rural lands, lands that are often considered to have scenic and visual values.

Battle Ground: Battle Ground's UGA would also expand, but much of the land to be brought into the new urban area is currently designated rural center residential. However, some agricultural land just north of the existing UGA would be included in the new UGA and is designated as commercial under Alternative 1. Land currently designated as Rural 10 is designated as urban medium-density under this alternative. The conversion of agricultural or rural land to commercial or more intensive residential uses would likely result in the loss of some scenic resource values, although the exact impact to these resources would depend on their particular characteristics. A portion of Salmon Creek crosses an area currently designated as Rural 10. Under Alternative 1, this area would be designated as urban medium density. Scenic values associated with this area could be impacted by more intensive development.

Camas: Much of the expansion of Camas' UGA would occur on land that is currently designated as mining or industrial. A portion of this area is located along the Columbia River and currently involves a surface sand and gravel mine. Under Alternative 1 this area is proposed for commercial development. Scenic values could be enhanced if the surface mine area were reclaimed for eventual commercial development. This area also provides a view of the Columbia River.

La Center: Part of La Center's new UGA under Alternative 1 is bisected by I-5. To the east of the freeway this area is currently designated industrial urban reserve. To the west there is agricultural land that would see eventual conversion to commercial use. Views of this area from the freeway would be

altered with the conversion of farmland to commercial development. In addition, agricultural and rural land north of the existing UGA would be converted to urban low density under Alternative 1.

Ridgefield: Similarly, Ridgefield's new UGA would include land currently designated agricultural. Under Alternative 1, this area would be designated office/business park. Impacts to any scenic resources associated with this agricultural land would depend on its current scenic resource value, adjacent land uses, and the type of development that is proposed for the area.

Vancouver: Vancouver's UGA would expand primarily north and east of the existing UGA. While much of this land is currently designated as urban reserve, it also includes agricultural and rural land. Land that is currently designated for agricultural use is proposed for urban low density development under Alternative 1. New residential development within a portion of the Salmon Creek area could impact scenic resources associated with this stream. Land within this area is currently designated urban reserve and parks and open space. Views of agricultural and less developed rural land from Interstate 5 would be impacted as land is converted to more intensive residential development.

Washougal: Washougal's UGA would expand north of the city to include land currently designated agricultural, Rural 5, and Rural 10. Under Alternative 1, rural land around Lacamas Lake would see urban low-density development. This more intensive level of development adjacent to the lake could impact scenic values. Similarly, agricultural land is also proposed for eventual conversion to urban low-density development.

b. Alternative 2

Alternative 2 would see less expansion of UGAs onto rural and agricultural land, and impacts to scenic resources would likely be fewer as a result.

Battle Ground: Under Alternative 2, Battle Ground's UGA expansion would include some rural and agricultural land south of the city; this land is proposed for office/business park development. This land is adjacent to Salmon Creek, and more intensive development around the stream could impact views and other scenic values.

Camas: The expansion of Camas' UGA under Alternative 2 would include limited agricultural land that would see an eventual conversion to office/business park development. This agricultural area is adjacent to land that is proposed for urban low-density and urban high-density residential development and provides some open space in an area otherwise surrounded by industrial, urban reserve, and mining lands. This agricultural area could have scenic value to those who live within this area. Urban reserve land adjacent to the Columbia River would be converted to office/business park development under Alternative 2. It is unclear whether this development would negatively impact views from SR 14.

La Center: There would be no change to the La Center UGA under Alternative 2, so there would be no impacts.

Ridgefield: Ridgefield's UGA expansion would occur only on land designated as urban reserve; it would not include any rural or agricultural land. Therefore, under Alternative 2 there would be few, if any, impacts to scenic or visual resources.

Vancouver: Most of the land included in the new UGA for Vancouver is now designated as urban reserve. Some agricultural land would be converted to urban low-density development. Less of the western portion of Salmon Creek would be included within the new UGA and the risk of impacts to scenic resources associated with this waterway would be reduced.

Washougal: Washougal's UGA expansion would primarily involve agricultural land north of the city. This land is proposed for urban low-density development under Alternative 2. The conversion of farmland to urban residential uses would result in the loss of any scenic values associated with this agricultural land.

c. Alternative 3

Alternative 3 would not involve the expansion of any UGAs. All growth and development over the next 20 years would occur within existing UGAs on land already targeted for urban development. While this would reduce the likelihood of impacts to scenic resources associated with rural and agricultural lands, particularly in northern and eastern Clark County, it may place greater pressure on scenic areas within existing urban boundaries—especially the Columbia River shoreline area and the Vancouver Lake Lowlands. However, under Alternative 3, projects would continue to be subject to review for compliance with policies and regulations that protect environmentally sensitive areas and parks and open space. Projects would also continue to be assessed for their impact on scenic resources in the design review process. To the extent that Alternative 3 encourages redevelopment and revitalization of existing urban areas, it could have a positive impact on urban visual resources.

d. Alternative 4

Whereas other alternatives would expand UGAs primarily to accommodate residential development, Alternative 4 would accommodate primarily industrial and commercial development on expanded UGAs. The amount of land that would be urbanized under this alternative (12,554 acres) is less than Alternative 1 (28,845 acres) but more than Alternative 5 (12,303 acres).

Battle Ground: Under Alternative 4, Battle Ground's UGA would expand to include land currently designated rural and agricultural stretching from the East Fork Lewis River to the north and across Salmon Creek to the south. A portion of Salmon Creek crosses rural and agricultural land that is proposed for commercial, mixed use, and residential development under this alternative. Conversion of this land to urban uses could impact any scenic values associated with the stream. Industrial development is proposed within 500 feet of the East Fork Lewis River. Although development near the stream corridor itself would be regulated to protect any riparian areas, new development could nevertheless impact views of the stream and impact scenic values by changing the general feeling of the area—a rural environment changed to an urban one.

Camas: Camas' UGA would expand less under this alternative than Alternatives 1 and 2. Some rural land adjacent to Lacamas Lake would be converted to urban low- and high-density development. This land is adjacent to Lacamas Park and its conversion to urban uses could impact the natural scenic values of the area. Under Alternative 4 agricultural land to the north of Lacamas Lake would convert to mixed-use and parks and open space. The conversion of farmland to parks and open space would not likely result in the loss of any scenic values associated with the land. However, converting agricultural land to mixed-use development could impact these values.

Vancouver: Most of Vancouver's UGA expansion would occur on land designated urban reserve. Much of this expansion area is now agricultural and rural land, which would be converted to industrial and commercial uses. Scenic values attached to this rural and agricultural land would be lost with its conversion to urban uses. Much of this land is located in the rapidly urbanizing eastern portion of Vancouver.

The UGAs of La Center, Ridgefield, and Washougal would not expand, so there would be no impacts.

e. Alternative 5

Alternative 5 would accommodate much new growth and development along the Interstate 5 corridor, creating a new center of economic activity that extends from Salmon Creek to La Center. This area was chosen to accommodate new growth because of the large tracts of land available for development and the availability of Interstate 5 for transportation to the area.

Vancouver's UGA would expand along I-5 to include rural and agricultural land. Under Alternative 5 this land would be designated office/business park. Conversion of this land to urban uses would affect views of farmland and open space for motorists on I-5. This is also true for Ridgefield and La Center, whose UGAs would be expanded along Interstate 5 on land that is now used for agriculture. This land would convert to office/business park development under this alternative. Views from the freeway of farmland would be lost as the land is converted to accommodate new jobs and businesses.

Under Alternative 5, agricultural land south of Battle Ground would be included in the city's new UGA. Most of the land brought into the new UGA is currently designated Rural Center Residential and Rural-10. This land would be converted to urban low- and medium-density residential development, as well as office/business park development. Visual values associated with this agricultural and rural land would be lost with its conversion to urban uses.

Washougal's UGA would see a small expansion under Alternative 5. Agricultural land near Lacamas Park would be converted to office/business park development. Camas' UGA would also expand to include rural land immediately adjacent to Lacamas Park. Eventual development with low density housing could impact the scenic values associated with this area. Rural land generally provides a more gradual transition to areas designated for parks and open space. Residential and commercial development provides a sharper, more distinct contrast to parks and open space land when it is adjacent to these areas.

3. Mitigation

a. Plans and Ordinances

Clark County: While Clark County contains a variety of scenic areas, the most prominent and the only one federally protected is the Columbia River Gorge National Scenic Area. In 1996, Clark County adopted an implementing ordinance, subsequently approved by the Gorge Commission, to allow for local County administration and jurisdiction over these lands. There are specific regulations that pertain in this area. Chapter 18.334A implements the ordinance by incorporating the provisions by reference. Evergreen Highway and Lucia Falls Road are designated scenic routes by CCC 12.05.070.

Battle Ground: Draft goals and objectives under Goal 1 (Livability) adopted in December 2001 include policies to encourage new development to be designed to protect and promote significant views (LG5). Policy LO5.1 is to preserve and enhance unique and significant existing public views. Actions include establishing criteria for views qualifying for protection, inventory of views, and guidelines for public projects to protect, identify and enhance them. In addition, the City intends to determine the feasibility of requiring view identification as part of the development permit process.

Camas: Chapter 16.06 of the Camas Municipal Code provides for the responsible official to condition or deny a proposal to eliminate or reduce its adverse impacts on designated public views or open space networks. It is the city's policy to protect public views of significant natural and human-made features such as views of Mount Hood and major bodies of water including the Columbia River, Lacamas Lake and the Washougal River. Public places consisting of viewpoints, parks, scenic routes, and view corridors are identified in the comprehensive Plan and the comprehensive park and recreation plan. In addition, it is the city's policy to protect public views of historic sites or landmarks designated by the city or identified in the review process which, because of their prominence of location or contrasts or siting, age, or scale,

are easily identifiable visual features of their neighborhood or the city and contribute to the distinctive quality or identity of their neighborhood or the city.

b. Additional Mitigation

Scenic resources have generally not been recognized as a critical or sensitive resource which should be inventoried and protected to the same extent as other natural resources. The first step in mitigation of the potential impacts of development on these resources would be to inventory the views from major public routes, public facilities, and viewpoints particularly those used by tourists to the area. Policies and programs could then be developed to protect these scenic resources from alteration as a result of development.

VII. ENVIRONMENTAL HEALTH

A. Noise

1. Setting

Noise is a by-product of increased human activity. Noise levels from traffic sources depend on volume, speed, and the type of vehicle. Generally, an increase in volume, speed, or vehicle size increases traffic noise levels. Vehicular noise is a combination of noises from the engine, exhaust, and tires. Other conditions affecting traffic noise include defective mufflers, steep grades, terrain, vegetation, distance from the roadway, and shielding by barriers and buildings.

Noise levels decrease with distance from the noise source. For a line source such as a roadway, noise levels decrease over hard ground (concrete, pavement) less than over soft ground (grass). The propagation of noise can be greatly affected by terrain and the elevation of the receiver relative to the noise source. Level ground is the simplest case. Noise travels in a straight line-of-sight path between the source and the receiver. The addition of a berm or other area of high terrain will reduce the noise energy arriving at the receiver. If the noise source is depressed or the receiver is elevated, noise generally will travel directly to the receiver. In some situations, noise levels may be reduced because the terrain crests between the source and receiver, resulting in a partial noise barrier near the receiver.

There is no comprehensive mapping of noise levels in Clark County although Portland International Airport has noise contour maps of Vancouver. Section I of the *Perspectives Resource Document* contains a discussion of noise issues and regulations affecting Clark County. Primary noise sources in Clark County are: vehicular traffic; railroads, rock quarrying, industrial and commercial operations, airplanes and airport activity; construction equipment and activities; rural activities associated with farming and timber harvesting; residential equipment such as heat pumps and air conditioners; and human activity such as parties, sports and games, etc.

The Noise Control Act of 1974 established maximum noise levels permissible in identified environments and standards relating to the reception of noise within such environments. Three classes are identified:

1. Class A: lands where human beings reside and sleep (i.e., residential areas);
2. Class B: lands involving uses requiring protection against noise interference with speech (i.e., commercial areas); and,
3. Class C: lands involving economic activities of such a nature that higher noise levels than experienced in other areas are normally to be anticipated (i.e., industrial, agricultural or forest lands).

These environments generally correspond to zoning districts. Residential zoning districts are Class A, commercial zoning districts are Class B, and industrial zoning districts are Class C.

2. Impacts

The population and employment growth expected in Clark County will increase noise levels. Noise in an urbanizing area is a more serious problem than is usually recognized. Environmental noise at high intensities directly affects human health by causing hearing loss. Although scientific evidence currently is not conclusive, noise is suspected of causing or aggravating other diseases. Environmental noise indirectly affects human welfare by interfering with sleep, thought, and conversation. Problems occur when sources of loud noise impact sensitive environments such as residences, schools, and hospitals.

It is difficult to predict noise impacts from future development patterns and uses at a plan level. Impacts are described generally in terms of the relative intensity and types of uses under each alternative. In particular, as rural uses are converted to urban uses, the impression of increasing noise levels would be sharpest for rural residents at the edge of those converting land uses and along heavily traveled routes.

a. Alternative 1

Although it would have greater growth overall, this alternative would have a predominance of large-lot, single-family development. This would offer more opportunity to buffer noise-sensitive uses from the noise and other side effects associated with traffic and commercial and industrial development. The buffering would be in the form of distance between the noise source and the sensitive receptors or residences. Additional noise would be expected in areas of more intense residential and industrial uses, and where heavy traffic impacts would occur, which in this alternative is all major corridors except SR-500. The area between Battle Ground and Vancouver would likely experience a distinct change as those rural uses become urban uses: industrial, commercial, and medium residential.

b. Alternative 2

Less rural land would be converted under this alternative. Office/Business Park, low density single-family and medium-density are the main uses proposed in Alternative 2. Office/Business Park uses tend to have noise impacts related to traffic rather than industry. More medium-density residential uses would also tend to elevate noise levels. Less rural land would be converted so overall the impacts would be expected to be less than under Alternative 1, perhaps the least impact after Alternative 3. More traffic between employment and residential areas is anticipated, with attendant increases in traffic noise through intervening rural areas.

c. Alternative 3

This alternative would have no changes to the rural areas so no noise impacts would be anticipated. Some areas within Vancouver and Battle Ground would be rezoned to Office/Business Park, but given the urbanizing nature of the area, no significant impacts would be expected. This alternative has the least traffic impacts of all alternatives so a lower overall increase in noise from traffic would be expected with Alternative 3.

d. Alternative 4

This Alternative would add rural land to the UGAs of Vancouver, Camas, and Battle Ground, primarily in commercial, industrial and mixed uses. These uses are all more intensive uses that tend to generate more noise than the low-density residential uses planned under Alternatives 1 and 2. This alternative could have greater noise impacts from traffic due to the fact that much of the employment and household growth are located in corridors that are not served or are underserved by transit so more single-occupant vehicle traffic is predicted for those areas.

e. Alternative 5

Noise impacts under this alternative would be related to more intensive development along I-5, between Camas and Vancouver, and west and south of Battle Ground. Since I-5 is already a noise generator, it is unlikely that the Office/Business Park use itself would increase that level except to the extent that more traffic would be occurring in that corridor. Additional commercial, mixed uses, and medium-density residential would tend to be noisier overall than the areas planned for low-density residential. As with Alternative 1, the more rural area between Battle Ground and Vancouver could experience considerable change in noise levels as traffic, industrial uses, and commercial uses increase.

3. Mitigation

Federal and state regulations limit the noise exposure in different classes of land use. When new developments are proposed, the noise standards are part of the approval process since noise is a factor considered in SEPA review. However, experience has shown that enforcement of noise regulations can be a problem if they involve limitations on actions instead of buffering. Noise conflicts can be reduced in all of the alternatives simply by assuring that policies and programs are implemented that would buffer noise between uses.

Vancouver is in the process of adopting the state noise ordinance with the exception of Class A regulations.

Potential mitigation measures that could apply to all of the alternatives, but would be especially important in areas where rural uses would experience a change to uses other than low-density residential or where traffic impacts would be greatest, are listed below.

1. Revise development codes to incorporate noise and safety mitigation, for example, requirements that all industrial activity occur within buildings or that all industrial sites include noise-attenuated buffer walls.

2. Revise building codes to increase noise insulation requirements for both industries and homes (especially in the mixed-use districts proposed for Alternatives 1, 4 and 5). Extra insulation will also improve energy efficiency.

3. Require sound mitigation for adjacent residential development with all widening projects along transportation corridors.

4. Require noise insulation on all mechanical equipment (HVAC, etc.) in new construction.

VIII. LAND USE

A. Population, Housing, and Land Use

1. Setting

a. Urban Growth Areas and Population

The GMA mandates changes to local land use plans to:

- Encourage development in urban areas where adequate public facilities and services exist or can be provided in an efficient manner.
- Reduce the inappropriate conversion of undeveloped land into sprawling, low-density development.
- Ensure that applications for both state and local government permits are processed in a timely and fair manner to ensure predictability.

- Maintain and enhance natural-resource-based industries, including productive timber, agricultural, and fisheries industries. Encourage the conservation of productive forest lands and productive agricultural lands, and discourage incompatible uses.

To accomplish these goals, each county and city planning under the GMA must designate a 20-year UGA distinct from rural development and resource lands. UGAs are an essential part of required GMA comprehensive plans. They shape the character of development within a region by designating where urban growth will be encouraged and where urban services will be provided. Urban services cannot be provided outside UGAs, and urban levels of development are permitted only within UGAs. The designation of new or expanded UGAs will have a major impact on current land use and transportation patterns and development approval procedures in Clark County.

The purpose of this section is to evaluate the effects of the County's five proposed UGA alternatives on land use patterns, housing population, and employment distribution.

The housing needs of the county are determined by the characteristics of its existing and projected population (household size, income, etc.), when compared to the characteristics of the existing and expected housing supply (total units, size, cost, etc.). The issue facing local governments is where to direct this growth given environmental constraints and the cost of providing public services, and how to ensure that a range of housing types and prices are available.

Much of the data contained in this section comes from the U.S. Bureau of the Census, the Clark County/City of Vancouver Consolidated Housing and Community Development Plan (2000-2004) (H&CD) prepared by Clark County Department of Community Services and the City of Vancouver Community and Housing Services, and the State of Washington Office of Financial Management (OFM). The H&CD is required under the Cranston-Gonzalez National Affordable Housing Act of 1990. All jurisdictions eligible for funding under this act that wish to participate in the program are required to prepare a plan identifying the different types of housing needed in the community and setting priorities for addressing them.

Land Use information from the Clark County *Plan Monitoring Report* (July 2000) and the Assessor's GIS system was used in the land use analysis.

b. Historic Population Growth

Table 22 shows the population trends of the cities and unincorporated areas of the county from 1970 to 2002. There was a significant increase in the overall population (188 percent) between 1970 and 2002. Not surprisingly, incorporated areas have experienced the most growth, increasing in population by 464 percent since 1970. The majority of growth within urban areas has occurred since 1990 during which the population increased at an average annual growth rate of nearly 14 percent. This increase includes population in areas added to the city UGAs in 1994.

Table 22. Population Trends in Clark County, 1970-2002

Area	1970	1980	1990	2000	2002	Percent Change 1970-2002	Average Annual Growth Rate 1970-2002	Percent Change 1990-2002	Average Annual Growth Rate 1990-2002
Clark County	128,454	192,227	238,053	345,238	370,463	188%	3.4%	56%	3.8%
Incorporated*	54,267	57,168	64,115	178,959	305,927	464%	5.6%	377%	13.9%
Unincorporated	74,487	134,974	173,844	166,279	64,536	-13%	-0.4%	-63%	-7.9%
Percent Incorporated	42.2%	29.8%	27.0%	51.8%	82.6%				
Percent Unincorporated	57.8%	70.2%	73.0%	48.2%	17.4%				
Battle Ground	1,438	2,774	3,758	9,322	11,775	719%	6.8%	213%	10.0%
Camas	5,790	5,681	6,798	12,534	15,401	166%	3.1%	127%	7.1%
La Center	300	439	483	1,654	2,017	572%	6.1%	318%	12.6%
Ridgefield	1,004	1,062	1,332	2,147	2,169	116%	2.4%	63%	4.1%
Vancouver	41,859	42,834	46,380	143,560	263,492	529%	5.9%	468%	15.6%
Washougal	3,388	3,834	4,764	8,595	9,836	190%	3.4%	106%	6.2%
Yacolt	488	544	600	1,055	1,237	153%	2.9%	106%	6.2%

Sources: Clark County Population and Economic Handbook (1970-1990 population); U.S. Bureau of the Census (2000 population), WA State Office of Financial Management, 2002 Population Trends for Washington State, September 2002 (2001 population estimate);

**Includes a portion of the City of Woodland in Clark County*

While population growth has been concentrated in urban areas over the last 30 years, a significant amount of growth has also occurred in unincorporated areas, mainly in the 1970s and 1980s prior to adoption of the GMA. Since 1990, stricter land use regulations and annexation of urbanized rural land has reduced rural population growth dramatically. Unincorporated areas went from strong growth in the 1970s and 1980s to negative growth in the 1990s, due in large part to annexation of previously developed unincorporated land into Vancouver in 1997 (e.g., Cascade Park).

Among cities within Clark County, La Center and Vancouver have had double-digit annual growth rates in the last decade. La Center grew annually at 12.6 percent between 1990 and 2002, increasing its population by over 1,700 new residents, a 318 percent increase since 1990. Vancouver grew annually at 15.6 percent for the same period and added the most new residents overall of any jurisdiction, increasing its population by nearly 120,000 new residents, a 468 percent increase since 1990. Much of this growth was the result of annexation. Other cities have also grown quickly, with average annual growth rates between 4.1 percent (Ridgefield) and 10.0 percent (Battle Ground) annually. Even the slowest growing municipalities have had substantial population increases since 1990.

c. Projected Urban Population and Household Growth

The OFM develops a range of population projections for counties; the counties then select a target within that range based on local input about economic trends and planned development. For most of the alternatives evaluated (Alternatives 2 through 5), the County chose a 1.5 average annual growth rate that would produce a 2023 population of 486,225. One alternative (Alternative 1) assumes a higher growth rate of 1.83 percent that is based on the growth assumptions in the adopted plan. Accommodating the forecasted population growth will mean adding between 38,587 and 61,323 additional households by the year 2023. Table 23 shows the projected population and projected growth for each alternative.

Approximately 81 percent of the population growth is assumed to occur in urban areas; about 19 percent is assumed to occur in rural areas.

Table 23. Projected Population and Dwelling Units by Alternative

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
2002 population	370,463	370,463	370,463	370,463	370,463
Planned Urban Population for Each Alternative					
2023 population	530,962	486,225	486,225	486,225	486,225
2002-2023 population growth	160,499	115,762	115,762	115,762	115,762
Urban population growth *	130,004	93,767	93,767	93,767	93,767
Persons per household	2.12	2.43	2.40	2.43	2.43
Planned households	61,323	38,587	39,070	38,587	38,587
Single-family	36,794	28,941	27,739	28,941	28,941
Multi-family	24,529	9,647	11,330	9,647	9,647
Actual Capacity for Each Alternative (assuming full build-out)					
Urban growth capacity*	191,128	138,627	107,840	117,943	138,759
Persons per household	2.12	2.43	2.40	2.43	2.43
Household capacity	90,155	57,048	44,933	48,536	57,103
Single-family	54,093	42,786	31,903	36,402	42,827
Multi-family	36,062	14,262	13,031	12,134	14,276
Percent of capacity used	***68%***	***68%***	***87%***	***80%***	***68%***

Source: Clark County Planning Department; Clark County Department of Assessment and GIS, 2003

Note: Household capacity is based several factors including anticipated urban growth and plan designation, average household size, and housing split. Household capacity is also calculated for school districts, which shows slightly different results due to different assumptions and household size estimates.

**81percent of population growth would be in urban areas*

While the County is required to plan for the population growth it agreed to, the County also evaluated each alternative for the actual capacity it could hold based on assumed residential designations. This analysis found that the total planned population and housing units are less than the actual capacity under each alternative. For example, Alternative 1 could hold an additional 32 percent in population, while Alternative 3's planned and capacity population is the most similar.

The total amount of land needed for housing depends on the overall densities achieved and the percentage of housing devoted to single-family and multifamily uses. While foreseeing demand is not easy because housing markets can change quickly, the county currently has a less diverse housing stock than the PMSA, potentially limiting its attractiveness for residents looking for varied housing choices. *Section G, Renter and Owner-Occupied Housing* discusses county housing in more detail.

d. Projected Rural Population and Household Growth

Increases in population would occur in urban and rural areas (outside of proposed UGAs). Between 1995 and 2000, about 19 percent of the new housing development occurred in rural areas within the county. This percentage of development is expected to continue independent of the alternative chosen. Table 24 shows the amount of population anticipated in rural areas for each alternative and compares the actual capacity within the county for accommodating the projected population. All alternatives assume that 19 percent of the planned population growth would occur in rural areas.

Table 24. Projected Rural Population and Dwelling Units by Alternative

	Alternative 1	Alternative 2	Alternative3	Alternative 4	Alternative 5
2002 population	370,463	370,463	370,463	370,463	370,463
Planned Rural Population for Each Alternative					
2023 population	530,962	486,225	486,225	486,225	486,225
2002-2023 population growth	160,499	115,762	115,762	115,762	115,762
Rural population growth*	30,495	21,995	21,995	21,995	21,995
Persons per household	2.12	2.43	2.4	2.43	2.43
Planned households	14,384	9,051	9,164	9,051	9,051
Actual Rural Capacity for Each Alternative (assuming full build-out)					
Rural population capacity	23,439	30,081	31,918	29,150	29,296
Persons per household	2.12	2.43	2.4	2.43	2.43
Household capacity	11,056	12,379	13,299	11,996	12,056
Percent of capacity used	*130%*	*72%*	*69%*	*75%*	*75%*

Source: Clark County Planning Department; Clark County Department of Assessment and GIS, 2003
**19 percent of planned population growth would be in rural areas*

The County compared the planned population and household increases for each alternative to the actual capacity in rural areas under each alternative based on existing residential designations. This analysis showed that Alternative 1 would not have adequate capacity for the planned population under current zoning densities and would exceed capacity by about 30 percent. Under current zoning densities, Alternative 1 would only be able to accommodate about 15 percent of the County's total planned population increase, less than the 19 percent rural population growth assumed for rural areas. However, this analysis also found that for the total planned population and housing units under Alternatives 2, 3, 4 and 5, planned population increases are less than the actual capacity under each alternative. For example, Alternative 2 has the capacity to accommodate an additional 28 percent in population, while Alternative 3 could accommodate 31 percent more population that what is planned.

e. Households

A household is all of the people living in one housing unit, whether or not they are related. A single person renting an apartment is a household, just as is a family living in a single-family house. The number and type of households in a community can indicate the housing needs of that community. Table 25 describes the number of households in Clark County and each of its cities. As is the case with population, most of the household growth has occurred in incorporated communities over the past 20 years. All local jurisdictions have grown considerably, although La Center, Vancouver, and Battle Ground have received the majority of new households.

Table 25. Number of Households in Clark County, 1980-2000

Jurisdiction/Area	1980	1990	2000	Percent change 1980-1990	Percent change 1990-2000
Clark County	68,750	88,571	134,030	29%	51%
Incorporated**	24,248	26,630	73,210	10%	175%
Unincorporated	44,502	61,941	60,820	39%	-2%
Battle Ground	972	1,341	3,209	38%	139%
Camas	2,096	2,438	4,736	16%	94%
La Center	156	129	585	-17%	353%
Ridgefield	382	441	777	15%	76%
Vancouver	18,844	20,135	60,039	7%	198%
Washougal	1,544	1,898	3,463	23%	82%
Yacolt	205	199	344	-3%	73%

Source: U.S. Bureau of the Census, 1980-1990; WA State Office of Financial Management (2000), 2002 Population Trends for Washington State

***Includes a portion of the City of Woodland that is in Clark County*

Another characteristic that will affect the type of housing needed in Clark County is the average household size. Average household size has declined nationally and in Washington over the past several decades. Table 26 shows that in 1980, the average household size in Clark County was 2.76 and has continued to decline in the last 20 years. The 2000 Census reported an average household size of 2.69 persons per household in Clark County. The OFM projects that average household size will continue to decline through 2023, when the projected average household size will fall to 2.43 persons per household. Smaller household size means more units are needed even if the population remains unchanged.

Table 26. Household Characteristics in Clark County, 1980-2023

Year	Total households	Persons per household
1980	68,750	2.76
1990	88,571	2.66
2000	127,208	2.69
2023	200,093	2.43

Sources: U.S. Bureau of the Census (1970-2000); Office of Financial Management (2023)

f. Income

The relationship of household income to housing prices is the main factor affecting the ability of Clark County's residents to secure adequate housing. Table 27 shows median household incomes (MHI) for the state and region. Median household income is defined as the mid-point of all of the reported household incomes; that is, half the households had higher incomes and half the households had lower incomes than the mid-point.

Median household incomes have increased in Clark County as a whole at a rate comparable to the Portland-Vancouver PMSA, and slightly faster than Washington. Nearly all of the cities have experienced much more substantial increases in median household income than either the county or the PMSA. The largest percent increases between 1990 and 2000 occurred in La Center (124 percent), Yacolt (117 percent), and Camas (111 percent).

The 2000 Census reported that Clark County had an MHI of $48,376, which is slightly higher than the Portland-Vancouver PMSA ($47,077) and the state of Washington ($45,776). Camas has the highest median household income of any city ($60,187 annually). The only other jurisdiction with a higher median household income than the county is La Center, where the median household income is $55,333. While Yacolt experienced one of the largest percent increases in the last decade, households in Yacolt still earn less than every other jurisdiction annually except Washougal. Income is also discussed in *Section g, Housing Affordability*.

Table 27. Median Household Incomes, 1990-2000

Jurisdiction/Area	1990	2000	Percent change 1990-2000
Washington State	$31,183	$45,776	47%
Portland-Vancouver PMSA	$31,259	$47,077	51%
Clark County	$31,800	$48,376	52%
Battle Ground	$24,256	$45,070	86%
Camas	$28,576	$60,187	111%
La Center	$24,750	$55,333	124%
Ridgefield	$26,992	$46,012	70%
Vancouver	$21,552	$41,618	93%
Washougal	$25,463	$38,719	52%
Yacolt	$18,194	$39,444	117%

Source: U.S. Bureau of the Census (1990-2000)

Clark County residents who fall below the federal poverty level have a more difficult time securing adequate housing than those with higher incomes do. Table 28 shows the poverty rate for all residents in Clark County and the Portland-Vancouver PMSA by relationship. Overall, the percentage of individuals below the poverty level in Clark County is slightly lower than the PMSA, although female householder families are having a harder time making ends meet. The percentage of all families in poverty in Clark County (6.9 percent) is slightly higher than families in poverty in the PMSA (6.4 percent).

Female-headed households are much more likely to live in poverty than other families. The percentage of female-headed households in Clark County in poverty (24.2 percent) is higher than the PMSA (20.9 percent). The biggest concern is female-headed households with children under five; over 43 percent live below the poverty line in Clark County compared to about 40 percent for the PMSA.

Table 28. Poverty, 2000

Category	Clark County	Percent of population	Portland-Vancouver PMSA	Percent of population
Individuals	31,027	9.1	178,528	9.5
Persons 18 years and older	19,220	7.9	122,372	8.7
Persons 65 years and older	2,180	6.8	14,057	7.3
All families	6,291	6.9	30,896	6.4
With related children under 18	5,207	10.3	25,067	9.7
With related children under 5	2,799	13.4	13,738	13.1
All female householder families	3,208	24.2	14,737	20.9
With related children under 18	3,006	31.1	13,575	27.6
With related children under 5	1,514	43.5	6,869	40.0

Source: U.S. Bureau of the Census, 2000

g. Rental and Owner-Occupied Housing

Table 29 shows the total number of units (both occupied and vacant) by structure type, based on the 2000 Census. The total number of housing units in Clark County in 2000 was 134,030 units, a 44 percent increase from 1990. Single-family homes make up 81 percent (108,411units) of this stock. Multi-family homes constitute 19 percent (25,303 units) of total housing stock. The percentage of single-family homes in Clark County in 2000 was slightly less than in 1990. By far the majority of single-family homes are one-unit-detached structures, although other single-family housing types, particularly one-unit-attached structures (townhouse) have also grown in popularity in the last ten years. The total number of single-family attached units increased by over 73 percent between 1990 and 2000,while single-family detached homes increased by about 47 percent. The number of multi-family housing units has also increased, particularly in apartment complexes with 50 or more units. The number of units in complexes with 10-19 units actually declined over the same period.

Single family units account for a higher percentage of units in Clark County than in the Portland-Vancouver PMSA, where single-family units account for about 74 percent of housing stock and multifamily units account for about 26 percent of total units. The lower percentage of multifamily and other types of housing within Clark County limits housing choices for those needing less expensive housing or wanting an alternative to single-family residences. A more varied housing stock better serves the needs of the entire population that includes seniors, low-income households, and other residents with specific needs.

Table 29. Number of Housing Units by Type in Clark County, 1990-2000

Unit Type	1990	Percent of total housing units	2000	Percent of total housing units	Percent change 1990-2000
Single-family					
1, detached	61,187	65.9%	90,081	67.2%	47.2%
1, attached	2,655	2.9%	4,583	3.4%	72.6%
Duplex	4,515	4.9%	4,914	3.7%	8.8%
Mobile home	7,320	7.9%	8,833	6.6%	20.7%
Subtotal	75,677	81.5%	108,411	80.9%	43.3%
Multi-family					
3 or 4 units	3,105	3.3%	4,803	3.6%	54.7%
5 to 9 units	3,965	4.3%	6,203	4.6%	56.4%
10 to 19 units	4,549	4.9%	4,418	3.3%	-2.9%
20 to 49 units	2,311	2.5%	3,032	2.3%	31.2%
50 or more units	2,708	2.9%	6,847	5.1%	152.8%
Subtotal	16,638	17.9%	25,303	18.9%	52.1%
Other	534	0.6%	316	0.2%	-40.8%
Total Units	92,849	100.0%	134,030	100.0%	44.4%

Source: U.S. Bureau of the Census, 1990, 2000

Table 30 shows housing units by type of occupancy over time. While total housing units increased by over 44 percent between 1990 and 2000, vacancy rates have remained relatively stable at about five percent. This is considered a normal or healthy vacancy rate, signifying a housing market with an adequate number of units to meet a growing population's needs. Of the occupied units (127,208 units), about 67 percent (85,551 units) were owner-occupied. Renters occupied 33 percent of the units (41,657 units).

Table 30. Number of Housing Units by Occupancy Type in Clark County, 1990-2000

Housing occupancy type	1990	2000
Total housing units	92,849	134,030
Vacant units (percent vacant)	4,409 (4.7%)	6,822 (5.1%)
Occupied units	88,440	127,208
Owner-occupied units	56,872	85,551
Renter occupied units	31,568	41,657

Source: U.S. Bureau of the Census, 1990, 2000

There is very little information on housing affordability in Clark County. However, rents for one- and three-bedroom apartments in Clark County are similar in price to those in the PMSA, although two-bedroom apartments tend to be about 15 percent cheaper in Clark County, as shown in Table 31. While this does provide a general indication that renting an apartment in Clark County is no more expensive and in some cases more affordable than renting in Oregon, there is no information available about the total number of units by price or by location. It is likely that lower priced rental units are more competitive than higher rents for larger units or units with more amenities. Transportation is also a critical issue for locating an affordable apartment. Finding an affordable apartment may require living farther from employment, potentially offsetting money saved in rent for time and money spent commuting.

Table 31. Average Rent by Number of Bedrooms in Unit in Clark County, 2002

	Clark County*	Portland PMSA (Oregon only)
One-bedroom	$583	$600
Two-bedroom	$621	$735
Three-bedroom	$854	$873

Source: Clark County/City of Vancouver Consolidated Housing and Community Development Plan (2004); Housing Authority of Portland, 2002

**1999 was the most recent rental data available for Clark County. Average rents have been adjusted to 2002 dollars.*

For some moderate and upper income households (particularly retirees), renting is a choice since they have the financial means to buy a home. For some young households, renting is an interim step to future homeownership. For many low and moderate-income households, however, renting is the only financially feasible choice due to the relatively high cost of purchasing and maintaining a home. The rising cost of renting has the greatest effect on the most vulnerable of Clark County's population. Once rents get too high, low-income households are forced to double up with family members, live in an apartment that is far away from their job, school, or social networks, and some are even forced into homelessness.

For those buying homes, home prices in Clark County are lower than the average for the Portland Metro area. According to the Regional Multiple Listing Service (RMLS), the median home price in the Oregon portion of the PMSA[1] was $170,000 in 2001, compared to $152,000[2] in Clark County for the same year.

h. Housing Affordability

The market value for existing housing is only one facet of determining how much home Clark County residents can afford, or if they can even afford to purchase a home. Income requirements from lenders and savings for a down payment are two stumbling blocks, but affording the monthly mortgage payment on a

1 Includes Clackamas, Washington, and Multnomah Counties.
2 Washington Center for Real Estate Research/ Washington State University, 2002

home can also be a burden. Housing affordability is based on the percentage of monthly income spent on housing. HUD uses a standard formula to determine affordability, assuming no more than 30 percent of monthly household income is spent on rent or mortgage. Table 32 compares household income to fair market rents in Clark County.[3] Fair market rents are used to assess the average cost of rental housing within each county and are a better indicator of the entire rental housing stock in the region. Using HUD's formula, approximately 15 of percent of Clark County residents cannot afford even a studio apartment, and over 27 percent are not able to afford a two-bedroom apartment.

Table 32. Housing Affordability in Clark County Based on Household Income

	Clark County	**Percent of households**	**Affordable housing cost (30 percent)**	**HUD fair market rent (2002)**
Less than $10,000	7,434	5.8%	0-$250	Studio: $492 One-bedroom: $606
$10,000 to 14,999	6,082	4.8%	$250-$375	
$15,000 to 24,999	13,386	10.5%	$375-$625	
$25,000 to 34,999	15,269	12.0%	$625-$875	Two-bedroom: $747
$35,000 to 49,999	23,938	18.8%	$875-$1,250	Three-bedroom: $1,038 Four-bedroom: $1,127
$50,000 to 74,999	30,448	23.9%	$1,250-$1,875	
$75,000 to 99,999	15,697	12.3%	$1,875-$2,500	
$100,000 to 149,000	10,649	8.4%	$2,500-$3,725	
More than $150,000	4,387	3.4%	more than $3,750	

Source: U.S. Census Bureau, 2000 Decennial Census; HUD; analysis by David Evans and Associates, Inc.

Although many residents cannot afford even the most basic housing, most Clark County households can. Households with incomes between $35,000 and $75,000 account for about 67 percent of households and all are able to afford at least a two-bedroom apartment.

While many Clark County households are able to afford larger and more expensive housing, households with lower incomes are in a more precarious situation. When rent accounts for more than 30 percent of income, HUD considers the household "cost burdened." Households spending more than 50 percent of monthly income on rent are considered "extremely cost burdened" and likely to be financially stressed by emergencies or even unable to afford basic needs such as food and transportation. HUD breaks low-income households into several categories: extremely low-income (earning at most 30 percent of the median household income); very low-income (earning at most 50 percent of the median household income); and low-income (households earning at most 80 percent of the median households income). Table 33 illustrates what different Clark County household income levels can afford based on the median household income. Extremely low-income households (earning less than $14,512 annually) cannot afford even a studio apartment in Clark County. Very low-income households earning less than $24,188 annually and accounting for about 20 percent of Clark County's population are able to afford only a one-bedroom apartment. In order to find housing, very-low income households may double up or accept substandard units. Low-income residents (earning less than $38,700) can sometimes afford larger units.

3 HUD determines fair market rent based on annual phone survey and other data gathering techniques down to the county level, but does not collect data for smaller geographic units.

Table 33. Monthly Affordable Housing Costs for Clark County Residents

		Affordable monthly housing costs (30 percent of income)			
Percent of median household income	**Median household income**	**30 percent of MHI**	**50 percent of MHI**	**80 percent of MHI**	**100 percent of MHI**
Clark County	$48,376	$363	$605	$968	$1,209

Source: U.S Census Bureau, 2000 Decennial Census; Analysis by David Evans and Associates, Inc.

The National Low-Income Housing Coalition (NLIHC) estimates that, nationally, 55 percent of low-income households experience cost burden, live in substandard housing, and/or live in overcrowded units. For extremely low-income households (30 percent of MHI), the likelihood that a household experiences some type of housing problem is even higher, at 88 percent.

The high percentage of extremely low and very low-income households in Clark County, in combination with high rental rates and home prices, indicates a lack of affordable housing for low-income households.

i. Residential Density/Housing Split

As a part of updating the 20-Year Comprehensive Growth Management Plan, the County evaluated residential building permit data for local jurisdictions and rural areas between 1995 and 2000, as shown in Table 34. Overall the county achieved a density of 1.5 units per acre. Growth has been concentrated in UGAs, where residential densities were significantly higher at 6.0 units per acre. The highest densities within individual UGAs were achieved within the Vancouver and Battle Ground UGAs, achieving 7.1 and 5.4 units per acre, respectively. Within the city limits, urban densities were also higher in Vancouver and Battle Ground than any other local jurisdiction, reaching a density of 9.5 and 6.1 units per acre, respectively. In contrast, development outside UGAs in rural areas averages one unit per five acres.

Table 34. 1995-2000 Residential Development and Housing Split

Area	Single-family				Multi-family				Total		
	Units	Percent single-family	Acres	Units per acre	Units	Percent multi-family	Acres	Units per acre	Units	Acres	Units per acre
Battle Ground											
City	1,285	88.1%	230.1	5.6	174	11.9%	11.1	15.7	1,459	241.2	6.1
Total UGA	1,311	88.1%	262.1	5.0	177	11.9%	11.6	15.2	1,488	273.7	5.4
Camas											
City	1,304	92.0%	370.8	3.5	114	8.0%	10.0	11.4	1,418	380.8	3.7
Total UGA	1,316	92.0%	374.1	3.5	114	8.0%	10.0	11.4	1,430	384.1	3.7
La Center											
City	286	97.6%	63.5	4.5	7	2.4%	0.8	9.1	293	64.3	4.6
Total UGA	296	97.7%	78.4	3.8	7	2.3%	0.8	9.1	303	79.2	3.8
Ridgefield											
City	86	72.9%	36.8	2.3	32	27.1%	4.8	6.6	118	41.6	2.8
Total UGA	93	74.4%	142.3	0.7	32	25.6%	4.8	6.6	125	147.2	0.8
Vancouver											
City	4,414	50.2%	697.1	6.3	4,374	49.8%	231.9	18.9	8,788	929.1	9.5
Total UGA	10,726	67.3%	1,950.9	5.5	5,218	32.7%	310.5	16.8	15,944	2,261.4	7.1
Washougal											
City	332	72.5%	81.1	4.1	126	27.5%	11.2	11.3	458	92.2	5.0
Total UGA	344	73.2%	117.3	2.9	126	26.8%	11.2	11.3	470	128.5	3.7
Yacolt											
City	42	95.5%	12.1	3.5	2	4.5%	0.3	6.7	44	12.4	3.5
Total UGA	42	95.5%	12.1	3.5	2	4.5%	0.3	6.7	44	12.4	3.5
Total Cities	7,749	61.6%	1,491.4	5.2	4,829	38.4%	270.1	17.9	12,578	1,761.5	7.1
Total UGAs	14,128	71.3%	2,937.3	4.8	5,676	28.7%	349.1	16.3	19,804	3,286.4	6.0
Rural Areas	2,481	100.0%	11,899.0	0.2	-	0.0%	-		2,481	11,899.0	0.2
County Total	16,609	74.5%	14,836.3	1.1	5,676	25.5%	349.1	16.3	22,285	15,185.4	1.5

Source: Clark County Community Development Department. Clark County Buildable Lands Report (July 2001)

The 1994 comprehensive plans called for not more than 60 percent of new dwelling units to be single-family housing with multi-family units making up the remaining 40 percent. Overall, the county achieved approximately a 71 percent single-family/29 percent multi-family housing split within all UGAs. The only jurisdiction to come close in attaining the 60 percent single-family/40 percent multi-family housing split was Vancouver with 67 percent single-family/33 percent multi-family housing split. Within the Vancouver city limits, the housing split was nearly 50/50. The Ridgefield and the Washougal UGAs were the only other jurisdictions to achieve a housing split similar to what the County achieved; all other jurisdictions developed with at least 88 percent of total single-family dwellings within their UGAs between 1995 and 2000. Since single-family homes are generally more expensive, these communities are less likely to provide housing affordable to the full range of county residents.

j. Constraints on Housing Production

There are relatively few constraints on housing production in Clark County. Natural resources, such as lumber and gravel, are readily available in the area, and interest rates are lower than they have been in decades. The only foreseeable limitations to housing construction would be the amount of available land for construction and the effect of environmental protection regulations. Increasing federal, state, and local

environmental protection regulations have reduced the amount of land available for development and increased the time and cost involved in producing housing.

k. Land Use

The 1994 comprehensive plans provided sufficient land to accommodate 20 years of growth, and there is still some vacant and underutilized land inside UGAs. As required by state law, the Clark County *Plan Monitoring Report* (July 2000) surveyed development activity between 1995 and 2000 to determine how well the County has done at meeting the GMA goals.

Strong population growth has spurred residential development mainly inside UGAs, although rural areas also experienced strong growth. Total residential units increased by about 15 percent in rural areas. Rural residences tended to be larger and more expensive than homes within UGAs.

Land absorption (vacant or underutilized land converted to developed areas) in urban areas varied by jurisdiction between 1995 and 2000. Countywide, 6,153 acres of vacant or underutilized lands were converted to residential uses, which is about 38 percent of residential acres available for development although only one-quarter of the 20-year planning period has elapsed. Vancouver has converted the most vacant land (total acreage) to residential uses of any jurisdiction, converting about 24 percent of available residential acres into housing in about five-years, which is in keeping with the planned absorption rate.

Camas, La Center, and Yacolt absorbed more than 60 percent of their available vacant and underutilized residential land supply between 1995 and 2000, although actual residential absorption in Camas is less than shown because approximately 600 acres of residentially-zoned land within the city (known as Camas Meadows) was rezoned for industrial uses. For this reason, land absorption in Camas is overstated. Washougal and Battle Ground also experienced strong residential growth, with between 40 and 43 percent of available vacant residential land developed, well ahead of planned residential absorption rates. These communities will need to change density designations or expand their UGA in order to demonstrate that they can accommodate 20 years of growth.

An evaluation of the absorption of vacant and underutilized commercial land is difficult because of plan changes since the 1994 comprehensive plan's adoption. Between 1995 and 2000, gross vacant and underutilized commercial land has actually increased in several jurisdictions, either because of rezoning or changes to the city's plan map. Cities noting increases in available commercial land include: Battle Ground (90 percent), Camas (46 percent), La Center (288 percent), and Ridgefield (294 percent). Cities where available commercial land has decreased are: Vancouver (-30 percent), Washougal (-42 percent), and Yacolt (-100 percent). Overall, development has occurred on about 16 percent of the vacant or underutilized commercial land within the county.

Unlike commercial land, industrial land within cities has not increased except in Camas (6 percent), where about 600 acres was rezoned from residential to industrial, and Washougal, where the total acreage increased slightly (4 percent) since 1995. Vancouver's industrial land supply changed very little between 1995 and 2000, with development occurring on less than four percent of the vacant industrial land supply. Battle Ground, Ridgefield, and the La Center have developed at least 29 percent of their vacant or underutilized industrial land.

2. Impacts

a. Introduction & Methodology

The County has identified five alternative ways to meet the county's 20-year housing and employment needs described above. The calculation of how much land is needed varies depending on several assumptions including:

- The density and type of new development (housing units per acre or jobs per acre, mix of housing types, etc.);
- How much land will be needed for infrastructure;
- How much land is added as a market factor cushion to ensure that speculation does not drive up the cost of development unduly;
- How much land with sensitive natural resources will not be developed and how much land will be needed to mitigate impacts to sensitive resources on land that is developed;
- How much development will occur as in-fill on parcels within cities or as redevelopment of underutilized land (e.g., an equipment storage yard converted to an office building).

Assumptions were made about each of these issues in the plans adopted in 1994. Alternative 1 was drawn up using these assumptions. The Clark County *Plan Monitoring Report* (July 2000) showed that some of these assumptions were wrong. Alternative 3 reflects the actual land absorption patterns of development occurring in Clark County between 1995 and 2000. Table 35 compares the assumptions in the 1994 plans with the results of the Plan Monitoring Report and with the assumptions used in each alternative.

Table 35. Comparison of Assumptions

	1994 Plan	Actual	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
% Critical Lands that develop	Reduced density (4 units/ acre)	5%	0	5%	5%	5%	5%
% redevelopment	0	unknown	0	5%	5%	5%	5%
Average density per acre (within UGAs)							
Single-family	6	4.8	6	7.44	6	7.32	7.44
Multi-family	16	16.2	16		16		
% single/multi-family	60/40	71/29	60/40	75/25	71/29	75/25	75/25
% infrastructure	38%	27.5%	38%	38%	27.5%	38%	38%
Market factor							
Residential	25%	N/A	25%	25%	0	25%	25%
Commercial	25%	N/A	25%	25%	0	25%	25%
Industrial	50%	N/A	50%	50%	0	50%	50%

Redevelopment of underutilized residential and retail parcels is also expected to occur in all of the alternatives except Alternative 1, where no redevelopment is anticipated to occur. As with critical lands, five percent of existing residential and retail lands are expected to redevelop in Alternatives 2 through 4.

A market factor was added to the overall calculation of acreage needed to accommodate growth for each alternative except Alternative 3. This market factor is a "cushion" to ensure there would be an adequate land supply to meet projected residential and business needs and discourage artificial increases in land prices. For residential, retail, and office/business park lands, an additional 25 percent was added to the

total acreage for that land use type. For industrial lands, the estimated amount of land needed was increased by a factor of 50 percent.

The estimated land need was also increased to reflect infrastructure (e.g., roads, storm water detention etc.). Alternatives 1, 2, 4, and 5 assumed that 38 percent of land is dedicated to infrastructure for residential development; land was added to account for infrastructure. Alternative 3 also adds land for infrastructure, but the percentage is based on actual infrastructure created by past development, and assumes a lower percentage of 27.5 percent. Retail, industrial, and office/business park infrastructure are assumed to be 25 percent of the overall development.

b. Direct Impacts

Direct impacts are shown in three tables. Tables 23 and 24 show the alternative's capacity to accommodate both urban and rural growth. Table 36 shows the impact each alternative would have to existing county zoning and how land within each expansion area would be allocated.

c. All Alternatives

None of the alternatives would change the UGA or land use designations for Yacolt or Woodland. There would be no change to land use, population, or employment projections as a result of these alternatives. Development within these two communities would continue as in the past and the existing and proposed comprehensive plan policies and zoning ordinance would direct any anticipated growth.

The Clark County Department of Assessment and GIS calculated land use acreage for each alternative. Acreage that would be added to a city's UGA is generally rural in nature, but when annexed to a UGA, the intensity of use is expected by definition to increase over time. This can have significant impacts on agricultural, forest, and other lands where development is sparse or has yet to occur. See Section C for a discussion about the potential impacts to resource lands by each alternative. See Section B for a discussion about rural lands in Clark County.

Vancouver's updated comprehensive plan will include general designations of future urban activity centers and notes, to be implemented through application of zoning designations and other policy direction in future subarea plans. These are intended to serve as potential focal points for future development and redevelopment. Each may emphasize different combinations of housing, employment, shopping, and other activities to reduce reliance on the automobile and encourage using mass transit.

d. Alternative 1

Clark County: Alternative 1 projects the largest increase in population, housing units, and expansion of land to UGAs of any alternative. Countywide, the population is anticipated to increase by 160,499 residents by 2023, bringing the county's total population to 530,962 under this alternative. To accommodate the growing population, an additional 61,323 housing units would be required assuming 60 percent of new units are single-family and 40 percent are multi-family units.

Alternative 1 would also result in the largest expansion of UGAs, adding 28,845 acres, over twice the amount added by the second largest expansion (Alternative 4). While all of the cities' UGAs would expand under this alternative, most of the new growth would occur in an area between Vancouver and Battle Ground. About 80 percent of the land that would be added to UGAs would be for residential development.

Under Alternative 1, basic land use patterns within Clark County would not change. The majority of the land would continue to be used for low-density residential development (18,945 acres), more than three times Alternatives 2, which assume the next highest residential land increase. While this alternative would include some higher density housing near industrial and office/business park developments, large lot single-family housing developments would be more likely to occur with this alternative than with others. Most of these units would not be affordable housing as larger lot homes are typically more expensive than more compact residential developments. This alternative does assume a 60 percent single-family/40 percent multifamily housing split, a more even split than any other alternative. However, the large land area included under this alternative would create relatively few homes compared to other more dense alternatives, leading to a more sprawling, less compact urban form than other alternatives. The preponderance of low-density single-family housing would limit the potential for housing diversity and affordable housing options.

Most of the land that would be converted to urban uses, totaling about 11,925 acres, is currently zoned for rural residential land uses, mainly as single family homes on 5-acre lots (about 9,000 acres). While Alternatives 2, 4, and 5 would also affect these land uses, Alternative 1 would affect over five times the amount of existing rural residential land as Alternative 2, about two and one-half times as much as land as Alternative 4, and nearly three times as much land as Alternative 5. While the existing uses would not be required to increase in density, over time as the city expands to include these areas, rural residential development could be replaced with smaller lots and more units. It is unlikely though that this alternative would have this impact in the foreseeable future because the total amount of land added to the UGA would not require higher densities in the expansion areas. An analysis of actual capacity in rural areas outside of the new UGAs also showed than under Alternative 1, rural lands would not be able to accommodate the planned rural population growth assumed under this alternative unlike Alternatives 2, 3, 4, and 5 that would have adequate capacity.

Alternative 1 would also have a greater impact on resource land than any other alternative, converting more agricultural land (8,648 acres) to urban uses than any other alternative—nearly two and one-half times the amount of Alternative 5, the next largest inclusion. Impacts to resource land are discussed in more detail in Section C.

This alternative would have by the far the greatest land use impacts of any alternative and would likely provide the least amount of affordable housing. Less than one-quarter of the new UGA under this alternative would be dedicated to commercial and industrial uses, lower than the other alternatives. As with Alternative 2, the main focus of this alternative is to provide primarily low-density housing on large lots.

Table 36. Total Acreage Added to City UGAs by Alternative and Plan Designation

Rural Land → **Urban Land**

Existing County Comprehensive Plan Designations

	County					**Battle Ground**					**Camas**				
	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Existing Land Use Designation	Acres of existing Comprehensive Plan designations added to UGAs					County acreage dedicated to City					County acreage dedicated to City				
Rural Residential	**11,931**	**2,094**		**4,762**	**4,007**	4,036	1,983		3,881	2,560	428			263	278
Urban Reserve	**6,281**	**4,561**		**3,560**	**3,997**	410	41		412	411	373	189		369	216
Commercial	**159**	**15**		**15**	**45**	127	15		15	15					
Office Park/Business Park	**3**	**1**		**1**	**1**										
Industrial	**44**	**23**		**24**	**13**	26	8		8	8	15	2		13	2
Industrial Urban Reserve	**357**	**62**		**238**	**294**						238			238	176
Mining Lands	**195**	**195**		**195**	**193**						194	2		194	191
Agriculture	**8,648**	**2,207**		**3,179**	**3,589**	880	563		1,020	846	724	151		328	1
Forest land	**146**			**69**										69	
Other	**185**	**70**		**70**	**77**						70			70	1
Parks/Open Space	**361**	**76**		**52**	**37**						52	1		52	
Public Facility	**97**	**50**		**1**	**50**										
Water	**439**	**393**		**388**							379			379	
Total acres	**28,845**	**9,749**	**0**	**12,554**	**12,303**	**5,479**	**2,610**	**0**	**5,337**	**3,841**	**2,474**	**344**	**0**	**1,975**	**864**

	La Center					**Ridgefield**					**Vancouver**					**Washougal**				
	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Existing Land Use Designation	County acreage dedicated to City					County acreage dedicated to City					County acreage dedicated to City					County acreage dedicated to City				
Rural Residential	279			34	9	39					7,052	102		574	1,146	68	2			
Urban Reserve						223	217				5,080	3,907		2,764	3,370	195	208		15	
Commercial	9				9						23				20					
Office Park/Business Park											3	1		1	1					
Industrial											3	13		2	3					
Industrial Urban Reserve	119				118							62								
Mining Lands											2	193		1	2					
Agriculture	446			30	278	245	1			400	6,242	1,088		1,801	1,921	111	404			145
Forest land	146																			
Other	99				57					20	15	70								
Parks/Open Space	1										309	75			37					
Public Facility											97	50		1	50					
Water	2										58	393		8						
Total acres	**1,101**	**0**	**0**	**64**	**470**	**506**	**218**	**0**	**0**	**419**	**18,883**	**5,955**	**0**	**5,152**	**6,550**	**375**	**614**	**0**	**15**	**145**

2023 Projected Population	**530,962**	**486,225**	**486,225**	**486,225**	**486,225**

Table 36. Total Acreage added to City UGAs by Alternative and Plan Designation (continued)

Rural Land → **Urban Land**

New Land Use Designations

	County					Battle Ground					Camas				
	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
New Land Use Designation	Proposed Urban Land Use Designations added to UGAs					County acreage dedicated to City					County acreage dedicated to City				
Urban Low Density Residential	**18,945**	**5,325**		**1,682**	**5,360**	2,781	633		1,270	2,298	1,074			289	251
Urban Medium Density Residential	**3,819**	**1,822**		**383**	**1,609**	1,731	1,043		383	415	552	117			137
Urban High Density Residential	**507**	**129**		**321**		404			321		104	129			
Total new residential acres	**23,271**	**7,276**	**0**	**2,387**	**6,969**	**4,916**	**1,676**	**0**	**1,974**	**2,712**	**1,730**	**246**	**0**	**289**	**387**
Mixed Use	**492**			**1,971**	**481**				1,685	405				286	
Commercial	**2,403**	**88**		**2,816**	**897**	471	76				476			940	126
Office/Business Park	**2,458**	**3,581**	**901**	**197**	**3,353**	134	993	134		725		98		197	360
Industrial	**1,550**			**4,773**	**603**	93			1,541		281			16	
Public Facilities				**204**					137					52	
Parks/Open Space				**206**										206	
Total employment acres	**6,903**	**3,670**	**901**	**10,167**	**5,334**	**698**	**1,069**	**134**	**3,363**	**1,129**	**757**	**98**	**-**	**1,697**	**486**
Total acres	**30,173**	**10,945**	**901**	**12,554**	**12,303**	**5,614**	**2,745**	**134**	**5,337**	**3,842**	**2,487**	**344**	**0**	**1,986**	**873**
Minus rezoned land already within UGA	**1,328**	**1,196**	**901**			**134**	**134**	**134**							
Total acres	**28,845**	**9,749**	**0**	**12,554**	**12,303**	**5,480**	**2,612**	**0**	**5,337**	**3,842**	**2,487**	**344**	**0**	**1,986**	**873**

	La Center					Ridgefield					Vancouver					Washougal				
	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
New Land Use Designation	County acreage dedicated to City					County acreage dedicated to City					County acreage dedicated to City					County acreage dedicated to City				
Urban Low Density Residential	581			64			218				14,133	3,859		60	2,812	375	614			
Urban Medium Density Residential						158					1,377	662			1,058					
Urban High Density Residential																				
Total new residential acres	**581**	**0**	**0**	**64**	**0**	**158**	**218**	**0**	**0**	**0**	**15,510**	**4,521**	**0**	**60**	**3,870**	**375**	**614**	**0**	**0**	**0**
Mixed Use											492				76					
Commercial	208					68					1,180	13		1,876	770					
Office/Business Park	312				470	261				419	1,751	2,490	768		1,234					145
Industrial						20					1,156			3,216	603					
Public Facilities																			15	
Parks/Open Space																				
Total employment acres	**520**	**0**	**0**	**0**	**470**	**349**	**0**	**0**	**0**	**419**	**4,579**	**2,502**	**768**	**5,092**	**2,683**	**0**	**0**	**0**	**15**	**145**
Total acres	**1,102**	**0**	**0**	**64**	**470**	**506**	**218**	**0**	**0**	**419**	**20,089**	**7,023**	**768**	**5,152**	**6,553**	**375**	**614**	**0**	**15**	**145**
Minus rezoned land already within UGA											**1,194**	**1,062**	**768**							
Total acres	**1,102**	**0**	**0**	**64**	**470**	**506**	**218**	**0**	**0**	**419**	**18,895**	**5,961**	**0**	**5,152**	**6,553**	**375**	**614**	**0**	**15**	**145**

Source: Clark County Planning Department; Clark County Department of Assessment and GIS. 2003

Battle Ground: Alternative 1 would add 5,480 acres to the UGA, more than doubling the city's current UGA. This would be the largest increase to the Battle Ground UGA of any alternative. Most of the acreage would be dedicated to housing (4,916 acres) and would be predominately single family housing, although this alternative would also add more medium density housing than any other alternative. Most of this expansion would occur on land currently zoned for low-density residential development. Given the high water table and existing lot patterns, much of the area designated for medium density housing is unlikely to develop as such in the short term. Because most residential land would be dedicated to lower density residential development, this alternative would do less than other alternatives to provide affordable housing.

This alternative would provide more commercial land in the Battle Ground UGA than any other alternative, mainly to support residential development. However, it also includes much less office/business park and industrial lands than any other alternative except Alternative 3 that would not expand the existing UGA. As a part of this alternative, a portion of industrial land on the east side of the city would be changed to office/business park in an effort to increase the number of jobs within the city, although this alternative mainly provides new housing opportunities, adding fewer jobs for the projected population growth than other alternatives. This alternative would have a similar impact as Alternative 4, and even though Alternative 1 would add the most acreage for residential housing, would likely provide less affordable housing because of the relatively low housing density.

Camas: As with most other jurisdictions, Alternative 1 would add the most acreage to the Camas UGA (2,487 acres), mainly land zoned for agricultural uses. Under this alternative, low-density housing would be the primary land use (1,074 acres). However, Alternative 1 would also designate more medium density land than any other alternative and more high-density residential land than all other alternatives except Alternative 2. Affordable housing is more likely in medium and high density residential areas and would offer more housing choices to Camas residents. Low-density housing would be less affordable than more compact development utilizing less land. This alternative would have the least compact urban form of any alternative.

About one-third of the expansion area would be dedicated for commercial and industrial uses, which is more than Alternatives 2, 3and 5, but less than Alternative 4. This alternative would have the greatest land use impacts of any alternative.

La Center: This alternative would add approximately 1,102 acres to the city's UGA, mostly land currently used for agriculture and rural residences. The majority of land added to the UGA would be for low-density residential uses (581acres), but since La Center has grown rapidly and absorbed most of the residential land, some adjustment is needed. New residential development within the new UGA would likely continue to be composed of primarily single-family residential development on large lots.

A large block of land would also be added at the La Center Junction on I-5 for commercial and office/business park uses (520 acres), which is the same area proposed for inclusion under Alternative 5. This area is designated as urban reserve under the current comprehensive plan.

This alternative would have the greatest land use impacts of any alternative in terms of overall UGA expansion. Inclusion of land near I-5 in this Alternative would have similar impacts to Alternative 5. However Alternative 1 would also add a substantial amount of residential land for low density residential uses. La Center's current compact community would change substantially.

Ridgefield: Alternative 1 would add approximately 506 acres to the Ridgefield UGA, currently agricultural and urban reserve land. The expansion area would be primarily for medium density housing (158 acres) and office/business park uses (261acres). Unlike other cities, all residential uses within the

expansion areas would be medium density housing, potentially single-family homes intermixed with multifamily units. Most of the added land is surrounded on three sides by the existing UGA.

While this alternative would add more land to the UGA than any other alternative, the land is surrounded on three sides by the existing UGA. In terms of overall acres added, this alternative would have the greatest impact of any alternative, but because of the expansion area's location, would not have as great of an impact to the city's urban form as Alternative 5 that proposes expansion along I-5.

Vancouver: Vancouver would see the largest increase in total acreage of any city in Clark County under Alternative 1, growing by 18,895 acres, almost three-times as much as Alternative 5, the next biggest expansion of the Vancouver UGA. Most of this growth would occur on rural residential, urban reserve and agricultural land. Overall, about 80 percent of the total land (15,510 acres) would be dedicated to residential uses, with the most land dedicated to low-density residential development (14,133 acres, or about 80 percent of residential land), which is more than three times any other alternative. Some land would also be dedicated for medium (1,377 acres) and mixed-uses (492 acres). Mixed use areas would also support commercial uses. About 1,194 acres of land now used for industrial purposes within the existing UGA would also be rezoned for office/business park uses as a part of this alternative.

The large amount of low density residential would make it hard for the city to meet the 60 percent single-family/40 percent multifamily housing split policy, although more land is dedicated to medium and high density development overall than in any other alternative.

As a result, it would be difficult for Vancouver to assure an adequate supply of affordable housing for all residents since single-family homes are less affordable options. Compared to other alternatives, Alternative 1 would use land least efficiently, creating the least compact urban form of any alternative.

Washougal: All land added to the Washougal UGA (375 total acres) would be low density residential and is mainly zoned by the County as urban reserve (195 acres) and agriculture (111 acres). Overall, land use impacts in gross acreage would be less for this alternative than under Alternative 2. Residential development patterns would continue to be predominantly single-family residential and would not increase affordable housing options within the UGA.

e. Alternative 2

Clark County: Because of a lower growth rate assumption, Alternatives 2,3,4, and 5 project a lower 2023 population of 486,225 (44,737 fewer people than under Alternative 1). The lower population projection means fewer new housing units would be needed. Alternative 2 would require 38,587 new units, about one-third less than Alternative 1 and the same as Alternatives 4 and 5. This alternative assumed new housing units would 75 percent single-family units and 25 percent would be multi-family residences.

Alternative 2 would add 9,749 acres to city UGAs, about one third of the total land proposed in Alternative 1 and about three quarters as much land than Alternatives 4 and 5. About three-quarters of this acreage would be devoted to residential development, more than any alternative except Alternative 1. While less land would be developed with housing than Alternative 1, the proposed increase in low density residential land (5,325 acres) under this alternative would still be higher than Alternatives 3 and 4, resulting in reduced the overall density of residential development within UGAs. Low-density residential acreage under this alternative is about the same as proposed under Alternative 5.

More medium density housing (1,822 acres) would be added under this alternative than Alternatives 4 and 5. Residential development would likely occur at similar densities as under Alternative 5, but lower

densities than under Alternatives 3 and 4, that would offer more mixed-use development and provide more housing choices.

Alternative 2 would have less impacts on resource land than any other alternative except Alternative 3 (which would have no impact), converting about 2,207 acres of agricultural land to urban uses. Impacts to resource land are discussed in more detail in Section C. More growth would occur on urban reserve lands than any other alternative (except Alternative 1) and on low-density rural residential lands.

About one-quarter of the land under this alternative would be dedicated to commercial and industrial uses, primarily business parks. These uses would be scattered throughout the expanded UGAs. However, as with Alternative 1, most of the expanded UGA would provide low-density housing.

Battle Ground: Under this alternative, the Battle Ground UGA would grow by approximately 2,612 acres in the southwest corner of the city toward Vancouver and mainly on rural residential land. This alternative would add less than half the acreage as Alternatives 1 and 4, and about two-thirds as much land as Alternative 5. Medium density housing (1,043 acres) would provide most of the housing within the expansion areas in Alternative 2; about half as much low-density housing (633 acres) is included in this option as Alternative 4, and about one-quarter as much as Alternative 5. As a result, this alternative would likely promote more compact residential development than Alternatives 1, 4, and 5, but less than Alternative 3 where no additional land would be added to the UGA. Overall, residential density could increase slightly more than Alternatives 1and 5, although not more so than Alternative 4 that designates 1,685 acres for mixed-use, and Alternative 3 that would not add any new land. Affordable housing options would therefore be more likely under this alternative than Alternatives 1 and 5, and offer more housing choices.

This alternative would provide more office/business park land than any other alternative, increasing the potential for jobs located within the proposed UGA, and better balancing jobs with housing within the community. As a part of this alternative, a portion of industrial land on the east side of the city would be changed to office/business park in an effort to increase the number of jobs within the city. Alternative 2 would not add industrial or mixed use land as in Alternative 4.

Camas: The Camas UGA would grow less with Alternative 2 than any other alternative except Alternative 3 where the UGA boundary would remain the same. Overall, approximately 344 acres would be added to the city's UGA, all of that dedicated to medium and high density housing, and office/business park space. Growth would occur mainly on urban reserve and agricultural land west of Camas Meadows.

Under this alternative, a variety of housing options could develop over time that would support households at different life stages and different income levels. The combination of fewer acres available for development than Alternatives 1, 4, and 5 and increased density near employment centers could provide variety of housing types while allowing existing low-density residential uses to predominate. Alternative 2 could result in higher density developments than Alternatives 1, 4, and 5, and promote a more compact urban design than any other alternative except Alternative 3.

La Center: This alternative would not add any land to the La Center UGA. New households would be accommodated on land currently within the UGA, likely by increasing densities in some areas if needed. No new commercial or industrial development would be added either. The overall land use impacts would be the same under this alternative as Alternative 3, resulting in a more compact urban form than Alternative 1.

Ridgefield: Alternative 2 would increase Ridgefield's UGA by approximately 218 acres of land currently designated as urban reserve. All of the expansion area is designated for low density residential uses similar to adjacent residential development within the UGA. Development in Ridgefield could result in

lower overall average density than under Alternatives 3,4, and 5, where no additional residential land would be added to the UGA.

Vancouver: Under Alternative 2, the Vancouver UGA would grow approximately 5,961 acres, which is less than Alternatives 1 or 5, but more than Alternatives 3 and 4. Most of the land to be included within the UGA is now designated as urban reserve and agriculture, but would be mainly low density residential (3,859 acres) and office/business park (1,428 acres) uses. In addition to the expansion area, about 1,062 acres within the existing UGA would be rezoned for office/business park uses, totaling 2,490 acres for office/business park uses. About 662 acres would be designated for medium density residential areas, primarily around office/business park areas and Washington State University. This is about half as much medium density residential as in Alternative 1 and about 60 percent as much as in Alternative 5.

Overall, Alternative 2 would result in a lower density, more sprawling development pattern than any other alternative except Alternative 1. Some multifamily housing would still occur around job centers or would be located in more central areas, but housing types would be more limited than under Alternatives 3 and 4, where population densities might support more affordable housing choices.

Washougal: Alternative 2 would add about 614 acres to the existing Washougal UGA, all designated for low density residential uses. The expansion area is currently zoned for agricultural uses (404 acres) and as urban reserve (209 acres). This alternative would add about two-thirds more land to the Washougal UGA than Alternative 1, the only other alternative that would add any residential land to the UGA. This increase in available land would not likely support affordable housing; lots would likely be large and more expensive. Affordable housing options would not increase as a result of this alternative.

f. Alternative 3

Clark County: Alternative 3 would maintain the existing UGAs for each jurisdiction and accommodate projected population increases through 2023 on existing vacant or underutilized parcels. The estimated population is the same for this alternative as for Alternatives 2, 4, and 5. However, more housing units would be needed (38,587 units compared to 39,070 units), the result of a slightly different housing split of 71 percent single-family/ 29 percent multifamily units. This is the housing split for new units experienced in the county since 1995. Generally, families living in single-family homes are larger than in multifamily units, so even though this alternative assumes a higher percentage of multifamily housing to single-family units, the smaller household size in multifamily actually increases the number of needed units.

Alternative 3 would accommodate all new growth within the existing UGAs; no land outside of existing UGAs would be added. Alternative 3 does not include a 25 percent market factor for residential land, unlike all other alternatives. Land already identified for residential development would develop at densities that have been achieved over the past 5 years. No additional urban land would need to be designated and higher density zoning would not need to occur.

Alternative 3 may result in slightly more affordable housing than the other alternatives, and considerably more affordable housing than Alternatives 1 and 2, which provides little incentive for higher densities or multi-family units. To meet housing demand, Alternative 3 would encourage neighborhood infill and redevelopment of passed over or underutilized land. This alternative would make the most efficient use of existing infrastructure and best support transit.

Alternative 3 would have no impact on resource lands. No resource lands would be made available for development as a part of this alternative because all development would occur within the existing city UGAs. About 901 industrially zoned acres within Vancouver and Battle Ground would be rezoned for Office/Business park uses in an effort to increase the number of jobs. Urban services are already planned for or are in place for these areas.

Battle Ground: No change would occur to Battle Ground's UGA as a result of this alternative. Development would occur on vacant and underutilized parcels and some larger lots with only one home would likely be subdivided.

This alternative would result in the most efficient use of existing infrastructure of any alternative while accommodating the anticipated population and job increases. As a part of this alternative, some land on the east side of downtown would be changed to an office/business park designation to allow more intense development and increase the number of jobs within the city.

Camas: No change would occur to the Camas UGA as a result of this alternative. Development would continue as it has in the past. As population increases, some underdeveloped larger lots would likely be subdivided to increase the number of housing units.

This alternative would result in the most efficient use of land of any alternative while accommodating the anticipated population and job increases.

La Center: No change would occur to La Center's UGA as a result of this alternative. Development would continue as it has in the past and no rezoning to higher densities would be needed. As population increases, some larger underutilized lots would likely be subdivided to increase the number of housing units.

This alternative would result in the most efficient use of land and infrastructure of any alternative while accommodating the anticipated population and job increases.

Ridgefield: No change would occur to the Ridgefield UGA as a result of this alternative. No upzoning would occur and development would continue as it has in the past. As population increases, some larger underutilized lots would likely be subdivided to increase the number of housing units. Residential impacts under this alternative would also be similar to those in Alternatives 4 and 5.

This alternative would result in the most efficient use of land and infrastructure of any alternative while accommodating the anticipated population and job increases.

Vancouver: No change would occur to the Vancouver UGA as a result of this alternative. No rezoning to increase density would be needed and development would continue as it has in the past. As population increases, some larger underutilized lots would likely be subdivided to increase the number of housing units.

This alternative would result in the most efficient use of land of any alternative while accommodating the anticipated population and job increases. As a part of this alternative, about 768 acres of industrial land within the existing UGA would be changed to office/business park in an effort to increase the number of jobs in Vancouver.

Washougal: No change would occur to the Washougal UGA as a result of this alternative. Development would continue as it has in the past under existing zoning densities. Some larger underutilized lots could be subdivided to increase the number of housing units.

This alternative would result in the most efficient use of land and infrastructure of any alternative while accommodating the anticipated population and job increases.

g. *Alternative 4*

Clark County: This alternative is a composite of the preliminary growth plans for each city and town, with limited effort to reconcile inconsistencies or overlap. Alternative 4 projects the same population and housing unit increases as Alternatives 2 and 5.

Under Alternative 4, most new growth would occur to the west and south of Battle Ground although Vancouver would also expand its UGA to the north, and Camas and Washougal would also slightly expand their UGAs. Overall, the total expansion under this alternative would require approximately 12,554 acres of land now designated for rural residential uses and urban reserve. This alternative would add more land to city UGAs than any other alternative except Alternative 1, and aside from Alternative 1, would convert the most rural residential land within the county. Under Alternative 4 residential needs would be met largely with mixed-use housing. Low-density residential would only be about one-third as much as in Alternatives 2 and 3 and less than one-tenth as much as under Alternative 1. The remaining land would be designated for commercial or industrial uses.

Two of the defining features of this alternative are the inclusion of 1,971 acres of mixed-use and the large commercial and industrial land base added to the Vancouver and Battle Ground UGAs. About 80 percent of land under this alternative would be dedicated strictly to job creation (including mixed-use areas that would also include housing), which is about 50 percent more than Alternative 5, more than twice as much as Alternative 2, and about 35 percent more than under Alternative 1.

Unlike Alternatives 1, 2 and 5 that rely on low density residential housing for the majority of new units, this alternative would rely on higher density mixed-use development that could potentially offer more affordable housing options. However, mixed-use housing can also be expensive, so affordable housing may still be limited to higher density multifamily housing. Affordability under this alternative would not likely be as good as under Alternative 3 where the most housing choices might be found.

Alternative 4 would have a greater impact on resource land than Alternatives 2 and 3, converting about 3,179 acres of agricultural land to urban uses. Impacts to resource land are discussed in more detail in Section C.

Battle Ground: Alternative 4 would add 5,337 acres to the existing UGA, nearly the same as under Alternative 1 and about one-third more than Alternative 5. The area that would be added to the UGA is mainly rural residential and agricultural land uses. Under this alternative, growth would occur to the north as well as the south and west of the existing city. Most land within the expansion area would be dedicated to mixed use (1,685 acres) and industrial uses (1,541 acres), which is significantly more than in any other alternative.

Industrial and commercial development would be spread throughout the expansion area, not concentrated in one sector or located on major arterials and highways. The majority of residential land would be dedicated for mixed-use and low density single-family housing. Traditional medium and high density housing would be less available with this alternative than any other alternative proposing a UGA expansion. Instead this alternative focuses on mixed-use housing to provide affordable housing choices, although affordable housing could still be limited because mixed-use housing can often be as expensive as other housing options and more expensive than multifamily units. New business and industry locating to the area may put some development pressure on existing large lot developments as the need for housing would increase with population relocating to be closer to work. These large lot residences may eventually subdivide as residential land values increase.

Camas: Alternative 4 would add approximately 1,986 acres to the Camas UGA, primarily to the north and west of the existing UGA. This is more than any other alternative except Alternative 1. Growth would

occur mainly on rural residential and resource lands, affecting more resource land than any other alternative except Alternative 1. Nearly one half of the expansion area would be designated for commercial uses (940 acres), and about 197 acres would also be designated for office/business park uses. Compared to other alternatives, this option would add over twice the amount of commercial land as Alternative 1 and over seven times the amount proposed in Alternative 5. However, Alternative 5 would have almost twice the amount of office/business park land as this alternative. This alternative could create more jobs than any other alternative. This alternative is the only alternative where park/open space (also an existing use) would be added to the Camas UGA.

Alternative 4 would also add more residential land than Alternatives 2 and 3. Housing acreage would be split evenly between low-density residential (289 acres) and mixed-use (286 acres), although mixed-use also would support commercial uses. Alternative 4 is the only alternative to offer mixed use in the Camas expansion area. Low-density residential acreage would be slightly higher than Alternative 5, but about one-quarter as much as under Alternative 1. As a result, mixed use housing options would increase under this alternative, but medium and high density housing would be lower than the other alternatives. Because there is no medium or high density housing included in this option except what would be provided in mixed-use developments, affordable housing options would be more limited than under the other alternatives. While individual large lot residential development would occur, some larger lots would likely be subdivided to increase the number of housing units.

La Center: About 64 acres of low-density residential land would be added to the UGA under Alternative 4. Most of this land is already designated for rural residential uses, although about 30 acres are currently used for agriculture. This alternative would slightly reduce the city's density and would have a greater impact to residential uses than Alternatives 2, 3 and 5 that would not add any residential land to the UGA. However, since rapid growth in the late 1990's absorbed most residentially designated land in the UGA, some adjustment is needed.

Ridgefield: No change would occur to Ridgefield's UGA as a result of this alternative. Land use impacts would be similar to Alternative 3.

Vancouver: Alternative 4 would add approximately 5,152 acres to the Vancouver UGA, land that is now zoned primarily for urban reserve (2,764 acres) and agriculture (1,801 acres). Nearly all of the land added under this alternative would be designated for industrial (3,216 acres) or commercial uses (1,876 acres). No additional residential acreage would be added to the UGA as a part of this alternative. The City is assuming that existing residential areas would be able to accommodate future population growth. Compared to other alternatives, Alternative 4 would add about 60 percent more commercial land and nearly three times the amount of industrial land included in Alternative 1. Extending infrastructure to support development in these employment areas will be expensive.

Residential development would occur in a similar fashion as in Alternative 3 since no new residential land is included in this alternative. If development patterns continue as they have in the past, subdivision of large lots to make room for more single-family units would occur. Some areas would develop at higher densities as multifamily housing, offering more housing options than currently exist and potentially more affordable housing than other alternatives.

Washougal: Very little land would be added to the Washougal UGA under Alternative 4. About 15 acres would be designated for public facilities along the northern UGA boundary currently zoned by the County as urban reserve. All other land use impacts would be similar to Alternative 3.

h. Alternative 5

Clark County: Alternative 5 assumes the same population growth as Alternatives 2, 3 and 4 and the same housing needs as Alternatives 2 and 4. This alternative would have a greater impact to county land than either Alternative 2 or 3, but less than Alternatives 1and 4. Countywide, 12,303 acres would be reallocated to city UGAs. Much of this land is currently designated as urban reserve (3,997 acres), agriculture (3,589 acres), and low density rural residential (2,442 acres). Section C describes the impacts this alternative would have on resource land. Most UGA expansion for residential development would occur north of Vancouver along I-5 and southwest of Battle Ground.

This alternative would likely produce a residential development pattern very similar to Alternative 2. Both alternatives assume that most housing in the expansion area would be low-density residential. Alternative 5 would have three times as much low-density residential as Alternative 4, but about one third that of Alternative 1. Alternative 5 varies from Alternative 2 in that a portion of the housing would be mixed-use (481 acres), with less land devoted to medium density housing. Overall, housing development would be less compact than Alternative 3 where all housing would be located within the existing UGA, and Alternative 4 that assumes most housing would be in mixed-use developments.

As with other alternatives, affordable housing could increase slightly around office/business park nodes as higher density housing is built to house employees, but affordable housing options would still be limited. Affordable housing would likely be found closer to cities where more housing options are available. This alternative would spread development along the I-5 corridor, rather than producing a more compact development pattern.

The primary focus of Alternatives 4 and 5 is to make land available for creating jobs. Both alternatives would designate a higher percentage of land for commercial, industrial, and office/business park use than other alternatives (80 percent for Alternative 4 and 40 percent for Alternative 5, including mixed-use). However, unlike Alternative 4 where most land would be in industrial, commercial, and mixed use designations, Alternative 5 would concentrate land in office/business park uses. Alternative 5 would designate about the same amount of land to office/business parks as Alternative 2, but Alternative 5 would also designate more land to mixed use, commercial, and industrial uses. Most of this development would occur along major thoroughfares and I-5, increasing accessibility via automobile. However, since most housing would be within the existing city limits where housing is often less expensive, longer commute distances for work may be more common with this alternative than others.

Battle Ground: Alternative 5 would have less overall impact on land use than Alternative 4, but would include more land area than Alternative 2. This alternative would add approximately 3,842 acres to the Battle Ground UGA, generally to the west and south of the existing UGA on land currently utilized for rural residential and agricultural uses. Office/business park development (725 acres) would occur within the expansion area. Housing options would be more limited with this alternative than any other because most residential land would continue to be large lot single family residential units. Less medium density development would occur under this alternative than any other except Alternative 4, where mixed-use housing would be dominant that would also support commercial uses. Alternative 5 would provide mixed-use development (405 acres) but less than one-quarter of Alternative 4. As a result, affordable housing options would likely be limited with this alternative; higher density development would have to rely on vacant or redevelopable areas within the existing boundary to provide less expensive multifamily housing.

Camas: Alternative 5 would add approximately 873 acres to the Camas UGA, primarily to the north and west of the existing UGA affecting land currently used for rural housing and industrial uses. Like Alternative 3, this alternative would not have an impact on resource land. The majority of land would be

designated for commercial and office/business park uses (486 acres), which is about one-third as much as under Alternative 4.

Slightly more low and medium density residential land (387 acres) would be added to the UGA under this alternative than Alternative 2, but only about one-fifth as much as under Alternative 1. Affordability could be affected under this option more than under Alternatives 1, 2, and 3 because of the lack of higher density housing choices.

La Center: This alternative would add approximately 470 acres to the existing UGA at the La Center Junction along I-5, which is more in total acres than any other alternative except Alternative 1. However, unlike Alternative 1, all of the expansion area would be dedicated to office/business park development; no residential land would be added as a part of this alternative. Residential development would occur only within the existing UGA. As population increases and the business park develops, residential demand can be expected to increase, and housing choices should be more varied as population densities reach levels that could support varied housing types. Some larger lots within the current UGA would likely be subdivided to increase the number of housing units.

Ridgefield: This alternative would add approximately 419 acres of office/business park to the existing UGA along I-5, which is more land than under any other alternative except Alternative 1. Of the 419 acres, 400 acres are currently used for agriculture. This alternative would have the greatest impact to resource land in the Ridgefield area of any alternative, affecting about 40 percent more resource land than Alternative 1. However, unlike Alternative 1, all of the expansion area would be dedicated to office/business park development; no residential land would be added as a part of this alternative. As population increases, housing choices should be more varied. Some larger lots would likely be subdivided to increase the number of housing units, especially if the new office/business park land develops as anticipated.

Vancouver: Alternative 5 would expand Vancouver's UGA approximately 6,553 acres, primarily to the north of the existing UGA along the I-5 corridor. Most of this land is currently designated for urban reserve and agriculture. In terms of overall expansion, this alternative would add only one third the area that Alternative 1 would add. Expansion areas would be designated for residential, commercial, and office/business park uses. This alternative would designate less office/business park land than Alternatives 1 and 2, but more than the other two alternatives. Alternative 5 would also designate less than half as much industrial land and about one-quarter as much commercial land as Alternative 4 where nearly all of proposed expansion areas would be commercial or industrial uses.

Unlike Alternative 4, Alternative 5 would add residential land, but to a less degree than Alternatives 1 or 2. However, residential land in Alternative 5 would be about 40 percent more medium density residential than under Alternative 2. Higher density residential uses would be located near major office/business park developments, offering more housing choices for employees working in the area. Low density residential development would also make up a portion of the expansion area. This alternative would likely produce more housing options and more affordable housing choices than Alternatives 1 and 2, but less so than Alternatives 3 and 4. While there would be more residential land available, most land would develop as single-family homes on large lots rather than in a more compact pattern.

Washougal: This alternative would add approximately 145 acres of office/business park north of the UGA, land now zoned for agriculture. All of the expansion area would be dedicated to office/business park development; no residential land would be added as a part under this alternative. Residential development would be similar to Alternative 3.

i. Site Specific Requests for Changes to Land Use Designations

In addition to the proposed comprehensive plan changes proposed under each alternative, individual property owners have submitted requests for the County to change their property's comprehensive plan/zone designation. The requests fall into one of three situations:

1. The property is within a proposed UGA and the proposed land use is consistent with the land use proposed by that alternative.

2. The property is within a proposed UGA but the change is not consistent with the land use proposed by the alternative.

3. The property is outside any proposed UGA, in which case the change is therefore not consistent with any alternatives (because no comprehensive plan map changes are proposed for rural areas).

In the first situation, the request can be considered as part of this SEPA analysis and may be approved if it is included as part of the BOCC decision on adoption of the Preferred Alternative. In the second situation, where proposed changes are within a proposed UGA, but the requested map designation is not consistent with the proposed land use designation then the BOCC may elect to evaluate the request in the development of a Preferred Alternative, and subsequent approval or denial would again depend on whether the proposed change was consistent with the final plan adopted by the BOCC. In the third situation, the BOCC may need to make a separate decision on the proposed change to deny or approve the application separate from this process.

Table 37 groups the proposed requests by existing plan designation and shows whether the request falls within an expansion area under one of the alternatives and whether the requested change is consistent with that alternative. Figures 26 through 30 shows the location of the requests by alternative.

Table 37. Site Specific Requests in Clark County

		Alternative 1		Alternative 2		Alternative 3		Alternative 4		Alternative 5	
Designation Existing	**Proposed**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**
AG&UR/AG-20	UL/R1-7.5	yes	yes	yes	yes	no	no	yes	no – ml	no	no
AG/AG-20	UL/R1-6	yes	no – ml	no	no	no	no	no	no	no	no
AG/AG-20	R/R-5	yes	no – ul	no	no	no	no	no	no	yes	no - ml
AG/AG-20	R/R-5	no	no	no	no	no	no	no	no	no	no
AG/AG-20	UR/UR-10	yes	no – ul	yes	no - ul	no	no	yes	no - ml	no	no
AG/AG-20	CR/CR-1	yes	no – ml	yes	no – bp	no	no	yes	yes	yes	no - bp
AG/AG-20	R/R-5	no	no	no	no	no	no	no	no	no	no
AG/AG-20	ML/ML	yes	no – com	no	no	no	no	no	no	no	no
AG/AG-20	UL/R1-6	yes	no – um	no	no	no	no	no	no	no	no
AG/AG-20	UL/R1-6	no	no	no	no	no	no	no	no	no	no
AG/AG-20	R/R-5	yes	no – ul	no	no	no	no	yes	no -cc	yes	no - ul
AG/AG-20	R/R-5	no	no	no	no	no	no	no	no	no	no
AG/AG-20	CR/CR-1	no	no	no	no	no	no	no	no	no	no
AG/AG-20	UL/R1-7.5	yes	yes	yes	yes	no	no	yes	no - ml	no	no
AG/AG-20	MU/MX	yes	yes	yes	no – bp	no	no	yes	no - cc	yes	no - bp
AG/AG-20	CC/C-3	yes	yes	no	no	no	no	yes	yes	yes	yes
AG/AG-20	UL/R1-6	yes	no	no	no	no	no	no	no	no	no
AG/AG-20	UL/R1-7.5	yes	yes	yes	no – um	no	no	yes	no - ml	no	no
AG/AG-20	UL/R1-6	yes	yes	no	no	no	no	yes	no - ml	yes	yes
AG/AG-20	R/R-5	no	no	no	no	no	no	no	no	no	no
AG/AG-20	R/R-10	no	no	no	no	no	no	no	no	no	no
AG/AG-20	R/R-5	yes	no – ul	no	no	no	no	yes	no - cc	yes	no - ul
AG/AG-20	CR/CR-1	no	no	no	no	no	no	no	no	no	no
AG/AG-20	R/R-5	no	no	no	no	no	no	no	no	no	no
AG/AG-20	UL/R1-6	yes	yes	no	no	no	no	yes	no - ml	no	no
AG/AG-20	R/R-5	no	no	no	no	no	no	no	no	no	no
AG/AG-20	UL/R1-6	yes	yes	no	no	no	no	no	no	no	no
AG/AG-20	UL/R1-6	yes	yes	no	no	no	no	no	no	no	no
AG/AG-20	UL/R1-6	yes	yes	no	no	no	no	yes	no - park	no	no
AG/AG-20	UL/R1-7.5	yes	yes	yes	yes	no	no	no	no	yes	yes
AG/AG-20	R/R-5	no	no	no	no	no	no	no	no	no	no
AG/AG-20	R/R-5	no	no	no	no	no	no	no	no	no	no
AG/AG-20	UM/R-18	no	no - ul	no	no – bl	no	no	no	no - ml	yes	no
AG/AG-20	UL/R1-6	yes	yes	no	no	no	no	yes	no - ml	no	no
AG/AG-20	R/R-10	no	no	no	no	no	no	no	no	no	no
AG/AG-20	R/R-5	no	no	no	no	no	no	no	no	no	no

		Alternative 1		Alternative 2		Alternative 3		Alternative 4		Alternative 5	
Designation Existing	**Proposed**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**
AG/AG-20	R/R-5	yes	no - bp	no	no	no	no	no	no	yes	no - bp
AG/AG-20	R/R-5	no	no	no	no	no	no	no	no	no	no
AG/AG-20	R/R-5	no	no	no	no	no	no	no	no	no	no
AG/AG-20	UL/R1-5	yes	yes	no	no	no	no	no	no	no	no
AG/AG-20	R/R-5	no	no	no	no	no	no	no	no	no	no
AG/AG-20	R/R-5	no	no	no	no	no	no	no	no	no	no
AG/AG-20	ML/ML	yes	no - bp	no	no	no	no	no	no	yes	no - bp
AG/AG-20	R-R-5	yes	no - ul	no	no	no	no	no	no	no	no
AG/AG-20	UR/UR-10	yes	no - ul	yes	no - bp	no	no	yes	no - ml	yes	no - mu/cc
AG/AG-20	R-R-5	no	no	no	no	no	no	no	no	no	no
AG/AG-20	R/R-5	no	no	no	no	no	no	no	no	no	no
AG/AG-20	R/R-5	no	no	no	no	no	no	no	no	no	no
AG/AG-20	R/R-5	no	no	no	no	no	no	no	no	no	no
AG/AG-20	MU/MX	in & out	no - cc	no	no	no	no	no	no	no	no
AG/AG-20	R/R-5	yes	no - ul	no	no	no	no	no	no	no	no
AG/AG-20	UL/R1-5	yes	yes	no	no	no	no	no	no	no	no
AG/AG-20	UL/R1-6	yes	no - uh	yes	no - um	no	no	no	no	no	no
AG/AG-20	R/R-5	no	no	no	no	no	no	no	no	no	no
AG/AG-20	R/R-5	no	no	no	no	no	no	no	no	no	no
AG/AG-20	R/R-5	no	no	no	no	no	no	no	no	no	no
AG/AG-20	MU/BP	no	no	no	no	no	no	no	no	yes	yes
AG/AG-20	R/R-5	yes	no - um	no	no	no	no	no	no	no	no
AG/AG-20	UL/R1-6	yes	yes	no	no	no	no	no	no	no	no
AG/AG-20	R/R-5	no	no	no	no	no	no	no	no	no	no
AG/AG-20	UL/R1-5	yes	no - um	no	no	no	no	no	no	no	no
AG/AG-20	RC/CR-1	no	no	no	no	no	no	no	no	no	no
AG/AG-20	UL/R1-7.5	yes	yes	yes	yes	no	no	yes	no - ml	no	no
AG/AG-20	R/R-5	no	no	no	no	no	no	no	no	no	no
AG/AG-20	UR/UR-20	no	no	no	no	no	no	no	no	no	no
AG/AG-20 &UR-20	ML/ML	yes	no – cc	no	no	no	no	no	no	yes	no - bp
AG/AG-20S	R/R-5	no	no	no	no	no	no	no	no	no	no
CC/C-3	UL/R1-6	yes	no	yes	no	yes	no	yes	no	yes	no
CC/C-3	GC/CH	yes	no	yes	no	yes	no	yes	no	yes	no
CC/C-3	GC/CH	yes	no	yes	no	yes	no	yes	no	yes	no
CC/C-3	GC/CH	yes	no	yes	no	yes	no	yes	no	yes	no
CC/C-3	ML/ML & GC/CH	yes	no	yes	no	yes	no	yes	no	yes	no
FR-1/FR-80	R/R-5	no	no	no	no	no	no	no	no	no	no

		Alternative 1		Alternative 2		Alternative 3		Alternative 4		Alternative 5	
Designation Existing	**Proposed**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**
FR2/FR-20	R/R-10	no	no	no	no	no	no	no	no	no	no
FR2/FR40	R/R-5	no	no	no	no	no	no	no	no	no	no
FR2/FR40	R/R-5	no	no	no	no	no	no	no	no	no	no
FR2/FR-40	R/R-5	no	no	no	no	no	no	no	no	no	no
FR2/FR-40	R/R-5	no	no	no	no	no	no	no	no	no	no
FR2/FR-40	R/R-5	no	no	no	no	no	no	no	no	no	no
FR2/FR-40	R/R-5	no	no	no	no	no	no	no	no	no	no
FR2/FR-40	R/R-5	no	no	no	no	no	no	no	no	no	no
FR2/FR-40	R/R-5	no	no	no	no	no	no	no	no	no	no
FR2/FR-40	R/R-5	no	no	no	no	no	no	no	no	no	no
FR2/FR-40	R/R-5	no	no	no	no	no	no	no	no	no	no
FR2/FR-40	R/R-5	no	no	no	no	no	no	no	no	no	no
FR2/FR-40	R/R-5	no	no	no	no	no	no	no	no	no	no
FR2/FR-40	R/R-20	no	no	no	no	no	no	no	no	no	no
FR-2/FR-40	R/R-10	no	no	no	no	no	no	no	no	no	no
FR-2/FR-40	R/R-10	no	no	no	no	no	no	no	no	no	no
FR-2/FR-40	UL/R1-7.5	yes	yes	no	no	no	no	no	no	yes	no
FR-2/FR-40	R/R-10	no	no	no	no	no	no	no	no	no	no
FR-2/FR-40	R/R-5	no	no	no	no	no	no	no	no	no	no
FR2/FR40 & R/R10	FR2/FR-40S	no	no	no	no	no	no	no	no	no	no
FR2/FR-40S	R/R-5	no	no	no	no	no	no	no	no	no	no
GC/CL	GC/CH	yes	no	yes	no	yes	no	yes	no	yes	no
ML/ML	CC/CL	yes	no	yes	no	yes	no	yes	no	yes	no
ML/ML	CC/C-3	yes	no	yes	no	yes	no	yes	no	yes	no
ML/ML	UL/R1-6	yes	no	yes	no	yes	no	yes	no	yes	no
ML/ML	UL/R1-6	yes	no	yes	no	yes	no	yes	no	yes	no
ML/ML	GC/CH	yes	no	yes	no	yes	no	yes	no	yes	no
ML/ML	GC/CH	yes	no	yes	no	yes	no	yes	no	yes	no
ML/ML	GC/CH	yes	no	yes	no	yes	no	yes	no	yes	no
ML/ML	GC/CH	yes	no	yes	no	yes	no	yes	no	yes	no
ML/ML	CC/C-3	yes	no	yes	no	yes	no	yes	no	yes	no
ML/ML	CC/C-3	yes	no	yes	no	yes	no	yes	no	yes	no
MU/C-3	GC/CH	yes	no	yes	no	yes	no	yes	no	yes	no
MU/R-22	NC/C-2	yes	no	yes	no	yes	no	yes	no	yes	no
NC/C-2	CC/C-3	yes	no	yes	no	yes	no	yes	no	yes	no
NC/C-2	CC/C-3	yes	no	yes	no	yes	no	yes	no	yes	no
OP/OC	UL/R1-10	yes	no	yes	no	yes	no	yes	no	yes	no
R/CR-2	ML/ML	yes	yes	no	no	no	no	no	no	no	no

		Alternative 1		Alternative 2		Alternative 3		Alternative 4		Alternative 5	
Designation Existing	**Proposed**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**
R/R-10	UL/R1-6	yes	yes	no	no	no	no	no	no	no	no
R/R-10	R/R-5	no	no	no	no	no	no	no	no	no	no
R/R-10	UL/R1-5	yes	yes	no	no	no	no	yes	no - ml	yes	yes
R/R-10	R/R-10S	no	no	no	no	no	no	no	no	no	no
R/R-10	UL/R1-6	yes	yes	no	no	no	no	yes	no - ml	yes	yes
R/R-10	MU/MX	yes	no - ul	no	no	no	no	yes	no - ml	yes	no - ul
R/R-10	UL/R1-6	yes	yes	no	no	no	no	no	no	no	no
R/R-10	MU/MX	no	no - ul	no	no	no	no	yes	yes	yes	no - ul
R/R-5	UH/R-30	yes	no – ul	no	no	no	no	no	no	no	no
R/R-5	CR/CR-1	no	no	no	no	no	no	no	no	no	no
R/R-5	R/CR-1	yes	no - ul	no	no	no	no	no	no	yes	no - bp
R/R-5	UL/R1-6	yes	yes	no	no	no	no	yes	no - ml	yes	yes
R/R-5	UL/R1-6	yes	yes	no	no	no	no	yes	yes	yes	no - um
R/R-5	RC/RC-1	no	no	no	no	no	no	no	no	no	no
R/R-5	UL/R1-6	yes	yes	yes	no - bp	no	no	yes	no - ml	no	no
R/R-5	UL/R1-6	yes	yes	yes	no - bp	no	no	yes	no - ml	no	no
R/R-5	UL/R1-6	yes	yes	yes	no - bp	no	no	yes	no - ml	no	no
R/R-5	CC/C-3	yes	no - ul	no	no	no	no	no	no	no	no
R/R-5	RC/RC-2.5	no	no	no	no	no	no	no	no	no	no
R/R-5	UM/R-18	yes	no - ul	yes	no - bp	no	no	yes	no - ml	no	no - cc
R/R-5	UL/R1-6	yes	yes	yes	no - bp	no	no	yes	no - ml	no	no
R/R-5	UL/R1-10	yes	yes	yes	no - bp	no	no	yes	no - ml	no	no
R/R-5	GC/CH	yes	no	no	no	no	no	no	no	yes	no
R/R-5	CR/CR-1	no	no	no	no	no	no	no	no	no	no
R/R-5	UL/R1-6	yes	yes	no	no	no	no	yes	no - cc	yes	yes
R/R-5	CC/C-3	yes	no - ul	yes	no - bp	no	no	yes	no - ml	no	no
R/R-5	UL/R1-6	no	no	no	no	no	no	no	no	no	no
R/R-5	R/CR-1	no	no	no	no	no	no	no	no	no	no
R/R-5	RC/CR-2	yes	no - ul	no	no	no	no	no	no	no	no
R/R-5	CC/C-3	yes	no - ul	yes	no - bp	no	no	yes	no - ml	no	no
R/R5 RC/RC-1	RC/RC-1&CR-2 RC/CR-2	yes	no - ul	yes	no - bp	no	no	yes	no - ml	yes	no - bp
R/R-5 &RC/CR	RC-1 &CR-2	yes	no – ul	yes	no – bp	no	no	yes	no - ml	yes	no - bp
R/UR-10	UL/R1-5	yes	yes	yes	yes	no	no	yes	no - cc	yes	no - um
RC/RC-1	CR/CR-2	no	no	no	no	no	no	no	no	no	no
RC/RC-1	CR/CR-2	yes	no – ul	yes	no – ul	no	no	yes	no - ul	yes	no - ul
RC/RC-2.5	RC/RC-1	no	no	no	no	no	no	no	no	no	no

		Alternative 1		Alternative 2		Alternative 3		Alternative 4		Alternative 5	
Designation Existing	**Proposed**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**
RC-RC-1 &RC2.5 R/R-5	UL/R1-6 & CC/C-3	yes	yes	yes	no - bp	no	no	yes	yes	yes	no - bp
SF/SF	ML/ML	yes	yes	yes	no	yes	no	yes	no	yes	no
UH/R-30	GC/CH	yes	no	yes	no	yes	no	yes	no	yes	no
UH/R-43	GC/CH	yes	no	yes	no	yes	no	yes	no	yes	no
UL&A/R1-20&A	A/A	yes	no	yes	no	yes	no	yes	no	yes	no
UL/R106	UH/R-30	yes	no	yes	no	yes	no	yes	no	yes	no
UL/R1-5	UM/R-18	yes	no	yes	no	yes	no	yes	no	yes	no
UL/R1-5	CC/C-3	yes	no	yes	no	yes	no	yes	no	yes	no
UL/R1-5	CC/C-3	yes	no	yes	no	yes	no	yes	no	yes	no
UL/R1-5	ML/ML	yes	no	yes	no	yes	no	yes	no	yes	no
UL/R1-5	ML/ML	yes	no	yes	no	yes	no	yes	no	yes	no
UL/R1-6	CC/C-3	yes	no	yes	no	yes	no	yes	no	yes	no
UL/R1-6	ML/ML	yes	no	yes	no	yes	no	yes	no	yes	no
UL/R1-6	CC/C-3	yes	no	yes	no	yes	no	yes	no	yes	no
UL/R1-6	ML/ML	yes	no	yes	no	yes	no	yes	no	yes	no
UL/R1-6	NC/C-2	yes	no	yes	no	yes	no	yes	no	yes	no
UL/R1-6	GC/CH	yes	no	yes	no	yes	no	yes	no	yes	no
UL/R1-6	CC/C-3	yes	no	yes	no	no	no	yes	no	yes	no
UL/R1-6	ML/ML	yes	no	yes	no	yes	no	yes	no	yes	no
UL/R1-6	ML/ML	yes	no	yes	no	yes	no	yes	no	yes	no
UL/R1-6	CC/C-3	yes	no	yes	no	yes	no	yes	no	yes	no
UL/R1-6	CC/C-3	yes	no	yes	no	yes	no	yes	no	yes	no
UL/R1-6	CC/C-3	yes	no	yes	no	yes	no	yes	no	yes	no
UL/R1-6	GC/CH	yes	no	yes	no	yes	no	yes	no	yes	no
UL/R1-7.5	CC/C-3	yes	no	yes	no	yes	no	yes	no	yes	no
UL/R1-7.5	GC/CH	yes	no	yes	no	yes	no	yes	no	yes	no
UL/R1-7.5	ML/ML	yes	no	yes	no	yes	no	yes	no	yes	no
UL/R1-7.5	UH/R-43	yes	no	yes	no	yes	no	yes	no	yes	no
UM/R-12	ML/ML	yes	no	yes	no	yes	no	yes	no	yes	no
UM/R-18	ML/ML	yes	no	yes	no	yes	no	yes	no	yes	no
UM/R-18	CC/C-3	yes	no	yes	no	yes	no	yes	no	yes	no
UM/R-18	GC/CH	yes	no	yes	no	yes	no	yes	no	yes	no
UM/R-18	OP/OC	yes	no	yes	no	yes	no	yes	no	yes	no
UM/R-18	CC/C-3	yes	no	yes	no	yes	no	yes	no	yes	no
UM/R-18	UM/OR-18	yes	no	yes	no	yes	no	yes	no	yes	no
UM/R-18	CC/C-3	yes	no	yes	no	yes	no	yes	no	yes	no
UM/R-18	GC/CH	yes	no	yes	no	yes	no	yes	no	yes	no

		Alternative 1		Alternative 2		Alternative 3		Alternative 4		Alternative 5	
Designation Existing	**Proposed**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**	**Within Proposed UGA?**	**Consistent w/ Proposed Land Use?**
UM/R-18	CC/C-3	yes	no	yes	no	yes	no	yes	no	yes	no
UM/R-18	CC/C-3	yes	no	yes	no	yes	no	yes	no	yes	no
UM/R-18	ML/ML	yes	no	yes	no	yes	no	yes	no	yes	no
UM/R-18	NC/C-2	yes	no	yes	no	yes	no	yes	no	yes	no
UM/R-18	GC/CH	yes	no	yes	no	yes	no	yes	no	yes	no
UM/R-18	GC/CH	yes	no	yes	no	yes	no	yes	no	yes	no
UM/R-22	GC/CH	yes	no	yes	no	yes	no	yes	no	yes	no
UR/UR-10	UL/R1-7.5	no	no	no	no	no	no	yes	no - ml	yes	yes
UR/UR-10	UL/R-16	yes	yes	yes	yes	no	no	yes	no - cc	yes	no - cc
UR/UR-10	UL/R1-6	yes	yes	yes	yes	no	no	no	no	no	no
UR/UR-10	GC/CH	yes	no - ul	yes	no – ul	no	no	yes	no - ml	yes	no - um
UR/UR-10	UL/R1-6	yes	yes	yes	no – um	no	no	no	no	yes	yes
UR/UR-10	UL/R1-20	yes	yes	yes	yes	no	no	no	no	no	no
UR/UR-10	UL/R1-6	yes	yes	no	yes	no	no	yes	no - cc	no	no
UR/UR-10	NC/C-2	yes	yes	yes	no – ul	no	no	yes	no - ml	yes	no - ul
UR/UR-10	ML/ML	yes	yes	yes	yes	no	no	yes	no - ul	yes	no - bp
UR/UR-10	UL/R1-6	yes	yes	yes	yes	no	no	yes	no - cc	yes	no - um
UR/UR-10	CC/C-3	yes	yes	yes	no - ul	no	no	yes	no - ml	yes	yes
UR/UR-10	UL/R1-20	yes	yes	yes	yes	no	no	no	no	no	no
UR/UR-10	UL/R1-5	yes	yes	yes	yes	no	no	no	no	yes	yes
UR/UR-10	UL/R1-7.5	yes	yes	yes	yes	no	no	no	no	yes	no
UR/UR-10	CC/C-3	yes	yes	no	no	no	no	yes	yes	yes	no - ul
UR/UR-10	ML/ML	yes	yes	yes	no - bp	no	no	yes	yes	yes	no - bp
UR/UR-10	UL/R1-6	yes	yes	yes	yes	no	no	yes	no - cc	yes	no -um
UR/UR-10	UL/R1-20	yes	yes	yes	yes	no	no	no	no	yes	yes
UR/UR-10	UL/R1-6	yes	yes	yes	yes	no	no	no	no	no	no
UR/UR-10	UL/R1-10	yes	yes	no	no	no	no	yes	no - cc	no	no
UR/UR-10	UL/R1-6	yes	no - bp	yes	yes	no	no	no	no	no	no
UR/UR-20	ML/ML	yes	yes	yes	no – bp	no	no	yes	yes	yes	no - bp
UR/UR-20	ML./ML	yes	yes	yes	no	no	no	yes	no	yes	yes
UR/UR-20	CR/CR-1	yes	no - ml	yes	no - bp	no	no	yes	no - ml	yes	no - bp
UR/UR-20	ML/ML	yes	no - cc	yes	no - um	no	no	yes	no - cc	yes	no - bp
UR/UR-20S	ML/MLS	yes	yes	yes	no	yes	no	yes	no	yes	no

j. Impacts

Table 38 summarizes the requests, indicating how many fall into each situation. As is clear from the table, the majority of requests are not consistent with the plan designation as proposed in each alternative. However, this table does not give any indication of the relative impacts in terms of acreages proposed for conversion to different land uses than proposed by the alternative.

Table 38. Summary of Site Specific Redesignation Requests in Unincorporated Clark County

Redesignation requests under review	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Total Redesignation requests	217	217	217	217	217
Outside of the Proposed UGAs	66	108	153	101	105
Within the Proposed UGAs	151	109	64	116	112
Consistent with proposed use	54	16	0	8	14
Not consistent with proposed use	97	93	64	108	98

Source: Clark County Department of Assessment and GIS, 2003

All current applications under County review, according to the Clark County Department of Assessment and GIS, would total approximately 5,500 acres within unincorporated Clark County. Table 39 summarizes the potential impact of these requests in terms of acreage converted. The majority of requests are for changing resource land into rural or urban uses, totaling nearly 4,000 acres. Approximately 35 percent of the acreage is proposed to change from agricultural or forest resource lands to rural residential use. Another 28 percent of the 5,586 acres is proposed to be changed from resource land to urban land uses.

Table 39. Summary of Proposed Private Requests for Changes to Land Use Designations

Proposed Change by Land Use Type	Acreage	
Resource Land to Rural land	1,968	
Resource to Urban Land	1,584	
Resource to Urban Reserve	439	
Total Resource to Non-Resource Land		***3,971***
Rural to Urban Residential	399	
Rural to Urban Mixed Use	90	
Total Rural to Urban Land		***489***
Rural to Rural Commercial/Rural Center		121
Urban Reserve to Urban Residential	161	
Urban Reserve to Urban Commercial	18	
Urban Reserve to Urban Industrial	410	
Total Urban Reserve to Urban		***589***
Urban Commercial to Urban Commercial	39	
Urban Residential to Urban Commercial	47	
Urban Industrial to Urban Residential	99	
Urban Industrial to Urban Commercial	142	
Total Urban to Urban		327
Total Acreage Proposed for Plan Designation Change*		***5586***

Source: Clark County Departments of Assessment and GIS and Community Development, 2003

**Excludes land with surface mining overlay.*

k. *City of Vancouver Site Specific Requests*

The City of Vancouver also is also currently reviewing plan map requests. A list of the Vancouver requests is shown in Table 40 and the location of the requests can be found on Figure 31. There are approximately 50 properties for a total of 79.13 acres proposed for new map designations. For the purpose of the analysis in the DEIS, the sites are included with the designation as requested, although the City has not yet made a determination on the proposals.

Table 40. Site Specific Requests in the City of Vancouver

Case Number	Existing Plan	New Plan	Existing Zone	New Zone	GIS Acres
CPZ2000-00016	UL	CC	R1-5	CC	1.63
CPZ2000-00018	UL	CC	R1-6	CC	3.31
CPZ2000-00019	UH	CC	R-30	CC	2.59
CPZ2000-00021	UH	CC	R-30	CC	1.1
CPZ2000-00022	UL	CC	R1-5	CC	0.86
CPZ2000-00024	PF	ML	VCP	ML	2.17
CPZ2000-00025	UL	UM	R1-5	R-18	0.25
CPZ2000-00027	UL	UM	R1-5	60	0.33
CPZ2000-00028	UM	GC	R-12	GC	2.54
CPZ2000-00029	UM	CC	R-18	CC	1.98
CPZ2000-00030	UM	CC	R-22	CC	1.7
CPZ2000-00032	UL	UH	R1-7.5	R-30	6.38
CPZ2000-00033	UM	CC	OR-22	CC	0.16
CPZ2000-00034	UL	UM	R1-5	R-12	0.8
CPZ2000-00036	UL	CC	R1-7.5	CC	0.54
CPZ2000-00037	ML	UH	ML	R-30	0.49
CPZ2000-00041	ML	CC	ML	CC	2.05
CPZ2000-00046	UL	CC	R1-20	CC	9.65
CPZ2001-00009	UL	CC	R1-5	CC	0.1
CPZ2001-00010	UL	CC	R1-5	CC	0.11
CPZ2001-00011	ML	CC	MC	CC	0.36
CPZ2001-00012	NC	CC	NC	CC	1.62
CPZ2001-00013	UL	CC	R1-5	CC	1.8
CPZ2001-00014	UM	CC	R-22	CC	0.13
CPZ2002-00012	UL	UL/CC	R1-20	R1-20/CC/R1-10/R1-7.5	2.4
CPZ2002-00013	UL	UM	R1-7.5	R-22	0.55
CPZ2002-00014	UL	UL	R1-20	R1-7.5	0.5
CPZ2002-00015	UL	UL	R1-20	R1-10	1.84
CPZ2002-00016	UL	CC	R1-7.5	CC	1.04
CPZ2002-00017	UL	NC	R1-10	NC	0.81
CPZ2002-00018	UM	CC	R-22	CC	0.09
CPZ2002-00019	UL	CC/UL	R1-20	CC/R1-7.5	1.12
CPZ2002-00020	UL	CC/UL	R1-20	CC/R1-7.5	0.96
CPZ2002-00021	UL	UM	R1-6	R-22	4.79
CPZ2002-00022	UH	UH	R-30	OR-30	1.97
CPZ2002-00023	UM	CC	R-18	CC	0.28
CPZ2002-00024	UL	ML	R1-6	ML	0.53
CPZ2002-00025	UL	CC	R1-5	CC	0.11
CPZ2002-00026	UL		R1-5		0.23
CPZ2002-00027	UL	UL	R1-10	R1-5	1.73
CPZ2002-00028	PF/UM	OP	R-30/R-18/R-12	OC	9.43
CPZ2002-00029	UL	ML	R1-6	ML	4.31
CPZ2002-00030	UL	CC	R1-5	CC	0.34

Case Number	Existing Plan	New Plan	Existing Zone	New Zone	GIS Acres
CPZ2002-00031	MH	UM	ML	R-12	0.25
CPZ2002-00032	UL	UL	R1-7.5	R1-5	2.57
CPZ2002-00033	MH	UM	ML	R-12	0.4
CPZ2002-00034	MX		MX	CC	0.23
Total Acreage Proposed for Changes					**79.13**

l. Mitigation Measures

Each of the alternatives will affect, to a greater or lesser extent:

- the conversion of rural land to urban land;
- the distinction between rural and urban uses at the edge of urban development;
- the affordability of housing;
- the diversity of housing types;
- the cost of providing urban levels of services to residential development within UGAs; and
- the balance between jobs and housing.

The primary mitigation for these impacts is to select an alternative that would minimize adverse impacts by using land efficiently. In most cases, that would be Alternative 3. However, even Alternative 3 could be made more efficient by changing zoning and development standards to increase density and minimize the footprint of urban growth.

With respect to mitigating the impacts of each alternative, there are few remedies other than changing the assumptions behind the designated UGA. For example, changing assumptions about the amount of land taken up by infrastructure—from a policy decision of 38 percent to a historic trend of 27.5 percent—would change the overall amount of land needed to accommodate the same population. Changing the number of jobs per acre changes the amount of land needed to provide for those jobs. This is not mitigation of impacts, but changing the alternatives proposed. Table 41 on the following page shows how the land use targets and capacity would change with a change in the assumptions behind the alternatives.

An insufficient supply of rural land to accommodate projected rural population as in Alternative 1 can be mitigated by changing plan and zoning designations on subdividable lands or changing the alternative to convert less rural residential land to urban land.

m. Additional Mitigation Measures

Consideration should be given to applying an Urban Holding designation to newly added urban growth areas where inadequacies in infrastructure, or phasing plans for infrastructure improvements make urban development premature.

Table 41. Comparison of Existing and Alternative Assumptions for Market Factors and Infrastructure

	Market Factor					Infrastructure						
	Res.	**Com.**	**Ind.**	**OP/BP**	**Total**	**Res.**	**Com.**	**Ind.**	**OP/BP**	**Total**	**Total acres for market factors and infrastructure**	**Total needed acres by alternative**
Alternative 1 (land)	**23,762**	**2,403**	**1,550**	**1,130**		**23,762**	**2,403**	**1,550**	**1,130**			
Assumption	25%	25%	50%	25%		38%	25%	25%	25%			
Total land	5,941	601	775	283	7,600	9,030	601	388	283	10,302	17,902	**28,845**
Alternative assumption	**23,762**	**2,403**	**1,550**	**1,130**		**23,762**	**2,403**	**1,550**	**1,130**			
Assumption	0%	0%	0%	0%		27.5%	25%	25%	25%			
Total land	0	0	0	0	0	6,535	601	388	283	7,807	7,807	**18,750**
Alternative 2 (land)	**7,276**	**88**	**0**	**2,385**		**7,276**	**88**	**0**	**2,385**			
Assumption	25%	25%	50%	25%		38%	25%	25%	25%			
Total land	1,819	22	0	596	2,437	2,765	22	0	596	3,383	5,820	**9,749**
Alternative assumption	**7,276**	**88**	**0**	**2,385**								
Assumption	0%	0%	0%	0%		27.5%	25%	25%	25%			
Total land	0	0	0	0	0	2001	22	0	596	2,619	2,619	**6,548**
Alternative 3: Does not include a market factor. The percentage of land dedicated to infrastructure is the 27.5% experienced since 1995.												
Alternative 4 (land)	**4,358**	**2,816**	**4,773**	**197**		**4,358**	**2,816**	**4,773**	**197**			
Assumption	25%	25%	50%	25%		38%	25%	25%	25%			
Total Land	1,090	704	2,387	49	4,230	1,656	704	1,193	49	3,603	7,832	**12,144***
Alternative assumption	**4,358**	**2,816**	**4,773**	**197**		**4,358**	**2,816**	**4,773**	**197**			
Assumption	0%	0%	0%	0%		27.5%	25%	25%	25%			
Total land	0	0	0	0	0	1,198	704	1,193	49	3,145	3,144	**7,456**
Alternative 5 (land)	**7,450**	**897**	**603**	**3,353**		**7,450**	**897**	**603**	**3,353**			
Assumption	25%	25%	50%	25%		38%	25%	25%	25%			
Total Land	1,863	224	302	838	3,227	2,831	224	151	838	4,044	7,271	**12,303**
Alternative assumption	**7,450**	**897**	**603**	**3,353**		**7,450**	**897**	**603**	**3,353**			
Assumption	0%	0%	0%	0%		27.5%	25%	25%	25%			
Total Land	0	0	0	0	0	2,049	224	151	838	3,262	3,262	**8,294**

*Does not include 410 acres that would be designated for park/open space or public facilities.

B. Rural Lands

1. Setting

Rural lands are defined as areas that lie outside of UGAs and that are not reserved for agriculture, forest, or mineral resources (WAC 365-195-210(19)). The GMA provides guidelines for the development of policies and development regulations that preserve rural lands. A basic principle of the GMA is that growth should first be directed to areas already characterized by development and to areas where this growth can be supported by adequate urban facilities and services. By directing development to areas where facilities are currently provided, or that can be efficiently provided in the future, the County can better utilize resources in both rural and urban areas. Additionally, by directing growth to such areas, Clark County can ensure that a distinct option for rural living will be available for future generations.

The GMA's mandatory Rural Element (RCW 36.70A.070(5)) requires comprehensive plans to designate rural areas, provide for population growth with a variety of densities, identify rural services and address rural character.

Planning for rural lands in Clark County is important for the following reasons:

- To maintain rural character;
- to recognize rural lands at the urban fringe, where they are susceptible to sprawl, which can overwhelm the existing character, infrastructure, and way of life;
- to create transition areas between urban and resource uses because urban and resource uses are dependent on each other but are not always compatible;
- to provide services and goods that support resource activities;
- to supply nearby urban residents with locally harvested resource products;
- to allow the efficient provision of public facilities and services by clearly delineating between urban and rural uses so that growth is directed to more compact urban centers; and
- to provide for the planned future expansion of urban uses in rural land areas, if needed.

Approximately 108,000 acres, or 32 percent of Clark County's land area, is currently designated for rural uses. These rural areas contain predominantly low-density residential development, farms, forests, watersheds crucial to fisheries and flood control, mining areas, small rural commercial centers, historic sites and buildings, archaeological sites, and regionally important recreation areas.

Various types of development are permitted within rural areas, development that is to be consistent with the existing rural character of these lands. Permitted uses are outlined in the different rural districts, which include Rural Center Residential (lands found within designated rural centers that encourage small-scale natural resource activities in conjunction with residential uses) and Rural-5, Rural-10, and Rural-20 zones (lands that provide for residential living in rural areas, that encourage small-scale forestry and farming, and that establish minimum lot sizes). Most rural land in the county (76,000 acres) is designated Rural-5; that is the minimum lot size is five acres. There are also areas designated for rural commercial and industrial development.

Historically, rural lands have provided affordable home-ownership opportunities for county residents. In recent years this has changed. Rural lands within the county have become increasingly scarce and expensive. The county's rapid population growth over the past decade has been due, at least in part, to the availability of developable rural lands. While rural land in Clark County has become more expensive in recent years, it is still less expensive than rural land in the Portland metropolitan area. Much less land in the Portland metropolitan area has been zoned for rural residential development. Clark County has about 98,000 acres zoned for 5- and 10-acre parcels, more than Multnomah, Clackamas, and Washington Counties combined.

In addition to providing homes for people who work in resource-based industries, rural residential areas are attractive to those who want to keep animals (kennels, horses, or other farm animals), grow food crops (smaller-scale home orchards, specialty farms, and gardens), and to those who prefer rural living to life in urban areas. Scattered throughout the rural areas of the county are small communities that serve rural residents by providing supplies (grocery stores, hardware stores, feed stores), public facilities (schools, post offices, churches, community buildings), and services (doctor offices, veterinarians, equipment repair). These communities often have small-lot residential areas that are home to the people who work in these rural centers or on the resource lands surrounding these areas. Examples of these communities include Amboy, Brush Prairie, and Dollars Corner. An assessment of the supply of rural residential land and impacts of the alternatives is contained in the previous section.

2. Impacts

The intent of the GMA is to protect rural lands from premature urban development, just as resource lands are protected. Existing policies and development regulations that protect rural lands would remain unchanged under each of the alternatives. Each of the action alternatives would bring land currently designated as rural into new UGAs. In doing so, each of the alternatives would contribute to redefining the rural landscape of the county. This impact analysis looks at the amount of rural land that would be converted to urban uses under each alternative and how the rural landscape would change as a result. Table 42 shows the rural acreage that would be added to each city's UGA under the different alternatives.

a. Alternative 1

Under Alternative 1, approximately 12,088 acres of rural land would be brought into new UGAs. Most of the rural land converted to urban uses would be north of Vancouver and south of Battle Ground. Vancouver would add approximately 7,075 acres of rural land, mostly designated R-5, to its UGA, while Battle Ground would add around 4,189 rural acres, mostly R-5 and Rural Center Residential. Under Alternative 1, the loss of rural land north of Vancouver would reduce the rural buffer that currently exists between Ridgefield and Vancouver. Land that is now rural would see eventual conversion to urban low-density residential development. Vancouver's new urban growth boundary would extend almost to the southern edge of Ridgefield's UGA. Similarly, rural land that provides a buffer between Battle Ground and Vancouver would be converted to residential uses. Rural land north of Lacamas Lake would also see eventual residential development.

b. Alternative 2

Alternative 2 would see UGAs expand less than under Alternative 1, and less rural land would be added to UGAs. Under Alternative 2, approximately 2,106 acres of rural land would be brought into UGAs. Almost all of this land would be added to Battle Ground's UGA, around 2,006 acres. Most of this rural land is currently designated Rural-5 and Rural Center Residential and is found south of the city in the Meadow Glade area. This land would be converted to mixed-use, commercial, and residential development. As with Alternative 1, the rural buffer between Vancouver and Battle Ground would be reduced. Vancouver and Washougal would see smaller amounts of rural land added to their UGAs—102 acres and two acres, respectively. Camas, La Center, and Ridgefield would not have any rural land added to their existing UGAs.

c. Alternative 3

Under Alternative 3, there would be no expansion of UGAs and no additional rural land would be converted to urban uses. This would be consistent with the goals of the GMA and with the rural element of Clark County's comprehensive plan that work to preserve rural land. Additional growth and development over the next 20 years would be accommodated within existing UGAs. By not bringing rural lands into UGAs, rural buffers that currently exist between jurisdictions and that provide for a contrast

between urban and rural lands would more likely be preserved. Alternative 3 would help to preserve the rural character of the county, small-scale resource uses, and the other values—recreational, scenic, historic, and environmental—that area associated with these lands.

d. Alternative 4

Alternative 4 would limit urban area expansions to Vancouver, Battle Ground, Camas, and La Center. Under this alternative a total of about 12,550 acres would be added to existing UGAs, of which 4,775 acres would be rural land. Battle Ground would add around 3,905 acres of rural land, Camas would add 263 acres, Vancouver would add 573 acres, and La Center would add around 34 acres. Much of this rural land is located between Battle Ground and Vancouver. The rural land to be brought into Camas' UGA is located northeast of the city, around Lacamas Lake, an area bounded by parks and open space and agricultural land. The 34 acres of rural land to be added to La Center's UGA is located north of the city and would see eventual conversion to residential use.

e. Alternative 5

As with Alternative 4, around 12,300 acres would be added to UGAs under this alternative. Of this amount, 4,046 acres is rural land that would be converted to urban uses. Battle Ground and Vancouver would see the most rural land added to their UGAs, 2,584 acres and 1,166 acres, respectively. As with the other action alternatives, much rural land to be urbanized is located south of Battle Ground. This land is currently designated Rural Center Residential. Alternative 5 also directs new growth to an area north of Vancouver near I-5. Much of this land is designated Rural-5. Under Alternative 5, Camas would add 278 acres of rural land to its UGA, while Ridgefield and Washougal would not add any.

Table 42. Rural Land Added to UGAs

	Alternative 1 (acres)	**Alternative 2 (acres)**	**Alternative 3 (acres)**	**Alternative 4 (acres)**	**Alternative 5 (acres)**
Battle Ground	4,189	2,006	-	3,905	2584
Camas	428	0	-	263	278
La Center	288	0	-	34	18
Ridgefield	39	0	-	0	0
Vancouver	7,075	102	-	573	1,166
Washougal	69	2	-	0	0

Source: Clark County Department of Assessment and GIS

3. Mitigation

a. Plans and ordinances

Mitigation for conversion of rural lands consists primarily in ensuring that provisions to protect remaining rural lands are in place in the comprehensive plan and development regulations, since rural land brought into an UGA will (and is intended to) eventually urbanize and lose its rural character. Clark County's comprehensive plan defines rural lands and rural centers with the intent to provide for land uses and densities that are compatible with designated resource lands and ultimately maintain the rural character of those areas. The following describes proposed County goals and policies for rural lands and suggests additional mitigation measures.

Chapter 4 of the comprehensive plan addresses rural and natural resource land. Goal 4.1 is to maintain the existing rural character and compatibility with resource lands and activities. Policies under that goal define rural lands in terms of their function (4.1.1) and typical uses expected (4.1.2). Policy 4.1.4 allows for Master Planned Resorts if they meet certain criteria, consistent with the GMA requirements (RCW 36.70A.365). Policies 4.1.5 – 4.1.7 address compatibility issues between rural uses and resource-based

uses in the rural area. Policies 4.1.8 through 4.1.14 deal with provision of services, and ensure that the type and availability of services are appropriate to the rural area. Policy 4.1.8 provides for the intensity of rural development based on availability of public facilities, circulation, proximity to natural resource lands, and open space areas.

Goal 4.2 calls for maintaining the character of designated Rural Centers. Policies 4.2.1 through 4.2.10 help to define and circumscribe the density, types, and descriptive character of rural centers, including defined edges, surrounding open lands, rural commercial uses that serve residents (not strip development) and resource-based industrial uses. Location of schools is restricted except under specific circumstances (Policy 4.2.6).

In addition, the County's zoning code establishes rural residential districts with a range of densities (5 to 20 acre minimum lot sizes). It also establishes rural center districts limited to those areas specified on the comprehensive plan map.

The Rural element goals and policies are also supported by the provisions in the Land Use element that restricts urban levels of development and public services in the county to UGAs.

b. Additional Mitigation

1. The county could include a greater portion of the undeveloped rural lands with soils identified by SCS as prime agricultural and forest lands as resource lands, regardless of lot size.

2. Incentives (e.g., transfer or purchase of development rights) and strict development regulations could be developed to discourage the construction of any residences on resource lands that have already been subdivided.

3. While the County's comprehensive plan includes policies for advising residents of adjacent resource-based uses and calls for incentives for resource uses, issues of incompatibility with residential uses can still arise and place pressure on resource uses. The County could be more aggressive in protecting resource uses by adopting "right to farm" or "right to harvest timber" ordinances to protect resource-based industries on rural lands from residential development adjacent to their operations.

C. Resource Lands

1. Setting

Clark County contains a rich diversity of resource lands, which include forests, farmland, and mineral resource areas. Around half of the county's 656 square miles is covered by forests, agricultural land, and surface water. Resource lands are an important component of the region's economy and provide jobs, tax revenue, and commodities for local use and for export. In addition to their economic value, these lands have recreational and aesthetic value and are important for the environmental services they provide.

The identification and protection of resource lands is one of the central goals of the GMA. The Act requires all counties and cities to preserve agricultural, forest, and mineral resource lands and to protect these areas from adjacent incompatible land uses that would interfere with their long-term commercial viability. Each county and city must designate resource lands of long-term commercial significance—that is, land with the physical characteristics to support a resource industry—and establish policies and development regulations that ensure the conservation of these lands for their economic, social, and environmental values.

The Washington State Office of Community Development (OCD) provides counties and cities with guidelines to assist in the classification of resource lands. Using the OCD's guidelines, Clark County has

identified and mapped its most productive resource lands when the 1994 comprehensive plan was developed.

Historically, agriculture has played a central role in the development of the region's economy and way of life. However, as the county has urbanized and as its economy has diversified, the relative size of the agricultural sector has decreased. The loss of productive farmland has become an important issue not only within Clark County, but also around the country. According to the 1997 Census of Agriculture, land acreage in farm use within the county decreased by 12 percent between 1992 and 1997. The average size of farms decreased by 6 percent during the same period. The further loss of agricultural land within the county would continue this trend. Moreover, while the number of acres in agricultural production is an important indicator of the commercial significance of the agricultural sector, the health of farmland and farm businesses within the county is also dependent on the degree to which farmland is fragmented and isolated. Fragmentation of the farmland base can make it more difficult to farm and can increase conflicts between agriculture and other surrounding land uses. The loss of agricultural land would also impact other values that are associated with this land—aesthetic, recreational, cultural, and environmental.

Figure 10 shows agricultural capability, primarily those lands with the highest quality soils and larger parcel size. Generally, agricultural lands are scattered throughout the county, with larger agricultural areas south of La Center and Battle Ground and north of Camas. Another large agricultural area is east of Washougal. Approximately 42,308 acres have been designated as agricultural resource land. Around 2,401 acres is zoned Agriculture-Wildlife (AG-WL). This district, applied primarily to areas in the Columbia River Lowlands, requires a 160-acre minimum lot size for single-family housing and a 20-acre minimum lot size for agriculture and related uses. The purpose of this zone is to encourage the preservation of agricultural and wildlife use on land that is suited for agricultural production and to protect agricultural areas that are highly valuable seasonal wildlife habitat from incompatible uses. The remaining 39,907 acres within the county are zoned Agricultural District (AG), zoning that is designed "to encourage the preservation of agricultural production and to protect agricultural areas from incompatible uses." These lands are subject to a 20-acre minimum lot size and are concentrated primarily in two areas: the area east of Vancouver and north of Camas along the Lacamas Creek drainage that extends northwesterly to the Brush Prairie/Hockinson area south of Salmon Creek; and the area north of Salmon Creek along the bluff overlooking the Columbia River Lowlands, an area that extends northeasterly to south of Ridgefield, through Ridgefield Junction to north of La Center.

Clark County has designated approximately 158,092 acres as forest resource land, land that has been further designated as Tier I or Tier II. Tier I represents the most productive forest land and Tier II represents lands that have one or more characteristics that could compromise the long-term commercial viability of the land. Of the 158,042 acres designated as forest land, 127,835 acres are Tier I and 30,060 acres are Tier II. Figure 11 shows forest capability classifications in the county.

The designation and conservation of significant mineral resource lands within Clark County is also required by the GMA. The GMA defines minerals as gravel, sand, and valuable metallic substances. A large portion of Clark County is underlain by commercial grade sand and gravel resources. Approximately 195 acres are actively used for mineral resource extraction. Figure 32 shows mineral resource lands in the county, which are limited to sand, gravel, and jetty stone. These materials are used for construction in concrete and asphalt aggregate. While metals occur in Clark County, they are not commercially significant.

Clark County currently manages mineral resources through the Surface Mining Combining District, an overlay zone that can be combined with any other zoning district. Development standards to protect and regulate surface mining were adopted in CCC Chapter 18.329. In rural areas, a surface mining overlay was placed on parcels with an underlying resource lands plan designation. Two areas within or adjacent to

the Vancouver UGA (Fisher Quarry and Section 30/31) were designated as "Mining Lands" with future land use designations to be determined at the time of reclamation.

The ordinance permits the extraction of sand, gravel, and minerals within the Surface Mining Combining District, but related high-impact activities, such as rock crushing, require a conditional use permit. Uses legally established prior to ordinance adoption are "grandfathered" with the right to continue as nonconforming uses. When it was originally implemented, the combining district was applied to all existing gravel pits, whether active or inactive, as well as to unmined sites for which the owner indicated an intent to mine. This district continues to provide for the ability to extract minerals within the county.

a. Aggregate Resources

The mineral resources identified and mined in Clark County are aggregate resources of two types: sand and gravel (round rock) and quarry rock. There are four principle sand and gravel mining areas in Clark County: the North County-Woodland Area, East Fork of the Lewis River, Orchards and East Mill Plain. The most abundant gravel deposits lie in the southern portion of the county (Orchards, East Mill Plain). The expansion of the Vancouver and Camas urban areas has made a major portion of this resource permanently inaccessible.

The second type of aggregate, quarry rock, is typically used as base rock for roads, riprap, jetty rock or as crushed aggregate. While, most quarry rock in southwest Washington is characterized by poor strength and durability, Clark County has several deposits of high-quality basalt bedrock capable of producing substantial amounts of durable aggregate. Approximately seven rock quarries are in active operation in the county. With the exception of Fisher Quarry, most rock quarries are located in the north and east portions of the county a considerable distance from the market.

<u>Demand</u>

Estimates of aggregate demand statewide are based on surveys of producers. Because the survey response rates are typically low, use of these estimates for planning purposes requires considerable caution. Data from a 1991 US Bureau of Mines survey suggest that the per-capita annual demand for sand and gravel in Washington was eight tons or six cubic yards. Similar USGS statewide production data for 2001 indicate a per capita demand of seven tons for sand and gravel and three tons for quarry rock.

However, a 1991 Washington Division of Geology and Earth Resources (DGER) survey, which had an exceptionally high response rate of 24 percent from sand and gravel producers, suggests that the per-capita annual demand for sand and gravel in Washington was 12 tons or nine cubic yards. Demand for quarry rock products was four tons or three cubic yards per capita based on data from the same DGER survey.

A 1992 survey of Clark County aggregate producers found that total production rates were 16.5 tons per capita in 1991 and 14.5 tons in 1992. Net exports of aggregate out of the county comprised 33 percent of the 1991 production. Therefore, the combined per capita consumption of aggregate in Clark County was 11.3 tons in 1991 and somewhat lower in 1992.

<u>Supply</u>

The Resource Document of the 1994 comprehensive plan included forecasts of supply and demand and predicted that the supply of good quality sand and gravel on designated mineral lands in the county would be exhausted within the next three years at current rates of production unless new sites are permitted.

There have been five permits issued for new or expanded sand and gravel mining since the 1993 analysis was done:

- SE 1st Street Facility (11 acres)
- Columbia Tech Center (148 acres)
- Frost Pit (40 acres)
- Columbia/English Pit (3 acres)
- Tebo Pit expansion (58 acres)

One additional quarry site and two expansions were also permitted:

- Chelatchie Rock (13 acres)
- Maple Pit (37 acres)
- Livingston Mt. (40 acres)

While additional sites extend the aggregate supply, the supply of available sand and gravel in the southern portion of the county is likely to be exhausted over the next five years. Extraction of Lewis River terrace deposits comes at a high environmental cost. Despite the market preference for round rock in concrete, a transition to greater use of crushed quarry rock, which produces a much greater return of aggregate per acre of surface area disturbed, is likely to occur over the next 10 to 20 years.

2. Impacts

Under each of the alternatives, County policies and regulations to protect resource lands and resource-related industries would remain unchanged. For agricultural land, this means the Agricultural-Wildlife District and the Agricultural District would continue to define permitted uses and development standards for these areas. For forest lands, the Forest and Agricultural District would continue to regulate uses and development within these areas. The Surface Mining Combining District would define uses for surface mining areas.

Relatively little forest land would be impacted by any of the alternatives, since most forest land is in the eastern portion of the county, away from urban centers.

Each of the action alternatives would convert some agricultural land to urban use.

Alternatives 1 and 2 would add the most mineral resource lands to UGAs. Table 43 shows the amount of resource land designated within the county under each alternative.

Table 44 shows the amount of resource land added to UGAs under each alternative.

Table 43. Acres of Designated Resource Land within Clark County

Alternative	Agricultural	Forest	Mineral Resource
Alternative 1	33,660	157,947	1,175
Alternative 2	40,101	158,092	1,259
Alternative 3	42,308	158,092	1,749
Alternative 4	39,130	158,024	1,360
Alternative 5	38,791	158,092	1,365

Source: Clark County Department of Assessment and GIS

Table 44. Acres of Resource Land Added to UGAs

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Battle Ground					
Agriculture	880	563	-	1020	846
Forest	0	0	-	0	0
Mineral Resource	0	0	-	0	0
Camas					
Agriculture	724	151	-	328	1
Forest	0	0	-	69	0
Mineral Resource	* 0 - 189	* 0 - 189	-	* 0 - 189	* 0 - 189
La Center					
Agriculture	446	0	-	30.1	278
Forest	145	0	-	0	0
Mineral Resource	150	0	-	0	0
Ridgefield					
Agriculture	245	1	-	0	400
Forest	0	0	-	0	0
Mineral Resource	0	0	-	0	0
Vancouver					
Agriculture	6,242	1,088	-	1,801	1,921
Forest	0	0	-	0	0
Mineral Resource	* 0 - 189	* 0 - 189	-	* 0 - 189	* 0 - 189
Washougal					
Agriculture	111	404	-	0	145
Forest	0	0	-	0	0
Mineral Resource	36	97	-	0	0

*Source: Clark County Department of Assessment and GIS. *Up to 189 acres of mineral resource lands between Camas and Vancouver could be absorbed into one of their UGAs.*

a. Alternative 1

Under Alternative 1, the policies and growth assumptions of the 1994 *Comprehensive Growth Management Plan* would remain in effect and, as a result, UGAs would need to expand to accommodate projected growth. This alternative includes the largest expansion of UGAs and would have the greatest impact on forest and agricultural lands.

There are currently around 42,308 acres designated as agricultural land in the county. Under Alternative 1, approximately 8,648 acres of agricultural land would be designated for urban growth. All of the land added to new UGAs would be from land designated AG; no AG-WL land would be included in new UGAs. Vancouver would see the most agricultural land added to its UGA (6,242 acres). Each of the other cities would see smaller additions. Most of the agricultural land to be urbanized is found between Vancouver and Ridgefield and between Battle Ground and Vancouver. Several hundred acres north of Camas would also be added to that city's UGA.

Approximately 145 acres of Tier II forest resource land would be converted to urban uses under Alternative 1 (all in La Center's UGA) along with around 379 acres designated as mineral resource land.

Alternative 1 would add around 189 acres of mineral resource land to the UGAs of either Camas or Vancouver. Around 150 acres of mineral resource land would be added to the UGA of La Center and around 36 acres of mineral resource land would be brought into Washougal's UGA. In total, about 375 acres of mineral resource lands would be brought into UGAs under Alternative 1.

b. Alternative 2

The expansion of UGAs under Alternative 2 would be less than under Alternative 1, and less resource land would be added to UGAs. Alternative 2 adds 2,207 acres of agricultural land to UGAs, compared to 8,649 acres under Alternative 1. Most of this land would be added to the UGAs of Vancouver (1,088 acres), Battle Ground (563 acres), and Washougal (404 acres). Smaller amounts of agricultural land would be brought into the UGAs of Camas and Ridgefield.

No designated forest resource land would be added to UGAs under Alternative 2. Approximately 293 acres of mineral resource land would be added to UGAs, about the same amount as Alternative 1.

Like Alternative 1, this alternative would add around 189 acres of mineral resource land to the UGAs of either Camas or Vancouver. About 97 acres of mineral resource land would be brought into Washougal's UGA. In total, around 286 acres of mineral resource land would be added to UGAs, 89 acres less than under Alternative 1.

c. Alternative 3

Alternative 3 would not expand UGAs. All new growth and development over the next 20 years would be accommodated within existing urban growth boundaries. As a result, this alternative would preserve the most agricultural and forest land and reduce the amount of fragmentation that occurs with the conversion of farmland to other uses. This alternative is consistent with the GMA's goal of protecting and preserving resource land for its long-term commercial viability by providing an adequate agricultural land base and by reducing conflicts between agriculture and other surrounding land uses. The preservation of agricultural land would help to preserve the role of the agricultural sector within the county's economic life. In addition, other values that are associated with the preservation of farmland—scenic, recreational, historic, environmental—would also be provided greater protection under Alternative 3.

d. Alternative 4

Alternative 4 would expand UGAs primarily around Battle Ground and Vancouver, with a smaller expansion of Camas' and La Center's UGAs. Ridgefield, La Center, and Washougal would see no expansion. Around 3,178 acres of agricultural land would be added to the UGAs of Battle Ground, Camas, Vancouver, and La Center. No agricultural land would be added to the UGAs of Washougal or Ridgefield. Unlike Alternative 1, no agricultural land between Vancouver and Ridgefield would be converted to urban uses. Rather, most of the converted land is found south of Battle Ground and northeast of Vancouver.

Alternative 4 would also see approximately 68 acres of forest resource land added to the Camas UGA. No other forest land would be brought into UGAs.

Similar to Alternatives 1 and 2, this alternative would add around 189 acres of mineral resource land to the UGAs of either Camas or Vancouver. No other mineral resource land would be added to expanded UGAs.

e. Alternative 5

Under Alternative 5, each city would add agricultural land to its UGA. Other than Alternative 1, this alternative adds the most agricultural land to urban areas—approximately 3,589 acres. Most of this land would be included in the UGA of Battle Ground (846 acres), Vancouver (1,920 acres), and Ridgefield (399 acres). The greatest impact would be on agricultural land between Battle Ground and Vancouver.

No forest resource land would be converted to urban uses under this alternative. Around 189 acres of mineral resource land would be added to the UGAs of either Camas or Vancouver. This resource land is found in the Fisher quarry area, between Camas and Vancouver, north of SR 14.

3. Mitigation

Once resource land is included in an UGA, it is assumed that the resource itself is no longer protected from conversion to urban uses and loss of the resource will eventually occur. However, the County's mineral resource overlay zone does provide some protection. While protecting resource lands is largely Clark County's responsibility, the cities can contribute by designing their UGA expansion areas to avoid resource lands. The following sections describe proposed County policies and suggest additional mitigation measures.

a. Plans and Ordinances

Clark County: The County's Rural and Natural Resource Element goals provide for the maintenance and enhancement of productive forest (Goal 4.3), agricultural (Goal 4.4), and mineral (Goal 4.5) lands and discourage incompatible uses on those lands (also known as right-to-farm and right-to-harvest-timber regulations). Policies under each goal seek to encourage conservation through identifying, designating, and protecting resource lands. Policies encourage protection of these lands through uses that enhance and are compatible with the nature of these lands, a level of public facilities that can meet the production needs of these areas, reviewing impacts of proposals on resource uses, support for special purpose taxing districts, and preservation of parcel sizes that are conducive to farm or forest production (Policies 4.3.4 – 4.3.8, 4.4.1 – 4.4.9, 4.5.1 – 4.5.3). Policies for farm and forest land encourage the concept of cooperative resource management (Policies 4.3.9 and 4.4.10). It discourages rural residential development near resource lands and encourages special development standards for construction within or adjacent to resource lands (Policies 4.3.10 – 4.3.12, 4.4.11- 4.4.12, 4.5.10, 4.5.12). In addition, policies encourage the continuation of commercial resource management by supporting land trades that result in consolidated forest and agricultural ownership and other incentives for continued production (Policies 4.3.13, 4.3.14, 4.4.14, 4.4.15, 4.4.16).

Finally, the resource element establishes some specific policies with regard to mining. These policies encourage the recycling of concrete and aggregate materials and preserves the use until the resource is depleted or reasons to discontinue extraction are demonstrated (4.4.5 and 4.5.7). Policies establish some limitations on mining activities and encourage the extraction of minerals in a manner which minimizes the adverse effects on water quality; fish and wildlife; adjacent activities; and sensitive, scenic, or wildlife habitat areas (4.5.8 and 4.5.9). The plan also provides for the eventual conversion of exhausted sites to other uses through the removal of the surface mining overlay (4.5.13 through 4.5.17).

Battle Ground: Resource lands are not discussed in the Battle Ground comprehensive plan or implementing ordinances.

Camas: Camas' 1994 comprehensive plan notes that two areas of mineral resource extraction affect its UGAs, one at 192nd Avenue north of SE 15th Street (English Pit) and one north of SR 14 (Fisher Quarry/Pacific Rock Products quarry). The comprehensive plan notes that protection of the resource should be considered if or when other uses are proposed for those sites. The Fisher Quarry resource area is currently under negotiation for future addition to either Vancouver's or Camas' UGA. Future land uses for English Pit are planned by Clark County to be studied in a subarea plan.

La Center: The La Center comprehensive plan incorporates the CWPP that excludes land having the primary use of agricultural production or extraction of mineral resources from the definition of urban growth, which is allowed only within the urban growth boundary. In addition, Policy 11 states that prime and important agricultural and timber land shall be located outside the urban growth boundary and

encouraged to continue in productive resource use, while conversion or incompatible uses are discouraged.

Ridgefield: Ridgefield's comprehensive plan Goal 11 (Rural to Urban Land Conversion and City-County Coordination within the Urban Planning Area) includes a policy that excludes agricultural and forest resource land from consideration for inclusion in UGA expansions (11.2.b).

Vancouver: Vancouver's zoning ordinance provides for a Surface Mining Combining District that permits mineral resource extraction from lands within its corporate boundary.

Washougal: Policy 1-D of the Land Use Strategy of the Washougal comprehensive plan state that the City will direct all urban development within the urban growth boundary. Goal 1 of the Natural Resources section promotes the efficient utilization of the city's mineral resources while protecting them from conflicting land uses.

b. Additional Mitigation

1. The cities of Battle Ground, Camas, and Vancouver could redraw the proposed UGA to exclude all viable farm and forest lands.

2. The county could include a greater portion of the undeveloped lands classified as prime soils by SCS as agricultural and forest lands as resource lands, regardless of lot size. Specialty agriculture, such as the thriving ornamental nurseries in Oregon, does not require large parcels.

3. Incentives (e.g., transfer of development rights) and stricter development regulations in the county could be developed to discourage the construction of any residences on resource lands, unless they are necessary to support the resource use.

D. Economy

1. Setting

a. Framework

The GMA established statewide economic development goals that:

> Encourage economic development throughout the state that is consistent with adopted comprehensive plans; promote economic opportunity for all citizens of the state, especially for unemployed and disadvantaged persons; and encourage growth in areas experiencing insufficient economic growth all within the capacities of the state's natural resources, and local public services and facilities.

To meet these goals, Clark County, the business community and the CREDC worked to devise a set of economic development strategies that leverage existing strengths into new economic power. The *Economic Development Strategic Plan* (EDSP) was provided to Clark County in 2002 to guide the update of the Growth Management Plan.

The EDSP is centered on growing a high-wage economy that creates jobs at a rate in excess of population growth. Given the limited resources facing all communities, the plan directs Clark County to focus economic development energy on emerging industry clusters that depend on a knowledge-based workforce; understanding that the dynamics of the marketplace will create supporting businesses.

The clusters targeted to drive the future economy are:

- Semiconductor and electronic manufacturing

- Telecommunications
- Knowledge-based service industries
- Life sciences
- Healthcare
- Expansion of locally owned businesses and the retention and expansion of existing businesses as the baseline for additional job creation

Other strategies in the plan include:

- Supporting the expansion of the academic and technical programs at local community colleges and satellite campuses, specifically in creating a technical institute and joint training center that would grant applied technology, four-year undergraduate, and advanced degrees in areas supporting targeted industry types.
- Growing targeted industries that support the desired pattern of growth by increasing the overall inventory of designated commercial and industrial lands. The inventory will include a number of larger parcels (larger than 75 acres) that individually and collectively accommodate knowledge-based campus development and the clustering of targeted industries.
- Making targeted infrastructure investments in advance of business growth to guide development and streamline the development process. Local jurisdictions should share revenue to support targeted investments. These investments can also be supported by new public sector finance mechanisms sufficient to allow for infrastructure investment in advance of development and to direct growth to identified nodes.
- Supporting master-planned and mixed-use developments that incorporate both traditionally defined manufacturing uses, office commercial uses, and in some cases residential uses. The focus on a knowledge-based economy will increasingly demand the development of campus-style development.
- Developing and marketing a designated area containing high-technology and knowledge-based industries that will support the continued growth of existing high-technology firms and encouraging more knowledge-based industries.
- Redesigning the development review process to support timelines, predictability, and cost effectiveness. To be competitive for economic growth and investment, the benchmark is a 60-90-day turn around for development permits within designated nodes of growth.
- Increasing the percentage of individuals who both live and work in Clark County. Expanded opportunities and partnerships between education and business will provide an engaged citizenry and an educated workforce for existing, and start-up companies.
- Supporting transportation improvements along the interstate corridor and coordination between regional port authorities to improve freight mobility. Constructing a regional light rail system as proposed by the Portland/Vancouver I-5 Transportation and Trade Partnership is also an important needed transportation improvement.

b. The Local and Regional Economy

The following information was summarized from Appendix 3 of the EDSP (2002), which discusses existing economic conditions in Clark County and Portland/Vancouver Metropolitan Area.

Clark County has had one of the most vibrant economies in Washington State and the nation during the past two decades; especially during the 1990's, the county experienced a period of remarkable economic and population growth. Clark County's location within a larger urban area and its existing and new industries have provided the basis for continued growth and prosperity.

Clark County's history, economy, and future are inextricably linked to its regional location. Clark County comprises a portion of the Portland-Vancouver PMSA. The PMSA is a six-county region encompassing Clark County in Washington, and Multnomah, Clackamas, Washington, Yamhill and Columbia counties in Oregon. The PMSA is home to more than 1.95 million people.

Clark County's population increased 45% between 1990 and 2000 to a population of nearly 353,000 people. Vancouver is the largest city in the county with a population of 143,600 and the fourth largest in the state behind Seattle, Spokane, and Tacoma. The OFM estimates that Clark County will continue to grow during the next twenty years with the 2023 population projected to be between 419,188 and 587,622 people.

Clark County's economy mirrors that of the PMSA as a whole. It is broadly diversified and is strong in high technology manufacturing, financial and business services, and international trade. Nationally, the region is known as the Silicon Forest, a concentration of more than 2,000 high technology and technology related firms. The addition of these industries to an already highly diversified economy within the PMSA has made Clark County more resilient to national economic downturns (e.g. 1991), although even with diversification the area has not been immune to the most recent national recession and downturn in the high-tech sector.

The growth of small and medium sized firms at new locations, not the growth of existing large businesses, has largely driven economic expansion in the PMSA. A study by the Institute of Portland Metropolitan Studies (1999) found that between 1986 and 1996, the 50 largest firms contributed only two-percent of the overall employment growth. Regardless of actual employment *growth*, there are several large employers in Clark County. These firms are located throughout the county, with the majority of the industries concentrating in the Vancouver/Clark County urban area. The top five employers in 2002 were Vancouver School District with 3,050 employees, Bonneville Power Administration with 3,000 employees, Southwest Washington Medical Center with 2,900 employees, Evergreen School District with 2,600 employees, and Hewlett-Packard with 1,700 employees. Existing firms have created both a skilled work force as well as network of suppliers and business relationships that attract and foster growth in these sectors. The county's largest employers are shown in Table 45.

The growth of the economic base in the 1990s has resulted in employment growth. Prior to the current recession, the labor force grew to 178,000 in 2000, a 40% increase over 1990. The PMSA was similar to the nation with low unemployment during the 1990s, eventually dipping to as low as 3.5% in 1997. The national recession starting in 2001 reversed a period of fast economic growth and low unemployment, resulting in significant layoffs and unemployment rates increasing to 8% by February 2002 in Clark County and the PMSA. This downturn has affected over 14,000 Clark County residents.

A Riley Research Associates study referenced in the EDSP placed the percent of employed workers living in Clark County but working in Oregon at 25 percent, or about 41,000 people. This rate has remained remarkably stable during the past decade despite the growth in the Clark County economy and local employment opportunities. The study found that Clark County residents traveling to Oregon for work are employed in various industries, but primarily: transportation services (13 percent), health care (13 percent), low-and high-tech manufacturing (11 percent and 8 percent, respectively), professional/business services (10 percent), and construction (9 percent). The availability of employment opportunities within the PMSA allows the area to attract and retain working age residents, but as shown by the number of people leaving Clark County for work, the area does not provide jobs for all of its residents. Some Clark County residents working in Oregon may have moved to Clark County from Oregon for more affordable housing while retaining their jobs in Oregon.

c. Regional Industrial Clusters

A concept central to economic development is that the economic success of the region depends on the competitiveness of key industry clusters. Six significant clusters in the PMSA have driven regional growth and are expected to remain the foundation of the future economy. These include high-technology products and services, telecommunications, creative services, nursery products and metals fabrications. With the exception of perhaps nursery products, all have a significant presence in Clark County.

The growth and development of significant industry clusters serve as the basis for attracting similar firms and investment as well as growth of existing businesses. An example of an industry cluster is the Cascade Business Park area in Camas which houses Sharp Microelectronics, Sharp Labs of America, WaferTech, C-Tech, Body Cote-IMT, Linear Technology, Heraeus Shin Etsu, Furuno and Underwriters Laboratory (UL). Existing industrial clusters in Clark County are shown in Table 45.

d. Factors Influencing Economic Growth

The existing economic conditions indicate broad potential for economic development in Clark County. However, various factors may hinder or impede the progress of development and the successful achievement of economic viability. For instance, the county has a manufacturing base that exceeds the state average and has a concentration of business services in the form of corporate offices and technical support services, and yet the county still exports workers to Oregon and takes more than its share of houses. The pace of industrial, commercial, and residential development within the county will be dependent on the economic prospects of the entire PMSA. Continued but slower economic growth of the Portland metropolitan area seems assured for the foreseeable future. The pace of growth will depend upon significant regional planning decisions (e.g. Columbia River dredging and I-5 improvements) and the ability to capitalize on a combination of domestic and Pacific Rim markets.

Table 45. Largest Employers Clark County, Washington

Sector	Company	Location		Product/Service	Function	NAICS 2 digit	Estimated Employment May 2002
		City	County				
All Sectors	Vancouver School District	Vancouver	Clark	Public Education	School	61	3050
	Bonneville Power	Vancouver	Clark	Utilities	HQ/Admin. Office		3000
	Southwest Washington Medical Center	Vancouver	Clark	Medical Center	Hospital	62	2900
	Evergreen School District	Vancouver	Clark	Public Education	School	61	2600
	Hewlett-Packard	Vancouver	Clark	Inkjet Printers	R&D/Marketing Dept.	33	1700
	Fred Meyer	Countywide	Clark	Retail	Retail	44	1500
	Clark County	Vancouver	Clark	Government	County Government	92	1300
	SEH America	Vancouver	Clark	Silicon Wafers	Branch manufacturing plant	33	1260
	Safeway	Vancouver	Clark	Retail	Retail	45	1223
	Georgia-Pacific	Camas	Clark	Pulp, Paper	Branch manufacturing plant	32	1160
	City of Vancouver	Vancouver	Clark	Government	Government		950
	WaferTech	Camas	Clark	Silicon Wafers	HQ/Admin. Office	33	950
Manufacturing	Hewlett-Packard	Vancouver	Clark	Inkjet Printers	Marketing Dept.	33	1700
	SEH America	Vancouver	Clark	Silicon Wafers	Branch manufacturing plant	33	1260
	Georgia-Pacific	Camas	Clark	Pulp, Paper	Branch manufacturing plant	32	1160
	WaferTech	Camas	Clark	Silicon Wafers	HQ/Admin. Office	33	950
	Frito Lay	Vancouver	WA	Food Products	Branch manufacturing plant	31	620
	Columbia Machine	Vancouver	Clark	Concrete Block Machines & Palletizers	HQ/Admin. Office	33	406
	Sharp Microelectronics & Sharp Labs	Camas	Clark	Electronics/R&D	Branch manufacturing plant	33	362
	Columbian Publishing Co	Vancouver	Clark	Newspaper	HQ/Admin. Office		260
	Linear Technologies	Camas	Clark	Linear & analog circuits	Branch manufacturing plant	33	260
	Matsushita Kotobuki Electronics	Vancouver	Clark	TV/DVD/VCR	Branch manufacturing plant	33	258
	Pendleton Woolen Mills	Washougal	Clark	Clothing	Branch manufacturing plant		250
	C-Tech Industries	Vancouver	Clark	Pressure washers	HQ/Admin. Office	33	240
	Bemis	Vancouver	Clark	Multiwall and small paper bags	HQ/Admin. Office	32	150
Distribution							
	Consolidated Freightways	Vancouver	Clark	Warehouse/Distribution	HQ/Admin. Office	48	767
	US Foodservice	Ridgefield	Clark	Warehouse/Distribution	HQ/Distribution center	48	120
	Corwin Bottling	Vancouver	Clark	Warehouse/Distribution	HQ/Admin. Office	48	55
	Food Express	Vancouver	Clark	Warehouse/Distribution	HQ/Distribution center	48	50
	Blue Bird Transfer	Vancouver	Clark	Warehouse/Distribution	HQ/Distribution center	48	55
	Vancouver Warehouse & Distribution	Vancouver	Clark	Warehouse/Distribution	HQ/Distribution center	48	50
Call Centers							

Sector	Company	Location		Product/Service	Function	NAICS 2 digit	Estimated Employment May 2002
		City	County				
	Electric Lightwave	Vancouver	Clark	Full service integrated telecommunication services	Inbound	51	508*
	New Edge Networks	Vancouver	Clark	DSL Internet Network Provider	Inbound	51	275*
	CenturyTel	Vancouver	Clark	Telephone Provider	Inbound/Western Regional HQ	51	180*
	Nautilus Group	Vancouver	Clark	Exercise Equipment	Inbound	42	300
	Charter Communications	Vancouver	Clark	Call Center	Inbound	56	300
	Hilton/Red Lion Hotels Corp.	Vancouver	Clark	Hotels	Inbound reservation center	72	160
	Cascade Callworks	Vancouver	Clark	Call Center	Inbound/Outbound	56	140
* Total Employment Number. Only a portion of this total includes employees involved in inbound customer call center operations.							

Source: Columbia River Economic Development Council. May 2002

Table 46. Clark County Industrial Clusters

Company	Product	2002 Employment	Cluster/Sub Cluster	Location
Blue Bird Transfer	Distribution	55	Distribution	Vancouver
Corwin Bottling	Distribution	55	Distribution	Vancouver
Food Express	Distribution	50	Distribution	Vancouver
US Foodservice	Warehouse/Distribution	95	Distribution	Ridgefield
Vancouver Warehouse & Distribution	Distribution	50	Distribution	Vancouver
Control Tek	Electronics	71	Electronics	Vancouver
Furuno	Marine Electronics	62	Electronics	Camas
Matsushita Kotobuki Electronics Industries	TV/VCR's	258	Electronics	Vancouver
Radiall/Larsen Antenna Technologies	Electronics	107	Electronics	Vancouver
Wacom Technology Corporation	Electronics	62	Electronics	Vancouver
Southwest Washington Medical Center	Healthcare	2,900	Healthcare	Vancouver
Bonneville Power Administration	HQ/Admin. Office	3,000	Knowledge Based	Vancouver
Columbia Ultimate	Software	157	Knowledge Based	Vancouver
Consolidated Freightways	HQ/Admin. Office	767	Distribution	Vancouver
Hewlett-Packard	Marketing Dept.	1,700	Manufacturing	Vancouver
RS Medical	HQ/Admin. Office	275	Health Service	Vancouver
Nutrition Now	Nutritional supplements	140	Life Sciences	Vancouver
Alpha Tec	InVitro Diagnosis	20	Life Sciences	Vancouver
Christensen Shipyards	Yacht Mfg.	180	Locally Owned	Vancouver
DeWils	Cabinet Mfg.	180	Locally Owned	Vancouver
BOC Gases	Chemicals	58	Manufacturing	Vancouver
Hereaus Shin Etsu	Quartz glass crucibles	37	Semiconductor	Camas
Linear Technologies	Linear/Analog circuits	260	Semiconductor	Camas
nLight Photonics	Pump Lasers	21	Semiconductor	Vancouver
Saint-Gobain Crystals & Detectors	Crystal Mfg.	75	Semiconductor	Washougal
Sharp Labs	R&D	185	Semiconductor	Camas
Sharp Microelectronics Technology	Electronics	177	Semiconductor	Camas
Shin Etsu - SEH America	Semiconductor	1,260	Semiconductor	Vancouver
Shell Solar	Solar Cells	NA	Semiconductor	Vancouver
Silicon 2000	OEM's	70	Semiconductor	Vancouver
Underwriters Laboratories	Testing	200	Knowledge Based	Camas
WaferTech	Semiconductor	950	Semiconductor	Camas
Sekidenko	Gauges for Hi Tech	50	Semiconductor	Vancouver
Silicon Forest Electronics	OEM's	75	Semiconductor	Vancouver
Cascade Callworks	Call Center	140	Telecommunications	Vancouver
CenturyTel	Telecommunication	180	Telecommunications	Vancouver
Charter Communications	Call Center	350	Telecommunications	Vancouver
Electric Lightwave	Telecommunication	508	Telecommunications	Vancouver
Hilton/Red Lion Reservation Center	Call Center	160	Telecommunications	Vancouver
Nautilus Group	Call Center	300	Telecommunications	Vancouver
New Edge Networks	Telecommunication	275	Telecommunications	Vancouver

Source: Columbia River Economic Development Council. May 2002

The Portland-Vancouver metropolitan area may not regain the number of heavy industry manufacturing jobs it had in the late 1970s as jobs shift from traditional manufacturing to service-oriented employment. As a result, the total Clark County employment forecast could be affected. In addition, further expansion of the labor force could be constrained by a shift in demographics, due to the forecasted aging of the county's population. These shifts are due to the fact that virtually all of the baby-boomers that are now in the labor force will retire over the next 20 years and the age cohort coming in behind is significantly smaller. Labor force participation rates tend to be highest where age is concentrated between 20 and 55 years and education levels are higher than average.

Another factor affecting the economic viability of the county is the ability to develop the industrial lands that have been identified. Clark County has the largest inventory of industrial lands in the six-county metropolitan marketplace. If developed appropriately industrial lands can generate high-wage jobs at a rapid pace and propel the county's economy. A major stimulus to long-term growth of the county is its location relative to the region. The Portland Metropolitan area attracts industry to the region but, for firms to locate in Clark County, adequately serviced and readily available land is needed. The biggest potential concerns could be the funding of infrastructure and jurisdictional questions between the land use planning and regulatory functions of Clark County and the water/sewer service functions of the cities.

e. Income Profile

Personal and household incomes are closely related to employment opportunities. Industries that pay low wages (e.g., restaurants, department stores) result in lower incomes. Income in turn affects the type of retail commercial and housing required to meet the needs of a lower income population. Personal and household incomes are indicators of the types of jobs available in the community and whether the income from one worker or a household will be enough to support a family. Income and Housing are discussed in more detail in the respective Population, Housing and Land Use sections.

f. Industrial and Commercial Land Analysis

The industrial land inventory revealed that the Clark County industrial land base is approximately 12,000 acres. Categorizing all industrial lands based on recommended criteria revealed that the county has approximately 800 acres of *prime* industrial land available for development within a total vacant inventory of over 5,000 acres. Prime is defined as immediately available industrial land of sufficient size that is vacant, properly zoned, served with adequate infrastructure, and free of land use and environmental conflicts. The pace of retail and office development activity has accelerated in the last several years. Estimates for land requirements for commercial are approximately 3,000 acres in the urban area to meet expected demand over the next 20 years.

2. Impacts

a. Introduction and Methodology

The ability of the local jurisdictions and the county as a whole to offer employment opportunities has a direct impact on how the county functions in a regional economy. Since Clark County adopted its GMA in 1994, county leaders have committed to focusing on economic development and balancing jobs and housing in the county.

To meet these goals, each alternative is anticipated to create jobs in a variety of business sectors, although the assumptions used to calculate total employment varies by alternative. Assumptions were also made about each of these issues in the plans adopted in 1994; the Alternatives were drawn up using these assumptions, although the Buildable Lands Report (Section 215 report) showed that some of these assumptions were wrong. Most significantly, the previously-used employment densities of nine and 12 units per acre have been greatly exceeded in recent years. Using these old assumptions results in higher

projections for necessary commercially and industrially designated lands. Alternative 3 reflects the actual employment densities occurring in Clark County between 1995 and 2000. Table 47 compares the assumptions in the 1994 plans with the results of the Plan Monitoring Report and with the assumptions used in each alternative.

Table 47. Comparison of Assumptions

	1994 Plan	Actual	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Retail							
Jobs per acre	12	29	12	12	29	12	12
Percent infrastructure	40%	**	25%	25%	25%	25%	25%
% redevelopment	0	5-9%	0	5%	5%	5%	5%
Market factor	25%	N/A	25%	25%	0	25%	25%
Industrial							
Jobs per acre	9	13	9	9	13	9	9
Percent infrastructure	40%	**	25%	25%	25%	25%	25%
% redevelopment	0	5-9%	0	0	0	0	0
Market factor	50%	N/A	50%	50%	0	50%	50%
Office/Business Park*							
Jobs per acre	12	20	20	20	20	20	20
Percent infrastructure	40%	**	25%	25%	25%	25%	25%
% redevelopment	0	5-9%	0	0	0	0	0
Market factor	25%	N/A	25%	25%	0	25%	25%

**Government employment was assumed to be the same as office/business park.*
***The percentage of land devoted to infrastructure was not calculated for retail, industrial, or office/business park developments. However, residential development averaged 27.5 % infrastructure.*

The total number of jobs created under each alternative was determined by evaluating the proposed 2023 population and assuming a ratio of jobs to population. Jobs were then distributed by employment sector depending on the assumed percentage under each alternative that varies depending on the type of employment.

Alternatives 1, 2, 4, and 5 all assume that commercial development would produce 12 jobs per acre and industrial uses 9 jobs per acre. Alternative 3 assumes a higher number of jobs per acre for commercial and industrial uses, assuming 29 and 13 employees per acre, respectively. This is based on actual achieved densities since 1995. Office/business park development varies slightly from the other uses; Alternative 1 assumes the lowest office/business park jobs per acre (12), while all other alternatives assume 20 jobs per acre, which is the actual achieved number in previous developments since 1995.

b. Focused Public Investment Areas

Concurrent with evaluating the growth alternatives, the County has undertaken an analysis of areas that have the potential to meet the needs of existing and new industry. Given the limited resources available, the County is planning to invest public funds in those areas most likely to generate family-wage employment. County investments targeted to capital improvements that eliminate gaps in public facilities for a particular geographical area will produce acceptable levels of service for development in that area. Such areas can be said to contain “fully-served” land because all public facilities meet or exceed standards, achieving some of the County’s economic development goals to have “shovel ready” land.

Clark County has identified several Focused Public Investment Areas (FPIAs) that will be evaluated in the Focused Public Investment Plan, a part of the County’s Capital Facilities Plan. FPIAs are areas that

concentrate the location of public facility capacity in order to produce fully-served land suitable for economic development. The County's priority for development is urban in character and FPIAs are generally within the existing UGAs, but some are also located in potential expansion areas and services would only be expanded to that area if it were included in a UGA. In some cases, such as with Battle Ground, the entire city is designated as a FPIA. At least a portion of that FPIA would be included under each alternative, although the total amount of land and anticipated improvements would depend on the alternative chosen and the funding available to complete the improvements. PIA areas are shown in Figure 33.

The planned job growth used to project the land need and resulting number of jobs for each alternative are shown in Table 48. Overall impacts on land use, that is, the amount of retail, industrial, and office/business park land added for job creation under each alternative, is discussed in detail in the Population, Housing and Land Use. Each of the alternatives would accommodate adopted employment growth targets. However, the actual capacity of each alternative is higher than the target, depending on the assumed number of employees per acre and percentage of jobs for each sector, available vacant land within the existing UGAs, and land within the expansion areas. This analysis found that, based on existing vacant land and the land within the proposed expansion areas, each alternative is adding at least 25 percent more land for job creation than is needed to meet County targets under each alternative. For example, under Alternative 3, assumed job growth is 72 percent of the actual capacity, based on existing vacant land within UGAs and jobs per acre achieved between 1995 and 2000.

Table 48. Projected Job Creation by Employment Sector and Alternative

	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
2002 population	370,463	370,463	370,463	370,463	370,463
Planned Population and Job Creation by Employment Sector					
2023 population	530,962	486,225	486,225	486,225	486,225
2002-2023 population growth	160,499	115,762	115,762	115,762	115,762
Urban population growth*	130,004	93,767	93,767	93,767	93,767
Average jobs to population ratio	1:2.53	1:2.3	1:2.3	1:1.5	1:1.5
Retail (percent of jobs)	*27%*	*22%*	*22%*	*22%*	*22%*
Employees per acre	12	12	29	12	12
Total retail jobs	14,818	9,815	9,815	15,400	15,400
Industrial (percent of jobs)	*25%*	*29%*	*29%*	*29%*	*29%*
Employees per acre	9	9	13	9	9
Total industrial jobs	13,721	12,938	12,938	20,300	20,300
Office/business park (percent of jobs)	*32%*	*40%*	*40%*	*40%*	*40%*
Employees per acre	12	20	20	20	20
Total office/business park jobs	17,562	17,846	17,846	28,000	28,000
Government (percent of jobs)	*16%*	*9%*	*9%*	*9%*	*9%*
Employees per acre (same as office)	12	20	20	20	20
Total government jobs	8,781	4,015	4,015	6,300	6,300
Target new Jobs (in urban areas)	54,882	44,615	44,615	70,000	70,000
Actual Capacity for Each Alternative (assuming full build-out)					
Urban population capacity	191,128	138,627	107,840	117,943	138,759
Average jobs to population ratio	1/2.1	1/1.8	1/1.6	1/1	1/1.4
Retail (percent of jobs)	*27%*	*22%*	*22%*	*22%*	*22%*
Employees per acre	12	12	29	12	12
Total retail jobs	25,130	17,287	14,630	28,528	21,797
Industrial (percent)	*25%*	*29%*	*29%*	*29%*	*29%*
Employees per acre	9	9	13	9	9

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Total industrial jobs	23,269	22,788	19,286	37,605	28,733
Office/business park (percent)	*32%*	*40%*	*40%*	*40%*	*40%*
Employees per acre	12	20	20	20	20
Total office/business park jobs	29,784	31,432	26,601	51,870	39,631
Government (percent)	*16%*	*9%*	*9%*	*9%*	*9%*
Employees per acre (same as office)	12	20	20	20	20
Total government jobs	14,892	7,072	5,985	11,671	8,917
Total new jobs (in urban areas)	*93,075*	*78,579*	*66,502*	*129,674*	*99,078*
Percent of land capacity used (for jobs)	***59%***	***61%***	***72%***	***57%***	***74%***

Source: Clark County Planning Department; Clark County Department of Assessment and GIS, 2003

**81percent of total population*

Note: Job totals by sector may not be equal to total jobs due to rounding.

c. All Alternatives

None of the alternatives would change the UGA or land use designations for Yacolt or Woodland. There would be no change to land use or projected population or employment growth as a result of these alternatives. Development within these two communities would continue as in the past and existing and proposed comprehensive plan policies would direct economic development.

The City of Camas has developed several economic development strategies similar to those adopted by the Clark County as a part of its draft comprehensive plan. Camas is attempting to accomplish several goals to diversify the local economy from one based primarily on wood products to one that also includes technology and business sector opportunities. The city has also developed a series of strategies for attracting businesses. One way the city would like to accomplish this is to have large vacant parcels available with public services nearby to attract new business wanting to locate in the area.

Vancouver's updated Comprehensive Plan will include general designations of future urban activity centers and nodes, to be implemented through application of zoning designations and other policy direction in future subarea plans. These are intended to serve as potential focal points for future development and redevelopment. Each may emphasize different combinations of housing, employment, shopping, and other activities to reduce reliance on the automobile and encourage using mass transit, as well as encouraging job growth.

d. Alternative 1

Alternative 1 plans for a 54,882 increase in total jobs by 2023, adding land for commercial, industrial, and office/business park development. The land use designation on about 1,328 acres within the existing Vancouver and Battle Ground UGAs would be changed from industrial to office/business park. Compared to other alternatives, Alternative 1 would accommodate about 15 percent more jobs than Alternatives 2 or 3, but about one-third fewer jobs than Alternatives 4 or 5. This alternative would include 14 of the candidate public investment areas and would include more of the Battle Ground and Ridgefield FPIAs than any other alternative. However, providing urban services for such a large area in Battle Ground would be expensive and may not be feasible in the foreseeable future.

Alternative 1 projects the highest population of any alternative; it also projects the lowest ratio of population to jobs of any alternative (one job for every 2.53 people). Job creation would occur primarily in the Vancouver UGA where most expansion would occur, although some of the expansion for jobs would also occur in Battle Ground, Camas, La Center, and Ridgefield.

Alternative 1 would do less than other alternatives to balance jobs and housing for existing and future residents in Clark County. This alternative focuses more on housing growth than creating jobs. Alternative 1 also relies more on commercial development (27 percent of jobs) for job creation than any other alternative, mainly to support the higher population and resulting residential development. Some commercial sector employment would likely be family-wage jobs, but commercial employment typically consists of lower skill retail and other service-related jobs that offer lower wages than jobs in industrial and office/business park developments. While Alternative 1 would create more jobs than Alternatives 2 and 3, the wages earned in those jobs could be lower than those created in other alternatives. An emphasis on commercial job growth with lower wage jobs, coupled with a predominance of low density housing under this alternative could make it harder for county residents to find work with adequate wages, forcing them to travel to other areas. Battle Ground and Camas may be the most affected cities under this alternative because the majority of their job growth would occur in the commercial sector. La Center, Ridgefield, and Vancouver, while they still would add a significant amount of commercial land, also add more office/business park development areas, potentially increasing the number of higher paying jobs.

Alternative 1 would not meet the EDSP strategies as well as other alternatives would. One of the economic development strategies is to attract "knowledge based" business and group them in key geographic areas. Alternative 1 would rely more on traditional commercial sector employment rather than increasing jobs in high-skill fields, generally more limited to office/business parks and some types of industrial employment. High skill, high wage jobs would be less prevalent under this alternative than under Alternatives 2, 4 and 5. So while it does meet some strategies, such as providing large tracts of land and includes the most FPIAs of any alternative, it still lacks the key features for targeting specific, higher paying jobs for Clark County residents.

e. Alternative 2

Alternatives 2, 3, 4, and 5 project a lower population than Alternative 1 but vary in the number of planned jobs. Under Alternative 2, the target employment increases would be 44,615, based on one job for every 2.3 people, which is the same number of jobs as Alternative 3, but about 20-percent less than Alternative 1, and about one-third less than in Alternatives 4 and 5. This alternative would add about 3,581 acres of office/business park land, the most of any alternative, although about 1,196 acres would be rezoned industrial land within the existing Vancouver and Battle Ground UGAs. Alternative 2 would add land for jobs only to the Battle Ground, Camas, and Vancouver UGAs. Economic development in the other UGAs would occur on existing vacant and underutilized land with the existing UGAs. This alternative would include 11 FPIAs (mostly in Vancouver), and portions the Ridgefield, Battle Ground, and WSU Campus FPIAs.

The percentage of jobs allocated to each type of employment in Alternative 2 is consistent with Alternatives 4 and 5, with a higher percentage of jobs for industrial and office/business park development and a lower percentage of jobs dedicated to commercial and government sectors. Alternatives 2 and 3 are anticipated to produce more office/business park jobs than Alternative 1, but less than Alternatives 4 and 5. Most of the job growth would be centered in the Vancouver UGA, with some growth also found within the Battle Ground and Camas expansion areas.

This alternative would include large lots for office/business park development and does contain FPIAs where infrastructure, if built, could attract new businesses. This alternative assumes very few retail positions would be added, instead focusing on "knowledge-based" industries. However, overall job creation compared to housing growth may still mean that Clark County residents have to look for employment in other areas because of the higher percentage of land devoted to housing.

f. Alternative 3

Alternative 3 would accommodate the same number and type of jobs as under Alternative 2, although all job creation would be on land within the existing UGAs. About 901 acres of land currently zoned as industrial would be changed to office/business park uses in an effort to increase the total number of jobs produced by this alternative. Although UGAs would not expand, Alternative 3 would still include all or a portion of 11 FPIAs, the same as under Alternatives 2 and 4. The main difference would be less of the area of those FPIAs crossing UGA boundaries would be available for development. This would mainly affect the Battle Ground, Discovery Corridor, Ridgefield Junction and WSU industrial park FPIAs. Nevertheless, Alternative 3 is anticipated to have the capacity for creating the same number of jobs as Alternative 2 mainly because the assumed number of employees per acre is higher. This is based on actual achieved employment density on development between 1995 and 2000 and actual capacity still available within the existing UGAs. Most jurisdictions have developed only a small percentage of their vacant industrial and commercial land and still have large tracts of land available for development.

Both Alternatives 2 and 3 assume one job for every 2.3 people. Alternative 3 would meet Vancouver's goals of creating activity centers more than other alternatives because it would concentrate housing and employment on land within the existing UGA and have the greatest opportunity to connect new development with the existing urban development pattern. Compared to other alternatives, especially Alternative 4 that would have little connection to the existing development pattern and would provide relatively little mix of jobs and housing except in Battle Ground, Alternative 3 would meet the Vancouver's policies around Activity Centers the best of any alternative.

While Alternative 3 is anticipated to have the capacity to accommodate the same number of jobs as Alternative 2, it would offer fewer large tracts of vacant land for economic development and therefore would not support some of the County's economic development strategies, particularly those with emphasis on campus development and industry clusters.

g. Alternative 4

Alternative 4 is planned to accommodate 70,000 jobs, more than any other alternative except Alternative 5, based on one job for every 1.5 people. Alternative 4 would include 11 FPIAs and portions of the Battle Ground, Discovery Corridor, Ridgefield Junction and WSU industrial park FPIAs. While some development and job creation would likely occur within existing UGAs, most new jobs would likely be found on the north side of Vancouver, in Battle Ground, and west of Camas. Battle Ground is the only jurisdiction under this alternative that also plans to add large tracts of land for mixed uses. Housing for new employees would be increased in Battle Ground as a result of the mixed use development. Land currently designated for housing would have to meet the needs of additional employees in Vancouver and Camas, where very little new housing is planned. The cities considered this and the capacity of existing residential land in requesting their UGA adjustments.

Under this alternative, more jobs are assumed in new industrial and commercial development than any other alternative. Very few jobs would be created in office/business parks under this alternative. Instead, higher paying jobs would most likely be industrial jobs. More jobs would be created in the commercial sector than any other alternative; many could be lower paying retail and service industry jobs. Considering that the housing added under this alternative is mostly low density and mixed use, which can be more expensive than high density housing, many of the new jobs created under this alternative, especially commercial employment, may not provide the necessary income for residents to afford the new housing.

Nearly all land within the expansion areas, particularly in Vancouver and Battle Ground would be for job creation and for establishing a large industrial land base within the Vancouver and Battle Ground UGAs,

meeting a County strategy for attracting new businesses. However, Alternative 4 would do less to meet the EDSP strategies than Alternative 5, and potentially Alternative 2, for securing "knowledge based" businesses. The addition of large tracts of vacant industrial land, particularly between Vancouver and Battle Ground, could enable targeted industries to cluster on large lots, which is an important part of the County's economic development strategy. However, public facilities would be expensive to expand to serve these new areas, and may not be financially feasible in the foreseeable future.

h. Alternative 5

Alternative 5 also anticipates the creation of about 70,000 new jobs. This alternative assumes the same ratio of jobs to population (1 to 1.5). However, rather than focusing employment between Vancouver and Battle Ground, most employment growth would occur along I-5. About 70 percent of the land would be designated for office/business parks.

Aside from the location of the employment areas, the main difference between alternatives 4 and 5 is the type of jobs that would be generated. Alternative 5 relies on office/business park employment while Alternative 4 relies more heavily on industrial and commercial employment. Alternative 5 could produce a higher number of better paying jobs than Alternative 4 because it does not rely on commercial employment for many of its jobs. As already discussed, many commercial jobs pay less than jobs in other sectors.

Alternative 5 spreads development along the I-5 corridor and would add more land for jobs in Ridgefield and La Center in locations designated as FPIAs. Twelve FPIAs would be within Alternative 5's UGAs, with portions of the Battle Ground, Discovery Corridor, Ridgefield Junction and WSU industrial park FPIAs also included. The relatively high number of better paying jobs expected within office/business park developments is matched with an increase in potentially more expensive low density residential development, more low density land than any other alternative except Alternative 1, particularly in Battle Ground and Vancouver, where most new housing opportunities in the expansion areas would be.

Alternative 5 would meet the EDSP strategies emphasizing large vacant tracts and a focus on "knowledge based" businesses. The additional land added to the expansion areas would also allow targeted industries to cluster on large lots, which is an important part of the County's economic development strategy. However, as with Alternative 4, expanding public services to the area would be expensive may not be financially feasible.

3. Mitigation Measures

Each of the alternatives will affect, to a greater or lesser extent:

- the number of total new jobs created;
- the balance between jobs and housing;
- the number of FPIAs contained in the expansion areas;
- the diversity and types of industry sectors favored; and
- the cost of providing urban levels of services to commercial and industrial development within UGAs.

As with mitigation for land uses, the primary mitigation for economic impacts is to select an alternative that would contain sufficient land to accommodate firms of varying sizes and sectors, minimize adverse impacts, and distribute commercial and industrial land equitably.

With respect to mitigating the impacts of each alternative, there are few immediate remedies other than changing the assumptions behind the designated UGA. For example, changing assumptions about the

amount of land taken up by infrastructure — from a policy decision of 38 percent to a historic trend of 27.5 percent — would change the overall amount of land needed to provide the same employment. Changing the number of jobs per acre changes the amount of land needed to provide for those jobs. This is not mitigation of impacts, but changing the alternatives proposed. Table 49 shows how the land use targets and capacity would change with a change in the assumptions behind the alternatives.

Other mitigation measures to protect the existing and proposed industrial land supply are to implement policies and zoning regulations that protect industrial uses. For example, to achieve no net loss of industrial lands, the County's Policy 7.2.9 allows the consideration of comprehensive plan and zoning map changes from secondary and tertiary industrial lands to non-industrial uses only after a determination that (1) such lands cannot feasibly be improved to prime industrial status due to physical conditions, (2) a non-industrial designation and zoning is more appropriate, and (3) after other replacement sites within the existing UGA of equal or greater industrial potential have been designated and zoned industrial on the plan and zoning maps.

Table 49. Estimated Number of Jobs by Jurisdiction

	Alternative 1		Alternative 2		Alternative 3		Alternative 4		Alternative 5	
	Planned	**Capacity**	**Planned**	**Capacity**	**Planned**	**Capacity**	**Planned**	**Capacity**	**Planned**	**Capacity**
County										
Population change (urban)	130,004	191,128	93,767	138,627	93,767	107,840	93,767	117,943	93,767	138,759
Total jobs	54,882	105,889	44,615	102,776	44,615	92,733	70,000	117,885	70,000	126,899
Retail	14,818	28,590	9,815	22,611	9,815	20,401	15,400	25,935	15,400	27,918
Industrial	13,721	26,472	12,938	29,805	12,938	26,893	20,300	34,187	20,300	36,801
Office/business park	17,562	33,884	17,846	41,111	17,846	37,093	28,000	47,154	28,000	50,759
Government	8,781	16,942	4,015	9,250	4,015	8,346	6,300	10,610	6,300	11,421
Battle Ground										
Population change	18,368	22,406	15,867	10,881	15,867	5,772	15,867	11,741	15,867	11,588
Total jobs	7,754	12,413	7,550	8,067	7,550	4,963	11,845	11,735	11,845	10,598
Retail	2,094	3,352	1,661	1,775	1,661	1,092	2,606	2,582	2,606	2,331
Industrial	1,939	3,103	2,189	2,339	2,189	1,439	3,435	3,403	3,435	3,073
Office/business park	2,481	3,972	3,020	3,227	3,020	1,985	4,738	4,694	4,738	4,239
Government	1,241	1,986	679	726	679	447	1,066	1,056	1,066	954
Camas										
Population change	7,867	9,711	5,936	7,464	5,936	5,835	5,936	6,900	5,936	7,823
Total jobs	3,321	5,380	2,824	5,534	2,824	5,018	4,431	6,897	4,431	7,154
Retail	897	1,453	621	1,217	621	1,104	975	1,517	975	1,574
Industrial	830	1,345	819	1,605	819	1,455	1,285	2,000	1,285	2,075
Office/business park	1,063	1,722	1,130	2,213	1,130	2,007	1,773	2,759	1,773	2,862
Government	531	861	254	498	254	452	399	621	399	644
La Center										
Population change	2,072	1,615	1,732	1,199	1,732	1,042	1,732	1,077	1,732	1,220
Total jobs	875	895	824	889	824	896	1,293	1,076	1,293	1,116
Retail	369	242	181	196	181	197	284	237	284	245
Industrial	156	224	239	258	239	260	375	312	375	324
Office/business park	66	286	330	356	330	358	517	431	517	446
Government	28	143	74	80	74	81	116	97	116	100

	Alternative 1		Alternative 2		Alternative 3		Alternative 4		Alternative 5	
	Planned	**Capacity**	**Planned**	**Capacity**	**Planned**	**Capacity**	**Planned**	**Capacity**	**Planned**	**Capacity**
Ridgefield										
Population change	8,983	3,122	8,057	2,182	8,057	1,866	8,057	1,719	8,057	2,021
Total jobs	3,792	1,730	3,834	1,618	3,834	1,605	6,015	1,718	6,015	1,848
Retail	1,024	467	843	356	843	353	1,323	378	1,323	407
Industrial	948	432	1,112	469	1,112	465	1,744	498	1,744	536
Office/business park	1,214	553	1,533	647	1,533	642	2,406	687	2,406	739
Government	607	277	345	146	345	144	541	155	541	166
Vancouver										
Population change	82,346	149,148	53,645	111,931	53,645	89,894	53,645	93,090	53,645	112,107
Total jobs	34,763	82,631	25,525	82,984	25,525	77,301	40,048	93,044	40,048	102,525
Retail	9,386	22,310	5,615	18,257	5,615	17,006	8,810	20,470	8,810	22,555
Industrial	8,691	20,658	7,402	24,065	7,402	22,417	11,614	26,983	11,614	29,732
Office/business park	11,124	26,442	10,210	33,194	10,210	30,921	16,019	37,218	16,019	41,010
Government	5,562	13,221	2,297	7,469	2,297	6,957	3,604	8,374	3,604	9,227
Washougal										
Population change	10,319	4,676	8,647	4,591	8,647	3,101	8,647	3,081	8,647	3,625
Total jobs	4,356	2,591	4,114	3,404	4,114	2,667	6,455	3,079	6,455	3,315
Retail	1,176	699	905	749	905	587	1,420	677	1,420	729
Industrial	1,089	648	1,193	987	1,193	773	1,872	893	1,872	961
Office/business park	1,394	829	1,646	1,361	1,646	1,067	2,582	1,232	2,582	1,326
Government	697	414	370	306	370	240	581	277	581	298

Note: This table is for illustrative purposes only. The total number of target numbers of "planned" jobs were disaggregated for each city is based on the projected city population increases and the number of jobs that would be needed to meet the County's jobs per person goals for each alternative and is not based on actual vacant land or land proposed for inclusion under each alternative. The Clark County Department of Assessment and GIS determined the actual total job "capacity;" that is, the number of jobs potentially achievable under each alternative based on vacant and redevelopable land within the county as a whole did not disaggregate the total number of jobs to each sector or jurisdiction. The job capacity by jurisdiction and sector was estimated using the same assumed percentage of jobs by sector as in the planned estimates. Because total job "capacity" is determined by vacant land, not population, the jobs-to-population ratio varies depending on the land capacity and density of population growth, and land capacity and achieved employment density. Actual capacity will depend on achieved employment density and the total amount of vacant and redevelopable land.

E. Historic and Cultural Resources

1. Setting

The GMA requires all local jurisdictions "to identify and encourage the preservation of lands, sites, and structures that have historical or archaeological significance." The preservation of historic and cultural resources—bridges, buildings, landmarks, and archaeological artifacts—is critical to a community's sense of identity and understanding of itself, where it has been and where it may go in the future.

Historic and cultural resources in Clark County are rooted in a rich history that dates back thousands of years. The historic record of the county includes the formation of the region's unique physiography, the settlement of the region by Native Americans, and its exploration by European nations. The historic record also shows that this area once served as the headquarters for the Hudson's Bay Company Columbia District trade networks, was a destination for thousands who took the Oregon Trail, and later became an industrial center, first for pulp and paper, later for aluminum and shipping, and, most recently, for high-tech industries. Many of the county's historical resources — logging flumes, early sawmills, trestles, and logging railroad tracks—no longer exist due to development and increasing urbanization. Still, a number of historic, cultural, and archaeological resources within the county remain. A full list of these resources is maintained by County staff.

2. Impacts

Each growth alternative accommodates projected population growth, either within existing UGAs or in expanded UGAs. Alternatives that expand UGAs onto undeveloped rural lands would be more likely to impact rural historic and archaeological resources, while confining growth to existing UGAs would increase the pressure to remove urban historic resources, usually structures such as homes, schools, and churches, to make way for higher density and higher intensity development.

The Clark County Archaeological Predictive Model and associated probability maps were adopted by the County in 1994 and updated in 2001. These maps identify the likelihood of a particular area having archaeological resources and establish specific ranges of probability: low (1 to 20 percent), low-moderate (21-40 percent), moderate (41-60 percent), moderate-high (61-80 percent), and high (81 to 100 percent). Much of the county has been identified as having a high probability for archaeological resources, in part because of the area's rich history and its importance as a settlement location. Many of the high probability areas are located along streams, rivers, and other water bodies. Each of the action alternatives would include areas identified as having a high probability for archaeological resources. Only Alternative 3, which accommodates growth within existing UGAs, would not increase the likelihood of impacts on high probability areas. Numerous historic sites, primarily sites listed on local historic inventories, have been identified within the new UGAs of the action alternatives.

While this analysis cannot determine the precise impact to particular historic and archaeological resources of the different growth alternatives, since these impacts will largely be a matter of project-level decisions, it can give some indication of the probability of encountering historic and archaeological resources in these areas based on probability maps and historic registers.

a. Alternative 1

Clark County: Alternative 1 assumes the highest rate of population growth of all the alternatives and would accommodate more population than the other alternatives. Expansion of UGAs would occur primarily around Battle Ground and Vancouver. Because this alternative involves the largest conversion of land to urban uses (28,845 acres), the likelihood of impacts to historic and archaeological resources on rural lands would be greater, while impacts to urban historic resources would likely decrease as there would be less pressure to redevelop land to achieve the maximum allowed by zoning.

Battle Ground: Most of the expansion of Battle Ground's UGA occurs to the west and south of the city. High probability areas are found along Salmon Creek and Mill Creek. The new UGA contains five known historic sites, all of which are listed on the local historic inventory. No National Register of Historic Places (NRHP) or Clark County Heritage Register (CCHR) sites are found within the new UGA.

Camas: Those areas proposed for urban area expansion occur in a rapidly urbanizing portion of Camas that does include high probability areas. There is also one property listed on the local historic inventory that is located near Fisher Creek.

La Center: Under Alternative 1, La Center's UGA would expand southwest of the city, to the La Center Junction on I-5. It would also include an area along La Center Road. Much of this area, which includes McCormick Creek, has been identified as having a high or moderate probability for archaeological resources. The new UGA would also include segments of Brazee Creek, which also is shown as a high probability area. One historic property is found within a portion of the new UGA that is designated for residential development. The property is listed on the local historic inventory.

Ridgefield: The expansion of Ridgefield's UGA involves mostly land that is surrounded by the existing UGA. Within this new UGA, land along Gee Creek is identified as a high probability area. The area proposed for commercial development near I-5 is predominantly a high probability area. The UGA expansion area contains no listed historic properties.

Vancouver: Under Alternative 1, the expansion of Vancouver's UGA would occur primarily north and east of the city. Much of this land is currently in rural and agricultural use. The areas along Salmon Creek, Whipple Creek, Mill Creek, Gee Creek, and Packard Creek are all high probability areas. Most of the land in the Brush Prairie area is also identified as having a high probability for archaeological resources. Numerous historical sites are located within the new UGA. Most of these sites are listed on the local historic inventory. However, there are also sites listed on the NRHP (Lambert School, Arndt Prune Farm, and Glenwood School) and the CCHR (Sarah Store).

Washougal: Washougal's UGA would expand north of the city onto land currently designated urban reserve, agricultural, and rural. Most of this area is identified as having a low-moderate or moderate probability for archaeological resources. There is one property listed on the NRHP within the new UGA—the Pittock Lakeside House.

b. Alternative 2

Clark County: Alternative 2 would see less of an expansion of UGA than under Alternative 1. Whereas Alternative 1 saw 8,648 rural acres converted to urban uses, Alternative 2 converts 2,207 acres. The likelihood of impacts to historic and archaeological resources located in rural areas would be fewer under this alternative. However, as more growth and development is accommodated within existing UGAs, the opportunity for conflicts between urban historic resources and new development may become more likely.

Battle Ground: Under Alternative 2, Battle Ground's UGA would expand along Mill Creek and Salmon Creek, both areas with a high probability for archaeological resources. As with Alternative 1, much of this area would include the Meadow Glade area, which is predominantly a high probability area. Two historic properties are found within the new UGA. Both are listed on the local historic inventory. No NRHP or CCHR properties are found within the area proposed for urban expansion.

Camas: Under Alternative 2, Camas' UGA would see less expansion than under Alternative 1 and would include an area near the Columbia River. While the shoreline area is shown as having a high probability for archaeological resources, most of area proposed for urban expansion has a low-moderate or moderate

probability for archaeological resources. No historical sites are located within the new UGA under Alternative 2.

La Center: There would be no expansion of the La Center UGA under Alternative 2, so there would be no impacts on resources outside the existing UGA.

Ridgefield: Under Alternative 2, Ridgefield's UGA would expand to include land for residential development. This area includes Gee Creek, a high probability area. No known historic sites are located in this area.

Vancouver: Vancouver's UGA would expand much less under Alternative 2 than under Alternative 1, and there are fewer historic sites located within the proposed UGA. All of those properties that do occur within the new UGA are listed on the local historic inventory; none are listed on the NRHP or CCHR lists. Generally, the amount of land with a high probability of containing archaeological resources is reduced under this alternative as well.

Washougal: Under Alternative 2, the expanded UGA of Washougal would include a tributary of the Little Washougal River, an area with a high probability for archaeological resources. Most of the new UGA is identified as having a low or low-moderate probability. No known historic sites occur within the area proposed for urban expansion.

c. Alternative 3

Alternative 3 would accommodate all growth and development within existing UGAs. This would provide greater protection to historic and archaeological resources located in rural areas outside the UGA. Accommodating new growth within existing urban areas may place greater pressure on historic resources within these areas, as the amount of land upon which new development can be accommodated is reduced and pressure to redevelop to make the most efficient use of land increases. Whether this occurs depends on the efficiency with which development occurs in urban areas and the degree to which existing historic sites are protected by local ordinances and policies. Urban historic resources tend to be clustered in or near downtown areas, but historic resources are not strictly limited to the downtown area and are found throughout the region.

d. Alternative 4

Clark County: Under Alternative 4, Vancouver and Battle Ground would see large expansions of their UGAs, Camas and Washougal would see a small increase, and La Center, and Ridgefield would see no expansion. Most of the land that would be converted to urban uses is rural and agricultural land. This alternative would involve fewer impacts to historic resources than Alternative 1 and, because less land area would be urbanized, would likely reduce impacts to archaeological resources located on less developed rural lands. Impacts to rural historic and archaeological resources would be greater under this alternative than under Alternative 2 or 3 because it would bring an additional 12,554 acres into UGAs.

Battle Ground: Battle Ground's UGA would see the largest expansion under this alternative, primarily to the southwest of the city in the Meadow Glade area. Most of this area has been identified as having a high probability for archaeological resources. The archaeological probability for the expansion area north of the city, the Cherry Grove area, is more varied, and includes primarily land with low and low-moderate probability. A total of six historic properties are located within the new UGA, and each is listed on the local historic inventory.

Camas: Camas' UGA expansion north of the city would see mostly agricultural land converted to mixed use and open space. While an open space designation would be compatible with historic and archaeological preservation, mixed use development, which would occur on land in the Lacamas Creek

area that has been identified as having a high probability for archaeological resources, would present a greater threat to the preservation of any resources located there. The expansion of UGAs would also occur on urban and industrial reserve land. This area reflects a variety of archaeological probabilities, ranging from moderate to high. One historic site is located within the new UGA. It is listed on the local historic inventory.

La Center: Under Alternative 4, La Center's UGA would not expand, and all new growth would be accommodated within the existing UGA. There is only one historic resource located within the current UGA of the city and three others located just outside of the boundary. By not expanding the UGA to include areas with these resources, pressure to redevelop the land for urban uses would be reduced.

Ridgefield: Ridgefield's UGA would not expand under Alternative 4. All growth would be accommodated within the existing UGA. Ridgefield has numerous historic properties located in its downtown area. All are listed on the local historic inventory. Various other historic properties are scattered throughout the jurisdiction. Ridgefield's population is expected to grow by 7,873 over the next 20 years. Increased development within the existing UGA could increase pressure to redevelop these properties to more intensive urban uses.

Vancouver: Vancouver would see a sizable increase of its UGA under Alternative 4. The land that would be brought into the UGA ranges from low to high in its archaeological probability, although most areas have at least a moderate probability. Generally, areas along streams and tributaries have a higher probability for archaeological resources. Fewer historic sites would be brought into the new UGA than under the other action alternatives. Four historic sites, all listed on local historical inventories, are found within the new UGA. One site—the Glenwood School—is on the boundary of the new UGA and is an NRHP-listed property.

Washougal: Washougal would see a small increase in its UGA under Alternative 4. Most of this area shows a low-moderate probability for archaeological resources, although it also contains high-probability areas along a tributary of the Little Washougal River. No known historical sites have been identified in this new UGA.

e. Alternative 5

Clark County: Alternative 5 would see each city's UGA expand to accommodate new employment growth and business development. Vancouver and Battle Ground would see the largest expansions, and much of the land that would be brought into UGAs is along I-5 from Salmon Creek to La Center. Approximately 12,303 acres would be brought into UGAs. Other than Alternative 1 (28,845 acres), this is the third largest expansion of UGAs, similar to Alternative 4. This would increase the likelihood that historic and archaeological resources currently located on rural lands would be impacted by new development. It would decrease the likelihood that urban historic resources would be impacted by directing development to new areas.

Battle Ground: Battle Ground would see a large expansion of its UGA west of the city in an area containing a large amount of land with a low probability for archaeological resources. An exception to this is the area adjacent to Mill Creek, which is shown as having a high probability of significant archaeological resources. Land to the south along Salmon Creek is largely defined as a high probability area. The area east of the city proposed for expansion is predominantly a high probability area as well. The UGA north of the city is shown as a moderate probability area. Four historic properties are located within the new UGA.

Camas: Potential impacts to historic and archaeological resources under Alternative 5 are similar to impacts under the other action alternatives, as most of the same areas are proposed for urbanization.

La Center: Impacts under this alternative are similar to Alternative 1 because the area south of La Center bisected by I-5 would be included in the UGA. The area shows a range of archaeological probabilities, and contains no listed historic sites.

Ridgefield: An area north of the city along I-5 is proposed for expansion under Alternative 5. The area is currently agricultural land and includes Allen Canyon Creek, along which are areas identified as having a high probability for archaeological resources.

Vancouver: Most of the expansion of Vancouver's UGA would occur north of the city along I-5. Much of this area, including land along Gee and Salmon creeks, shows a high probability for archaeological resources, although generally there is a range of probabilities for this area. The area proposed for expansion near Pleasant Valley shows predominantly low and low-moderate probability for archaeological resources, while the area near Glenwood shows mostly high probability. There are five historic sites within the new UGA under Alternative 5 that are listed on the local historic inventory.

Washougal: Under Alternative 5, Washougal's UGA would be expanded near Lacamas Heights to include land with a low or low-moderate probability for archaeological resources. Areas adjacent to tributaries of Lacamas Creek show high probability. No historic sites have been identified within this new UGA.

3. Mitigation

a. Plans and Ordinances

Clark County: Under Clark County's historic preservation ordinance (CCC Chapter 18.328), the Clark County Historical Preservation Commission is directed to collect and evaluate cultural resource information; review proposed restoration/rehabilitation for historic significance; review nominations to the National Register of Historic Places, Washington State Heritage Register, Clark County Heritage Register, or other local registries; and develop and manage a variety of educational and interpretive programs. Further, the Commission is responsible for evaluating probable impacts to historic properties, the nature of those impacts, and the reasons for a particular determination. Through interlocal government agreements, the Commission is able to provide historic preservation services to each incorporated city in the county.

Battle Ground: Draft adopted interim goals and objectives under Goal 1 (Livability) adopted in December 2001 include policies to encourage preservation, enhancement and integration of its historic resources and cultural heritage (LG6). Policies encourage the preservation of resources through public information and advocacy, and where necessary regulation (LO6.1) and support private efforts as well (LO6.2). The preservation is voluntary and the city will periodically review this approach to determine if additional measures are required (LA6.1.2). The City contracted with Clark County to complete a historic and cultural resource inventory. The City intends to maintain and update the inventory of potentially significant resources (LA6.1.5). Battle Ground does not currently have a historic preservation ordinance.

Camas: Camas has incorporated the provisions for protection of historic structures through the Clark County system in Chapter 16.06 of its municipal code. Camas' comprehensive plan has policies in its parks, recreation, open space and trail/bikeway element that identify and establish four Native American campsites for preservation as park areas. These include Parkersville, the property adjacent to the Parkersville site, the Wagon Wheel Park Site, and Bead Island. The city maintains a map of historic structures.

La Center: Policy 4 of the Land Use element of the comprehensive plan states that La Center shall identify and encourage the conservation of historic and archaeological resources within the city and UGA.

Ridgefield: Goal 12 of the comprehensive plan concerns historic Ridgefield. It calls for inventorying historic sites and structures and developing programs to resolve conflicts between sites and structures and growth objectives of the plan. The policies mandate coordination with the Clark County Historic Preservation Commission to conduct an inventory for the identification of historic and culturally significant sites and structures, to establish incentive programs to preserve identified areas, and to develop a historic district zoning overlay that would preserve these areas (Policies 12.1 through 12.3).

Vancouver: The Cultural Heritage and Diversity chapter of the Policy Document addresses cultural and historic resources. Policies P1 through P9 call for inventories of resources, protection of the resources, encouraging restoration and rehabilitation of significant buildings, using historic or overlay districts to preserve resources, and increasing public awareness and incentives to preserve resources. The Vancouver zoning ordinance implements the policies of the Policy Document through the Conservation Area and Heritage Area combining districts. Proposed revisions to the comprehensive plan include a policy for protecting and preserving cultural, historic, and archaeological resources. Preserving and restoring significant older buildings is promoted.

The City of Vancouver's historic preservation ordinances (VMC Chapter 17.39) is similar to Clark County's. The purpose is to provide a process for the identification, evaluation, and protection of historic and prehistoric resources within the county and the City of Vancouver and to encourage the preservation, restoration, and rehabilitation of eligible historic and cultural resources for their social and intrinsic value. Vancouver's historic preservation ordinance does differ from Clark County's ordinance in that it allows for the creation of historic districts. Vancouver has adopted an Archaeological Preservation Ordinance.

Washougal: Historic and cultural resources are not discussed in the comprehensive plan. These resources are perhaps indirectly protected through Policy 1F from the comprehensive plan, which encourages the preservation of neighborhood character.

Yacolt: Goal 6 from Yacolt's comprehensive plan states that "Development within the Yacolt UGA shall proceed in a manner consistent with the preservation of lands, sites, and structures that have historical or archaeological significance."" Policies 6-1 through 6-4 support this goal by requiring the identification of historic resources, offering financial incentives for the preservation of historic properties, establishing a process for when historic and cultural artifacts are found during project work, and encouraging public education on historic preservation.

b. Additional Mitigation

Other ways to reduce or avoid impacts are to:

1. Adopt development incentives which encourage the rehabilitation and preservation of historic structures and neighborhoods within urban areas.

2. Develop policies that preserve historic and cultural resources through historic or culturally significant zoning overlay districts and encourage increased neighborhood and citizen involvement in preservation and maintenance of these areas.

3. Encourage new development in historic areas to be designed to reflect the character of the area.

IX. TRANSPORTATION

The GMA requires that local land use and transportation systems be balanced and that land use decisions consider transportation needs and impacts. The GMA also requires that local and regional plans be coordinated. Once the comprehensive plans are adopted, jurisdictions will only be able to approve developments that can demonstrate that adequate transportation facilities will be available at the time of development or be planned and funded to be complete within six years of development approval without reducing the level of service below that set in the plan.

The following discussion summarizes information from the *Transportation Resource Document* prepared for Clark County by Parsons Brinckerhoff (2002). More detailed information on all aspects of transportation planning and regulation within Clark County can be found in that document. This section focuses on describing the basics of the transportation system, results of modeling the potential impacts for each alternative, and potential mitigation for the deficiencies.

A. Roadway Network

1. Setting

a. Planning

The Metropolitan Transportation Plan (MTP) for Clark County and the Transportation Element of the Clark County comprehensive plan follow the premise that land use and transportation are interrelated and that land use activities largely determine travel demand and desire. These plans were developed to provide for the mobility of people and goods and to support increases in travel demand caused by population growth and increased employment.

Transportation planning is conducted by various agencies. Federal regulations require a designated Metropolitan Planning Organization (MPO). The Southwest Washington Regional Transportation Council (RTC) is the MPO in Clark County.

The GMA requires that local comprehensive plans include a transportation element. The GMA further created a formal mechanism for local governments and the state to coordinate transportation planning for regional transportation facilities and authorized the creation of Regional Transportation Planning Organizations (RTPOs). The RTC was designated as the RTPO for the three-county area of Clark, Skamania, and Klickitat Counties. RTPOs are intended to be integrated with the federally required MPO in the urbanized areas.

The MTP for Clark County is the region's principal transportation planning document. The MTP must comply with the provisions of the federal Clean Air Act, which involves compliance with the mobile emissions budgets established in the Carbon Monoxide State Implementation Plan (SIP) Maintenance Plan (October 1996) and the Ozone SIP Maintenance Plan (April 1997), since the Vancouver area is designated as a maintenance area for carbon monoxide and ozone.

The 2000 MTP identifies future regional transportation system needs to the year 2023. It outlines plans and improvements necessary to maintain adequate mobility within and throughout Clark County. The MTP must be consistent with the area's comprehensive long-range land use plans, including the Clark County Community Framework Plan; urban development objectives; overall social, economic, and environmental system performance; and energy conservation goals and objectives. The MTP must also comply with the provisions set forth in the federal Americans with Disabilities Act and Title VI of the Civil Rights Act of 1964.

b. Transportation Demand

Several major factors must be considered when determining the future demand for transportation. These elements include the existing and future land uses in the area, which have an enormous impact on transportation demands. The GMA requires that local land use and transportation systems be balanced and that land use decisions consider transportation needs and impacts.

A second consideration in determining transportation demand is the rate of growth in Clark County. In recent years, Clark County has been one of the fastest growing counties in the state of Washington. Both population and employment in Clark County are expected to increase significantly in the future.

Households and Employment Patterns: An increase in the number of single-person households and the tendency toward smaller family size has caused a trend toward smaller household size in Clark County, while the total number of households has increased. Another trend that affects travel demand is the increase in two-worker households, which leads to an increase in vehicle miles traveled per household.

Employment patterns also have an affect on transportation demand. There has been an increase in "high-tech" employment opportunities and an expansion of the retail sector in suburban areas of the Portland-Vancouver metropolitan region. This has led to a greater dispersal of employment throughout Clark County. Suburban areas are often designed for auto commuters and may not be adequately served by transit.

Automobile Traffic: Travel demand has also grown as the number of registered passenger cars in Clark County increased dramatically between 1970 and 1999. The population of Clark County has increased 162 percent since 1970. In the same period, the number of registered vehicles increased by 216 percent.

Freight Traffic: Freight traffic is an important component of travel demand. A recent study commissioned by the Port of Portland, suggests that freight truck transportation will increase significantly in the region during next 20 years. Freight rail transportation is also expected to increase but at a much lower rate than freight truck transportation.

c. Forecasts and Projections

A Regional Travel Forecasting Model for the Clark County Region is used to forecast future traffic volumes on the regional transportation system (Table 50). Trips from home to the grocery store, childcare, etc. (home-based other trips) are dominant and predicted to remain the leading type of trips in the future. Home-based work trips (work-related trips that begin or end at home) account for the next highest amount of trips and are predicted to continue in the future. The actual number of total daily person trips is forecast to increase about 41 percent between 1999 and 2020. Over 85 percent of average weekday trips remain in Clark County in the 1999 base year and 2023 forecast.

Table 50. Regional Travel Forecasting Model Results Person Trips over 24-Hour Period

Trip	2000 (base year)	2023 (projected)
Home-Based Work	22%	21%
Home-Based Other	43%	42%
Non-Home-Based Work	8%	8%
Non-Home-Based Other	17%	19%
School/College	10%	9%
Total Trips	1,427,000	2,227,000

Source: Metropolitan Transportation Plan Update for Clark County: Southwest Washington Regional Transportation Council, 2002.

d. Existing Roadway Facilities

The Regional Transportation System has been designated by the Washington Regional Transportation Planning Program to include the four classifications of transportation facilities. The first category includes all state transportation facilities and services, including I-5, I-205, State Routes (SR) 14, 500, 501, 502 and 503.

A second category of facility includes all local freeways, expressways, and principal arterials. Principal arterials, such as Mill Plain, Fourth Plain, NE 78th Street, NE 112th Avenue, SE/NE 164th/162nd Avenue, and segments of St. John's and Andresen are included. Facilities either recently completed or nearing completion include the Padden Parkway, Mill Plain extension, and SE 192nd Avenue extension. Future planned arterials include the NE 18th Street extension.

The third type of regional transportation facility is high capacity transit (HCT) systems: any express-transit service operating on exclusive rights-of-way including high occupancy vehicle (HOV) lanes. The I-5, I-205, and SR-500 (I-5 to Orchards area) corridors are designated as HCT corridors. Planning for Light Rail Transit (LRT) in the I-5 corridor, terminating in the vicinity of Clark College, is underway. Clark County is served by the C-TRAN bus transit system. Greyhound provides inter-city bus service in the I-5 corridor. Two main Burlington Northern & Santa Fe (BNSF) rail lines, in addition to a privately owned rail line, provide both freight and passenger service in the county. Amtrak's Pacific Northwest Rail Corridor is one of five designated high-speed corridors in the nation. A 1999 Commuter Rail Feasibility Study outlines considerations for bi-state commuter rail service on the BNSF corridor.

The final category of regional facility includes all other transportation facilities and services considered necessary to complete the regional transportation plan. These include transit services and facilities, roadways, rail and truck facilities, airports, and marine transportation.

e. Southwest Washington Regional Transportation Council (RTC)

The functional classification of the Regional Transportation System is based on the Federal Functional Classification System. This classification system divides highways, roads, and streets into groups having similar characteristics of providing mobility and/or land access. Different criteria are used to determine functional classifications in rural as compared to urban areas.

These classifications describe the character of service that a road is intended to provide. That service is a trade-off or continuum between providing access to local land uses adjacent to the roadway and providing mobility to through traffic. The extremes of the continuum are local streets (which provide access to adjacent land uses and limit through traffic speeds) and freeways or highways (which limit local access in order to facilitate through traffic at higher speeds). The classification system is a functional hierarchy, with each element serving as a collecting/distributing facility for the next higher classification element. An efficient circulation system includes a balanced network of roadways of different classifications.

The Regional Transportation Plan (RTP) for Clark County defines the different types of transportation facilities. A description of the urban and rural (outside of urban areas) functional classification categories is presented here.

Principal Arterials permit traffic flow through the urban area and between major elements of the urban area. These arterials connect major traffic generators such as the central business district and regional community centers to other major activity centers. They carry a high proportion of the total urban area travel on a minimum of roadway mileage. They also carry traffic between communities and include important intra-urban and intercity bus routes.

Minor Arterials collect and distribute traffic from principal arterials to lesser classified streets. They also allow for traffic to directly access their destinations. They serve secondary traffic generators such as community business centers, neighborhood shopping centers, multiple residence areas, and traffic from neighborhood to neighborhood within a community. Access to land use activities is generally permitted.

Collectors provide for land access and traffic circulation between residential neighborhoods and commercial and industrial areas. They distribute traffic movements from such areas to the arterial system. Collectors do not carry long through trips.

Rural Principal Arterials are divided into two sets. These are interstate facilities and other principal arterials. They consist of a connected rural network of continuous routes and provide an integrated network without stub connections.

Rural Minor Arterials form a rural network which links cities and larger towns together with other major traffic generators. The principal arterials and rural minor arterials are spaced so that all developed areas of the state are within a reasonable distance of an arterial highway. Minor arterials provide a relatively high overall travel speed with minimum interference to through traffic.

Other lower function road classifications exist. These other roadways are not being evaluated as part of this planning update process.

Washington State Department of Transportation (WSDOT): Some roadways within Clark County are designated as National Highway System (NHS) and Highways of Statewide Significance (HSS) facilities. Additionally, the state's functional classification system is divided into three functional classes, for both urban and rural roads. These are principal arterial systems, minor arterial systems, and collector systems. NHS facilities include all of I-5, I-205, SR-502, and SR-14 within Clark County. Additionally, segments of certain state highways within Clark County designated as NHS routes include SR-500 (I-5 to SR-503), SR-501 (I-5 to the Port of Vancouver), and SR-503 (SR-500 to SR-502). Highway facilities in Clark County defined as HSS are I-5, I-205, SR-14, and part of SR-501 to access the Port of Vancouver.

Clark County: The Clark County 1999 Transportation Standards include classifications for urban and rural roads. These classifications include urban parkway arterials, urban principal arterials, urban minor arterials, urban collectors, urban neighborhood circulators, and other urban access roads. Rural classifications include rural major collectors, rural minor collectors, and rural access roads. Figure 34 shows the Clark County Regional Transportation System.

Vancouver: The Vancouver Transportation Standard Details list 12 classifications for all roadways within the City. These classifications include: principal arterials, minor arterials, collectors, neighborhood circulators, loops and cul-de-sacs, alleys, private streets, local access roads, primary industrial II, primary industrial I, secondary industrial, and local industrial. A map of the arterial system is included in the 2003-2008 TIP.

Battle Ground: Battle Ground has classifications and design standards for six road types: principal arterials, three-lane minor collector arterials, two-lane collector arterials, and primary industrial roadways and three classifications for residential streets.

Camas: Camas has five road classifications based on right-of-way and roadway widths: primary arterials, secondary arterials, collectors and two classifications for residential streets.

La Center: La Center has seven roadway standards: major arterials, secondary arterials, collectors and three remaining classifications for local roads.

Ridgefield: Ridgefield has six classifications of road standards: major and minor arterials, industrial/commercial streets, residential collectors and two classifications of residential streets.

Washougal: Washougal has six classifications of road standards: principal and minor arterials, industrial/commercial streets, residential collectors, and two classifications of residential streets.

Yacolt: Yacolt has four roadway standards: residential arterials, residential collectors, residential access streets and classifications for local roads.

In general, the roadway widths for arterial classifications of roadway are similar between the jurisdictions; there are some differences in collector classifications regarding roadway pavement depth and provision for bike lanes that may need to be resolved in the future. There are some minor differences in local and neighborhood street standards among the jurisdictions, but this is not expected to be of issue.

f. Current Road Conditions

Clark County has seen a significant growth in traffic volumes in recent years as a result of socioeconomic and demographic changes. The top five regional transportation system intersections with the highest traffic volumes, measured in terms of number of vehicles entering intersections, include: SR-500 and NE 112th Avenue, SR-500 and Thurston Way, Mill Plain and Chkalov, SR-500 and SR-503, SR-500 and St. John's Road, in order from higher to lower volume intersections. Examples of growth in traffic volumes at selected Clark County locations are listed in Table 51.

Table 51. Traffic Volumes at Selected Locations in Clark County

Location	1985 Volumes	Current Volumes	Year of Current Volumes	% Increase	Annual % Increase
I-5 Bridge	92,301	130,000	2002	41%	2.40%
I-5, South of SR-500	54,400	124,879	2001	130%	8.10%
I-5, South of NE 78th St	52,784	96,551	1999	83%	5.92%
I-5, South of Woodland	33,748	58,351	2001	73%	4.56%
I-205 Bridge	52,568	140,739	2002	168%	9.87%
I-205, South of SR 500	40,440	109,308	2001	170%	10.64%
78th St, West of Hwy 99	23,646	28,679	2000	21%	1.42%
164th Ave, South of SE 34th St	7,052	41,809	1999	493%	35.20%
Fourth Plain, West of NE Andresen	16,060	27,943	2000	74%	4.93%
Hwy 99, South of NE 99th St	19,653	19,178	1999	-2%	-0.17%
Mill Plain, East of NE Andresen	21,021	31,454	2001	50%	3.10%
Mill Plain, East of NE Chkalov	18,220	48,002	2000	163%	10.90%
SR 14, West of SE 164th Ave	22,600	76,680	1999	213%	15.20%
SR-14, West of NW 6th Ave	17,600	31,983	2000	82%	5.45%
SR 500, West of NE Andresen	20,054	47,886	1999	139%	9.91%
SR-500, West of 137th Ave	14,671	26,345	2002	80%	4.68%
SR 503, South of NE 76th	17,460	39,042	2000	124%	8.24%
SR-503, South of SR-502	7,360	19,207	2002	161%	9.47%

Source: Metropolitan Transportation Plan for Clark County: Southwest Washington Regional Transportation Council, 2002.

g. Performance Monitoring

The transportation planning process requires the monitoring of system performance. Elements of system monitoring include concurrency requirements and a Congestion Management System (CMS).

Concurrency: As defined by the Washington GMA, concurrency is the requirement that adequate transportation capacity be available to support development. The GMA requires local jurisdictions to set levels of service (LOS) standards for transportation facilities that are regionally coordinated. These levels of service are designated A through F, from best to worst. LOS E describes conditions approaching and at capacity (critical density).

Level of service standards represent the minimum performance level desired for transportation facilities and services within the region. The standards are used to identify deficient facilities and services in the transportation plan, and are also to be used by local governments to judge whether transportation funding is adequate to support proposed land use developments.

Concurrency helps balance the timing and sequencing of development in relation to transportation improvements, such as new streets and traffic signals. The two main parts of a concurrency program are an ordinance, which defines how concurrency is administered, and the comprehensive plan, which establishes transportation LOS standards. Clark County and each city jurisdiction have a concurrency program.

Congestion Management System (CMS): The Clark County region has been designated as a Transportation Management Area (TMA) under the federal Intermodal Surface Transportation and Efficiency Act (ISTEA) and TEA-21 legislation. In TMAs, the MPO must have a CMS that provides for the effective management of new and existing facilities through the use of travel demand reduction and operational management strategies. In TMAs classified as having poor air quality (non-attainment for ozone and/or carbon monoxide), highway capacity expansion projects that result in a significant increase in single occupancy vehicles can only be put in the transportation program if it is consistent with the CMS. The Clark County area was classified as having poor air quality but is currently in a maintenance period (see Air Quality section). The CMS network has 21 transportation corridors for ongoing monitoring and evaluation.

Other Monitoring Systems: The 1991 federal ISTEA required new systems to monitor and correct transportation system deficiencies. These include a Bridge Management System and Safety Management System. Most states also operate a pavement management system (PMS) to protect state roadway investment.

h. Transportation Management

Several techniques can be applied to maximize the efficiency of the existing transportation system investment. Clark County and its local jurisdictions have ongoing Transportation Demand Management (TDM) and Transportation System Management (TSM) efforts. These techniques can be used to mitigate some impacts to the transportation system.

Transportation Demand Management: TDM can help solve transportation-related air pollution, energy, and congestion problems by helping move more people in fewer vehicles and reducing vehicle miles traveled. TDM promotes alternatives to single-occupant vehicles. TDM focuses on work-related commuting because traffic congestion is heaviest on weekdays when people are traveling to and from work. In airsheds that do not meet federal air quality standards the regulations mandate employers with more than 100 employees to develop TDM policies to cut SOV work trips. Additionally, Washington State's Commute Trip Reduction law requires major employers (100 or more employees) to reduce commute trips by 35 percent from 1993 levels by 2005. Currently, there are fifty affected employers in Clark County. Another seven employers participate voluntarily in the program.

Transportation System Management: TSM is another strategy to maximize the efficiency of the existing transportation system. TSM measures can include an incident response program, increased

signage to alert motorists of travel conditions, ramp metering, Intelligent Transportation System (ITS) projects, channelization of traffic at intersections and traffic signal interconnects to improve the efficiency of operations of the regional transportation system.

Planned/Funded Road Improvements: Several programs affect funding for planned transportation improvements in Clark County. They include state and federal transportation funding program, federal air quality requirements, and state concurrency requirements.

ISTEA and TEA-21 significantly expanded the MPO role. In areas with over 200,000 people, the MPO must conduct the project selection and prioritization process. It expands the MPO planning boundary to include a 20-year growth area and air quality non-attainment areas. The ISTEA/TEA-21 requirements also call for a Transportation Improvement Program (TIP) to be approved by the MPO and the Governor and include a three-year priority list of projects that have a realistic financial plan to implement them.

The Clark County region has been classified as non-attainment for ozone and carbon monoxide. As noted earlier, transportation planning and project programming cannot occur without consideration for air quality impacts. Both the Clark County MTP and TIP undergo air quality conformity analysis before they are adopted. Projects can only be programmed in the TIP if they come from a conforming MTP. Additionally, the federal Congestion Mitigation and Air Quality Improvement Program (CMAQ) targets funding for projects in non-attainment areas, that contribute to the attainment of national ambient air quality standards.

Multiple transportation improvement projects are planned by Clark County and local jurisdictions, such as roadway improvements, traffic signals, road widenings, overlays, intersection reconstruction, access ramps, bicycle lanes and sidewalks, school crossings, guard rails, culvert replacements, and storm drainage improvements. Approximate total cost of these programmed projects (reasonably funded projects) are: $184 million for Clark County, $80 million for the City of Vancouver, $26 million for the City of Battle Ground, $19.2 million for the City of Camas, $5.3 million for the City of La Center, $630,000 for the City of Ridgefield, $6.4 million for the City of Washougal, and $4.9 million for the City of Yacolt.

B. Transit

1. Setting

Transit supports the land use goals established in the GMA, which envision denser developments in growth centers and in primary transportation corridors. To reinforce the success of the transit system, local jurisdictions must ensure transit supportive urban design provides for convenient access to the transit system. Transit is also important in meeting the mobility needs of the transit dependent; those unable to drive automobiles or who choose not to drive for a variety of reasons.

Within Clark County, local transit is provided by C-TRAN and intercity scheduled transit is provided by Greyhound and Amtrak. High capacity transit (HCT) has been extensively studied for the region.

a. Local Transit

Transit needs in Clark County are primarily served by C-TRAN, a publicly funded transportation system. C-TRAN operates 28 routes with urban, intercity, rural and commuter-oriented lines. Additionally, eight vanpool passenger vans operate Monday through Friday to transport employees to work. C-TRAN provided over five million rides in 2000. Vanpool and paratransit services served an additional 229,000 riders in 2000. During the 1990s, C-TRAN ridership tripled and service was increased. However, 2000 ridership numbers reflect a decline of over 10 percent from 1999, attributed to both a fare increase and substantial service reductions with the elimination of the Motor Vehicle Excise Tax, which cut

C-TRAN's budget by 40 percent. C-TRAN fixed route service has 29 routes (15 Urban Clark County, five rural Clark County and nine commuter routes to Portland) covering a distance of over 510 route miles. C-TRAN also provides more than 1,600 parking spaces at eight park-and-ride facilities.

A large majority of the county's population and employment, clustered within the established urban growth area, are within a reasonable walking distance (¼ mile) of C-TRAN fixed route bus lines. This includes 75 percent of the (residential and employment) population within the City of Vancouver as well as close-in areas within the county and other served cities (Camas, Washougal, Battle Ground, Ridgefield). Three C-TRAN transit centers serve multiple C-TRAN and connecting bi-state/intermodal services. A major park and ride is planned for 99th Street and I-5. Other park-and-ride facilities are located at Salmon Creek, Evergreen, BPA Ross Complex, Fisher's Landing, Vancouver Mall, Battle Ground, Ridgefield, and Camas/Washougal.

C-TRAN's Six Year Plan (2001-2007) addresses system-wide operations. The budget includes upgrades to reduce pedestrian barriers to transit routes and increase ridership. C-TRAN is forecasting service for more than 7.7 million fixed route and 0.3 million paratransit trips by 2007. Capital plan funds are expected to be shared between federal (55 percent) and local sources.

Plans for transit support land use goals established in the GMA, which envision denser development in growth centers and primary transportation corridors. Future transit development will be shaped by the outcome of local jurisdiction land use plans and HCT projects. C-TRAN is also an active partner in HCT planning, including the bi-state I-5 Trade Partnership project, with potential HOV enhancements and new commuter/light rail systems.

C-TRAN has also taken the lead in coordinating with the region's social service providers to develop a regional "welfare to work" transportation plan and is pursuing funding. Program elements under consideration include: connector services to mass transit; vanpools; shared elderly and youth bus programs; coordination of human services and public transit; employer provided transportation; GIS based ride matching; guaranteed ride home programs; and public-private transportation partnerships.

b. Inter-City Bus

Greyhound provides inter-city bus service in the I-5 corridor from its bus depot in downtown Vancouver (613 Main Street). As of May 21, 2002 Greyhound operates seven northbound buses and seven southbound buses daily. All destinations east have their origin in Portland.

c. High Capacity Transit Studies

Recent and ongoing efforts have studied HCT options in Clark County, with links across the Columbia River to Portland. These include the South/North High Capacity Transit Corridor Study and the associated Draft Environmental Impact Statement (DEIS), and the bi-state I-5 Trade Corridor project. These studies support various HCT designated corridors including I-5 from the state line to the vicinity of Clark College as a LRT corridor, I-5 north to 134th street as a HCT corridor, SR-500 between I-5 and Orchards marked for potential future HCT extension, and I-205 as a potential future HOV/Busway corridor.

Establishing successful HCT in Clark County requires transportation corridor planning coordinated among various local and bi-state jurisdictions. A transportation corridor needs urban, high-density residential and commercial land uses.

Regional HCT studies focus on the need to meet future travel demand between Portland and Vancouver and within Clark County. The South/North Transit Corridor Study laid out LRT options that extend the Portland MAX system to a northern terminus near Clark College. The I-5 Trade Corridor envisioned a

transit loop connecting the I-5 and I-205 river crossings with the Clark College area. Additionally, a Commuter Rail Feasibility Study looked at the potential to use an existing BNSF rail corridor for commuter passenger service. Meanwhile, construction continues on an extension of a Tri-Met LRT line north to the Expo Center, just south of the Columbia River.

The Commuter Rail study found that passenger rail service should not be pursued without major rail investments necessary to support the diverse demands of intercity passenger, freight, and commuter rail. This regional discussion has continued with I-5 capacity enhancement options under consideration by the I-5 Trade Corridor project. The I-5 project has included an explicit evaluation of land use effects and impacts and opportunities for local jurisdiction land use and corridor planning.

C. Non-Motorized Modes

1. Setting

The use of bicycles for transportation as well as recreation in Clark County is becoming increasingly important and is supported by the Clark County RTP. Reduced reliance on automobiles is largely dependent on the development of adequate sidewalks and bikeways to access activity centers and to allow for intermodal connections in use of the transit system. The development of non-motorized transportation modes (bicycling, walking) would maximize the capacity of the existing transportation system.

Clark County and other local jurisdictions have included bicycle and pedestrian elements in their comprehensive plans. The 1992 Clark County Trails and Bikeway System Plan outlined development of new bicycle and pedestrian facilities. Recognizing that it is more cost effective to incorporate paths in initial construction, the plan included revisions to Clark County and local jurisdiction road standards. Clark County completed an analysis of the barriers to pedestrian and bicycle access to arterial streets, incorporating improvements in the comprehensive plan capital project list. C-TRAN began a Bike & Bus program in 1994, which included installing bike racks on commuter bus routes and adding bicycle lockers to some Transit Centers and Park and Ride facilities.

Bicycling is allowed on all state routes in Clark County except on 1-5 between the Interstate Bridge and slightly north of the Mill Plain Boulevard interchange. There are sidewalks on some sections of SR 500, SR 501 and SR 503. In addition, there is a short pathway on SR 500 between Andresen Road and Thurston Way. There is also a pedestrian over-crossing of SR 500 at Falk Road.

Notable pedestrian and bicycle projects in Clark County include the completion of the City of Vancouver's Columbia River Waterfront Trail, the Discovery Trail, the Columbia River/Evergreen Highway Trail, Hazel Dell Avenue bike lanes, and SE 164th Avenue bike lanes. Also of regional significance are improvements of pedestrian and bicycle facilities, which will improve access to transit facilities, highlighted in the Clark County Transit Access Improvement Plan. Clark County also has a Safe Walkways to Schools Task Force that addresses transportation policy for school children and the physically challenged by giving priority to those projects that serve the ADA requirement, wheelchair accessible transit service, social service and/or health care offices, or provide for improvement to mobility, such as wheelchair curb ramps at intersections.

The Vancouver Parks and Recreation Department has designated certain paths within the city as bikeways, including portions of the Discovery Trail. The proposed roads that will be served by bike routes in Vancouver are listed in Table 52.

Table 52. City of Vancouver Proposed Bicycle Routes

Road Name	From	To
39th Street	Fruit Valley Road	F Street
Evergreen Boulevard	Main Street	Andresen Road
Fourth Plain Boulevard	Mill Plain Boulevard	Andresen Road
St. Helens Ave	Lieser Road	SE 105th Avenue
Mill Plain Boulevard	C Street	Columbia Street
MacArthur Boulevard	Mill Plain Boulevard	Lieser Road
Falk Road	Fourth Plain Boulevard	SR 500
Andresen Trail Crossing	18th Street	Mill Plain Boulevard
Main Street	Fourth Plain Boulevard	45th Street
Burnt Creek Bridge Trail	Andresen Road	SR 500/Gher Road
Scenic Evergreen Trail	Chelsea Street	Ellsworth Road
Scenic Evergreen Trail	Bidle Nature Preserve	SE 164th Avenue
18th Street Powerline Trail	86th Avenue, parallel to BPA Powerline	Lacamas Lake

Source: City of Vancouver, 2003-2008 Transportation Improvement Program, Pedestrian/Bike Projects Pending Funding (August 2002).

D. Airports

1. Setting

There are six general aviation airports operating in Clark County. General aviation airports are either publicly or privately owned airports that serve general aviation users. There are several additional private unattended airfields located throughout Clark County.

a. Portland International Airport (PDX)

This is a regional airport in Portland with domestic and international passenger and freight service. PDX has seen rapid growth in passenger numbers and freight in recent years and now consistently serves over 1 million passengers per month.

b. Pearson Airpark

Pearson Airpark is a general aviation airport two miles southeast of downtown Vancouver. Pearson Airpark is publicly owned and is operated by the City of Vancouver. It is within 1 mile of I-5 and local bus service is available nearby along East Evergreen Boulevard.

c. Evergreen Airpark

Evergreen Airpark is located six miles east of Vancouver. It is a privately owned airfield with three runways and a base for 245 planes on the 102-acre site. The airport is within five miles of I-205 and local bus service is available along Mill Plain Boulevard The airport has dense commercial and residential uses on three sides, including a public school. Adjacent neighborhoods have petitioned against noise impacts from the airpark. A representative of the owner has applied to change the current airport designation to other zoning designations.

d. Grove Field

Grove Field is three miles north of the City of Camas. The 42-acre, general aviation airfield is owned and operated by the Port of Camas/Washougal. Highway access is on SR-500 and SR-14. Up to 65 aircraft can be accommodated in hangars. A $0.33 million capital improvement program through 2010 is planned. A critical safety issue affecting operations is the close proximity of residential land uses. A mobile home

park is within the "clear zone" on the east end of the runway. Grove Field has cleared 15 acres at the end of the runway to try to compensate for this situation.

e. Goheen Airport

Goheen Airport is three miles northwest of Battle Ground, and is privately owned. It is accessed from I-5 via SR-502 and NE 279th Street. It has one turf runway (and an emergency only runway) and provides a base for 39 planes. Forty-five acres of the 60-acre area are zoned for airport use. Rural residential, agriculture, forest and an auto salvage yard surround the facility. Capital improvement projects of $0.29 million will upgrade the primary runway and taxiways by 2010.

f. Fly for Fun

Fly for Fun airport is a small privately owned facility located within two miles of I-205, SR-503, and SR-500 in Clark County. Single family residential surrounds the airport. No capital improvement projects are planned through 2010.

g. Taylor's Green Mountain Airpark

This is privately owned, 23-acre facility, located nine miles east of downtown Vancouver with one paved runway, six hangars and ten tie-downs. Limited aircraft are based at the airpark.

E. Rail Facilities

Rail service in Clark County is operated by Burlington Northern Santa Fe Railroad (BNSF), Amtrak, the Union Pacific Railroad (UP), the Lewis & Clark Railway Company (LINC), and the Battle Ground, Yacolt, and Chelatchie Prairie Railroad Association (BYCX). These operators provide either passenger or freight service as described below.

a. Burlington Northern and Santa Fe Railroad (BNSF)

BNSF operates freight service 365 days a year throughout Clark County. All BNSF trains in Clark County are dispatched from Seattle. BNSF maintains and operates the Vancouver railyard, which serves as the primary classification yard for the Portland-Vancouver metropolitan area. This facility contains 35 miles of track with a holding capacity of 1,500 rail cars. Overflow from BNSF tracks can be accommodated by the Port of Vancouver, which maintains supplementary holding tracks.

The BNSF Seattle/Vancouver line has two tracks, both in excellent condition, operating 75-80 trains daily in the corridor, consisting of BNSF, UP, and Amtrak. The Vancouver to Spokane line is single track in excellent condition operating between 35 to 42 trains per day in the corridor. The Rye Branch is a short segment that diverges from the main line just north of 78th Street and runs from the mainline to Rye Yard off St. John's Road. The track is in fair condition with tri-weekly service. This line was given to Clark County after the floods of 1996.

The overall condition of BNSF's Clark County trackage is excellent. The speed limits on the BNSF mainline are not due to track condition, but rather at-grade crossings with arterial streets.

b. Clark County Railroad

The Clark County Railroad is owned by the County but leased to two different outside operators. The line is also known as the Chelatchie Prairie Railroad or the Lewis & Clark Railroad. The railroad extends from the BNSF mainline in north Vancouver, diagonally through the County, to Chelatchie Prairie in the far northeast corner of the County. LINC serves freight customers on the "South Line" which is the line

segment south of Battle Ground. BYCX operates a passenger excursion program on the "North Line" which is north of Battle Ground.

The Lewis and Clark Railway is owned by the County but leased to a private operator. The 30-mile line extends from the Rye Yard to Chelatchie Prairie and offers both freight and passenger excursion services. The height of activity is between May and September when up to 16 excursion and 6 freight trains operate weekly. Freight cargo deliveries of plasterboard, plastics, chemicals, and machinery are made to local industries. In addition, special trips are made during the holiday season for Christmas trees.

c. Amtrak

Amtrak has an agreement with BNSF to operate passenger service on the freight carrier's rail lines. Amtrak operates passenger and parcel service 365 days a year throughout Clark County. Twelve daily Amtrak trains serve Vancouver. The *Empire Builder* travels between Seattle and Chicago via Portland, Oregon; the *Coast Starlight* travels between Seattle and Los Angeles via Portland, Oregon; and the *Cascades* travels between Vancouver, British Columbia, and Eugene, Oregon. An average of 5,274 passengers per month pass through the Clark County station. The overall condition of Amtrak's facilities is good. In addition, a proposed high speed rail system would provide 150 mph or greater service between Portland, Oregon and Vancouver, British Columbia.

d. Union Pacific Railroad

UP operates some freight trains to Tacoma and Seattle on BNSF's lines. UP is privately owned and operates freight service 365 days a year. Twenty trains per day run north through Woodland and up to the Seattle area.

F. Ports

1. Setting

Clark County's location at the terminus of the Columbia River's deep draft channel makes water transportation an important element in the overall transportation system. This location provides an important transfer point for large ships and river barges. The inland waterways of the Columbia River systems feature a variety of modern port facilities with intermodal connections to railroad and highway systems serving the entire nation. Clark County has three Port Districts: the Port of Vancouver, the Port of Camas-Washougal, and the Port of Ridgefield.

a. Port of Vancouver

The Port of Vancouver operates an international cargo dock used by over 400 ships, carrying over 5 million metric tons of cargo. The Port is located west of I-5.

This facility provides convenient access for numerous interstate truck and major rail lines and is within four miles of I-5 and within 10 miles of I-84. The Port has 600 acres of developed industrial and marine property and another 1,080 acres, including an additional 1.5 miles of waterfront access, available for future marine and industrial development.

b. Port of Camas-Washougal

The Port of Camas-Washougal, founded in 1935, has 95 square miles of land with an industrial park, marina, airport, park, and wildlife refuge. The Port owns and manages the 200-acre industrial park with land and nine buildings for lease to light/heavy industrial users.

c. *Port of Ridgefield*

The Port of Ridgefield is a 57 square mile district, formed in 1940, and located seven miles north of Vancouver. The Port is developing industrial areas, but does not operate any transportation facilities. The Port is working to clean and redevelop the Lake River Industrial site, left by Pacific Wood Treating when it declared bankruptcy. It is estimated the full clean-up project at the Lake River Industrial Site will take 10 to 15 years and cost more than $40 million. The site includes approximately 190,000 square feet of leasable building space and 16 acres of leasable land.

d. *Summary of Existing Conditions*

The GMA, along with TDM and HCT legislation, and the TEA-21 require local jurisdictions to coordinate and balance land use and transportation planning. In addition, these local plans must be regionally coordinated. This section documents the existing transportation systems and transportation planning efforts that will need further coordination. Specific issues facing the County include:

- There are minor differences in the functional classification systems and roadway standards used by different municipalities and the County. These differences need to be resolved for regional facilities in order to complete regional transportation plans and meet the qualifications for federal and state funding.
- Most Clark County jurisdictions have established level of service (LOS) standards for road segments or intersections. LOS standards must be adopted in order to impose traffic impact fees permitted under the GMA. There should be agreement among Clark County's jurisdictions about the definition of LOS, at least for regional facilities (arterials and above), in order to ensure consistent treatment of development.
- A bi-state committee is evaluating the I-5 corridor. Local jurisdictions and the County must be involved in this planning, because of the implications for land use planning.
- The Port of Vancouver is a major trans-shipment point for goods and materials from eastern Washington and Oregon. Changes in shipping in the Columbia River (due to federally-listed endangered species issues) may change the way that they receive goods for shipment and increase the truck traffic into the port area. This would have an impact on traffic in the SR 14 corridor and downtown Vancouver, and should be planned for jointly by all involved jurisdictions.
- Clark County’s airports are located in developed areas where conflict with surrounding uses is a problem. Siting and constructing a replacement facility would require the cooperation of several jurisdictions.

2. General Impacts and Methodology

This summarizes the transportation analysis, impacts, and potential mitigation measures for the five land use scenarios being considered in the Clark County comprehensive plan update. An additional sub-alternative that includes Light Rail was also analyzed. Existing conditions are summarized in the Resource Document (2002). Transportation modeling was conducted by the RTC using the regional EMME/2 travel demand model. Results were reviewed and manual adjustments made during “post processing” where volume balancing was needed, or where the model may have been estimating trips differently in the existing conditions compared to traffic counts. Adjustments were also made by applying a traffic operations modeling software, Synchro, on select corridors using as input the adjusted demand model volumes.

Current transportation providers include Clark County; the Cities of Vancouver, Camas, Washougal, Ridgefield, Battle Ground, and La Center; WSDOT; and C-TRAN (for public transportation). School transportation providers include Laidlaw (Battle Ground), Vancouver School District, Evergreen School

District, KWRL (La Center, Woodland, Ridgefield), Camas School District, and Washougal School District.

A series of performance measures were used to analyze the alternatives and their impacts. These measures were also normalized to enable direct comparison of the alternatives. These are summarized in Tables 53 and 54 below. The household and employment data listed in Table 53 were provided by RTC. Figures 35 through 39 show the resultant LOS E/F facilities for each alternative.

Modeling was performed on the 2023 Metropolitan Transportation Plan Update (2023 MTP Update) network for both highways and transit. Refer to RTC's 2023 MTP Update document for details on the network assumptions. Each alternative was analyzed as a "stand alone" alternative for impacts and mitigation. Where necessary, comparison is made between alternatives.

Table 53. Summary of Impacts (Based on Performance Measures)

	Alternatives					
Performance Measure	**1**	**2**	**3**	**3a**	**4**	**5**
Future Households	235,959	209,286	193,645	208,797	198,779	209,353
Future Employment	269,508	253,095	245,588	248,623	277,794	284,641
Employment per HH	1.14	1.21	1.27	1.19	1.40	1.36
Total Person Trips*	2,348,000	2,213,000	2,127,000	2,212,000	2,266,000	2,287,000
Average Trip Length (Miles: work/non-work)*	7.8/4.3	8.2/4.6	7.3/4.2	7.5/4.2	6.8/4.1	6.9/4.1
Percent to Portland	13.7%	9.8%	8.7%	9.8%	6.7%	7.2%
All-Day Bridge Crossings	394,000	326,000	311,000	324,000	301,000	304,000
Vehicle Miles Traveled	1,077,000	963,000	923,000	953,000	974,000	976,000
VMT per HH	4.6	4.6	4.8	4.6	4.9	4.7
Vehicle Hours Traveled	37,500	27,500	25,500	27,000	27,300	27,100
VHT per HH	0.16	0.13	0.13	0.13	0.14	0.13
Vehicle Hours of Delay (VHD)	9,510	2,838	2,024	2,604	2,208	2,065
Delay Per Hour of Travel (Minutes per VHT)	15	6	5	6	5	5
Lane Miles LOS E/F	273	127	85	109	124	105
Non-motorized mode share	5.2%	5.7%	5.7%	5.9%	5.7%	5.7%
Work Trip Transit Mode Share – within Clark County	1.1%	1.2%	1.3%	1.6%	1.1%	1.1%
Work Trip Transit Mode Share – Clark County to Portland Trips	5.8%	6.1%	7.0%	11.7%	6.3%	6.0%
Transit Share – all trips	1.3%	1.2%	1.3%	1.8%	1.1%	1.1%
Average roadway speed	29	35	36	35	36	36

Source: Transportation Resource Document, Parsons Brinckerhoff, July 2002

**With at least one Clark County trip end*

Table 54 below summarizes level-of-service deficiencies (LOS E/F) for major arterial corridors within Clark County. Where a facility is not listed, it is expected to be operating at LOS D or better conditions by 2023.

Table 54. Major Transportation Corridors: Level-of-Service by Alternative

	Alternatives					
Corridor Segment	**1**	**2**	**3**	**3a**	**4**	**5**
I-5, Columbia River to 99th Street	**F**	**F**	**E/F**	**E/F**	**E/F**	**E/F**
I-5, 99th to 134th	**F**	D/**E**	D	**E**	D/**E**	D/**E**
I-205, Columbia River to SR-500	**F**	**E**	D	D	D	D/**E**
I-205, SR-500 to I-5	**F**	D/**E**	D	D	D	D
I-5, I-205 to 219th	**F**	D	D	D	D	D
I-5, 219th to Ridgefield	**E**	D	D	**E**	**E**	D
SR-500, I-5 to I-205	D	D	D	D/**E**	D/**E**	D/**E**
SR-503, SR-500 to 119th Street	**F**	**F**	**E**	**E**	**E**	**E**
SR-503, 119th Street to Battle Ground	**E**	**E**	D/**E**	**E**	**E/F**	**E**
SR-502, I-5 to Battle Ground	**F**	D	D	D	D/**E**	**E**
SR-501, I-5 to Ridgefield	**E**	D/**E**	D/**E**	D/**E**	D/**E**	D/**E**
SR-14, I-205 to 164th Avenue	**E**	**E/F**	**E**	**E**	**D/E**	**E**
Ward Road, SR-500 to UGB	**F**	**E**	**F**	**E**	**E**	**F**
Ward/182nd, UGB to 159th Street	**E**	D	D/**E**	D	**E**	D/**E**
162nd Avenue, SR-14 to Mill Plain	**E**	**E**	**E**	D/**E**	**E**	**E**
162nd Avenue, Mill Plain to Ward	**E**	**E**	D/**E**	D	**E**	D/**E**
La Center Road, I-5 to La Center	**F**	**F**	**F**	**F**	**F**	**F**
Lakeshore/Fruit Valley, Vancouver to Felida	**F**	D	D/**E**	D/**E**	D/**E**	D/**E**
72nd Avenue, 119th to 219th Street	**F**	**E/F**	D/**E**	D/**E**	**E/F**	**E**
199th Street, NE 10th to 72nd Avenues	**E**	D	C/D	C/D	D	**E**
179th Street, I-5 to 72nd Ave.	**E**	D	C/D	C/D	C/D	D/**E**
Burton Road, Andresen to 86th Avenue	**F**	**E**	D/**E**	D/**E**	D/**E**	D/**E**
Andresen/Padden/88th Street vicinity	**F**	**E**	**E**	**E**	**E/F**	**F**
137th Ave., 28th to SR-500	**E/F**	D/**E**	D	D/**E**	D	D/**E**

Source: Transportation Resource Document, Parsons Brinckerhoff, July 2002.

3. Impacts to Roads and Highways

The 2023 MTP network was used as the base network for travel demand model runs of the land use alternatives. All alternatives show sizeable levels of congested lane miles of roadway, where congested is defined as a modeled volume-to-capacity ratio of 0.91 or higher, which is roughly LOS E and F. The congested facilities (LOS E/F) by alternative are shown in Figures 35 through 39.

Sections of I-5 south of 134th Street under all alternatives are forecast to be at LOS E/F conditions even with the widening to six lanes included in the MTP. The Leadership Committee of the Trade and Transportation Partnership Study has agreed not to widen I-5 beyond the six lanes in the MTP. The EIS for this study will begin in late 2003, and will include a variety of widening and light rail alternatives. At this time, there are no eight-lane I-5 alternatives for the section of I-5 from 134th Street to approximately Mill Plain Boulevard, although the section leading to the Columbia River crossing has a variety of lane configurations that in essence could serve as eight through-lanes of traffic across the Columbia River. Thus, while the modeling shows a need for eight lanes on I-5, this could be inconsistent with bi-state recommendations that have resulted from previous work on the I-5 Transportation and Trade Partnership Study.

I-205 between 83rd Street/Padden Parkway and the Columbia River crossing is under consideration for reconfiguration to improve long-term traffic operations. This includes a new split-diamond interchange with 18th Street and Burton Road, and a collector-distributor system in concert with the SR-500 interchange.

Modeling shows that for the most part these improvements would serve long-term traffic growth, with the exception of Alternative 1. Modeling also shows that the Glenn Jackson Bridge would be operating at LOS F under most of the alternatives.

For SR-503 between SR-500 in Vancouver and SR-502 in Battle Ground, all alternatives indicate that most of this corridor would be at LOS E/F conditions, demonstrating a need for six lanes to maintain LOS D along the corridor. Much of this is related to the growth in and expansion of the Battle Ground UGA that is occurring south and west of the current city limits. This growth and expansion uses SR-503 as its spine. Widening to six lanes likely carries with it impacts on adjacent residents, businesses, and two schools along with potential wetlands impacts near Salmon Creek and Meadowglade.

SR-14 is showing a deficiency between I-205 and SE 164th Avenue in all alternatives. This is primarily due to bottlenecks in both directions between the 164th Avenue and I-205 ramps. Providing an auxiliary lane in each direction should alleviate this deficiency.

LOS E and F results may have major impacts on concurrency, regional planning, or planning for Highways of Statewide Significance under HB 1487. Revenue forecasts were not available for this draft of the impact analysis. For any of the land use alternatives, with current revenue structure, it is likely improvement needs would exceed available revenue over the twenty-year horizon of the comprehensive plan. Thus, policy decisions would need to be made to mitigate those impacts. Policy options are discussed under mitigation.

a. Alternative 1

This alternative has the highest amount of congestion, delay, and LOS E/F lane miles of any alternative. Almost all freeway, expressway, and major arterial corridors in the southern half of the county would be congested during peak hours. This alternative has the highest number of Columbia River Bridge crossings and the highest percentage of all trips traveling from Clark County to Portland of all of the alternatives. With the number of bridge crossings projected, and with the modeled network not assuming replacement of the I-5 Bridge, the result would be substantial traffic queues approaching each Columbia River bridge as well as extending the length of the peak period for both morning and evening.

I-5 and I-205 would both be operating at LOS F conditions. Because of the impacts on the freeway mainlines, it is expected that in the a.m. peak travel time in Clark County, ramps leading to the I-5 and I-205 facilities would queue and would spill back onto the intersecting arterials, impacting traffic operations on those facilities.

For arterials in the county, major routes connecting the Vancouver UGA to other outlying UGAs would all be congested. Specifically, these include I-5 north of Vancouver up to Ridgefield, SR-503 between Vancouver and Battle Ground as well as 219th Street/SR-502 between I-5 and Battle Ground, SR-501 between I-5 and Ridgefield, and La Center Road between I-5 and La Center.

This congestion would affect mobility between major destinations and the Focused Public Investment Areas (FPIAs). It would also affect traffic circulation within the urban areas and FPIAs. With the forecast level of congestion, it is likely that there would be increased potential for cut-through traffic using neighborhood streets to avoid congestion on the major corridors, intersections, and interchanges. Areas where neighborhood traffic diversion could be expected include:

- neighborhoods along Mill Plain Boulevard, 18th Street and Burton Road east and west of I-205
- streets paralleling I-5
- central Battle Ground
- neighborhood streets near 162nd/164th Avenue, 137th/138th Avenue, and 112th Avenue in Vancouver
- neighborhood streets west of I-5 between 78th and 99th Streets in west Hazel Dell/Lakeshore areas

b. Alternative 2

This alternative has the highest average trip length for both work and non-work trips of any of the alternatives. Major north-south corridors which are congested (LOS E/F) include I-5, I-205, 72nd Avenue, SR-503, 162nd Avenue, and portions of Ward Road/182nd Avenue. Other than Alternative 1, this scenario has the highest number of congested lane miles.

I-5 and I-205 would both be operating at or near LOS F conditions. Because of the impacts on the freeway mainlines, it is expected that in the a.m. peak in Clark County, ramps leading to the I-5 and I-205 facilities would queue and would spill back onto the intersecting arterials, impacting traffic operations on those facilities. These queues are not expected to be as significant as for Alternative 1.

For arterials in the county, major routes connecting the Vancouver UGA to other outlying UGAs would all be congested. Specifically, these include I-5 north of Vancouver up to 99th Street, SR-503 between Vancouver and Battle Ground as well as portions of 219th Street/SR-502 between I-5 and Battle Ground, SR-501 between I-5 and Ridgefield, and La Center Road between I-5 and La Center.

This congestion would affect mobility between major destinations and the FPIAs and traffic circulation within the urban areas and FPIAs. Congestion on the major corridors, intersections, and interchanges could greatly increase the potential for traffic to use neighborhood streets to avoid congestion, although less so compared to Alternative 1. Areas where neighborhood traffic diversion could be expected include:

- neighborhoods along Mill Plain Boulevard, 18th Street and Burton Road east and west of I-205
- streets paralleling I-5 south of 99th Street
- central Battle Ground
- neighborhood streets adjacent to 162nd/164th Avenue and 137th/138th Avenue in Vancouver

c. Alternative 3

Major congested north-south corridors include I-5, I-205, 72nd Avenue, SR-503, 162nd Avenue, and portions of Ward Road/182nd Avenue, although less so than the other alternatives. This scenario has the lowest number of congested lane miles of any of the alternatives.

I-5 would be operating at LOS E/F conditions south of 99th Street, but unlike other alternatives I-205 would not be at LOS E/F.

Routes connecting the Vancouver UGA to outlying UGAs would experience some congestion, but not as much as under other alternatives. Congested routes include I-5 north of Vancouver up to 99th Street, SR-503 between Vancouver and Brush Prairie (but unlike other alternatives not north of Brush Prairie), SR-501 between I-5 and Ridgefield, and La Center Road between I-5 and La Center.

Mobility for this alternative overall is better than for Alternative 1 and similar to other alternatives. It would not affect traffic circulation within the urban areas and FPIAs as greatly as the other alternatives. Areas where neighborhood traffic diversion could be expected include:

- neighborhoods along Mill Plain Boulevard, 18th Street and Burton Road both east and west of I-205
- streets paralleling I-5 south of 99th Street
- central Battle Ground
- neighborhood streets adjacent to 162nd/164th Avenue in Vancouver

d. Alternative 3a

The outputs from the transportation modeling of 3a (which includes a HCT component) are not readily comparable with the other alternatives and should not be the basis of any decision making regarding HCT. Even compared to the same alternative (3 without HCT) the results show increased congestion levels in some road segments with the introduction of HCT. This is because thousands of additional jobs and households were introduced to represent high activity centers along the transit route. The increased trips generated by these uses (despite a high level of transit usage) still result in increased congestion. For comparison purposes, the total households and jobs would need to be held constant when considering HCT.

The impacts under this alternative are essentially the same as Alternative 3. Major north-south corridors which are congested (LOS E/F) include I-5, I-205, 72nd Avenue, SR-503, 162nd Avenue, and portions of Ward Road/182nd Avenue, although less so than the other alternatives. I-5 would be operating at LOS E/F conditions south of 99th Street. Because of the higher number of trips compared to Alternative 3 and increased employment outside of the Vancouver UGA, this alternative results in increased congestion on I-5 south of 134th Street and between 219th Street and Ridgefield. Unlike other alternatives, I-205 would not be at LOS E/F.

The 162nd Avenue corridor experiences some reduced congestion compared to Alternative 3. This alternative appears to redirect work trips to the LRT loop or I-205 while 162nd Avenue is used less. Similarly, Ward Road/182nd Avenue also experiences some reduction in congestion.

Routes connecting the Vancouver UGA to outlying UGAs would experience some congestion, but not as much as other alternatives. Congested routes include I-5 north of Vancouver up to 99th Street, SR-503 between Vancouver and Brush Prairie (but not north of Brush Prairie, unlike other alternatives), SR-501 between I-5 and Ridgefield, and La Center Road between I-5 and La Center.

Mobility overall is better than under Alternative 1 and similar to other alternatives, except along the state highway corridors, which generally experience a higher level of congestion than in Alternatives 3, 4, and 5. Traffic circulation within the urban areas and FPIAs would not be affected as greatly. Areas where neighborhood traffic diversion could be expected include:

- neighborhoods along Mill Plain Boulevard, 18th Street and Burton Road east and west of I-205
- streets paralleling I-5 south of 99th Street
- central Battle Ground
- neighborhood streets adjacent to 162nd/164th Avenue in Vancouver
- LRT loop station areas without appropriate traffic and pedestrian circulation access

e. Alternative 4

Under this alternative, the higher employment levels serve to balance peak traffic flows on I-5, I-205, and other major facilities. However, in some instances on major arterials such as Mill Plain Boulevard and SR-503, this balance of traffic flow when combined with closely spaced traffic signals reduces the ability to coordinate peak traffic flows between signals. It is difficult to coordinate traffic flows in both directions when signals are closely spaced.

This alternative reduces the number of cross-river person and vehicle trips by attracting work trips to Clark County. It has the lowest number of vehicle bridge crossings over the Columbia River of any of the alternatives. Consequently, this serves to improve traffic operations on I-5 and I-205 from mid-county, across the Columbia River, and into Portland by redirecting work trips to other Clark County destinations, compared to Alternatives 1 through 3. However, these results assume that the jobs, in ambitious numbers, truly manifest themselves on the designated lands.

Mobility for this alternative overall is better than for Alternative 1 and similar to other alternatives. It would not affect traffic circulation within the urban areas and FPIAs as greatly as the other alternatives. Areas where neighborhood traffic diversion could be expected include:

- neighborhoods along Mill Plain Boulevard, 18th Street and Burton Road both east and west of I-205
- streets paralleling I-5 south of 99th Street
- central Battle Ground
- neighborhood streets adjacent to 162nd/164th Avenue in Vancouver

f. Alternative 5

Under this alternative, the higher employment levels would serve to balance peak traffic flows on I-5, I-205, and other major facilities. As under Alternative 4, in some instances on major arterials such as Mill Plain Boulevard and SR-503, this balance of flow when combined with closely spaced traffic signals would reduce the ability to coordinate peak traffic flows between signals.

This alternative reduces the number of cross-river person and vehicle trips by attracting work trips to Clark County. The number of vehicles crossing the Columbia River Bridge is low, similar to Alternative 4. Consequently, this serves to improve traffic operations on I-5 and I-205 from mid-county across the Columbia River and into Portland by redirecting work trips to other Clark County destinations, compared to Alternatives 1 through 3.

Mobility for this alternative appears to be better overall than for Alternative 1 and similar to other alternatives. It would not affect traffic circulation within the urban areas and FPIAs as greatly as the other alternatives. Areas where neighborhood traffic diversion could be expected include:

- neighborhoods along Mill Plain Boulevard, 18th Street and Burton Road both east and west of I-205
- streets paralleling I-5 south of 99th Street
- central Battle Ground
- neighborhood streets adjacent to 162nd/164th Avenue in Vancouver

The I-5 corridor and interchanges between 219th Street and La Center would experience high levels of congestion, especially at the Ridgefield interchange. The Discovery Corridor is an employment center straddling I-5. The interchanges and I-5 provide the primary access to these centers and there is no parallel arterial route structure to I-5 in the Discovery Corridor. Thus, I-5 in this alternative serves as an "arterial" for the Discovery Corridor, which may be inconsistent with its interstate function as well as its

International Trade Corridor status. In order to maintain I-5 capacity for interstate functions, an alternative arterial system would be needed in the Discovery Corridor FPIA.

4. Impacts to Public Transportation

No HCT facilities were included in the transportation network other than the extension of the current southbound I-5 HOV lane between 134th Street and Mill Plain Boulevard and the inclusion of LRT in Alternative 3a. For the most part, C-TRAN buses would travel in mixed traffic on surface streets and freeways.

a. Alternative 1

C-TRAN buses would experience high congestion levels, even on I-5 (except for the HOV corridor). C-TRAN service corridors would expect substantial delays and, therefore, increased costs to provide levels-of-service reflecting current conditions. These corridors include:

- I-5 between 219th Street and the Interstate Bridge and downtown Portland, except on the HOV corridor from 134th Street to Mill Plain Boulevard and through Delta Park (although it is expected that buses would experience substantial delays trying to enter I-5 southbound and further delays trying to weave across the I-5 general purpose lanes to use the HOV lane)
- I-205 between 18th Street and the Glenn Jackson Bridge
- Lakeshore/Fruit Valley Road between Felida and downtown Vancouver
- Burton Road and Mill Plain Boulevard routes between downtown Vancouver and the Fisher's Landing Transit Center
- Routes connecting Battle Ground, La Center, and Ridgefield to Salmon Creek Transit Center and downtown Vancouver
- Andresen Road between Vancouver Mall and Hazel Dell
- Highway 99 between Salmon Creek Transit Center and downtown Vancouver
- Routes from the Vancouver Mall connecting to downtown Vancouver and Fisher's Landing Transit Center

Alternative 1 includes large expansions to existing UGA boundaries. Most of the land in these expanded areas would be allocated for additional moderate to low-density housing. Providing transit service to these areas would be difficult. C-TRAN would need to expand service hours and route miles, both of which have financial impacts on its operations and maintenance budget. Increased ridership might gained be through provision of additional park-and-ride facilities to capture commuter work trips on I-5, I-205, and the other regional facilities. Development of park-and-ride facilities would require significant capital expenditures and increased operating expenditures to provide new service routes to the facilities. Additionally, significant delay on I-5 and I-205 may serve to inhibit transit ridership.

b. Alternative 2

C-TRAN buses would experience high congestion levels, even on I-5 (except for the HOV corridor), although not to the extent of Alternative 1. C-TRAN service corridors would expect substantial delays and, therefore, increased costs to provide levels-of-service reflecting current conditions. Similar to Alternative 1, these corridors include:

- I-5 between 99th Street and the Interstate Bridge and downtown Portland, except on the HOV corridor from 134th Street to Mill Plain Boulevard and through Delta Park (although it is expected that buses would experience substantial delays trying to enter I-5 southbound and further delays trying to weave across the I-5 general purpose lanes to use the HOV lane)
- I-205 between 18th Street and the Glenn Jackson Bridge
- Lakeshore/Fruit Valley Road between Felida and downtown Vancouver

- Burton Road and Mill Plain Boulevard routes between downtown Vancouver and the Fisher's Landing Transit Center
- Routes connecting Battle Ground to Salmon Creek Transit Center and downtown Vancouver
- Highway 99 between Salmon Creek Transit Center and downtown Vancouver

Alternative 2 includes expansions to the Vancouver and Battle Ground Urban Growth Area boundaries. Much of the land in these expanded areas would be allocated for additional moderate to low-density housing. Providing transit service to these areas would be difficult. C-TRAN would need to expand service hours and route miles, both of which have financial impacts on its operations and maintenance budget. C-TRAN would also need to expand its park-and-ride facilities to capture commuter work trips on the region's major facilities.

c. Alternative 3

C-TRAN buses would experience some congestion levels, but not as severe as the other land use alternatives. C-TRAN service corridors expecting substantial delays include:

- I-5 between 99th Street and the Interstate Bridge and downtown Portland, except on the HOV corridor from 134th Street to Mill Plain Boulevard and through Delta Park (although it is expected that buses would experience substantial delays trying to enter I-5 southbound and further delays trying to weave across the I-5 general purpose lanes to use the HOV lane)
- Lakeshore/Fruit Valley Road between Felida and downtown Vancouver
- Burton Road and Mill Plain Boulevard routes between downtown Vancouver and the Fisher's Landing Transit Center
- Some delays on routes connecting Battle Ground to Salmon Creek Transit Center and downtown Vancouver but less so than the other alternatives

Alternative 3 does not include any expansions to the existing Urban Growth Area (UGA) boundaries. Future growth would occur inside existing UGAs. With greater housing and employment densities, demand for transit service would likely increase. C-TRAN would need to expand service hours which would have financial impacts on its operations and maintenance budget. Service miles may also need to be increased as the UGA develops. Bicycle/pedestrian improvements in FPIA would encourage access to and use of public transportation.

d. Alternative 3a

The transit network for this alternative is much different than the other alternatives since it includes a light rail loop. C-TRAN's route structure is modified to provide a feeder bus service to and from the LRT loop. The southbound HOV lane on I-5 is retained between 134th Street and Mill Plain Boulevard, and the C-TRAN commuter routes are retained.

It is somewhat difficult to directly compare the LRT/transit impacts of this alternative to Alternative 3 because the control totals are different. This alternative has 13,000 more households than Alternative 3. While households were placed in the LRT loop corridor, employment was not since there is little or no additional room to place employment centers directly along the LRT loop under current zoning.

This alternative does result in a substantially higher transit mode share than any other alternative: 1.8 percent of all trips compared to 1.3 percent as a maximum for the other alternatives. The land use control totals vary significantly among the identified alternatives. To ensure a fair comparison among alternatives, transit mode share is shown as a percentage of total trips.

However, because of the higher number of overall households and the higher number of trips produced within Clark County compared to Alternative 3, some roadway corridors (noted above) experience higher levels of congestion than in Alternative 3. While more work trips are on transit, additional employees are driving, and would impact the I-5 and SR-500 corridors, as noted in Table 51.

While the LRT loop increases accessibility to and from Portland, the reorientation of the C-TRAN bus system results in lower accessibility to suburban employment centers which do not have direct access to the LRT loop.

C-TRAN service corridors would expect substantial delays and, therefore, increased costs to provide levels-of-service reflecting current conditions. These corridors include:

- I-5 between 99th Street and the Interstate Bridge and downtown Portland, except on the HOV corridor from 134th Street to Mill Plain Boulevard and through Delta Park (although it is expected that buses would experience substantial delays trying to enter I-5 southbound and further delays trying to weave across the I-5 general purpose lanes to use the HOV lane). This would be offset by the increased mobility for trips from central Vancouver to Portland via the LRT line
- Lakeshore/Fruit Valley Road between Felida and downtown Vancouver
- Burton Road and Mill Plain Boulevard routes between downtown Vancouver and the Fisher's Landing Transit Center
- Some delays on routes connecting Battle Ground to Salmon Creek Transit Center and downtown Vancouver but less so than the other alternatives

Bicycle/pedestrian improvements in FPIA and LRT station areas would encourage access to and use of public transportation.

e. Alternative 4

C-TRAN buses would experience some congestion, but not as severe as under the other alternatives. This alternative has a higher level of outlying employment growth than in other alternatives. Employment centers are located in suburban locations with little or no transit service and little or no transit accessibility. This alternative has the lowest transit mode share of any of the alternatives.

To provide service to these locations, C-TRAN would need to expand service hours and route miles, both of which have financial impacts on its operations and maintenance budget. A potential beneficial impact could be increased opportunities for C-TRAN to raise overall ridership, if the FPIAs could focus on improving sidewalk and bicycle paths accessing transit routes instead of road improvements.

In the Discovery Corridor and Ridgefield Junction FPIAs, transit ridership may be gained by implementing development standards for transit-oriented development, in order to provide transit service to these outlying employment centers.

f. Alternative 5

C-TRAN would experience some congestion, but not as severe as under the other alternatives. This alternative contains a higher level of outlying employment growth than in other alternatives (except for Alternative 4). Employment centers are located in suburban locations with little or no transit service and little or no transit accessibility. This alternative and Alternative 4 have the lowest transit mode share of any of the alternatives.

To provide service to these locations, C-TRAN would need to expand service hours and route miles, both of which have financial impacts on its operations and maintenance budget. A potential beneficial impact could be increased opportunities for C-TRAN to raise overall ridership, if the FPIAs could focus on improving sidewalk and bicycle paths accessing transit routes instead of road improvements.

5. Impacts to the Pedestrian/Cycling Network

a. Alternative 1

Congestion on the major corridors could serve to encourage pedestrian and bicycle trips for shorter non-work trips and bicycle trips for work trips, if pedestrian and bicycle facilities were built on the major corridors. However, it is unlikely that a substantial increase in bicycle and pedestrian travel would occur. The expansion of the UGAs increases trip lengths and distances between trip origins and destinations and many of the major corridors are rural facilities with no dedicated pedestrian or bicycle facilities.

b. Alternatives 2, 3, 3a, 4, and 5

Impacts are the same under these alternatives. Congestion on the major corridors could serve to encourage pedestrian and bicycle trips for shorter non-work trips and bicycle trips for work trips, if pedestrian and bicycle facilities were provided. The outlying employment centers in Alternatives 4 and 5, without a focus on regional bicycle facilities connecting the Vancouver and Battle Ground UGAs to other FPIAs and urban areas, may serve to discourage longer-distance bicycle commute trips.

Listed below are locations of identified bicycle system deficiencies within each FPIA. The listed deficiencies are either “caution” areas or “failed” areas. It is recommended that cyclists use caution while riding on “Caution” corridors. Areas considered “Failed” are not recommended as bike routes. Extreme caution should be used while riding through these areas.

Ridgefield Junction: NE 10th Avenue

Discovery Corridor: NE 179th Street

St. John’s: NE 72nd Avenue

117th: NE 94th Avenue

Vancouver Mall: NE Andresen Road and NE Thurston Way

Each FPIA also includes many facilities considered to have low bike levels of service. These facilities are not recommended for bike riders of low and average riding skill.

Alternatives that increase traffic on these corridors will only exacerbate these problems. Bicycle and pedestrian facilities should be provided as these facilities are upgraded or expanded. Development of multi-use trails should also be considered where appropriate.

6. Impacts to the Freight System

a. Alternative 1

Freight mobility would be substantially impacted. Major freight corridors experiencing substantial delays are:

- I-5 between Ridgefield and the Interstate Bridge
- I-205 between I-5 and the Glenn Jackson Bridge

- Mill Plain/SR-501 into the Port of Vancouver
- SR-501/Pioneer at the I-5 interchange area
- Battle Ground: SR-502 out to I-5, 72nd Avenue south to Vancouver, and SR-503 south to Vancouver
- 162nd Avenue between SR-500 and SR-14
- Lakeshore/Fruit Valley Road between 99th Street and the Port of Vancouver

b. Alternative 2

Only Alternative 1 has more impact than this alternative on freight mobility. Major freight corridors experiencing substantial delays are:

- I-5 between 99th Street and the Interstate Bridge
- I-205 between SR-500 and the Glenn Jackson Bridge
- SR-501/Pioneer at the I-5 interchange area
- Battle Ground: portions of SR-502 out to I-5, 72nd Avenue south to Vancouver, and SR-503 south to Vancouver
- 162nd Avenue between SR-500 and SR-14
- Portions of Lakeshore/Fruit Valley Road between 99th Street and the Port of Vancouver

c. Alternative 3

Alternative 3 would impact freight mobility the least of all alternatives. Major freight corridors experiencing substantial delays are:

- I-5 between 99th Street and the Interstate Bridge
- SR-501/Pioneer at the I-5 interchange area
- Battle Ground: portions of 72nd Avenue south to Vancouver, and portions of SR-503 south to Vancouver
- 162nd Avenue between SR-500 and SR-14
- Portions of Lakeshore/Fruit Valley Road between 99th Street and the Port of Vancouver

d. Alternative 3a

Alternative 3a would have more impacts to freight mobility than Alternative 3. Major freight corridors experiencing substantial delays are:

- I-5 between the Interstate Bridge and 134th Street
- SR-501/Pioneer at the I-5 interchange area
- 162nd Avenue between SR-14 and Mill Plain Boulevard
- Portions of Lakeshore/Fruit Valley Road between 99th Street and the Port of Vancouver
- Battle Ground: portions of 72nd Avenue south to Vancouver, and portions of SR-503 south to Vancouver

e. Alternative 4

Alternative 4 would have more impacts to freight mobility than Alternatives 3 and 3a. Major freight corridors experiencing substantial delays are:

- I-5 between the Interstate Bridge and 134th Street
- I-5 between 219th and Ridgefield
- Battle Ground: portions of 72nd Avenue south to Vancouver, and portions of SR-503 south to Vancouver
- 162nd Avenue between SR-500 and SR-14
- Portions of Lakeshore/Fruit Valley Road between 99th Street and the Port of Vancouver

f. Alternative 5

Alternative 5 would have more impacts to freight mobility than Alternatives 3, 3a, and 4. Major freight corridors experiencing substantial delays are:

- I-5 between the Interstate Bridge and 134th Street
- I-205 between SR-500 and the Glenn Jackson Bridge
- Battle Ground: portions of 72nd Avenue south to Vancouver, and portions of SR-503 south to Vancouver
- 162nd Avenue between SR-500 and SR-14
- Portions of Lakeshore/Fruit Valley Road between 99th Street and the Port of Vancouver

7. Impacts to the School Transportation System

a. Alternative 1

Congestion on the major arterial roadways from this alternative would likely have adverse impacts on school bus operations. Peak morning congestion would increase travel time for school buses, which in turn reduces the length of routes that school buses can have and still run on time (high schools and middle schools). Because elementary schools tend to convene at a later time, the increased peak period congestion would be unlikely to have a significant impact on school bus transportation.

Conversely, in the p.m. peak, all school types dismiss prior to the start of the peak, which limits the impact of congestion on school bus operations.

School buses often serve high schools first, then middle schools, and then elementary schools. Since schools tend to use the buses for multiple trips, the number of buses and routes needed somewhat depends on the traffic levels during the high school and middle school morning pickups. Consequently, increased morning peak congestion on many of the major arterial routes under Alternative 1 is expected to negatively impact school bus operations by requiring a greater number of buses.

b. Alternatives 2, 3, 3a, 4, and 5

Congestion on the major arterial roadways from these alternatives would likely have adverse impacts on school bus operations. Congestion during peak morning hours would increase travel time for school buses, which in turn reduces the length of routes that school buses can have and still run on time (high schools and middle schools). Because elementary schools tend to convene at a later time, the increased peak period congestion would be unlikely to have a significant impact on school bus transportation.

Conversely, in the p.m. peak, all school types dismiss prior to the start of the p.m. peak, which limits the impact of congestion on school bus operations.

Consequently, increased morning peak congestion on many of the major arterial routes under these alternatives is expected to negatively impact school bus operations by requiring a greater number of buses.

8. Emergency Services

Figures 41 and 42 show the 5-minute minute emergency response time coverage areas under Alternative 1 and the other alternatives. (The response coverage areas for Alternatives 2, 3, 3a, 4, and 5 are very similar and, therefore, were combined in a single map.)

Emergency response coverage areas were calculated by examining average corridor travel speeds and the available roadway network. Average corridor travel speeds are lowest under Alternative 1. As a result, Alternative 1 would be expected to have the largest gaps showing no coverage. In general, the emergency response areas under Alternative 1 include good coverage in most areas currently inside UGA boundaries and those areas that already contain some urban development. Major gaps are located in areas not currently in UGAs and those areas within UGAs that are not currently developed. Under Alternative 1, coverage gaps are located in the northern and southern sections of the Ridgefield Junction area, the NE corner of the Discovery Corridor area, a large portion of the WSU area, the southern half of the Battle Ground area, a large section of the 117th area, the western section of the Port of Vancouver area, and the northern tip of the Fisher Swale area.

Future roadway development or enhancement in the gap areas may increase the coverage areas under Alternative 1. It is likely however that new fire stations will be required in the Ridgefield Junction area, the area south of Battle Ground, the WSU area, the western section of Port of Vancouver area, and the 117th area.

The emergency response areas under Alternatives 2-5 include much better coverage in most areas currently inside UGA boundaries and those areas that already contain some urban development. Gaps are again located in areas not currently in UGAs and those areas within UGAs that are not currently developed. Under Alternatives 2-5, coverage gaps are located in the far southern section of the Ridgefield Junction area, the center of the WSU area, the southern third of the Battle Ground area, the NE corner of the 117th area, the western section of the Port of Vancouver area, and the northern tip of the Fisher Swale area.

Future roadway development or enhancement in the gap areas may increase the coverage areas under Alternatives 2-5. It is likely however that new fire stations will be required in the area south of Battle Ground, the WSU area, the 117th area, and the western section of the Port of Vancouver area.

Consideration should be given to preparing fire district capital improvement plans based on these worst-case situations (peak hour or peak period response coverage areas). Planners and traffic engineers often employ similar methodologies for developing capital improvement programs.

9. Safety

There are several high accident corridors and locations currently identified within Clark County (identified by WSDOT, Clark County, and the City of Vancouver). These include:

- I-5 from 134th Street to 179th Street
- SR-500 from I-5 to SR-503

- SR-502 from I-5 to Battle Ground
- I-205 at Mill Plain/Chkalov
- NE 78th Street at Highway 99
- NE 182nd Avenue from NE 119th Street to NE 159th Street
- SR-14 from SE 192nd Avenue to Washougal
- NE 72nd Avenue from 119th Street to 219th Street
- NE 99th Street at 130th Avenue
- NE 78th Street at NE 5th Avenue
- Thurston Way at Parkway Drive
- Thurston Way/82nd Avenue at Vancouver Mall Drive
- NE 49th Street at 122nd Avenue
- Fourth Plain at F Street
- Columbia Street at W 13th Street

Alternatives which add significant traffic levels at these locations will likely serve to exacerbate the high accident problem unless mitigation measures are undertaken.

10. Impacts on Focused Public Investment Areas (FPIAs)

The intent of the FPIA approach is to be able to focus public infrastructure investments in a concentrated area for increased efficiency. For transportation, this could include a mix of roadway improvements, park-and-rides, bikeways and walkways, traffic calming, and safety improvements. Where congestion occurs within or adjacent to FPIAs, transportation funds can be focused on fixing those transportation problems. Conversely, where traffic congestion occurs outside of the identified FPIAs, improvements to these facilities would reduce the amount of funding available to make investments in the FPIAs. The following is a discussion by alternative of the impact of land use alternatives on transportation investments within the FPIAs.

a. Alternative 1

Substantial arterial traffic congestion occurs on most of the major corridors countywide. Relieving traffic congestion would require a sizeable investment in corridors connecting urban areas together (rural collectors) as well as within urban growth areas. The vast expansion of the UGAs outside of FPIAs, combined with the need to improve rural corridors, would severely limit the ability to focus public transportation funds on the FPIAs.

Specific transportation impacts related to the various Focused Public Investment Areas is summarized below. Included are potential publicly-funded transportation strategies to mitigate impacts and support each FPIA.

117th Avenue: Alternatives 1 and 5, which expand the Vancouver UGA to encompass this entire FPIA, would require additional roadways for access and circulation. Since SR-503 serves as the spine for this FPIA, it is affected as much by what occurs within the 117th Avenue FPIA as what occurs in other areas, such as in Battle Ground and Burnt Bridge Creek FPIAs. High levels of traffic congestion on SR-503 would make this FPIA more attractive for shorter trips and for work trips from the Vancouver UGA.

It is critical that new development along SR-503 has no or limited access directly onto SR-503, in order to protect the integrity of that corridor. A future, planned interchange at SR-503 and the Padden Parkway on the south side of this FPIA would require adequate setbacks and no access to SR-503 to accommodate this interchange, which would become a significant transportation node in the future. Land uses along SR-

503 should be developed so as to be walkable from C-TRAN service between Battle Ground, Vancouver Mall, and downtown Vancouver on SR-503. SR-503 will likely need to be widened to six lanes from NE 119th Street to SR-500/Fourth Plain, or the LOS standard for that facility reduced, to enable economic development within this FPIA.

164th Avenue: Much of this FPIA depends on the reclamation and redevelopment of Section 30. The 164th Avenue and Mill Plain concurrency corridors serve this FPIA, and both are showing LOS deficiencies by 2023. Land uses which serve to contain trips within this FPIA, or which send trips in the non-peak direction, can be accommodated, whereas adding more residential development, which adds trips to the peak direction, will contribute to the concurrency failure and cannot be accommodated without:

- Mixed use development within Section 30 to minimize trip length and to foster walking and bicycling modes
- A change in the LOS standard for both 164th Avenue and Mill Plain Boulevard
- Additional improvements to 164th Avenue and Mill Plain Boulevard, both of which will carry with them significant impacts to adjacent businesses and residences

A local street circulation system within the reclaimed Section 30 will be necessary.

Extension of transit service into this FPIA may be financially difficult. The lack of residential density, combined with current physical barriers between land uses, does not lend itself well to encouraging transit mode split. Impacts on the surrounding roadway system may be better mitigated by requiring or encouraging employer TDM programs, as well as retrofitting existing land uses to provide pedestrian and bicycle connections between land uses. Additionally, master planning of Section 30 should examine land use patterns which serve to contain trips, reduce trip length, and are amenable to walking or bicycling, or have services which support industrial and office employment on the site, such as retail stores and restaurants.

Battle Ground: This FPIA could result in a significant expansion of the Battle Ground UGA. The extent of new growth and the size of this FPIA carries with it potentially significant adverse traffic impacts to SR-503, SR-502, NE 72nd Avenue, and Ward Road/NE 182nd Avenue. Additionally, depending on land use alternative, a significant expansion of the local street and collector network will be necessary to serve this FPIA, including NE 239th Street (extended from NE 10th Avenue at Carty Road to Battle Ground) and NE 92nd Avenue. Areas which could experience significant traffic congestion include downtown Battle Ground, the SR-503 corridor between NE 199th Street and SR-502, and SR-502/Main Street from NE 112th Avenue to downtown Battle Ground.

Burnt Bridge Creek: Development of the Burnt Bridge Creek FPIA will require construction of a circulation collector and industrial roadway system, including NE 147th Avenue from Ward to NE 137th Avenue and NE 62nd/65th Street from NE 147th Avenue to NE 162nd Avenue. Some of the land use alternatives expand the UGA east of NE 162nd Avenue; a circulation system with a connection to 162nd Avenue as well as to SR-500/Fourth Plain should be provided for land access and local traffic circulation.

Intense industrial and commercial development in this FPIA will likely have impacts on Ward Road, NE 137th Avenue, Fourth Plain/SR-500, and NE 162nd Avenue.

Since this FPIA is near the fringe of the Vancouver UGA, it is unlikely that a high level of transit service could be provided to serve the FPIA and even with service it is unlikely that a significant number of trips would shift to transit. The western portion of this FPIA is near the proposed LRT loop contained in

Alternative 3A; a circulator shuttle service accessing LRT may increase transit trips compared to other land use alternatives.

Columbia Shores: This FPIA is considerably "land locked" from the surrounding transportation system, with one primary roadway into it. Transit service has been provided into this area in the past, but with the lack of density, the types of industrial and office uses, and the "dead-end" nature of the roadway system, transit ridership was minimal.

Isolation of this area from the surrounding system could be relieved by providing an eastern exit, somewhere near the interchange of SR-14 and Evergreen Boulevard/Riverside Drive.

Traffic impacts could be mitigated by providing employer-based programs for job sites and allowing for retail and restaurant establishments to reduce vehicular trip demand and trip length.

Columbia Tech Center: This FPIA assumes that the gravel pit area is reclaimed and redeveloped. The eastern portion has access to NE 192nd Avenue, which would be more attractive to trips to and from SR-14 if it were protected as a four-lane parkway, rather than allowing direct access from adjacent development. A circulation plan should be developed for land uses not already covered within the CTC Master Plan. The circulation system should be coordinated with the Section 30 redevelopment.

Discovery Corridor: Land use alternatives include industrial and office development along I-5 between NE 134th Street and the planned NE 219th Street interchange, with possible extension north along I-5 to include the Ridgefield Junction and La Center Junction areas. The planned land uses cause I-5 to take on a "pseudo arterial" function to serve the Discovery Corridor, which is inconsistent with its Interstate function. Urban and dense industrial development will contribute to increases in congestion along I-5 as well as at the NE 134th Street, 179th Street, 219th Street, and Ridgefield interchanges.

Therefore, it is recommended that transportation investments in this FPIA (as well as in the Ridgefield Junction FPIA) provide for alternative north-south arterial corridors, including a frontage road system adjacent to I-5 to provide local land access.

The Discovery Corridor concept may also lend itself to an extension of light rail service north along I-5, if development plans are built with walk and bike accessibility to LRT. The Discovery Corridor presents a unique opportunity for two-directional ridership similar to the Westside Light Rail line between Portland and Hillsboro. Ridership could come from Ridgefield residents commuting south, as well as workers in the corridor commuting northward from homes to the south. A transit oriented master plan for this FPIA should be developed prior to implementing the zoning plan.

Downtown Vancouver: Investments in this FPIA should be coordinated with the Port of Vancouver FPIA as well as the Columbia Shores and Fruit Valley FPIAs. Vancouver's Downtown Transportation System Plan should be revisited if the preferred land use alternative is significantly different than what was considered for the Downtown TSP. Densities in this FPIA lend themselves to a high level of transit service and ridership potential. Planning for the LRT extension into Vancouver and the LRT loop in Alternative 3A would increase accessibility of this FPIA.

Evergreen Airpark/Cascade Park: In the event that Evergreen Airpark closes, a local circulation and collector system should be planned and established to serve redevelopment. Additionally, east-west circulation via 4th Street and 9th Street across NE 136th Avenue would relieve high congestion levels on Mill Plain Boulevard and NE 18th Street; however, this would also result in a high potential for through traffic through residential neighborhoods on both sides of 136th Avenue. Traffic calming strategies should be implemented on NE 9th Street.

Mill Plain Boulevard is projected to be at LOS F conditions, to which development in this FPIA partially contributes. To relieve this, adaptive traffic control as well as a high level of traffic signal coordination should continue to be implemented along Mill Plain. Design measures to encourage use of NE 18th Street as a Principal Arterial, and Burton Road/28th Street as a Minor Arterial, should be implemented. Access management, signal spacing of ¼ to ½ mile at a minimum, and minimizing side street connections are measures to increase the capacity of both corridors.

This area is proximate to the planned LRT loop in Alternative 3A. LRT stations planned along I-205 should provide for walk, bike, and transit accessibility to this FPIA. At issue will be whether the current location of the Evergreen Park-and-Ride is retained at NE 138th Avenue/18th Street or moved to the LRT station at I-205 and 18th Street. It is likely that the park-and-ride will move to the LRT station. In that event, the current park-and-ride parking lot could be retained as a shared parking facility for adjacent land uses that could be developed (or redeveloped).

Fisher Swale: This area relies on NE 192nd Avenue as its primary north-south arterial. Adding urban development in this FPIA is projected to increase congestion along 162nd/164th Avenue unless vehicle travel can be encouraged to use 192nd Avenue. Access to NE 192nd Avenue should be limited and little or no additional direct access from adjacent land uses should be allowed, to maintain the integrity of 192nd Avenue as a Principal Arterial Parkway and to relieve 162nd/164th Avenue. Camas and Vancouver should coordinate in establishing a north-south and east-west local and collector circulation system.

The remoteness of this area from established community centers and existing transit service makes provision of a high level of transit service unlikely. Some relief may be available through a local circulator service connecting to Fisher's Landing Transit Center and the LRT loop, as well as the Columbia Tech Center FPIA.

Fruit Valley: Intensity of development in this FPIA will adversely impact Fruit Valley Road/Lakeshore Avenue. Land west of Fruit Valley Road is not readily accessible from Fruit Valley Road, and does not have a good connection to the south (Fourth Plain Boulevard). A subarea plan for this FPIA should be developed to provide local east-west and north-south circulation. An extension of 39th Street to the west of Fruit Valley Road, connecting to 26th Avenue south to Fourth Plain (and to the Port area) would provide for arterial-level travel. A resolution to the 39th Street crossing of the Burlington Northern Santa Fe mainline which allows for 24-hour east-west travel should be implemented.

This FPIA currently experiences a high level of transit ridership, and if land uses west of Fruit Valley Road provide for good walk/bike accessibility to Fruit Valley Road, transit should continue to be a viable travel mode serving this FPIA.

La Center Junction: Alternatives 2, 4, and 5 all provide for urban-scale development in the La Center Junction FPIA. Development at the junction would likely result in redesignation of La Center Road to an urban principal arterial with widening to multiple lanes, bike lanes, and sidewalks. If the development density and site layouts are transit- and pedestrian-oriented, bicycle trips to and from the Junction from the town core would be encouraged. Additionally, C-TRAN may find that extending fixed route service to serve the Junction as well as continuing town core service may be financially viable, especially coupled with service along the I-5 north corridor serving the Discovery Corridor and Ridgefield Junction employment centers.

Port of Camas/Washougal: Development in this FPIA will likely impact SR-14 through Washougal as well as 15th Street in downtown Washougal and NW 6th Avenue in downtown Camas. A high level of truck traffic will serve uses in the Port area. The remoteness of this site from existing transit routes discourages transit service within this FPIA. Intersection improvements and possibly interchanges with SR-14 should be provided.

Port of Vancouver: Only one route (Fourth Plain/Lower River Road) serves this FPIA. It is likely that Fourth Plain Boulevard would need to be widened to four lanes to provide an adequate LOS in this corridor.

The layout of land uses and the heavy industrial nature of this area do not lend themselves to a high level of transit ridership. Employer-based programs to encourage carpooling and flexible work hours can alleviate congestion in this FPIA.

Ridgefield Junction: Transportation investments should be coordinated with the Discovery Corridor and La Center Junction FPIAs (see above). New crossings of I-5 both south and north of the Ridgefield interchange should be provided for local circulation and to alleviate congestion on SR-501/Pioneer Street at the interchange. If the county advances the frontage road concept adjacent to I-5, a major reconfiguration of the Ridgefield interchange to provide access to the frontage roads (as well as the new crossings of I-5) should be examined as part of a subarea study.

The existing Ridgefield Park-and-Ride should be retained and expanded. This will serve Ridgefield residents commuting to destinations south of Ridgefield (Vancouver and Portland) as well as north (Kelso/Longview). Additionally, it could serve as the northern terminus of a light rail extension serving the Discovery Corridor and Vancouver.

St. Johns: More intense development within this FPIA will add traffic congestion to St. Johns both north and south of 78th Street. The Padden Parkway runs through the center of the FPIA and becomes a barrier to north-south local circulation. A local circulation system, similar to that being considered by Clark County, should be adopted and implemented with development.

Vancouver Mall: This area is building out with mixed uses, including office, commercial, and multifamily residential. Publicly-funded transportation investments to accommodate increased trip making include an interconnected pedestrian and bikeway system, as well as providing access to transit. Consideration should be made to extend Vancouver Mall Drive west of Andresen Road to NE 66th Avenue to provide a circulation alternative to NE 40th Street. An interchange is being planned for NE 54th Avenue/Stapleton Road at SR-500; a local circulation and collector system between this interchange, north and east to Andresen Road within the FPIA should be planned and implemented with new development.

WSU Industrial Park: Some of the land use alternatives extend the Vancouver UGB to incorporate this FPIA. It is in an area not readily accessible by transit. Public transportation investments could include widening of NE 179th Street to four lanes, NE 29th Avenue to two lanes plus a center turn lane, and NE 50th Avenue to four lanes in the area, as well as providing for on-street bike lanes and sidewalks to connect the FPIA with the established Mount Vista, Salmon Creek, and WSU areas. The on-street facilities on NE 179th Street will allow for connections to the planned 179th Street Park-and-Ride near the Clark County Fairgrounds, as well as the Salmon Creek Transit Center. Local street circulation should be planned and implemented with new development.

11. Mitigation

Mitigation needed to achieve a system-wide LOS D for highways is listed below. The impact analysis highlights several major policy issues. Current County policy does not allow for four-lane rural major collectors (except as state highways). NE 72nd Avenue under all alternatives shows a need for four lanes between 119th Street and 219th Street/SR-502. The policy will need to be changed or the plans adjusted to reduce growth and relieve congestion on this road.

Another policy issue is whether, and/or how, to incorporate state highways into the Capital Facilities Plan and TIF project list. Although HB 1487 exempts Highways of Statewide Significance (HSS) from concurrency requirements, it requires the County, RTC, and WSDOT to jointly adopt an LOS for Highways of Regional Significance (HRS: state highways that are not HSS). HB 1487 also requires WSDOT to set a level-of-service for HSS routes. All of the land use alternatives analyzed here contribute to traffic growth and congestion on Clark County's HSS and HRS routes. It is difficult to program local funds, including traffic impact fees, for state highway projects because uncertainty over state highway funding makes the state's share of the improvement unknown.

LOS E and F results may have major impacts on concurrency, regional planning, or planning for Highways of Statewide Significance under HB 1487. For any of the land use alternatives under the current revenue structure, improvement needs are predicted exceed available revenue over the 20-year horizon of the comprehensive plan. Thus, policy decisions considering the following options would need to be made:

- Seek out local option transportation funding and increased funding through the state legislature or referenda.
- Lower the LOS standards on corridors where appropriate funding levels are not available or where multimodal transportation use is to be encouraged.
- Reduce the UGA expansion or the intensity of growth in outlying urban growth areas.
- Amend the comprehensive plan to allow rural major collectors to become multi-lane, non-state highways on specific routes that connect urban areas.
- Implement a regional traffic impact fee structure whereby rural and outlying urban area development contributes toward the cost of rural corridor capacity improvements.

The following is a summary of the transportation capital facilities needs, with planning-level cost estimates by alternative (Table 55). Attached is a matrix showing planning-level cost estimates for mitigation projects by alternative. A table summarizing the cost estimates by source of funding is provided in the Fiscal Impacts section (GMA Conformance chapter).

Table 55. Capital Project Needs by Alternative

Corridor Segment	**Alternatives**					
	1	**2**	**3**	**3a**	**4**	**5**
Highways of Statewide and Regional Significance						
I-5, Columbia River to 99th Street, widen to eight lanes	X	X	X	X	X	X
I-5, 99th to 134th, widen to 8 lanes	X	X		X	X	X
I-205, Columbia River to SR-500, widen to eight lanes	X	X				X
I-205, SR-500 to I-5, widen to six lanes	X	X				
I-5, I-205 to 219, widen to 8 lanes	X					
I-5, 219th to Ridgefield, add auxiliary lanes	X			X	X	
SR-500, I-5 to I-205, auxiliary lanes				X	X	X
SR-500, 162nd to 182nd Avenues, widen to 4 lanes	X	X				
SR-503, SR-500 to 119th Street, widen to six lanes	X	X	X	X	X	X
SR-503, 119th Street to Battle Ground, widen to six lanes	X	X	X	X	X	X
SR-502, I-5 to Battle Ground, limited access	X				X	X
SR-501, I-5 to Ridgefield, additional turn and auxiliary lanes	X	X	X	X	X	X
Upgrades to I-5 interchanges at Ridgefield, La Center	X	X	X	X	X	X
SR-14, I-205 to 164th Avenue, auxiliary lane in each direction	X	X	X	X	X	X
Rural and Inter-urban Corridors						
Ward Road, SR-500 to UGB, widen to six lanes	X	X	X	X	X	X

Corridor Segment	Alternatives					
	1	2	3	3a	4	5
Ward/182nd, UGB to 159th Street, widen to four lanes	X		X		X	X
NE 10th Avenue, 219th/SR-502 to S. 5th/264th Street, widen to 4 lanes	X			X	X	X
72nd Avenue, 119th to 219th Street, widen to four lanes	X	X	X	X	X	X
179th Street, UGB to 72nd Avenue, widen to four lanes	X	X				X
199th Street, NE 10th to 72nd Avenues, geometric and safety improvements	X					X
NE 239th Street extension, 2 lane collector, Carty/NE 10th Avenue to 29th Ave.	X				X	X
Daybreak Bridge/259th Street over East Fork Lewis River, widen to 4 lanes	X	X			X	X
Multimodal						
High level of bike/pedestrian improvements in FPIAs			X	X	X	X
Light Rail or High Capacity Transit				X		
Extended transit service into outlying employment centers	X				X	X
Vancouver UGA						
Burton Road, Andresen to 86th Ave., widen to four lanes	X	X	X	X	X	X
Andresen/Padden/88th Street vicinity – new circulation system, 4 lanes on 88th Street, new 58th Avenue collector	X	X	X	X	X	X
137th Ave., 28th to SR-500, widen to 4 lanes	X	X		X		X
137th Ave, 99th St. to 119th St., new 3-lane minor arterial	X	X			X	X
104th Street, new 2-lane collector, 107th Ave. to 137th Avenue	X	X			X	X
162nd Avenue, SR-14 to Mill Plain, adaptive traffic control	X	X	X	X	X	X
162nd Avenue, Mill Plain to Ward, widen to six lanes	X	X	X		X	X
Lakeshore/Fruit Valley, Vancouver to Felida, widen to four lanes	X		X	X	X	X
50th Avenue, Salmon Creek to 219th Street, widen to 4 lanes	X	X	X	X	X	X
219th St. Arterial extension to NW 31st/Hillhurst	X				X	X
Extend Poplar/49th Street east of 162nd Ave.	X	X			X	X
Extend 28th Street collector to 172nd Ave.	X	X	X	X	X	X
139th Street, 50th Ave. to SR-503, 2-lane collector	X					
Battle Ground UGA						
92nd Ave., 199th to 239th Streets, 2 lane collector	X	X			X	X
239th Street/244th Street, 92nd to SR-503, 2 lane collector	X				X	X
Ridgefield UGA						
Pioneer Street extension, I-5 to NE 10th Avenue, 2/4 lanes	X	X			X	X
New I-5 Crossing at S. 10th Street, south of interchange	X	X	X	X	X	X
New I-5 Crossing at N. 10th Street, north of interchange					X	X
Local collector/circulation system	X	X	X	X	X	X
La Center UGA						
La Center Road, I-5 to La Center, widen to four lanes	X	X	X	X	X	X
NW 319th Street, half mile west of I-5, widen to 3 lanes	X				X	X

a. Alternative 1

To maintain service levels similar to LOS D, this alternative would require substantial mitigation. However, even after expanding I-5 to eight lanes and I-205 to six/eight lanes, the I-5 and I-205 corridors would likely not be improved to LOS D. SR-503 would need to be widened to six lanes, but would likely still operate at LOS E conditions at peak times south of 119th Street. Widening to four lanes would be needed for 72nd Avenue but it would likely still operate at LOS E between 179th Street and Padden Parkway.

Mitigation projects proposed for Alternative 1 are:

- Widen I-5 to eight lanes (six general purpose and two HOV) from 134th Street to the Interstate Bridge. Note that this would be inconsistent with the range of alternatives resulting from the recent work on the I-5 Trade and Transportation Partnership study.
- Add auxiliary lanes on I-5 between interchanges: I-205 to 179th Street, 179th Street to 219th Street, and 219th Street to Ridgefield
- Widen I-205 to six lanes from I-5 to SR-500, and eight lanes from SR-500 to the Glenn Jackson Bridge
- Widen 72nd Avenue to four lanes from 219th Street to 119th Street
- Implement ramp metering with transit/HOV bypass lanes at all southbound on ramps on I-5 and I-205 from 219th Street south
- Provide safety and geometric improvements to 199th Street from 10th Avenue to SR-503, including left turn lanes at major intersections
- Widen Ward Road/182nd Avenue from NE 159th Street to 162nd Avenue
- Widen Lakeshore/Fruit Valley to four lanes from 99th Street to Fourth Plain
- Widen Burton Road to four lanes from Andresen Road to NE 138th Avenue
- Install transit signal preemption for regional roadway routes for C-TRAN buses, to help improve transit performance

Total estimated costs for improvements under Alternative 1 would be approximately $2.4 billion. The sources of the funding would include Clark County and the cities of Vancouver, Battle Ground, Ridgefield, and La Center; federal, state, and other grant funds; private contributions (Traffic Impact Fees, frontage improvements, and latecomers reimbursements); WSDOT funds; and miscellaneous sources.

b. Alternative 2

To maintain service levels similar to LOS D, this alternative would also require substantial mitigation. Similar to Alternative 1, the I-5 and I-205 corridors would likely not improve to LOS D even after expanding I-5 to eight lanes and I-205 to six/eight lanes. SR-503 would need to be widened to six lanes, but would likely still operate at LOS E conditions at peak times south of 119th Street. Widening to four lanes would be needed for 72nd Avenue but it would likely still operate at LOS E between 179th Street and Padden Parkway.

Mitigation projects proposed for Alternative 2 are:

- Widen I-5 to eight lanes (six general purpose and two HOV) from 99th Street to the Interstate Bridge. This would be inconsistent with the range of alternatives resulting from the recent work on the I-5 Trade and Transportation Partnership study.
- Widen I-205 to six lanes from I-5 to SR-500, and eight lanes from SR-500 to the Glenn Jackson Bridge.
- Widen 72nd Avenue to four lanes from 219th Street to 119th Street.
- Implement ramp metering with transit/HOV bypass lanes at all southbound on ramps on I-5 and I-205 from 219th Street south.
- Provide safety and geometric improvements to 199th Street from 72nd Avenue to SR-503, including left turn lanes at major intersections.
- Widen Ward Road/182nd Avenue from NE 119th Street to 162nd Avenue.
- Widen Burton Road to four lanes from Andresen Road to NE 138th Avenue.
- Install transit signal preemption for regional roadway routes for C-TRAN buses, to help improve transit performance.

Total estimated costs for improvements under Alternative 2 would be approximately $2.05 billion. The sources of the funding would include Clark County and the cities of Vancouver, Battle Ground, Ridgefield, and La Center; federal, state, and other grant funds; private contributions (Traffic Impact Fees, frontage improvements, and latecomers reimbursements); WSDOT funds; and miscellaneous sources.

c. Alternative 3

To maintain service levels similar to LOS D, this alternative would likely require the least mitigation of all the alternatives. The I-5 corridor would likely not improve to LOS D, even after expanding I-5 to eight lanes. SR-503 would need to be widened to six lanes south of Brush Prairie. Widening to four lanes would be needed for 72nd Avenue south of 179th Street.

Mitigation projects proposed for Alternative 3 are:

- Widen I-5 to eight lanes (six general purpose and two HOV) from 99th Street to the Interstate Bridge. This would be inconsistent with the range of alternatives resulting from the recent work on the I-5 Trade and Transportation Partnership study.
- Widen 72nd Avenue to four lanes from 179th Street to 119th Street.
- Implement ramp metering with transit/HOV bypass lanes at all southbound on ramps on I-5 and I-205 from 219th Street south.
- Widen Ward Road/182nd Avenue from NE 119th Street to 162nd Avenue.
- Widen Lakeshore/Fruit Valley to four lanes from 78th Street to Fourth Plain
- Widen Burton Road to four lanes from Andresen Road to NE 138th Avenue.
- Install transit signal preemption for regional roadway routes for C-TRAN buses, to help improve transit performance.

Total estimated costs for improvements under Alternative 3 would be approximately $1.81 billion. The sources of the funding would include Clark County and the cities of Vancouver, Battle Ground, and Ridgefield; federal, state, and other grant funds; private contributions (Traffic Impact Fees, frontage improvements, and latecomers reimbursements); WSDOT funds; and miscellaneous sources.

d. Alternative 3a

Alternative 3a would require the second-lowest level of mitigation to maintain service levels similar to LOS D. The I-5 corridor would not likely be improved to LOS D, even after expanding I-5 to eight lanes. SR-503 would need to be widened to six lanes south of Brush Prairie. Widening to four lanes would be needed for 72nd Avenue south of 179th Street.

Mitigation projects proposed for Alternative 3a are:

- Widen I-5 to eight lanes (six general purpose and two HOV) from 99th Street to the Interstate Bridge. This would be inconsistent with the range of alternatives resulting from the recent work on the I-5 Trade and Transportation Partnership study.
- Widen 72nd Avenue to four lanes from 179th Street to 119th Street.
- Implement ramp metering with transit/HOV bypass lanes at all southbound on ramps on I-5 and I-205 from 219th Street south.
- Widen Ward Road/182nd Avenue from NE 119th Street to 162nd Avenue.
- Widen Lakeshore/Fruit Valley to four lanes from 78th Street to Fourth Plain.
- Widen Burton Road to four lanes from Andresen Road to NE 138th Avenue.

- Install transit-signal preemption for regional roadway routes for C-TRAN buses, to help improve transit performance.
- Routing LRT feeder buses to connect the LRT loop with outlying employment centers.

With the LRT proposed for this alternative, revised zoning or development standards should be instituted along the LRT loop. These include:

- Transit-oriented zoning codes which allow for a mix of retail and residential in the same block or building. For example, this could include providing street-level retail with townhouses, apartments, or condominiums on the floors above the retail, similar to the Heritage Place development in downtown Vancouver
- Mixed use designations that provide for reduced off-street parking requirements, or allow crediting of on-street spaces against the off-street requirements. This would limit the amount of land needed for parking lots, allowing for higher densities, while also encouraging transit and other non-vehicular mode use to travel to and from the site.
- Relaxing of building height limits where they do not conflict with scenic views or airport operations. This would allow for higher residential densities, which could in turn free up land surrounding the building for employment centers.
- Adopting a comprehensive plan designation called "Station Area" within a quarter mile of all LRT stations, which are more flexible for mixing of land uses but prescribe transit- and pedestrian-oriented development standards. The zoning plan would then develop station-area plans along the LRT loop that identify the specific land uses and layouts supporting the LRT line.
- Reducing the concurrency standard to a travel speed representing LOS E in the vicinity of LRT stations. This would support the higher densities in the station areas without substantial financial hardship on the development community to provide a high level of roadway LOS.
- In the FPIAs, focus a higher level of transportation funding for walkways and bikeways to and from the LRT stations.

Total estimated costs for improvements under Alternative 3a would be approximately $2.28 billion. The sources of the funding would include Clark County and the cities of Vancouver, Battle Ground, and Ridgefield; federal, state, and other grant funds; private contributions (Traffic Impact Fees, frontage improvements, and latecomers reimbursements); WSDOT funds; and miscellaneous sources.

e. Alternative 4

To maintain service levels similar to LOS D, this alternative would require less mitigation than Alternatives 1, 2, and 5 but more than Alternatives 3 and 3a because peak traffic flows on corridors serving employment centers as more balanced. The I-5 and I-205 corridors would improve, reducing the need to add travel lanes.

SR-503 would need to be widened to six lanes. Widening 72nd Avenue to four lanes would be needed. Both of these corridors have more balanced traffic flow than in other alternatives. The close spacing of traffic signals on the south end of SR-503, and the Padden/88th Street area of 72nd Avenue/Andresen Road, may make coordination of traffic signals in both directions difficult.

If this land use alternative is advanced for further consideration, it is recommended that a subarea arterial plan be developed which considers frontage roads adjacent to I-5 north of the 179th Street interchange and up to the La Center interchange, upgrades to the adjacent rural arterials, and a transit system as part of its transportation plan.

Mitigation projects proposed for Alternative 4 are:

- Widen I-5 to eight lanes (six general purpose and two HOV) from 99th Street to the Interstate Bridge. This would be inconsistent with the range of alternatives resulting from the recent work on the I-5 Trade and Transportation Partnership study.
- Widen 72nd Avenue to four lanes from 179th Street to 119th Street.
- Implement ramp metering with transit/HOV bypass lanes at all southbound on ramps on I-5 and I-205 from 219th Street south.
- Widen Ward Road/182nd Avenue from NE 119th Street to 162nd Avenue.
- Widen Lakeshore/Fruit Valley to four lanes from 78th Street to Fourth Plain.
- Widen Burton Road to four lanes from Andresen Road to NE 138th Avenue.
- Install transit signal preemption for regional roadway routes for C-TRAN buses, to help improve transit performance.

Total estimated costs for improvements under Alternative 4 would be approximately $2.15 billion. The sources of the funding would include Clark County and the cities of Vancouver, Battle Ground, Ridgefield, and La Center; federal, state, and other grant funds; private contributions (Traffic Impact Fees, frontage improvements, and latecomers reimbursements); WSDOT funds; and miscellaneous sources.

f. Alternative 5

To maintain service levels similar to LOS D, this alternative would require more mitigation than Alternatives 3, 3a, and 4 but less than Alternatives 1 and 2, as peak traffic flows on corridors serving employment centers as more balanced. The I-5 and I-205 corridors would improve, reducing the need to add travel lanes.

SR-503 would need to be widened to six lanes and 72nd Avenue would need to be widened to four lanes. Both of these corridors have more balanced traffic flow than in other alternatives; however, the close spacing of traffic signals on the south end of SR-503, and the Padden/88th Street area of 72nd Avenue/Andresen Road, may make coordination of traffic signals in both directions difficult.

If this land use alternative is advanced for further consideration, it is recommended that a subarea arterial plan be developed which considers frontage roads adjacent to I-5 north of the 179th Street interchange and up to the La Center interchange, upgrades to the adjacent rural arterials, and a transit system as part of its transportation plan.

Mitigation projects proposed for Alternative 5 are:

- Widen I-5 to eight lanes (six general purpose and two HOV) from 99th Street to the Interstate Bridge. Note that this would be inconsistent with the range of alternatives resulting from the recent work on the I-5 Trade and Transportation Partnership study.
- Widen 72nd Avenue to four lanes from 179th Street to 119th Street
- Implement ramp metering with transit/HOV bypass lanes at all southbound on ramps on I-5 and I-205 from 219th Street south
- Widen Ward Road/182nd Avenue from NE 119th Street to 162nd Avenue
- Widen Lakeshore/Fruit Valley to four lanes from 78th Street to Fourth Plain
- Widen Burton Road to four lanes from Andresen Road to NE 138th Avenue
- Install transit signal preemption for regional roadway routes for C-TRAN buses, to help improve transit performance

Total estimated costs for improvements under Alternative 5 would be approximately $2.16 billion. The sources of the funding would include Clark County and the cities of Vancouver, Battle Ground, Ridgefield, and La Center; federal, state, and other grant funds; private contributions (Traffic Impact Fees, frontage improvements, and latecomers reimbursements); WSDOT funds; and miscellaneous sources.

X. PUBLIC FACILITIES AND UTILITIES

Information contained in the Resource Document (1994) was updated as a part of the update of the GMA Plan. This section draws on information contained in the update.

A. Fire Protection

1. Setting

Fire protection for Clark County is provided by a combination of municipal fire departments, rural fire protection districts, the DNR and the USDA Forest Service (FS). Cities and towns in the state of Washington are responsible for fire suppression, medical and other emergency response, and fire prevention, investigation and code enforcement within their respective incorporated areas. Outside incorporated areas rural fire districts are responsible for fire suppression and emergency response. They are not responsible for fire code enforcement, and have only limited authority with respect to fire investigation. In unincorporated areas, Clark County is responsible for administering and enforcing the fire code, and investigating the cause and origin of the fires, as well as the extent of loss from fires. The City of Vancouver operates the only hazardous materials response team in Clark County. The DNR provides protection for all state trust land, in large sections of eastern and northern Clark County. The FS provides fire protection to the Gifford Pinchot National Forest, a portion of which is located in eastern Clark County. Figure 42 shows current fire district boundaries and facilities in Clark County.

All city fire departments and fire districts in Clark County have signed mutual aid agreements. Mutual aid agreements ensure that the nearest fire station responds to emergency situations regardless of the responsible district.

a. Level of Service

The Washington State Surveying and Rating Bureau (WSRB) is an independent property insurance rating bureau for the state of Washington. They operate as a public service institution, and their services are available to all companies licensed to sell property insurance in Washington, and to the public, including consumers, agents and professionals involved in promoting sound fire protection practices. Cities, towns, fire protection districts and suburban or rural localities are graded for insurance purposes according to the efficiency of their public fire protection. The grading system involves 10 classes. Class 10 indicates that the fire protection facilities, if any, are not considered adequate. Information on classifications for Clark County are published the WSRB Public Protection/BCEG Classification Manual. Classifications can change if the service provider improves services. This then affects insurance rates. For example, the addition of a ladder truck to a fire department's inventory of fire apparatus can improve the fire department's rating and lower insurance costs.

An emergency medical service ordinance adopted response time goals for emergency medical response for urban, suburban, and rural geographic areas. There are two sets of response time goals for both first response providers (fire departments and districts) and for ambulance response and transport. They are for urgent medical calls and less urgent medical calls. The urgent medical calls require the use of lights and sirens ("hot"). Table 56 presents standards for fire response.

Table 56. Fire Response Standards

	Urgent /Priority	Not Urgent/Priority
First Response		
Urban	4.59 minutes	8.59 minutes
Suburban	5.59 minutes	12.59 minutes
Rural	10.59 minutes	20.59 minutes
Advance Response		
Urban	7.59 minutes	11.59 minutes
Suburban	11.59 minutes	17.59 minutes
Rural	19.59 minutes	29.59 minutes

Source: Updated Perspectives Resource Document, 2002

b. Service Providers

Three municipal fire departments, eleven rural fire districts, DNR and the FS provide fire protection and emergency medical services (EMS) to Clark County. In addition, there are three ambulance services in the county: American Medical Response (AMR), City of Camas, and North County EMS District No. 1. Table 57 summarizes information about the area served, response times, and WSRB rating for fire protection providers.

Table 57. Fire Protection Providers

District	Population Served	Area (sq. mi.)	No. Stations	Avg. Response Time (minutes)	WSRB Rating
Municipal					
Camas	12,534	12	2	6	4
Vancouver*	210,223	93	9	4.38	4
Washougal	9,000	6	1	3 – 4	5
Rural Districts					
CCFD No. 1	3,070	23	2	5.5 fire; 4.5 EMS	8
CCFD No. 2	1,750	35	1	5 – 10	8
CCFD No. 3	18,000	82	4	6	5
CCFD No. 5*	62,000	44	Combined with City of Vancouver		
CCFD No. 6	60,000	37	3 + 1 joint	3.43	3
CCFD No. 9	6,700	37	3	5.35	8
CCFD No. 10	6,725	68	6	8	8
CCFD No. 11	25,100	54	3	7 fire; 6 EMS	6
CCFD No. 12**	12,800	72	5 + 1 joint	6 fire; 5 EMS	8 (5 Ridgefield; 6 La Center)
CCFD No. 13	5,380	36	2	8	8 (6 Yacolt)

CCFD = Clark County Fire District
**CCFD No. 5 contracts with the City of Vancouver to provide service*
*** Towns of Ridgefield and La Center have merged with CCFD No. 12.*
Source: DEA update of GMA Plan Resource Document (2002)

2. Impacts on Fire Protection

Increased demand for EMS and fire protection is related to population and employment growth in Clark County. The growth pattern determines cost of providing acceptable levels of service, and which service providers must bear that cost. In general, alternatives that convert more land to urban uses would be more expensive to serve. More compact development patterns are easier to serve, and particularly easier to provide with adequate water flows for fire suppression. Since none of the alternatives include very high

density or high rise development, the special fire protection problems associated with these development patterns is not an issue. All fire and EMS providers are challenged by the tax revenue limits posed by Initiative 747.

Table 58 summarizes the acreage of additional urban area that would need to be served by each fire district under each alternative. The impacts of each alternative are discussed below.

a. Alternative 1

Alternative 1 would have the greatest impact on fire protection and EMS. Growth would be more dispersed than under any other alternative, requiring additional facilities, equipment and staff to provide service. Because of the more dispersed development pattern, the cost per capita to provide service would be higher. The City of Vancouver, and CCFD No. 6 and 12 would experience the most growth. Fire District No. 12 is already planning a new fire station in the Ridgefield Junction area, and this would need to be sized to serve the total proposed expansion.

b. Alternative 2

Alternative 2 would expand the urban area served by CCFD 6 and the City of Vancouver, and (depending on where the UGA boundary between Camas and Vancouver is drawn in the Fisher Swale,) the City of Camas. The area added to each is not large, but the expansion areas are planned to accommodate commercial, industrial and business park development, which could require upgrading equipment and staffing for the stations that serve these areas.

c. Alternative 3

Alternative 3 would accommodate all growth within existing UGAs. As a result, existing facilities would be used to respond to calls. Some upgrade of equipment and facilities would probably be needed, particularly for those stations whose service area includes designated community centers (areas of higher density and intensity development) or business parks.

d. Alternative 4

Alternative 4 would substantially expand the Battle Ground UGA and Fire Districts 3 and 11 (which serves the City of Battle Ground) would be most affected by this expansion. Additional fire stations (with associated equipment and staffing) and improved fire flow would be needed to serve the expansion area.

e. Alternative 5

Alternative 5 would direct growth along the I-5 corridor north of the Fairgrounds. This area is served by CCFD No. 6 and CCFD No. 11. The change from a large-lot residential and rural area to intensive employment (industrial, business park and commercial development) would require substantial investment in extending water service, roads and fire protection.

Table 58.Impacts on Fire Protection and EMS Providers

Fire District	**Acres of Additional Urban Land Uses to be Served**				
	Alt 1	**Alt 2**	**Alt .3**	**Alt 4**	**Alt 5**
Battle Ground					
Industrial	--	--		0.02	--
Mixed Use	--	--		0.1	0.05
Low-density residential	0.2	--		--	0.05
Medium-density residential	0.1	0.24		--	--
High-density residential	0.1	--		0.5	--

Fire District	Acres of Additional Urban Land Uses to be Served				
	Alt 1	Alt 2	Alt .3	Alt 4	Alt 5
Camas					
Industrial	0.6	--		0.9	--
Business Park		0.4		0.6	0.9
Commercial	0.2	--		0.4	0.14
Low-density residential	0.2	--		0.33	0.01
Medium-density residential	0.4	0.24		--	--
High-density residential	0.1	0.01		--	--
Vancouver					
Industrial	8.5	--		0.01	7.1
Commercial	0.1	--		0.9	0.1
Business Park	--	0.1		7.3	--
Low-density residential	--	--		--	0.1
Medium-density residential	0.01	--		--	--
Washougal	--	--		--	--
Business Park	--	--		--	0.1
Low-density residential	0.3	0.1		--	--
CCFD No. 1					
Low-density residential	120.84	48.9		--	--
CCFD No. 3					
Industrial	28.3	--		415.6	602.8
Commercial	182.7	0.9		211.7	106.4
Business Park	273.4	1.9		--	193.8
Mixed Use	--	--		163.5	--
Low-density residential	1356.4	107		664.8	440.1
Medium-density residential	693.8	175.9		0.9	0.4
High-density residential	0.33	--		--	--
Parks/Open space	--	--		137.0	--
CCFD No. 5					
Industrial	572.9	--		2064.4	0.1
Commercial	820.5	--		2152.3	525.0
Business Park	--	1312.5		188.8	449.9
Mixed Use	378.9	--		229.0	75.8
Low-density residential	5085.7	772.2		193.6	1476.1
Medium-density residential	790.2	424.1		--	217.4
High-density residential	339.8	129.0		--	--
Parks/Open space	--	--		206.0	--
CCFD No. 6					
Industrial	--	--		108.7	--
Commercial	135.5	--		78.13	147.3
Business Park	414.6	--		--	--
Mixed Use	8.3	--		--	--
Low-density residential	1793.6	1367.4		--	339.2
Medium-density residential	612.4	--		--	--
High-density residential	176.9	--		--	--
CCFD No. 9					
Business Park	--	--		--	145.0
Mixed Use	--	--		56.9	--
Public Facility	--	--		67.3	--
Low-density residential	576.2	565.0		155.1	172.4
Medium-density residential	50.1	--		--	136.7

Source: Clark County Department of Assessment and GIS, 2003

3. Mitigation Measures

a. Plans and Ordinances

Clark County: Clark County has not included fire protection as one of the services considered under concurrency management. CWPPs set the minimum fire flow as 1,000 GPM for urban areas and rural centers, and 500 GPM in rural and resource lands. No changes are proposed to rural development densities or rural center locations and size, except that each alternative (except Alternative 3) would convert different amounts of rural area to urban uses. Individual cities have established general policies in their comprehensive plans requiring public facilities and services to be adequate to serve new development at the time it is available for occupancy and use, but fire is not included in concurrency management procedures. Individual cities and fire districts have set additional service standards that they attempt to meet. These standards and planned improvements are described below.

Battle Ground: The Fire Capital Facilities Plan adopted by the City in August 2000 identifies a need for additional fire stations and equipment to serve growth proposed under Alternative 4. Remodeling and upgrade of Fire Station 11-3, located in downtown Battle Ground, is also planned.

Camas: The City of Camas has established a response time standard of 6 minutes from dispatch to arrival with 1.3 fire fighters per 1,000 population. The fire station on Parker Road in the northwest of the city would provide service to proposed growth areas. When it was constructed, it was sized and equipped to handle proposed growth.

La Center: La Center is served by Fire District No. 12. Because the town does not provide its own fire protection, there are no specific LOS standards established for the District. Existing facilities in the town are adequate to serve the existing town limits as it develops. Expansion of the La Center UGA would occur in the area of the I-5 junction under Alternatives 1 and 5. CCFD No. 12 has plans to build a station in the Ridgefield Junction area to serve both the Ridgefield and La Center Junction areas.

Ridgefield: The Town of Ridgefield set a level of service standard of 5 minutes response time within the town limits, and CCFD No. 12 is meeting that standard. The need for an additional station at the Ridgefield Junction to support proposed development is recognized in the Ridgefield comprehensive plan. This need would be more acute if Alternatives 1 or 5 are adopted.

Vancouver: The City of Vancouver consolidated its fire department with CCFD No. 5 to more efficiently provide service to the Vancouver urban area. No additional facilities are needed at this time, although as planning for urban activity centers proceeds, upgrade to some facilities to serve higher intensity development may be needed.

Washougal: The City of Washougal has established a response time standard of six minutes from dispatch to arrival with 1.2 fire fighters per 1,000 population. A new fire station has been constructed to serve development in the northern part of the city. Only minor expansion of the Washougal UGA is proposed under any of the alternatives, and no additional facilities are expected to be needed. The capital facilities plan schedule includes construction of a new station and purchase of a new pumper in 2000 as well as replacement of the 1991 pumper in 2011.

Goal 6.6 of the comprehensive plan states that police, fire, and emergency medical services will be provided efficiently and cost effectively to residents of Clark County. Policies 6.6.1 – 6.6.4 and 6.6.8 focus on coordination and cooperation on a regional level for public safety and establishing benchmarks to measure performance and to form a basis of funding decisions. Policy 6.6.5 allows for rural levels of service and facilities in the rural areas. Policies 6.6.6 – 6.6.12 deal with the provision of specific services such as inspections, animal control, fire investigation, training, information management, and funding.

Policy 6.6.13 requires the implementation of emergency management plans for all service providers consistent with the elements of the comprehensive plan.

Goal 6.10 ensures that capital facilities and services are provided in as cost efficient manner as possible and are consistent with the comprehensive plan. Policies under this goal focus on coordination of land use planning with capital facilities planning, interjurisdictional and interagency cooperation for the provision and sharing of services and facilities and analysis of fiscal impacts related to annexation (Policies 6.10.1-6.10.4).

b. Additional Mitigation Measures

Additional mitigation measures that could be adopted to minimize impacts to fire and emergency services include the following:

1. Install fire sprinklers or provide an on-site water supply for fire suppression in all industrial and commercial development.
2. Construct all access drives (including private driveways) to standards adequate to permit emergency vehicle access. Provide the affected fire district the opportunity to review plans for proposed development to ensure adequate access.
3. Require developers in wildfire hazard areas to annex to fire protection districts, use fire retardant building materials and maintain a clear zone around any structure in order to reduce fire risk.
4. Require evidence of availability of adequate fire flow as a condition of approval on all new development.
5. Encourage consolidation of rural fire districts into urban fire departments where the majority of development is urban in character.
6. Encourage continued cooperation among districts in providing service and developing regional facilities.

B. Police Protection

1. Setting

The Cities of Camas, Washougal, Battle Ground, La Center, Ridgefield, and Vancouver provide local law enforcement services through local police departments. The Clark County Sheriff's Department provides services in those areas outside the city boundaries and in Yacolt. Cooperation between the cities and the county is good. Each jurisdiction provides backup for others in emergency situations. The Washington State Patrol has police jurisdiction on all state routes within the county. The State Patrol is largely responsible for state facilities, but also provides backup for the Clark County Sheriff's Department and local jurisdictions.

Regional or shared law enforcement and correction facilities include the County's jail, a leased office for the inter-jurisdictional Clark-Skamania Narcotics Task Force, the 911 Clark Regional Communication Agency, and the Child Abuse Intervention Center. A cooperative agreement established the Clark Regional Communications Agency (CRCA) in 1976, which responds to 911 emergency service calls and directs them to the appropriate agency. The role of this agency expanded in 2000 and the name changed to the Clark Regional Emergency Services Agency (CRESA). CRESA also provides emergency management coordination, ambulance contract oversight, and operation and maintenance of regional radio services. In addition to these regional facilities, Vancouver, Camas, Washougal, and Battle Ground each have their own jail/holding facility.

Larch Corrections Center is the only State detention facility in Clark County. It is an all-male, minimum security facility that houses 164 inmates. No additional state facilities are proposed for the region. Such facilities would be reviewed under Countywide Planning Policies related to the siting of new regional facilities.

Demand for law enforcement services is directly related to the population and employment in an area. Most of the growth in Clark County has occurred in the unincorporated, largely rural sections of the County. As a result, the Clark County Sheriff's Department has experienced the greatest increase in demand/need for services.

The Federal Bureau of Investigation (FBI) recommends a ratio of 1.6 sworn officers per 1,000 for urban areas and 1.8 sworn officers per 1,000 for suburban areas. Most calls for police assistance are associated with the home location of the population, not employment or shopping centers. Table 59 provides an overview of the current police departments and sheriff's department facilities and staffing.

Table 59. Police Service Providers

Jurisdiction	Staffing	Staff per 1,000 Population	Response times	Facilities
Clark County Sheriff	128 sworn 397 total	0.72	Priority CRESA goals are: Priority I Emergency: dispatched w/in one minute Priority II: attempt to dispatch w/in 1.5 minutes*	Clark County Law Enforcement Center Orchards Substation Clark-Skamania Narcotics Task Force
Battle Ground	17 sworn 20 total	1.53		Police department office at 505 SW 1st Street
Camas	23 sworn 29 total	1.64	5.5	Camas Police Department offices at 2100 NE 3rd Avenue Holding facility with three cells
La Center	3 sworn 8 total	6.2	Actual response time under 4 minutes	Police department offices
Ridgefield	4.3 sworn 7.5 total	2.0	Priority I	Police department offices
Vancouver	84 176 sworn 98205 total	1.2	Actual response times: Priority I Emergency: dispatched w/n 33 seconds, 3.32 minutes to arrival Priority II: 1.15 min to dispatch, 8.42 minutes to arrival Actual response times: Priority I Emergency: dispatched w/n 1.14 minutes, 3.23 minutes to arrival Priority II: 1.43 minutes to dispatch, 5.21 minutes to arrival	Vancouver Police Department offices Holding facility Vancouver Mall Precinct Vancouver facility
Washougal	14 sworn 24 total (includes 8 reserve officers)	1.6	5 to 8 minutes	Washougal Police Department offices Two holding facilities

Source: Battle Ground, Camas, Vancouver, and Washougal police departments and Clark County Sheriff's Office.
**CRESA response time goals would apply to all agencies.*

While service providers use ratios of staff to population and response time to measure level of service, residents and businesses care more about the crime rate and prefer jurisdictions where the rate is low or declining. The crime rate is also related to total population, age distribution of the population, and the economic state of the community. Table 60 shows crime statistics for Clark County communities.

Table 60. Crime Rates (Per Thousand Population)

		CC Sheriff's Office	Battle Ground	Camas	La Center	Ridgefield	Vancouver	Washougal	Woodland
1995	**Violent Crimes**	2.7	2	2.7	5.8	4.3	9.6	1.6	2.3
	Property Crimes	36.1	46.1	51.7	26.6	34.5	79.8	43.4	40
	Total	38.8	48.1	54.4	32.4	38.8	89.4	45	42.3
1996	**Violent Crimes**	3.7	1.6	0.6	2.6	1.7	4.5	2	0.9
	Property Crimes	31.1	36.8	35.5	6	27.1	34.7	19.8	37.9
	Total	34.8	38.4	36.1	8.6	28.8	39.2	21.8	38.8
1997	**Violent Crimes**	3.9	1.3	0.8	2.6	1.2	5.2	0.8	2
	Property Crimes	28.1	41.9	42.6	29	26	42.5	10.3	35.9
	Total	32	43.2	43.4	31.6	27.2	47.7	11.1	37.9
1998	**Violent Crimes**	3.2	2.2	1	0	0.6	5	1	1.1
	Property Crimes	28	33	32.9	27.3	23.4	36.9	20.7	36.7
	Total	31.2	35.2	33.9	27.3	24	41.9	21.7	37.8
1999	**Violent Crimes**	2.2	1.2	1.5	4.5	0.5	4.4	0.4	2.2
	Property Crimes	24.7	31.2	28.8	18.8	18.9	45.7	8.8	24
	Total	26.9	32.4	30.3	23.3	19.4	50.1	9.2	26.2
2000	**Violent Crimes**	1.8	1.5	0.4	1.2	1.4	4.3	2.1	0.3
	Property Crimes	24.4	38.4	32.9	28.4	16.6	52.4	29.7	42.4
	Total	26.2	39.9	33.3	29.6	18	56.7	31.8	42.7
2001	**Violent Crimes**	1.6	1	1.2	0.6	0.9	4.7	2.4	1.3
	Property Crimes	27.1	35.2	33.8	21.9	39.5	50.5	30.5	37.4
	Total	28.7	36.2	35	22.5	40.4	55.2	32.9	38.7

Source: Washington Association of Sheriffs and Police Chiefs, Uniform Crime Reports, 2003

2. Impacts on Police Protection

Each of the police protection agencies will provide service to the homes and businesses which locate in their service areas. As land in each UGA is annexed to the city or town, the responsibility for law enforcement will transfer from the sheriff to city police. Law enforcement standards have generally been measured through the number of officers per thousand population, and the average response time for calls. The projected population growth is the same under four alternatives, but Alternative 1 has a higher overall growth rate. Alternative 1 would require more sworn officers and equipment than the other alternatives in order to provide the same LOS. The differences between the other alternatives relate to the areas where growth is planned, and which jurisdiction would have to add equipment and staff to provide service. Table 61 provides estimates of how many new officers and facilities would be needed for each of the alternatives.

Table 61. Additional Law Enforcement Needed for Each Alternative

Jurisdiction	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Battle Ground	31	37	19	47	41
Camas	20	19	15	19	20
La Center	16	14	14	14	14
Ridgefield	24	19	18	16	17
Vancouver	171	125	97	99	131
Washougal	8	11	6	6	7
Yacolt	0	0	0	0	0
Clark County	35	35	36	30	31
Total	391	322	254	280	326

Source: Estimates based on LOS and GIS data

a. Alternative 1

Alternative 1 would have the greatest impact on the need for additional staff, equipment and facilities because it has the highest growth rate. Most of the impacts would be felt by the County Sheriff, because the growth area is unincorporated area north of Hazel Dell and west of Battle Ground. As the area annexed to cities, responsibility would be handed over to the Cities of Battle Ground and Vancouver. Because the development pattern is more dispersed in this alternative, it is likely that additional sub-stations and vehicles would be required to maintain response times in rural areas.

b. Alternative 2

Alternative 2 would have a lower overall population growth and therefore, less need for additional staff and equipment. Again, most of the growth would be in the rural area east of the Fairgrounds and southeast of Battle Ground. The introduction of large employment centers in these areas would probably require additional substations and vehicles to maintain adequate response times.

c. Alternative 3

Alternative 3 would not expand urban areas. All projected growth would be accommodated within existing UGAs. This alternative would make most efficient use of existing facilities. Additional staff and vehicles would be added, but no additional facilities, beyond those already planned, would be needed.

d. Alternative 4

Alternative 4 would have the greatest impact on the Battle Ground UGA, but Vancouver and Camas have proposed expansions UGA also. Initially, this demand would fall on the sheriff, but as land annexed to the city, the responsibility for serving this growth would fall to the City of Battle Ground. Additional facilities as well as staff and equipment would likely be needed.

e. Alternative 5

Alternative 5 would concentrate growth along the I-5 corridor north of the Fairgrounds. The Towns of Ridgefield, and La Center as well as the County Sheriff and (eventually) the City of Vancouver would be most affected.

3. Mitigation Measures

a. Plans and Ordinances

The GMA does not require the inclusion of law enforcement services in concurrency, and no Clark County jurisdictions have elected to include them, though minimum officers per thousand population standards have been adopted.

The individual jurisdictions have established policies in their comprehensive plans requiring public facilities and services such as police protection to be adequate to serve new development at the time that it is available for occupancy and use. The cities and towns have identified the following mitigation measures to mitigate impacts to police services on future growth. Additional mitigation measures which could be adopted are also identified below.

Clark County: Police protection is not included in the County's concurrency management program. As the GMA is implemented and urban areas are annexed to cities, the sheriff will not have to add staff, but may in fact reduce patrol officers. County jail and regional facilities responsibilities would not change, because they are related to countywide population. As responsibilities shift, the sheriff can be expected to focus more on countywide responsibilities.

The same policies discussed under Clark County's mitigation for impacts on fire and emergency services also apply to police services.

Camas: The new public safety facility on Parker Road provides service to the northwestern portion of the City. Plans to upgrade the downtown Public Safety Building are also underway.

La Center: The City of La Center estimates that its current facilities are adequate to serve existing needs and planned growth, except Alternatives 1 and 5. Either of these alternatives could require a new facility to serve development concentrated at the I-5 Junction. Financing this facility will be a challenge.

Ridgefield: Ridgefield anticipates a need for a new public safety facility (combining fire and police protection) in the vicinity of NW 31st and NW 269th in order to serve proposed development in the Ridgefield Junction area. Financing this facility will be a challenge.

Vancouver: The City of Vancouver will need to increase police staffing and equipment as the population grows and urban growth areas are annexed. New facilities will also be needed. Mitigation policies for fire and emergency medical service in Vancouver also apply to law enforcement.

Washougal: The city is not proposing to accommodate significant additional growth at this time. Existing facilities are expected to be adequate, but additional staffing and equipment may be needed.

b. Additional Mitigation Measures.

The following mitigation measures could be implemented by the cities and county in order to improve safety for residents and make most efficient use of staff, facilities and equipment.

1. Revise the development standards for residential, commercial and industrial development to incorporate safety measures (such as lighting, fencing and landscaping);
2. Include police precincts as part of new community facilities and identify locations for them on each local subarea plan.
3. Encourage neighborhood watch programs to support community policing efforts.

4. Encourage cooperation among law enforcement/correction agencies for shared enforcement and corrections services and facilities.

C. Public Schools

1. Setting

There are nine school districts within Clark County: Battle Ground, Camas, Evergreen, Green Mountain, Hockinson, La Center, Ridgefield, Vancouver, and Washougal. Figure 43 shows school district service areas and the locations of existing schools. Table 62 offers a summary of current facilities within these different districts.

Table 62. Summary of Current Clark County School District Facilities

School District	Number of Public Schools		
	Elementary	Middle School	High School
Battle Ground	6	5	3
Camas	4	1	1
Evergreen	17	6	4
Green Mountain	1	*	Students attend La Center High School
Hockinson	2	1	Students attend Battle Ground or Prairie High School
La Center	1	1	1
Ridgefield	2	1	1
Vancouver	21	6	6
Washougal	3	2	2

**Green Mountain School houses grades K-8*
Source: Capital Facilities Plan for Clark County School Districts

Over the past decade Clark County has experienced an annual population growth rate of 3.8 percent, adding an additional 107,175 residents. This growth has made it challenging for many districts to provide adequate services to students. The increase in the number of students attending Clark County public schools over the past decade is due to both significant in-migration, which accounted for three-quarters of total population growth, and to "echo boomers," those children between the ages of 6 and 23 who were born to baby boomers.

Table 63 shows total enrollments for Clark County school districts for the years 1980, 1990, and 2002. Enrollment in Vancouver School District schools has increased significantly over the past two decades. This school district has experienced a 43 percent increase in enrollment since 1980. However, rates of enrollment growth within the district differ considerably among schools and grade levels. Elementary schools, grades K through 5, have experienced the greatest overall growth since 1980. Since that year enrollment in elementary schools has increased 51 percent. For the period 1990-2001, elementary schools accounted for 33 percent of district-wide enrollment growth. Over the entire 1980-2001 period, middle school enrollment has increased by 43 percent, while high school enrollment for the same period increased 33 percent. For the more recent period between the years 1989 and 2001, the number of high school students in the Vancouver School District increased by 55 percent.

Table 63. Total School Enrollments for Clark County School Districts, 1980, 1990, 2002

School District	1980	1990	% change	2002	% change
Battle Ground	6,462	7,337	13.5	11,644	58.7
Camas	2,352	2,208	-6.1	4,110	86.1
Evergreen	11,544	13,744	19.1	22,763	65.6
Green Mountain	47	67	42.6	124	85.1
Hockinson	740	902	21.9	1,449	60.6
La Center	720	774	7.5	1,411	82.3
Ridgefield	1,545	1,302	-15.7	1,793	37.7
Vancouver	15,875	14,931	-5.9	21,531	44.2
Washougal	1,671	2,007	20.1	2,581	28.6
Total Enrollment	**40,956**	**43,274**	**5.7**	**67,406**	**55.8**

Source: Office of Superintendent of Public Instruction

Although enrollment in Vancouver public schools has grown at a significant pace, enrollment growth has been below the rates experienced by other school districts in Clark County. In 2001, the Vancouver School District represented just over 32 percent of countywide enrollment, a decline of four percent from 1986 levels. The Evergreen School District, with around 23,000 students, is now the largest school district in the county and the sixth largest school district in the state. This district, along with the Battle Ground and Camas school districts, has led the way in capturing an increased representation of countywide public school enrollment. As of 2001, Evergreen had 34 percent of all public school students (K-12) and captured 38 percent of Clark County's total public school enrollment growth since 1986.

Although the Legislature did not specifically include schools as one of the public facilities subject to the direct concurrency requirements of the GMA, schools are required by existing state law to be adequately provided for before land divisions can be approved (RCW 58.17.110). To meet minimum facility standards set by state and federal agencies, schools usually require relatively large sites of at least 10 acres for elementary schools, 20 acres for middle schools, and 40 acres for high schools. Space requirements, land acquisition costs, area to be served, access, and size of property are important factors to be considered by school districts in siting new facilities. Schools typically require a full range of urban services, including transportation, sewer, water, fire and police service, and utilities.

2. Impacts to Public Schools

All of the alternatives under consideration accommodate the growth that is expected to occur in Clark County over the next 20 years. Alternative 1 plans for the most growth, with 171,422 new residents by 2023. The other four alternatives plan for 126,685 new residents by 2023. In addition to overall population growth, other demographic trends are important in assessing impacts to school districts. For instance, over the next 20 years it is expected that Clark County's population will continue to get older, consistent with state and national trends, so that the share of the population that is 50 years of age and older will increase from 24 percent of total population in 2000 to 32 percent by 2020. Also, the proportion of adults in ages most likely to have children in Clark County may drop. This does not necessarily mean that there will be fewer school age children, as the total number of childbearing-age adults will increase, albeit at a lower rate of increase than with the number of adults over age 50. A key indicator of children that will be entering the school system is reflected in the number of women of childbearing age and their associated fertility rates. The population of childbearing age is expected to continue to increase in Clark County. Overall fertility rates are expected to be slightly higher than peak averages experienced in 2000. Fertility rates for women age 20-29 (women of prime childbearing age) are forecast to remain the highest over the next 25 years.

Each of the alternatives would have different impacts on the distribution of student populations, the growth of existing schools, and the location of new schools. Table 64 shows the expected growth in households for each school district under each alternative. The expected allocation of growth between multi-family and single-family residential development greatly affects the demand for school services. The target ratio of multi-family units to single-family units presented by each alternative does not necessarily reflect the ratio represented by the plan map designations under the alternatives. GIS data was used instead to generate the proposed number of multi-family and single-family units based on the proposed land use designations shown on the maps of the alternatives. While population or household growth will generate more demand for school facilities and services, growth in commercial and industrial development will generate a portion of the tax base to pay for services.

Table 64. Expected Growth in Single-Family and Multi-Family Households

	Alternative 1		**Alternative 2**		**Alternative 3**		**Alternative 4**		**Alternative 5**	
	SF	**MF**	**SF**	**MF**	**SF**	**MF**	**SF**	**MF**	**SF**	**MF**
Battle Ground	18,535	17,014	8,792	6,495	4,825	790	6,345	6,371	10,387	4,527
Camas	2,651	3,465	2,445	2,921	1,561	2921	1,857	2,921	1,839	3,699
Evergreen	5,723	4,660	5,234	4,835	4,991	3920	5,192	3,920	5,335	3,920
Hockinson	1,458	1,324	414	1,050	414	0	414	0	414	0
La Center	1,358	0	670	0	670	0	670	0	670	0
Ridgefield	5,562	8,192	4,248	2,070	2,241	1827	2,241	1,827	2,727	1,827
Vancouver	7,290	5,475	7,595	4,662	6,211	4662	6,211	4,662	6,321	4,662
Washougal	2,168	305	2,323	305	1,887	305	1,887	305	1,887	305

Table 65 shows the additional urban development in each district by land use type.

Table 65. Additional Acres of Urban Development under Each Alternative

School District	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Vancouver			No UGA expansion under this alternative		
Low density residential	571.6	828.5			97.1
Medium density residential	256.5				
Hockinson					
Low density residential	996.0				
Medium density residential	62.9	200.1			
High density residential	90.2				
Industrial	146.5				
La Center					
Low density residential	548.8			63.6	
Commercial	42.2				
Washougal					
Low density residential	162.3	173.2			
Evergreen					
Low density residential	2145.2	93.5		101.6	355.7
Medium density residential	150	116.6			
High density residential	103.5	129.0			
Mixed use	35.1			285.3	
Commercial	410.0			310.6	183.4
Industrial	281.1			640.8	
Business park		544.4		14.2	192.4
Camas					
Low density residential	596.6	541.5		247.4	181.3
Medium density residential	607.9				136.7
Mixed use				0.6	
Commercial	202.7			669.1	
Industrial	155.7			0.1	
Business park		603.55		182.5	410.4
Battle Ground					
Low density residential	8427.3	2354.6		1269.6	4483.3
Medium density residential	1938.9	1424.4		383.3	746.6
High density residential	725.97			321.5	
Mixed use	456.6			1685.1	480.6
Commercial	725.2	75.8		1835.9	479.5
Industrial	92.9			3264.4	602.8
Business park	273.4	1023.8			724.8
Parks & open space				137.0	
Ridgefield					
Low density residential	4719.1	1332.8			242.9
Medium density residential	853.9	80.4			726.2
High density residential	279.0				
Commercial	778.1	12.5			108.1
Industrial	702.0			868.3	
Business park	1286.9	212.8			2025.4

Source: Clark County Department of Assessment and GIS, 2003

a. Alternative 1

Alternative 1 would accommodate a higher overall population in the county over the next twenty years, and as a result would have a greater impact on schools. Most of the development would occur north of the existing Vancouver UGA, along I-5 and around Battle Ground. Therefore, the Battle Ground, Evergreen and Ridgefield school districts would absorb the greatest impact. Additional school facilities would be required in the new residential areas.

b. Alternative 2

Alternative 2 would accommodate a lower overall population than Alternative 1 over the next 20 years, so the impact on schools would be less. In addition, the proposed areas of UGA expansion are more dispersed around existing UGAs, so impacts would be more evenly distributed.

c. Alternative 3

Alternative 3 would accommodate all expected growth within existing UGAs. As a result, this alternative would focus growth on existing school facilities. Some expansion of existing facilities or new facilities would probably be needed, but this alternative would make most efficient use of existing facilities.

d. Alternative 4

Alternative 4 would expand the Vancouver and Battle Ground UGAs substantially, while Camas, Washougal, Ridgefield and La Center would each have modest boundary expansions. The impact of this alternative would be felt most by the Battle Ground because it would absorb most of the population growth. New facilities would be needed to serve the new residential areas.

e. Alternative 5

Alternative 5 would expand the UGAs along the I-5 corridor, primarily to encourage and accommodate business growth. Nonetheless, substantial residential growth would occur in the Vancouver, Ridgefield and Battle Ground school districts.

3. Mitigation Measures

a. Plans and Ordinances

Clark County's school districts have revised their long-range plans to reflect the 1994 GMA Plans of the County and cities and will revise their plans to respond to the plan that is ultimately adopted. Schools are not a part of the concurrency management system of the County or any of the cities. However, local jurisdictions have adopted school impact fees on new development for all school districts, as allowed by state law.

The school districts have also asked local jurisdictions to balance land uses within school districts so that they have the tax base to support the schools. That is, each school district would like to have a balance of residential, commercial and industrial land uses.

Clark County: Schools are major employment centers, require urban levels of water and sewer service and fire protection, and generate high volumes of traffic. They are also a focus of community life and should be located in activity centers. Schools are not included in the County's concurrency management system. Goal 6.5 of the County's comprehensive plan is to coordinate with school districts to ensure that sites are constructed to meet the educational needs of county residents. Policy 6.5.1 focuses on mitigating land use impacts of school sites by requiring location with UGAs where possible, ensuring that facilities hook up to water and sewer services and that transportation facilities are adequate. Policies 6.5.2-6.5.4 encourage coordination between the County and school districts for efficient provision of school services

and use of facilities. School impact fees are provided for as a funding source in Policy 6.6.5. Capital Facilities Plans for the school districts are adopted by reference in Policy 6.5.6.

Battle Ground: The Battle Ground comprehensive plan recognizes that additional school capacity will be needed, but does not designate additional sites, because new schools are expected to be located in other parts of the district. Policy 1-C of the Battle Ground 1995 comprehensive plan states that the City will coordinate planning with special districts such as schools. The Battle Ground comprehensive plan does not address schools in its goals and policies in the interim draft goals and policies adopted in 2001.

Camas: The Camas School District expects to accommodate expected growth within existing facilities. The district has invested in new schools and remodeling of existing facilities over the past 10 years in anticipation of the growth allocated in the 1994 comprehensive plan. Some modernization and expansion of facilities may be needed in the long run, but not within the next six years.

La Center: The La Center School District plans to construct an additional elementary school and expand the high school and middle school as needed to accommodate growth, using bond issues.

Ridgefield: The city envisions only minor residential growth beyond that already planned for in their adopted plan. The Ridgefield comprehensive plan establishes policies to ensure that future school site and facilities projects are coordinated with both Ridgefield and Clark County land use plans. Goal 14 of the comprehensive plan calls for coordination with the Ridgefield School district to ensure that school sites and facilities are planned and constructed to meet the needs of residents. Policies 14.1 to 14.5 require coordination in reviewing plan amendment requests and between the Ridgefield capital facilities planning and school district facilities planning, identification of proposed general locations in the urban reserve areas where schools might be needed, and conformance with development standards. Impact fees for schools may be considered.

Vancouver: Vancouver, Evergreen and Camas School Districts serve most of the city. A very small area is served by the Camas School District. The City's Urban Capital Facilities Plan Element calls for coordination with school districts to plan for projected growth, but does not include schools in concurrency management. Vancouver's comprehensive plan does not specifically address school services in its policies, other than as it relates to expansion of schools into urban reserve areas. The plan also indicates that schools are a public service that should be adequate to serve new development at the time that it is occupied.

Washougal: Only small additional residential areas would be added to Washougal under any of the alternatives, so the city expects that existing facilities will be adequate to serve expected growth. Additional classrooms or remodeling may be required. Policy 1-C of the Washougal comprehensive plan states that the City will coordinate planning with special districts such as schools.

Yacolt: The Town of Yacolt is served by the Battle Ground School District. Because it does not have a sewer system, Yacolt is not expecting to accommodate additional residential development, beyond that already planned for in its adopted GMA Plan. The 1994 plan states that additional classroom facilities and teachers will be needed at all grade levels. School impact fees will be used to fund expansion.

b. Additional Mitigation Measures

The following policies could be adopted by local jurisdictions and school districts to reduce or eliminate any adverse impacts to school services caused by amendment of the growth management plan.

1. Cooperate with the school districts to ensure that school impact fees are adequate for the increased demand generated by growth.

2. Include schools as one of the public facilities under the concurrency management system mandated by the GMA.

3. Identify school site requirements as part of the designation of land for community facilities when planning for urban activity centers.

4. Assist the school districts to identify alternative sources and means of funding school facilities and educational programs. Such sources might include certificates of participation for funding new facilities and establishment of endowments or trust funds for special programs (e.g., arts and/or sciences)

5. Eliminate the requirement for a conditional use permit for new school facilities that are proposed within cities or UGAs.

D. Parks and Recreation

1. Setting

Clark County has been involved in park acquisition and development since the 1930s. The early years were active years, and almost half the County's park land was acquired before 1972. In 1960, a Park and Recreation Board was established and an effort to plan comprehensively for parks and recreation facilities began. Comprehensive Parks and Recreation Plans were adopted in 1965, 1971, 1981, and 1987. In 1995/96, the City of Vancouver and Clark County joined forces and created the Vancouver-Clark Regional Parks and Recreation Dept. A joint parks plan for the Vancouver urban area was adopted and updated in 2001.

a. Funding

Park land acquisition and development is funded locally either by park impact fees (PIF) or a real estate excise tax (REET) of one-quarter percent. In addition, the V-CPRD has aggressively pursued grant funding for acquisition and development. The REET is dedicated to curing park deficits in developed urban areas. PIF are used to acquire and develop parks in developing areas. Under these funding programs, 54 park sites have been acquired and 16 community and neighborhood parks have been developed. Another 13 park sites have been funded through REET and are scheduled for development within the near future. Neither of these funding sources can be used for on-going maintenance and operation costs. These are funded from the general fund or facility use fees, and represent the limiting factor on parks development and recreation programming in the county.

Clark County has adopted minimum standards for the number of acres of parks of different kinds necessary to maintain the quality of life and recreation opportunities desired by county residents. The types of parks as well as the existing standards are outlined below.

b. Regional Park System

The overall standard for the regional park system is 10 acres per 1,000 people. In 2000, the county population was 340,011, resulting in a need for 3400 acres of regional facilities. However, the V-CRPD owned only 2300 acres, indicating a deficit of 1,100 acres.

There are several types of regional facilities, the adopted standard for each of which is described below.

Regional Parks: These parks are intended to serve several communities within one hour driving time, although closeness to population centers is desired. They typically range in size from 100 to more than 325 acres. The desirable size is 200 acres or greater, although no minimum is recommended. The standard is 10 acres per 1,000 persons.

Regional Trails: The Clark County Trails and Bikeways System Plan identifies a comprehensive trail and bicycle system throughout Clark County that provides opportunities for non-motorized travel (walking, bicycling, skating, and horseback riding) to meet county recreation, fitness, and commuting needs. Acquisition and development is guided by public need and available funding.

Regional Special Facilities: Special facilities parks are typically located and developed to serve one or more recreational, historical, cultural, environmental, or educational activities. Facility standards and minimum sizes vary. Some special facility types do not have standards; however the facility and/or site must be large enough to accommodate the specific use.

Regional Conservation and Greenway Systems: Regional conservation and greenway systems are resource-based open spaces. They are acquired with the intent of little or no development. Conservation and greenway systems serve various functions, including protection of environmentally sensitive areas and wildlife habitat, wildlife viewing, environmental education, and trails. The availability of funding and the level of threat to identified, high priority lands determine the rate at which the open space plan is implemented.

Wildlife Habitat: Wildlife habitat is composed of land, water, vegetation, and other natural resources necessary to support fish and wildlife populations. Clark County has used several methods to map and/or designate its highest priority habitat and critical/sensitive lands (e.g. high-quality wetlands.) While these programs utilized different methodologies to identify high-priority wildlife habitat, the results produce similar or complementary findings and lead to consistent preservation priorities. Acquisition is based on the value of the resource, and on completing/protecting identified, value wildlife habitat.

c. Urban Park System

The urban park system consists of urban-level parks within UGAs. These properties include small neighborhood parks (3 to 5 acres), community parks (15 to 100 acres), and open space. The acquisition standard for the urban park system is 6 acres per 1,000 people. In 2000, the urban area population was 251,348. Therefore the amount of urban park land needed to meet standard was 1508 acres. V-CPRD owned 1526 acres, for a surplus of 18 acres.

The standard for developed parks is 4.25 acres per 1,000 people, or a total need of 1068 developed park acres in 2000. However, only 653 acres of the total owned by V-CPRD was developed in 2000, for a deficit of 415 developed park acres.

There are several types of urban parks, each with different standards, as described below. Table 66 shows existing parks acreage.

Neighborhood Parks: These parks are intended to serve residential areas within walking distance (one-third to half-mile radius) of the park site. The minimum desirable size for a neighborhood park is three to five acres and will not normally exceed 20 acres. The standard is 2 acres per 1,000 people. V-CPRD has 568 acres of developed neighborhood park and 336.71 undeveloped neighborhood park acres.

Community Parks: These parks serve groups of neighborhoods within a one- to three- mile radius of the park site. The minimum desirable site is 20 acres and will not normally exceed 100 acres. The standard is 3 acres per 1,000 people, or a total of 754 acres needed. Currently V-CPRD has 689 acres of developed park and 288.4 acres undeveloped. More community parks will be needed as the region grows.

Schools: Schools meet an important part of the recreational need for parks. Neighborhood and Community parks complement and expand on the services provided by school grounds. In certain areas,

neighborhood and community parks are located adjacent to schools or involve developing and upgrading the school site.

Urban Open Space: These are not parks in the traditional sense, but provide visual and psychological relief from areas of intensive development. Urban Open Space sites may or may not be improved, but can include trails, greenway corridors, community gardens, farmed areas, and areas within community or neighborhood parks which are left in their natural state. The county standard is 1 acre per 1,000 people.

Table 66. Existing Clark County Park Facilities (includes School & Drainage Land)

Park Type	Developed (acres)	Undeveloped (acres)
Neighborhood Parks	569	337
Community Parks	688	288
Regional Parks	417	1026
Conservation and Greenway	NA	1898
Open Space	NA	318
Regional Trails	NA	105

Source: Clark-Vancouver Regional Parks & Recreation Plan (2002)

US Forest Service: Approximately 1,087 acres of the Gifford Pinchot National Forest are located within Clark County. Forest Service lands provide a variety of recreational opportunities including camping, hiking, hunting, fishing, horseback riding, and snowmobiling.

National Parks Service: The Parks service operates the 209-acre Fort Vancouver National Historic Site, including a visitor's center and the reconstructed fort, play area and a parade ground.

US Fish and Wildlife Service: The Fish and Wildlife service manages the 5,149 acre Ridgefield National Wildlife Refuge, located in the Columbia River lowlands west of Ridgefield and the Steigerwald Lake Wildlife Refuge in Washougal. Recreational opportunities include wildlife observation, hiking, environmental education, fishing, and hunting in portions of the site.

Washington State Department of Fish and Wildlife: WDFW manages five wildlife and hunting areas and several public access areas on the County's lakes and rivers.

Department of Natural Resources: DNR is the largest public land owner in Clark County. Most of their land is forest land and is managed for timber production. However, within the Yacolt Multiple Use Area DNR has developed six camping or picnic areas in Clark County. DNR also manages Caterpillar Island and the Woodland Special Campground for the handicapped.

Washington State Department of Parks and Recreation: The department owns and manages four park sites in Clark County, including Battle Ground Lake, Paradise Point, Reed Island, and Wormald.

In addition, each city has its own parks and recreation facilities. Not all of the cities have adopted park standards, and some differ from those adopted by Clark County. Table 67 compares park standards for each jurisdiction.

Table 67. Park Standards for Each Jurisdiction.

Jurisdiction	Parks and Open Space Standard (acre/1,000 population)			
	Neighborhood	Community	Urban	Regional
Battle Ground	5.0	--	--	N/A
Camas	2.5	--	--	10.0
La Center				N/A
Ridgefield	2.5	2.5	2.5	N/A
Vancouver	2.0	4.0	6.0	10.0
Washougal	5.0	--	--	N/A
Yacolt	1.0	3.0	1.0	N/A
Clark County	2.0	4.0	6.0	10

Source: Vancouver-Clark Parks Master Plan; Camas Parks and Recreation Master Plan; Battle Ground Parks and Recreation Plan; Washougal Needs Assessment

While Clark County owns a substantial amount of park land, a large portion of it remains undeveloped, limiting recreational use. State and federal funds are available to acquire park sites. Sometimes these grants include the cost of park development. However, the cost of maintaining facilities (including landscape maintenance, building maintenance, and maintenance of roads, trails, and parking facilities, as well as maintenance of recreational facilities) is not covered in these programs.

2. Impacts on Parks and Recreation

Park standards would not change among the alternatives, but the distribution of parks and the cost of acquiring them would affect different jurisdictions with each alternative. Because park standards are based on population, new parks would be required under any of the alternatives. Alternative 1, because it would accommodate a higher population would require more park acquisition and development. Table 68 provides a comparison of the amount of additional urban park land required under each alternative by jurisdiction.

As urban areas are annexed to the cities, the County's role will shift from being a provider of urban parks to providing regional and rural parks and recreation. This eventuality has already been considered in the creation of the Clark-Vancouver Parks and Recreation Department and adoption of the updated master plan by the County and the City of Vancouver.

Table 68. Impacts on Urban Parks and Open Space Land Needs

Jurisdiction	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Battle Ground	244	122	62	153	133
Camas	31	28	23	28	30
La Center	--	--	--	--	--
Ridgefield	47	37	36	31	33
Vancouver	1,715	1,249	974	988	1,307
Washougal	25	34	20	18	21
Yacolt	2	2	2	2	2
Clark County	460	454	473	392	406
Total	2,524	1,926	1,590	1,612	1,932

Source: Calculated based on adopted standards and GIS information from Clark County Department of Assessment and GIS.

a. Alternative 1

Alternative 1 would have both more population growth and a more dispersed development pattern than the other alternatives. Most of the growth would occur to the north of Vancouver and southwest of Battle Ground. Additional facilities of all types would be required, because this area does not currently have much in the way of developed park land.

b. Alternative 2

Alternative 2 would have a more compact urban development pattern, with most growth occurring in areas that have already been identified for urban development. Most of the land added to UGAs would be designated for commercial and industrial development, with some multi-family housing and mixed use development nearby. As a result, most parks would be located within existing UGAs and land already purchased for park development would serve much of the need.

c. Alternative 3

Alternative 3 would not move the urban growth boundaries at all. As a result, development would occur as infill on passed over parcels. This could increase competition for land and increase the cost of providing parks and other public facilities. However, land that has already been acquired for parks would be more efficiently used under this alternative.

d. Alternative 4

Alternative 4 would result in a substantial increase in the UGA for the city of Battle Ground. As a result, the City would need to make a substantial investment to meet adopted parks standards as growth occurs. Facilities would be needed on the north, west and south side of town, where growth is expected to focus. The Vancouver and Camas UGAs would also increase, resulting in a need for additional parks and open space in these communities also. However, the majority of the additional population growth would occur in Battle Ground.

e. Alternative 5

Alternative 5 would expand the UGA primarily in the I-5 corridor in order to provide land for businesses. Population growth would occur within and adjacent to existing UGAs. The cities of Battle Ground, Vancouver, and Ridgefield would all expand and need to provide additional parks.

3. Mitigation Measures

a. Plans and Ordinances

In their individual comprehensive plans, Clark County and the cities have established policies for provision of parks and open space to accommodate new development and enhance the quality of life in urban areas. The following discussion summarizes the ways that each jurisdiction intends to meet adopted standards.

Clark County: County standards for parks and open space are discussed above. The recently updated master plan includes interim objectives and financing mechanisms to ensure that the County can provide parks and recreation facilities at the adopted level of service. Chapter 8 of the comprehensive plan is the Parks, Recreation and Open Space element. Goal 8.1 and the associated policies discuss provision of parks in the urban areas in coordination with the cities according the priorities established by the respective comprehensive plans. Other goals and policies concern the types of parks and open space to be considered for acquisition and methods and criteria for acquisition and consistency with the County's current Parks and Recreations Master Plan.

Battle Ground: Battle Ground's plan estimates a need for 15 neighborhood parks or approximately 75 additional acres of park space by the year 2018, and includes policies for coordination with the County to acquire and designate potential park and recreation land within the city's UGA before development occurs and it is annexed. The draft interim policies adopted in 2001 have several goals, objectives, and actions relating to parks, open space, and trails. Unlike the 1995 plan, the interim goals do not set specific goals for parks per population forecasts, but state that the City will establish criteria for park development and determine the appropriate number, location, and size for future neighborhood, community, and pocket parks. The City envisions a network of parks and open space that includes valuable wetlands, drainage greenways (such as Salmon Creek) and regional parks connected by a series of bicycle and pedestrian paths.

Camas: The recently adopted Parks and Recreation Plan identifies a need for 483 acres of total park land in the next twenty years. Acquisition and development of parks would be funded through a variety of sources including impact fees, REET, state and local grants, and the general fund.

La Center: La Center recently completed a 12-acre community park that includes a variety of recreational facilities. The city indicates that it has adequate park facilities to serve expected growth. Chapter X of the comprehensive plan concerns Parks and Open Spaces and adopts the National Park standards (Policy 1). Policies call for coordination with Clark County and other agencies for preservation of recreation values of the East Fork Lewis River, implementation of the Parks and Recreation Master Plan, and exploration of park impact fees as a revenue source.

Ridgefield: Ridgefield expects only a minor amount of residential development, beyond that already anticipated in their adopted plan. As a result, no additional park land, beyond that already identified will be needed. Goal 15 of the comprehensive plan ensures that park land is acquired and developed to meet the needs of residents. Policies 15.1 – 15.3 require coordination between the city and the county in developing parks and trails systems. Policy 15.4 requires identification of proposed general locations in the urban reserve areas where parks might be needed, and conformance of park development proposals with current development standards. Impact fees for parks may be considered. Policy 15.6 establishes a level of service of 7.5 acres per 1,000 increase in population, requiring 45 acres for neighborhood and community parks through 2013.

Vancouver: As a part of the recently updated master plan, the City of Vancouver has identified the means that will be used to acquire additional land and develop those parcels that are not yet developed as parks. The REET will be continued and the city anticipates an aggressive program of seeking grants, donations, bond issues and trust funds to support parks acquisition and development. The Open Space and Recreation element of the comprehensive plan has policies to provide for parks and open space and protect them from incompatible uses. P27 calls for land to be set aside for recreation purposes during the site planning process for new residential development. P34 calls for maintaining adequate levels of service for pen space, parks and recreational facilities and programming.

Proposed new policies for the comprehensive plan address several park issues. Policies call for providing and maintaining parks services, providing a regional system of trails, coordinating with other agencies and entities, and provide for impact fees or provision of land through the development review process.

Washougal: Washougal anticipates only minor additional residential development, beyond that already planned for in their adopted plan. As a result, no additional park land, beyond that already identified will be needed. Chapter 5 of the comprehensive plan addresses standards for and types of parks for the city. Goal 1 is to satisfy the recreational needs of citizens. Policy 1-A states the city shall endeavor to provide for projected needs for additional parks and facilities. Policy 2-A states that the City will develop a specific ordinance to address the retention of open space for future generations.

Yacolt: Yacolt is not proposing any additional residential development since it does not have a sewer system to support it. Therefore, no additional parks facilities would be needed.

E. Libraries

1. Setting

Fort Vancouver Regional Library District (FVRLD), headquartered in Vancouver, Washington, was established in 1950 as the first inter-county rural library district in the state. The district has grown since 1950 to serve all of Clark, Skamania and Klickitat Counties and the city of Woodland in Cowlitz County. The City of Camas has its own library, located in downtown near City Hall, that was recently remodeled and expanded to better serve that growing community.

With twelve branch libraries, three bookmobiles, a Vancouver operations center, and dial-up and Internet access to electronic services, FVRLD provides information resources and services, and community and cultural events for a population of more than 365,000 residents. The 4,200-square mile service area includes farm, open range and national forest lands, communities along the Columbia River, small towns and expanding urban and industrial areas.

National library standards are not widely used to establish levels of service because local conditions vary so greatly nationwide. Standards in general use, and those used by Fort Vancouver Regional Library System (FVRLS) indicate that there should be 0.50 square feet of library space per capita. Currently, FVRLD provides a total of 69,400 square feet of library space in seven Clark County branches, which translates into a ratio of 0.19 square feet per capita.

FVRLD is in the process of updating their capital facilities plan. The draft plan proposes to divide the district into an Urban Service Model and Rural Service Model. Urban Service areas (largely the greater Vancouver UGA) would grow from the current public service space of 58,700 square feet to a proposed range of 163,000 – 193,000 square feet over the next 20 years. This would create a library service standard range of 0.49 to 0.58 square feet per capita. Rural Service areas would grow from the existing 8,325 square feet to 37,750 square feet in 2020 increasing the library service standard from the existing 0.09 square feet to an estimated 0.2 square feet per capita.

2. Impacts on Library Services

Library service demand is directly related to population. As the population of the County increases, demand for library service will increase. The differences in impact of the various alternatives relate to differing growth projections (Alternative 1 would accommodate more growth than the other alternatives under consideration.) and the location of proposed growth. Expected impacts of each alternative are discussed below.

a. Alternative 1

Alternative 1, because it would accommodate more growth, would increase impacts on FVRLD. More library facilities, staff and resource materials would be needed in order to meet proposed level of service standards. In addition, the dispersed development pattern would make it necessary to develop additional facilities to serve new library users.

b. Alternative 2

Alternative 2 also would expand the UGA for Vancouver, Battle Ground and Camas, but not as much as Alternatives 1, 4 or 5. As a result, library users would be closer to existing facilities, making efficient use possible.

c. Alternative 3

Alternative 3 would accommodate all expected growth within existing UGAs, largely by in-fill development on passed over lots. While this would encourage efficient use of existing facilities, it could increase competition for available land, making it more expensive to develop new library facilities.

d. Alternative 4

Alternative 4 would see major increases in the Battle Ground UGA, as well as substantial expansion of the Vancouver and Camas UGAs. Most of the expected additional population growth above that already planned for would be accommodated in the city of Battle Ground. This would increase demand for library services in that community and necessitate expansion of facilities as well as purchase of new materials.

e. Alternative 5

Alternative 5 would expand the UGAs mostly along the I-5 corridor in order to provide land for businesses, in order to better balance jobs and housing in the county. While commercial and industrial development does not generate as much library demand as household growth does, there would also be an impact. Under this alternative, Battle Ground and Vancouver UGAs would expand, but not as much as Alternative 4.

3. Mitigation Measures

a. Plans and Ordinances

None of the cities and towns or Clark County includes library services in the concurrency management system. Funding for FVRLD comes from property taxes, fees and donations.

4. Additional Mitigation

The following mitigation measures could be adopted by the County and cities and towns in order to assist FVRLD to meet the increased demand from expected growth.

1. Include library facilities in the planning for community facilities in planning for downtown development and urban activity centers.
2. Permit libraries to locate their facilities in coordination with local school districts, not only within designated UGAs, but also in urban reserve areas.
3. Provide land for libraries in or adjacent to urban parks (neighborhood or community parks).
4. Assist FVRLD to identify alternative sources and means of funding new facilities and outreach programs. Such sources might include certificates of participation for funding of new facilities and establishment of endowments or trust funds for special programs.

F. General Government

General government buildings house the staff that operate each city and town, and include offices, public works yards, and maintenance facilities. As cities and towns grow, more staff is required to provide services to residents and maintain city/town facilities. As a result, more general government space is needed.

1. Impact on General Government Facilities

General government buildings are not included in the concurrency management system. Government staff growth is more related to program mandates than to population growth.

After the 1994 comprehensive plan was adopted, Clark County completed a facility plan for all its operations and the result is the new office building to house County staff currently located in rental facilities around the Courthouse. No additional office space will be needed is expected to be needed over the next 10 years at least.

The City of Vancouver will also locate some staff (transportation planning and design) in the new County office building, but, based on historic trends, may need additional facilities over the next 10 years.

The City of Battle Ground expects to need additional space to serve the much greater population and employment base under Alternatives 1, 4 and possibly 5.

The City of Camas is expects to remodel its city hall over the next five years in order to provide for growth and changing state mandates.

The City of Washougal may have to expand its city hall to provide facilities for staff expansion as it grows over the next 20 years.

2. Mitigation Measures

None needed.

G. Solid Waste

1. Setting

Transfer stations serve as centralized collection points for solid wastes collected by licensed trash haulers. They also provide for the collection of additional solid wastes, such as source-separated recyclable materials (not collected by curbside programs), yard debris, household hazardous waste (HHW), certain sludge, bulky waste, asbestos and other special wastes.

Central Transfer and Recovery Center (CTR) is located at 11034 N.E. 117th Avenue (SR 503). CTR includes a 40,000-square-foot transfer building with a hydraulic compactor unit, a 13,000 square feet building for use as a drop-off area for HHW and source-separated recyclable materials. CTR serves primarily the northern Vancouver urban area, outlying rural areas and the cities of Camas and Washougal.

The West Van facility is located at 6601 NW Old Lower River Road, on the west side of Vancouver. Most of the waste delivered to this facility is generated in west and north Vancouver. This facility functions as a transfer station and materials recovery center. West Van includes an 82,000-square-foot main building, entry and exit scales, control facilities, a truck wash facility, a container and drop-box storage area, administration and employee buildings, a six-acre C & D processing and composting area and a stormwater detention and treatment area.

Clark County does not have a licensed landfill within its boundaries. Municipal solid waste delivered to CTR and West Van is end-loaded by hydraulic compactor units into shipping containers which are transported directly to the barge-loading facility at Tidewater Barge Lines. They are then shipped upriver for final transport to the Port of Morrow and ultimately the Finley Buttes Landfill. Tidewater Barge Lines is the contracted transport company.

2. Impacts

Both CTR and West Van have been designed to receive and transfer up to 438,000 tons per year of solid waste (250,000 tons of solid waste were received during 2001). Under interim emergency conditions, either facility is designed to handle the entire projected year 2011 flow of municipal solid waste within Clark County. This full backup capability is expected to last throughout the 20-year planning period

covered in the comprehensive plan. The current system has been designed with flexibility to respond to changes in population and economic growth and in the behavior of residential and non-residential waste generators. It is essential for the waste transfer system to maintain an acceptable "level of service" during the 20-year planning period covered by the comprehensive plan.

The loading and unloading capacity of the existing crane at the Port of Morrow is approximately 15 containers per hour, or 330 containers per day during a three-shift work day. During the two weeks each year when the navigation locks on the Columbia River are closed for routine maintenance, or in the event of unanticipated locks closures, containers can be shipped by truck or train.

Each shipping container holds approximately 30 tons of municipal solid waste and has an internal volume of approximately 90 cubic yards. The existing staging yard behind the dock has a storage capacity of approximately 500 containers. Two sizes of barge systems are used for transport. The smallest barges carry up to 36 containers; the largest carry up to 80 containers. Based on the tonnage of non-recycled waste exported to Finley Buttes Landfill, the average number of loaded shipping containers transported upriver and through the Port of Morrow was about 150 containers per week in 1998.

Finley Buttes Landfill is located in Morrow County, Oregon, approximately 180 miles east of Clark County and approximately 12 miles south of Boardman, Oregon. The facility is owned and operated by Finley Buttes Landfill Company and is the designated disposal site for municipal solid waste generated within Clark County. The landfill is designed, constructed and operated to be in compliance with all requirements of the Oregon DEQ and EPA Subtitle D MSW landfill requirements.

The projected life of the current permitted landfill exceeds the 20-year period covered by this plan. Finley Buttes Landfill occupies a permitted 510-acre site. The estimated available fill capacity at the site, as currently permitted by the Oregon DEQ, is 90 million tons of municipal solid waste. The design of the landfill incorporates features to protect groundwater and surface water, prevent soil erosion, provide fire protection, allow ease of access and manage and control landfill gas and leachate. The site is designed to be compatible with the surrounding land use, both during the active life of the landfill and after the landfill closes.

A backup disposal facilities plan was submitted to the County by CRC in 1992. The plan describes the designated alternative disposal sites if Finley Buttes Landfill ceases operations, either temporarily or permanently. CRC has backup disposal agreements with both Columbia Ridge Landfill in Gilliam County, Oregon, operated by Waste Management, Inc., and Roosevelt Regional Landfill in Klickitat County, Washington, operated by Allied Waste. In addition, a landfill in Wasco County, Oregon is owned and operated by Waste Connections Inc. Both truck and rail transport are available to these backup sites.

3. Mitigation Measures

Mitigation measures are not required, since the existing system has the capacity to accommodate all expected growth. However, in the interests of the long-term health of the system, each jurisdiction could adopt waste reduction measures and encourage additional recycling. The county's recycling rate is estimated at 35% with a recovery rate of 45%.

H. Sanitary Sewer

1. Setting

Several jurisdictions and public agencies provide sanitary sewer services in Clark County. These include the cities of Battle Ground, Camas, Ridgefield, Vancouver, Washougal, CPU, and Hazel Dell Sewer District. CPU operates La Center's sewer system under contract and provides septic system monitoring for the Yacolt. Generally, urban sewer service areas include all locations within the city limits and may

include portions of unincorporated Clark County. The Hazel Dell Sewer District serves unincorporated areas, and uses a county-owned and operated a regional treatment facility to treat its wastewater. Figure 44 shows the service areas for each sewer provider and the location of existing treatment facilities. Table 69 summarizes all treatment facilities in Clark County.

Interlocal agreements between local sewer service providers determine the service areas for each jurisdiction. When a local sewer provider determines they can provide the best service to a particular area, then that area is reassigned to that service provider and formalized through mutual service agreements.

While new developments within a jurisdiction's UGA are required to connect to the local sewer system, urban areas currently not served by sewer and rural areas still utilize septic systems. Since 1974, septic systems have been regulated through the Southwest Washington Health District (now Clark County Health Department). Septic systems are the dominant sewer systems outside the UGA and within Urban Holding areas where higher density developments are prohibited.

Table 69. Sewage Treatment Facilities

Agency	Type of Treatment	Design Capacity Average Flows (MGD)	Average Daily Flow 2001 (MGD)	Min. Average Daily Flow 2001 (MGD)	Max. Average Daily Flow 2001 (MGD)	Sludge Disposal Method
Clark County						
Salmon Creek Plant	Secondary/Activated sludge treatment	10.3	5.8	5.4	9.4	Land Application
Hazel Dell Sewer District	N/A	Uses SCWTP				N/A
City of Battle Ground	N/A	Uses SCWTP				N/A
City of Camas	Secondary/Activated sludge treatment	6.1	1.6	0.8	5.3	Land Application
City of La Center	Secondary/Activated sludge treatment	0.3	0.8	0.1	0.2	Transferred to SCWTP
City of Ridgefield	Secondary/Activated sludge treatment	0.70	0.2	0.1	0.3	Land Application and Silviculture
City of Vancouver						
Westside	Secondary/Activated sludge treatment	21.3	11.0	9.5	12.6	Incineration at the Westside Plant. Ash disposed of at the Boardman Landfill
Marine Park	Secondary/Activated sludge treatment	16.0	9.0	6.9	11.0	
Industrial Pretreatment	Secondary/Lagoons Flaculative treatment	3.2	2.4	2.1	3.0	
City of Washougal	Secondary/Lagoons	2.3	0.9	0.8	1.4	Land Application
City of Woodland	Secondary/ Rotating Biological Contact treatment	N/A	N/A	N/A	N/A	N/A

Sources: City of Camas, 2002; City of Camas Wastewater Facility Plan, 1997; City of Battle Ground, 2002; General Sewer Plan for the City of Battle Ground, 2000; City of Ridgefield, 2002: Facility Plan for the City of Ridgefield, 1997; City of Washougal, 2002; City of Washougal Needs Analysis, 2001; Clark County Public Works Department, 2002; Clark County Resource Document, 1992.

a. Clark County

Clark County does not collect wastewater, but operates a treatment facility that is used on a contract basis by service providers that operate collection systems. The County's local collection system was transferred to the Hazel Dell Sewer District in 1993, although the County does still maintain and operate the eight-mile long wastewater interceptor for the Hazel Dell Sewer District and the City of Battle Ground.

Clark County operates the Salmon Creek Wastewater Treatment Plant (SCWTP) near the confluence of Salmon Creek and Lake River. The SCWTP is an activated sludge facility that provides secondary treatment prior to discharge into the Columbia River. The Clark County Health Department regulates sludge application.

The SCWTP has undergone two expansions in the last ten years to provide adequate service for the rapidly growing service area. Constructed in 1974 with an original treatment capacity of two million gallons per day (MGD), the treatment plant was last expanded in 1999 to 10.3 MGD, and is currently at 75 to 80 percent capacity. The City of Battle Ground and the Hazel Dell Sewer District are currently the only treatment plant users. The City of Battle Ground transfers all of its wastewater to the SCWTP for treatment on a contract basis, while the Hazel Dell Sewer District also has a contract that allows it to transfer approximately 80 percent of its wastewater.

b. Hazel Dell Sewer District

The Hazel Dell Sewer District serves approximately 19,400 customers in unincorporated Clark County. The SCWTP provides approximately 80 percent of the District's treatment needs, while the City of Vancouver treats the remaining wastewater at its Westside Wastewater Treatment Plant.

c. Battle Ground

The Battle Ground sewer system serves approximately 9,000 customers in the Battle Ground service area.

The City of Battle Ground owns, operates, and maintains its collection lines and mains. Two other collection systems located adjacent to the Battle Ground UGA (Meadow Glade and Hockinson) are owned and operated by the Hazel Dell Sewer District. These are Septic Tank Effluent Pump (STEP) systems.

The City of Battle Ground conveys all of its wastewater to the SCWTP for treatment and disposal. An interlocal agreement allows the city to use 18 percent of the treatment plant's capacity. Wastewater flows are sent to the SCWTP via a wastewater transmission system that was activated in April 1993 when the Battle Ground Wastewater Treatment Plant was abandoned. The transmission system serves the Battle Ground and Cedars collection systems, and also serves Meadow Glade and Hockinson systems located outside of the Battle Ground UGA and within the Hazel Dell Sewer District.

d. Camas

The Camas sewer system serves approximately 13,000 customers in the Camas service area. The City of Camas provides wastewater service to all areas within the city limits and to areas west and north of the city limits within the city's UGA.

The City of Camas operates its own complete mix activated wastewater treatment plant. The Camas treatment facility is operating at approximately 43 percent of its capacity.

Since 1985, the City of the Camas has used STEP systems for new residential, commercial, and industrial connections to the sewer systems. The STEP systems are designed to settle the majority of suspended solids, which remain in the tank for three to five years. When the tank reaches capacity, the solids are

pumped out and sent to the treatment facility. Use of a STEP system has not deterred residential or commercial development; however, the city is pumping the settling tanks more frequently as use increases.

e. La Center

The La Center sewer system serves approximately 1,665 customers in the La Center service area. CPU owns and operates the city's sewer collection system and treatment plant.

The collection system for the city of La Center was constructed in 1967 and rehabilitated in 1988 to reduce the amount of infiltration and inflow. The wastewater treatment plant uses an activated sludge process and provides secondary treatment. Sludge is stored on-site and is then transported to the Clark County Treatment Facility where its is disposed of with the county's sludge. The plant discharges treated effluent to the East Fork Lewis River. The La Center treatment facility is currently operating at approximately 60 percent capacity.

f. Ridgefield

The Ridgefield sewer system serves approximately 2,300 customers in the Ridgefield service area. The service area includes all land within the city's UGA, although most of the area is rural and relies on septic systems. The city sewer system serves areas with higher densities located within the city limits. There is currently no industrial discharge into the city's wastewater system. The existing facility is generally adequate to handle wastewater; however, the mainline into the treatment plant is undersized and needs to be replaces with a larger pipe.

The Ridgefield wastewater treatment facility is an extended aeration activated sludge plant that was constructed in 1959 and expanded in 2002. The plant is designed to treat 0.70 MGD and is currently operating at approximately 30 percent capacity. The plant generally meets residential needs, but is often overloaded during heavy rainfall.

g. Vancouver

The City of Vancouver provides wastewater collection and treatment services to approximately 142,000 customers within the Vancouver city limits and some unincorporated areas. This includes portions of the Hazel Dell Sewer District north of the city limits and the Orchards areas northeast of the city limits. The service area includes three major drainage basins: Burnt Bridge Creek, Columbia Slope, and the Fisher/Lacamas, and the minor Westside Lowlands basin.

The City of Vancouver operates two wastewater treatment facilities and one treatment facility for industrial waste. The Industrial Pretreatment Lagoon treatment facility is currently operating at approximately 75 percent capacity.

Residential and commercial wastewater flows can be shifted between the Westside Treatment Plant and the Marine Park Treatment Plant depending on available capacity. In addition to treating the city's wastewater, the Westside Treatment Plant also treats wastewater from the Hazel Dell Sewer District. The Marine Park Treatment Plant receives flows from the southeasterly section of the city, that is primarily residential wastewater. Both treatment plants release treated water into the Columbia River.

As of 2001, the Westside Treatment Plant treated is operating at approximately 40 percent capacity. The Marine Park Treatment Plant is operating at approximately 56 percent capacity.

The City of Vancouver incinerates its sludge at the Westside facility. Ash is deposited at the Boardman landfill, which is designed specifically for handling this type of waste.

h. Washougal

The Washougal sewer system serves approximately 3,600 customers in the Washougal service area. The City's wastewater treatment facility is capable of treating approximately 2.25 MGD. In 2001, the Washougal facility was operating at approximately 41 percent capacity. Once treated, the effluent is released into the Columbia River. The City applies sludge to land leased from the Port of Washougal.

i. Yacolt

There is no public sewer service in Yacolt. All existing development is served by on-site septic systems. The City recently adopted a sewer plan that includes a small monthly fee to inspect individual septic systems and ensure that they are operating properly. CPU performs these inspections. Eventually, the town plans to construct a local sewer system and treatment facility.

j. Septic Systems

Septic systems are used extensively throughout Clark County for wastewater treatment and disposal. The Clark County Health Department administers the permit process, although prior to 1959 no permit was required and there is no permit database prior to 1986. Septic systems are the primary method of sewage disposal in the suburban and rural areas of the county. They are also still used within the urban service areas of the county, and within some cities' municipal limits.

Septic systems were virtually unregulated until 1974 when the Southwest Washington Health District began regulating the installation of septic systems. Some communities and homeowners associations that use septic systems have implemented maintenance agreements to inspect and maintain septic systems. The City of Vancouver estimates that there are 7,000 septic systems within the Vancouver Sewer Service area. The health district has a schedule of regular inspections and maintenance for these septic systems that is funded by a dumping fee collected by the City. Yacolt contracts with CPU to perform regular inspections of septic systems in its water service area.

Prior to 1979, Clark County policy allowed installing septic systems on urban lots and in subdivisions within the urban area. Now, new urban subdivisions are only permitted if sanitary sewer serves them. The County does still allow construction on individual large lots to be on septic systems within an urban area if sewer is not readily available. A large lot is defined as being double the allowable minimum lot size or larger.

The Southwest Washington Health District estimated that there are approximately 7,000 septic systems in use within the urban Vancouver Sewer Service Area. SWWHO has a scheduled inspection and maintenance program for septic systems, which is funded by a dumping fee collected by the City of Vancouver. In the Hazel Dell sewer service area, it is estimated that there are between 15,000 and 20,000 septic systems in use, with approximately 40,000 septic systems in the entire county.

2. Impacts on Sanitary Sewer Systems

Sanitary sewer service is one of the urban services that the County includes in its concurrency management system. Under all alternatives, public sewer service would be limited to urban areas, as required by GMA. Rural areas would continue to rely on septic systems.

Impacts on sewer service are directly related to population and employment growth. Table 70 summarizes the impacts of each alternative, showing the impact if each alternative develops to full capacity. Sewage generation factors are based on observed flow data from the City of Vancouver of 250 gallons per day (GPD) per household, 700 GPD per acre of commercial development, and 350 GPD per acre of industrial development.

Table 70. Additional Sewage Generated under Each Alternative (gallons per day)

Jurisdiction	Capacity Alternative 1	Capacity Alternative 2	Capacity Alternative 3	Capacity Alternative 4	Capacity Alternative 5
Battle Ground					
Residential	5,015,250	2,502,250	1,266,500	3,158,500	2,737,250
Commercial	108,942	178,249	71,916	219,923	244,648
Industrial	37,081	728,060	24,478	74,856	999,268
Total	***5,161,273***	***3,408,559***	***1,362,894***	***3,453,279***	***3,981,166***
Camas					
Residential	1,282,000	1,162,750	954,000	1,161,750	1,249,250
Commercial	247,655	219,525	199,496	265,920	262,739
Industrial	84,296	896,651	67,904	90,513	1,073,160
Total	***1,613,951***	***2,278,926***	***1,221,400***	***1,518,183***	***2,585,149***
Hazel Dell	**Included in Vancouver totals**				
Residential					
Commercial					
Industrial					
Total					
La Center					
Residential	263,250	229,750	229,750	232,000	234,250
Commercial	27,385	9,741	9,741	9,766	34,591
Industrial	9,321	39,788	3,316	3,324	141,288
Total	***299,956***	***279,279***	***242,807***	***245,090***	***410,129***
Ridgefield					
Residential	644,500	502,750	497,250	427,750	455,000
Commercial	105,836	61,479	78,924	61,380	120,622
Industrial	36,024	251,111	26,864	20,892	492,681
Total	***786,360***	***815,340***	***603,038***	***510,022***	***1,068,303***
Vancouver					
Residential	14,710,500	10,711,250	8,346,250	8,470,000	11,204,750
Commercial	1,970,332	1,675,089	1,514,781	2,123,482	1,961,709
Industrial	670,653	6,841,912	515,595	722,782	8,012,613
Total	***17,351,485***	***19,228,251***	***10,376,626***	***11,316,264***	***21,179,072***
Washougal					
Residential	506,500	699,500	404,000	371,500	432,500
Commercial	108,942	26,515	33,249	23,781	54,223
Industrial	37,081	108,301	11,317	8,095	221,473
Total	***652,523***	***834,316***	***448,566***	***403,376***	***708,196***
Countywide	**30,833,259**	**27,797,653**	**14,639,207**	**17,835,751**	**32,288,115**

Source: Calculations based on County GIS data.

a. Alternative 1

Alternative 1 would accommodate more growth than the other alternatives, and so would generate more sewage to be collected and treated. Much of the area that would be added to UGAs is outside current sewer service boundaries, so it would be necessary to reach agreement on which is the most appropriate agency to serve it. If the area is served by Hazel Dell or Battle Ground, the SCWTP and the 8 miles of interceptor sewer along Salmon Creek would have to be expanded or another treatment plant constructed to serve the area. The cost of upgrading the SCWTP and interceptor is estimated to exceed $40 million.

In addition to expanding treatment plant capacity, new collection systems would have to be installed in much of the area. The terrain along and west of I-5 is hilly and criss-crossed with ravines. Pump stations

would be required to move the sewage over hills and streams to the main collection system. Hazel Dell Sewer District has indicated that the area west of I-5 would be a good candidate for using STEP systems. Assuming this is done, the total cost for the sewage collection system in Alternative 1 is estimated as $104 million.

b. Alternative 2

Alternative 2 would involve a less extensive expansion of the UGA, and largely in areas already designated as urban reserve areas. As a result, the sewer service agencies have included eventual urbanization of much of this area in their planning to date. New sewer mains would be required in the area around WSU and Battle Ground, but not as extensive as in Alternatives 1, 4 or 5. The additional area could be served by the SCWTP with only minor expansion, and that expansion would not have to occur until 10 or more years out. The total cost of extending service to this alternative is estimated to be $61 million.

c. Alternative 3

Alternative 3 would not expand the UGAs, and so would not require planning and construction of sewer collection facilities beyond the area already covered in sewer provider plans. This alternative would make most efficient use of existing systems. Some sewer mains might have to be replaced over the twenty-year life of this alternative to support higher intensity use and new lines will be needed in some areas. Treatment plant capacity would need to be expanded to accommodate expected to be adequate to serve the projected growth with planned improvements. The overall cost of serving expected growth is estimated at $33 million.

d. Alternative 4

Alternative 4 would also involve a large expansion of existing UGAs, predominantly in the Battle Ground area. Since much of this area has a high water table, extensive use of septic systems is not appropriate. The Meadow Glade area has converted to a STEP system, and at a minimum, new development would be expected to develop with STEP or sewer systems. Additional cost can be expected for piping sewage across Salmon Creek for treatment, or the City of Battle Ground could construct a new treatment plant to serve the area. Expansion of the SCWTP and interceptor sewer or construction of a new treatment plant for the City of Battle Ground would be required for this alternative. The total cost of providing sewer service to this alternative is estimated as $ 67.9 million, and assumes that the City constructs a new treatment plant.

e. Alternative 5

Alternative 5 would direct growth along the I-5 corridor, primarily to provide additional land for businesses in order to encourage employment growth. Most of the area proposed for addition to UGAs is not currently served by public sewer systems. New facilities would be needed to collect and carry sewage from the La Center Junction to the treatment plant located on the Lewis River adjacent to town. A new collection system would also be required to serve the Ridgefield Junction area, possibly including a treatment plant.

If the cities of Ridgefield and La Center cooperate in the construction of a single treatment plant to serve both the La Center Junction and Ridgefield Junction areas, the cost of transmission to existing plants and upgrade of these plants could be avoided. The terrain along and west of I-5 is hilly and criss-crossed with ravines. Pump stations would be required to move the sewage over hills and streams to the main collection system. Hazel Dell Sewer District has indicated that the area west of I-5 would be a good candidate for using STEP systems. Assuming this is done, the total cost for the sewage collection system

in Alternative 5 is estimated as $88.1 million. If it is necessary, expansion of the SCWTP and interceptor sewer to serve this development could cost in excess of $40 million, for a total of $128.1 million.

3. Mitigation Measures

Sewer service must be included in concurrency management programs under the GMA, and policies for providing sewer service concurrent with new development within UGAs are established in all of the comprehensive plans. Additional mitigation measures that would reduce the impacts of growth on sanitary sewer services, are also highlighted.

a. Plans and Ordinances

Clark County: Goal 6.1 is to ensure that necessary and adequate capital facilities and services are provided to all development in the county consistent with the comprehensive plan. General policies under that goal establish the County's role as coordinator and provider of regional facilities, including assisting in siting essential public facilities. Goal 6.3 is to provide sewer service within UGAs efficiently at least public cost. Policies under that goal call for new development in the UGAs to be served by connection to a public sewer system. Several policies regard septic systems and planned-for conversions to public sewers. Regular inspections of septic systems are required in wellhead protection areas (6.3.4). Policy 6.3.6 calls for working to implement a mandatory system of inspection and maintenance. Policies also restrict public sewer service to UGAs, except for parks, and to expand treatment facilities to meet current and future demands within UGAs (6.3.7 to 6.3.9).

Battle Ground: New draft interim goals and policies adopted in 2001 state that the City will work to provide adequate urban services concurrently with development (GM01.4). The City will identify urban services that need concurrency requirements and review existing ones and adjust as needed (GMA1.4.1). Action GMA2.1.2 states that the City will determine the infrastructure needs for future growth areas to the south and west and plan for that infrastructure. Goal CFG1 relates to the sustainable provision of capital facilities and policies under that goal call for developing capital facilities plans and review the development code to ensure consistency with them. Goal CFG2 and objective CFO2.1 states that the city will require concurrent provision of capital facilities.

Camas: Camas has policies for water and sanitary sewer in its 1994 comprehensive plan. They include working with eliminate private systems, encouraging connecting to public systems, and prohibiting construction of new private wells and subsurface sewage disposal systems. Plans for providing services will be coordinated with plans for designation of UGAs, rural uses, and for the transition from rural to urban uses. Services are to be planned to maximize efficiency and cost effectiveness and ensure concurrency. Public sanitary service will be permitted only in urban areas.

La Center: Policies 9-11 of Chapter VI of the comprehensive plan concern development and adoption of levels of service standards for sanitary sewer, domestic water, and stormwater facilities serving new development in the UGAs and approval of proposals based on concurrent provision of those services to the standards. Public sewer is not to be extended outside the UGA except in health emergencies, and all new construction shall connect to public sewer and water, with some exceptions.

Ridgefield: Goal 10 of the Ridgefield comprehensive plan is to provide the key public utilities required to support planned urban development efficiently and at least public cost. Policy 10.2 requires the City to develop levels of service for sanitary sewer and domestic water facilities serving new development within the UGA. Policies also call for the City to provide sanitary sewer service to the UGA, to work to eliminate private sewer systems, to require all new construction in the UGA to connect to the City's sewer system (except for single-family development on existing lots), and a commitment to develop a gravity flow system in the long-term to serve the UGA.

Vancouver: Existing plan policies P82 – P85 deal with provision of sanitary sewer service. New on-site sewage treatment systems are discouraged in the urban area (P82). Policy P83 recommends conversion of on-site systems to sewer when available. P84 states that regular inspections of on-site sewage treatment systems should be conducted in the Vancouver urban area. Extension of public sewer service beyond the Vancouver urban area should not be permitted (P85).

New draft policies on sewer service are proposed for the comprehensive plan. In general, sewer is considered a necessary public service and the city ensures that sewer facilities are in place prior to occupancy of development. Level of service standards and locational standards are to be based on local land use designations and nationally-recognized standards. A specific sewer policy would eliminate health hazards from domestic and industrial wastewater and return clean water to the environment. In addition, a second policy would provide sewers and sewer service to every Vancouver home, business, and industry at an affordable and equitable cost. Public sewer is not to be extended outside the Vancouver urban area except when there is a threat to public health or safety, to water resources, or to support development consistent with a jurisdiction's comprehensive plan.

Washougal: The 1994 comprehensive plan does not have a section for capital facilities and services. Policy 2-E under Urban Design Strategy states that the City will provide adequate public services and facilities to support desired development in an efficient manner.

b. Additional Mitigation

Additional mitigation could include:

1. Plan for and develop adequate sewage treatment capacity prior to need.
2. Adopt a program of regular sewer line inspection and maintenance.
3. Adopt water conservation measures to reduce the volume of sewage generated.

I. Public Water Systems

1. Setting

GMA requires that availability of public water be included in the concurrency management system of each local jurisdiction. The ability of local governments and utilities to keep up with service demands can be difficult in times of rapid growth. At worst, this may result in water shortages. After the adoption of the growth management plans in 1994, water service providers amended their long range plans to be consistent with expected levels and patterns of growth.

Water service within Clark County is provided by a variety of local jurisdictions and a publicly owned water provider. Within urban areas, the Cities generally provide water service. This is true in the case of Vancouver, Battle Ground, Camas, Ridgefield, and Washougal. CPU is the primary water provider for rural areas outside of UGAs and also operates the water systems for La Center and Yacolt. CPU is a publicly owned water provider that supplies areas outside of other water districts. Figure 45 shows Clark County and the local jurisdiction water system service areas. Generally, the city water districts are larger than the existing city limits, and do not necessarily correspond with city or UGA boundaries.

Water systems within Clark County generally have three components, including source (wells), storage, and transmission facilities. All water in the local systems comes from groundwater well fields. Water is then stored in one or more reservoirs or standpipes.

Consuming 5,000 or more gallons of water per day from ground or surface water from a particular source by any public or private entity requires a water right certificate granted by the State Department of Ecology. These are prioritized by seniority and new water rights must ensure that no existing water rights

would be affected. Some wells could produce more water than is currently extracted, but water rights regulate the total amount that can be taken from each well.

Rural development not supplied with water from a provider usually relies on private wells for domestic needs. Although there is generally an adequate water supply for rural users, the water providers have difficulty finding aquifers that provide consistent, long-term water output. Identifying additional water sources is essential to serve the growing population. To address this concern and to ensure that water resources are protected for all users, a committee was created in 1983 to develop a coordinated water system plan for the county. The Water Utility Coordinating Committee (WUCC) is a committee composed of managers and technical officials from Clark County, the County Health Department, local communities and other water providers, and the Southwest Washington State Department of Health. In 1983, WUCC instituted a process to develop a countywide plan. The culmination of these efforts was Clark County Coordinated Water System Plan (CWSP) that was adopted in 1983 and most recently updated in 1999. The plan is updated every five years. The CWSP contains information about service areas and capacities for each jurisdiction and the entire county. Table 71 summarizes information about existing water systems in Clark County.

Table 71. Existing Water Systems in Clark County

Provider	Population Served	Water Rights*	Number of Wells	Storage Capacity (gal)	Average MGD
Battle Ground	11,775	979	6	767,000	0.74
Camas	15,401	7,430	9**	8,450,000	2.39
CPU	62,419	11,793	33		24.5
Ridgefield	2,169	681	6	812,200	0.22
Vancouver	263,492	50,226	40	24,500,000	24.9
Washougal	9,836	3,789	5	3,060,000	0.44
Yacolt	1,237	311	2		0.13

**acre-feet/year*
*** Camas also draws water from two creeks.*
Source: CWSP, 1999

2. Impacts on Public Water Systems

Water is one of the services that is included in concurrency management in Clark County. That is, all new urban development must have public water available at the time that it is occupied. Increase in demand for water is a function of population and employment growth, and the pattern of development. Table 72 summarizes the impact of each alternative on water demand in Clark County. It shows the impact if each alternative is developed to capacity.

a. Alternative 1

Because it would accommodate a larger number of people and jobs, Alternative 1 would have the greatest increase in water demand over the next 20 years. In addition, the more dispersed development pattern would increase the length of transmission lines and therefore the cost of providing water to those residents and businesses. The area where most of the growth would occur (north of the fairgrounds along I-5 and between Battle Ground and Vancouver) is hilly and criss-crossed by ravines. As a result, pump stations would be required to serve some areas. The total cost of providing service to this alternative is estimated as $56.8 million.

b. Alternative 2

Alternative 2 would involve a less extensive expansion of the UGA, and largely in areas already designated as urban reserve areas. As a result, the water service agencies have included eventual urbanization of much of this area in their planning to date. New water mains would be required in the area around WSU and Battle Ground, but not as extensive as in Alternatives 1, 4 or 5. The additional area could be served by existing supplies with only minor expansion, and that expansion would not have to occur until 10 or more years out. The total cost of extending service to this alternative is estimated to be $29.7 million.

Table 72. Public Water Demand under Each Alternative (gallons per day)

Jurisdiction	Capacity Alternative 1	Capacity Alternative 2	Capacity Alternative 3	Capacity Alternative 4	Capacity Alternative 5
Battle Ground					
Residential	5,617,080	2,802,520	1,418,480	3,537,520	3,065,720
Commercial	108,942	178,249	71,916	219,923	244,648
Industrial	37,081	728,060	24,478	74,856	999,268
Total	***5,763,103***	***3,708,829***	***1,514,874***	***3,832,299***	***4,309,636***
Camas					
Residential	1,435,840	1,302,280	1,068,480	1,301,160	1,399,160
Commercial	247,655	219,525	199,496	265,920	262,739
Industrial	84,296	896,651	67,904	90,513	1,073,160
Total	***1,767,791***	***2,418,456***	***1,335,880***	***1,657,593***	***2,735,059***
La Center					
Residential	294,840	257,320	257,320	259,840	262,360
Commercial	27,385	9,741	9,741	9,766	34,591
Industrial	9,321	39,788	3,316	3,324	141,288
Total	***331,546***	***306,849***	***270,377***	***272,930***	***438,239***
Ridgefield					
Residential	721,840	563,080	556,920	479,080	509,600
Commercial	105,836	61,479	78,924	61,380	120,622
Industrial	36,024	251,111	26,864	20,892	492,681
Total	***863,700***	***875,670***	***662,708***	***561,352***	***1,122,903***
Vancouver					
Residential	16,475,760	11,996,600	9,347,800	9,486,400	12,549,320
Commercial	1,970,332	1,675,089	1,514,781	2,123,482	1,961,709
Industrial	670,653	6,841,912	515,595	722,782	8,012,613
Total	***17,116,745***	***20,513,601***	***11,378,176***	***12,332,664***	***22,523,642***
Washougal					
Residential	567,280	783,440	452,480	416,080	484,400
Commercial	108,942	26,515	33,249	23,781	54,223
Industrial	37,081	108,301	11,317	8,095	221,473
Total	***713,303***	***918,256***	***497,046***	***447,956***	***760,096***
UGA Total	**34,145,699**	**34,928,683**	**21,500,977**	**24,011,011**	**38,933,155**

Source: Calculations based on County GIS data.

c. Alternative 3

Alternative 3 would not expand the UGAs, and so would not require planning and construction of new water facilities beyond the area already covered in provider plans. This alternative would make most efficient use of existing systems. Some water mains might have to be replaced over the twenty-year life of this alternative and some areas would need larger water lines to support more intensive development.

New wells and treatment plant capacity would probably also need to be expanded to accommodate all expected growth. The estimated cost of these system improvements is $21.3 million.

d. Alternative 4

Alternative 4 would direct most of the population growth to the Battle Ground area, and between Battle Ground and Vancouver. Vancouver does not currently have plans for extending lines into a portion of this area, but expansion would not be difficult. The areas proposed for inclusion in the Camas UGA are already within its water service area and included in its system plans. The same is true of the minor expansion of the Ridgefield UGA. The total cost of providing water service to this alternative is estimated to be $32.5 million.

e. Alternative 5

Growth in Alternative 5 would occur largely along the I-5 corridor and focus on industrial and commercial uses in order to better balance jobs and housing in the County. Most of the area proposed for addition to UGAs is not currently served by public water systems, although CPU has several wells and transmission facilities in the area. New transmission facilities would be needed for the La Center Junction, the Ridgefield Junction area, and the area north of the fairgrounds. The terrain along and west of I-5 is hilly and criss-crossed with ravines. Pump stations would be required to move water over hills and streams to users. The total cost for water system improvements in Alternative 5 is estimated as $38.7 million.

3. Mitigation Measures

Mitigation to preserve the quality and quantity of surface and ground water (as discussed above) also works to protect public water supplies (see Sections IVa and b). The impacts of additional growth creating demand for water can be mitigated to some extent by additional conservation policies and implementation measures.

a. Plans and Ordinances

Clark County: Chapter 6 of Clark County's comprehensive plan establishes goals and policies related to the provision of water as a public utility. Goal 6.2 is to provide water service to all households minimizing environmental impacts and long-term public cost. Policies stipulate that water service is to be extended to the urban areas and limited in rural areas in accordance with the Clark County Coordinated Water System Plan (1999) and 20-Year Plan map (Policies 6.2.1-6.2.4, 6.2.7 –6.2.9, 6.2.11). Development approval is contingent on sufficient and sustainable sources of water (6.2.10). Water conservation and elimination of private water providers where appropriate is encouraged (6.2.12-6.2.15).

Battle Ground; New draft interim goals and policies adopted in 2001 state that the City will work to provide adequate urban services concurrently with development (GM01.4). The City will identify urban services that need concurrency requirements and review existing ones and adjust as needed (GMA1.4.1). Action GMA2.1.2 states that the City will determine the infrastructure needs for future growth areas to the south and west and plan for that infrastructure. Goal CFG1 relates to the sustainable provision of capital facilities and policies under that goal call for developing capital facilities plans and review the development code to ensure consistency with them. Goal CFG2 and objective CFO2.1 states that the city will require concurrent provision of capital facilities.

Camas: Camas has policies for water and sanitary sewer in its 1994 comprehensive plan. They include working with property owners to eliminate private systems, encouraging connecting to public systems, and prohibiting construction of new private wells and subsurface sewage disposal systems. Plans for providing services will be coordinated with plans for designation of UGAs, rural uses, and for the

transition from rural to urban uses. Services are to be planned to maximize efficiency and cost effectiveness and ensure concurrency. Adequate public water service should be extended throughout urban areas.

La Center: General policies under the Capital Facilities and Utilities chapter of the comprehensive plan address the provision of services. Policy 1 states that the City will annually adopt a capital facilities program. The City will ensure that public utilities, facilities, and services necessary to support proposed developments will be adequate to serve them at the time of development without decreasing current service levels (Policy 2). The City will also adopt and review annually level of service standards for sanitary sewer service and domestic water serving new development with in the UGA (Policy 9). Public water is not to be extended outside the UGA (Policy 10). All new construction is required to connect to public water and sewer (with some exceptions).

Ridgefield: Goal 10 of the Ridgefield comprehensive plan is to provide the key public utilities required to support planned urban development efficiently and at least public cost. Policies require new construction to connect to the City's water system. Policy 10.2 requires the City to develop levels of service for sanitary sewer and domestic water facilities serving new development within the UGA. The City will coordinate with CPU to limit the service area to boundaries coincident with the urban reserve area. New development will be required to connect to the City's water system (with some exceptions).

Vancouver: Existing plan policies P86 – P88 deal with provision of water service. New private wells are not permitted in the Vancouver urban area (P86). Policy P87 states that private wells should be properly abandoned and converted to public water service when available. P88 states that water service should be extended throughout the Vancouver urban area in accordance with the capital facilities plan. Extension outside the Vancouver urban area should not be permitted.

A proposed new policy for the comprehensive plan is to provide safe, clean, quality drinking water, discourage private drinking water wells, and ensure that the infrastructure to support water service is in place prior to or at the time of development. New general policies on public facilities and services consider water a necessary public service and the city will ensure that facilities are in place with six years following occupancy of development that requires them. Level of service standards and locational standards are to be based on local land use designations and nationally-recognized standards.

Washougal: The 1994 comprehensive plan does not have a section for capital facilities and services. Policy 2-E under Urban Design Strategy states that the City will provide adequate public services and facilities to support desired development in an efficient manner.

b. Additional Mitigation

There are additional measures that could be implemented to mitigate impacts.

1. The Water Utilities Coordinating Committee (WUCC) should review and revise existing plans and agreements to ensure that the region's water services and resources are managed efficiently through greater regional coordination, system consolidation, and system interconnections where appropriate, and reflect the policies of the GMPs.

2. Regional water supplies may come from major new supply or water-conservation sources developed to meet regional needs, or from existing supplies whose water rights significantly exceed the supply required to meet service-area needs. Water supply activities must be coordinated with DOE and the local building permit processes, and must be consistent with the County's comprehensive plan.

3. Areas that are future groundwater source areas, like the Vancouver Lake lowlands, should be managed to prevent contamination. This management should be as intensive as that in wellhead protection areas.

4. Water system infrastructure that might provide water supplies exceeding existing local needs should not be used to justify development counter to Countywide land use policies, and any such development proposal should be denied by all appropriate County and local government permitting agencies.

5. Provision of water service should be coordinated among cities and purveyors to ensure protection and preservation of resources in both rural areas and in areas that are developing, and to ensure that new regional supplies are used to serve those areas targeted for additional growth and densities.

6. Water supply planning, development, and implementation decisions should be consistent with coordinated water system plans, basin plans, and other comprehensive regional plans and goals involving water, wastewater, stormwater, water reuse, and other public priorities and needs.

7. Water reuse and reclamation should be encouraged, especially for large commercial and industrial developments, and for high water users such as parks, schools, and golf courses.

8. Water conservation should be aggressively pursued as a means of ensuring efficient water use and protection of water resources, and as a water supply source that can make a substantial contribution toward meeting future regional water needs.

9. Cities, special districts, and other water purveyors not already involved in such programs should develop and implement conservation and public education programs consistent with the state Department of Health's and WDOE's Interim Conservation Guidelines.

10. Prohibit the drilling of new private wells in urban areas and require all households to connect to public water as soon as it is available.

11. Establish a water pricing structure to encourage conservation and cover the full cost of providing water service.

12. Fully implement conservation measures prior to development of an alternative water source.

J. Electrical system

1. Setting

Electricity is provided to all Clark County jurisdictions by CPU, a consumer-owned public utility founded in 1938 that both generates and buys electricity. About half of the power supplied to CPU customers is generated at the River Road Generating Plant. Built in 1997, this is a combined-cycle, gas-powered plant producing 250 megawatts per year. The plant is operated by General Electric for CPU. The remainder of the power provided to customers is purchased from Bonneville Power Administration (BPA), other producers (for example, Pacificorp), and co-generators such as the Great Western Malting Company. Hydropower supplies the majority of purchased electrical energy used in the County.

CPU has a significant investment in electrical transmission and distribution facilities throughout Clark County to serve its more than 157,000 customers, including 48 substations and over 3,500 miles of power lines. Most of these lines are 65 and 115 kilovolt (kV) lines, and most of CPU's facilities are located in urban areas. CPU has three electric utility centers:

- the Electric Center in downtown Vancouver
- the Ed Fisher Customer Service and Operations Center on 117th in Orchards
- the Camas Customer Service and Operations Center

In addition, BPA has a major substation and the control center for the western power grid located in Vancouver. This substation has 65, 115, 230 and 345 kV lines feeding in and out of it. Major electricity users (such as aluminum processing plants) can buy electricity wholesale directly from BPA.

2. Impacts on the Electrical System

Electrical service is entirely a "pay as you go" service. Electrical system upgrades are paid for by new development directly (in the form of system connection fees) and by utility rates paid by CPU customers. Rates are adjusted to reflect changing costs of purchasing or generating power. CPU has adjusted rates four times in the past 18 years, three times since 1999 as prices to produce and buy electricity have risen significantly. CPU has instituted an aggressive energy conservation policy and provides incentives to customers to encourage their participation in conservation efforts.

For this reason, CPU expects to be able to expand the electrical system to serve development, no matter which alternative is selected. Likewise, availability of electricity is not expected to be a limiting factor for new development. (However, industries with special power needs – either total amount or reliability – may prefer to locate near existing substations or in areas where the power grid is more fully developed.)

3. Mitigation Measures

Suggested mitigation for energy conservation is discussed under the Energy and Natural Resources section.

XI. CONFORMANCE WITH THE GROWTH MANAGEMENT ACT

A. Setting

The GMA establishes the overall framework for planning activities in Washington State. Central to the planning process established by the GMA is the preparation and adoption by local jurisdictions of comprehensive plans, which reflect a community's existing conditions as well as a vision for its future growth and development.

The GMA substantially changed the requirements related to the content of comprehensive plans and the procedures that each jurisdiction must follow in reviewing and approving development proposals. Comprehensive plans must include the following mandatory elements: land use, housing, transportation, capital facilities, utilities, and, for counties, rural lands. In addition, jurisdictions must designate natural resource lands—forest, farm, and mineral lands—and critical areas—wetlands, aquifer recharge areas, geologically hazardous areas, frequently flooded areas, and fish and wildlife conservation areas. The designation of natural resource lands and critical areas is the primary mandate of the GMA.

This section looks at how the comprehensive plans of Clark County and its cities conform with the requirements of the GMA. It also looks at the conformance of these plans with the requirements of the CWPPs, which serve as the framework for local comprehensive plans and development regulations and with the procedural criteria established by the Department of Community Development (DCD). Together

these requirements are meant to ensure consistency among the plans of the region and that the plans will be implemented as envisioned.

This section also addresses concurrency, fiscal impacts, and annexation and incorporation issues that are associated with the different alternatives under consideration. There are important policy implications arising from the transportation improvements needed to mitigate the impacts of each alternative. Consequently, a separate analysis of each alternatives' consistency with transportation policies is also included.

B. Conformance with the GMA Requirements and Countywide Planning Policies

Tables 73 through 88 identify those sections of the comprehensive plans of Clark County and its cities that address the requirements of the GMA and CWPPs. Generally, the County and each City has addressed these requirements in their comprehensive plans, in some cases through specific programs and in other cases through more general policy statements.

Table 73. Conformance with Land Use Element Requirements of the GMA

GMA Requirement	Battle Ground	Camas	La Center	Ridgefield	Vancouver	Washougal	Yacolt	Clark County
Land use designations?								
Agriculture	N/A	N/A	N/A	In progress	N/A	N/A	N/A	RRL:p 4-6
Timber Production	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL: p 4-10
Housing	In progress	iv:p.7	In progress	In progress	60-64, Map 6	iv:D	In progress	H
Commerce	In progress	iv:p.10	In progress	In progress	60-64, Map 6	iv:D	In progress	Pg 1-2, 1-9
Industry	In progress	iv:p.10	In progress	In progress	60-64, Map 6	iv:D	In progress	RRL: p 4-4
Recreation	In progress	vii		In progress	60-64, Map 6	iv:D	In progress	RRL p 4-4
Open Space	In progress	vii	In progress	In progress	60-64, Map 6	iv:D	In progress	RRL p 4-4
Open Space Corridors						CP PV		P
Public Utilities	In progress	viii			60-64, Map 6	CF:E:1		RRL: p 4-4
Public Facilities	In progress	iv:p.14	In progress	In progress	60-64, Map 6	iv:D	In progress	H: pg 5-1
Other	In progress						In progress	
Land use map showing all?	In progress	iv:p.15	In progress	In progress	Map 6	Exhibit IV	In progress	Figure 22-A
Lands useful for public purposes identified (utility corridors, transportation corridors, etc.)?	In progress	In progress	In progress	In progress	In progress	CP PV	In progress	CF:p.6-20
Population densities?	In progress	iv:p.7	In progress	In progress	Tech Supt	iv:B:3	In progress	LU:p.2-2
Building intensities?	In progress	iv: p. 9	In progress	In progress	p. 42	iv:B:3	In progress	H
Population & employment forecasts?		iii:p.23	In progress	In progress	p. 11	iv:C:1	In progress	LU: p 2-2
Consistent with regional?	In progress				p. 40			RRL: 4-2
Groundwater protection?	In progress	viii:p.10	In progress	In progress	p. 21-22		In progress	
Flood hazard areas identified?	In progress	iii:p.8	In progress	In progress	Res Doc.	ii:C:2:d	In progress	RRL p 4-4, Figure 5B
Surface water quality protection?	In progress	viii:p.10	In progress	In progress	p.40	ii:C:3:(1)	In progress	RRL p 4-4
Vacant buildable land inventory?	In progress	Tech Supt.	In progress	In progress	Tech Supt.	iv:	In progress	LU: pg 2-15
Implementation strategy?	In progress	In progress	In progress	In progress	Plan doc.	iii:E,F	In progress	RRL: p 4-18
Consistency: internal, external, interjurisdictional?	In progress	In progress	In progress	In progress	Plan doc, new Pol 78	CP iii	In progress	CWPP 1.1
Consistency with Relevant CWPPs	In progress	In progress	In progress	In progress	Plan doc, new Pol 1-14, 78	CP iii	In progress	CWPP 1.1

(-) Goal or Policy Number, p. page number, Pol: Policy number, LU: Land Use Element, RRL: Rural and Resource Lands Element, H: Housing Element, CF: Capital Facilities Element, Pks: Parks Recreation, Open Space Element, T: Transportation Element, CP: Comprehensive Plan

Res. Doc.: Resource Document, Tech. Supt.: Technical Support, VMC: Vancouver Municipal Code

Table 74. Conformance with Land Use Element Requirements of the Countywide Planning Policies

Requirement	Battle Ground	Camas	La Center	Ridgefield	Vancouver	Washougal	Yacolt	Clark County
Urban Growth Areas								
Consistent with County?	iii:A:2:d	iv:p.1-2	iii:B	(11)	Intro, new Pol 78	iii:E:(1-A)	In progress	N/A
Consistent w/ CWPPs?	In progress	In progress	In progress	In progress	Plan doc, new P 1-14, 78	CP iii	In progress	CWPP 1.1
Consistent with adjacent cities?	N/A		N/A	N/A	Intro, new Pol 78	iv:F:(1-C)	N/A	CWPP 1.1 (-d)
Accommodate expected growth?	iv:C:3	iv:p.1	iii:B	(11.1)	Res. Doc.	iii:F	p.8	LU:p 2-2
Balance business & housing?	iii:C:1:b	iv:p.1	iii:B	In progress	p.56	vii:E:(3), viii:E:(5)	In progress	LU:p p 2-5
No resource lands?	N/A	iv:p.13	plan map	Insert	plan map	ii:B:3:(1)	plan map	
Changes to UGAs with reasons?	In progress	In progress	In progress	In progress	New Pol 79	CP iii	In progress	CWPP 1.1 f (3)
Provide for Accessory Units? (20,000+ pop.)	In progress	In progress	In progress	In progress	Adopted ADU stds	In progress	In progress	H: P.24
Population densities?	iv:C:3	iv:p.7	iv:p.13	Insert	Tech. Supt.	iv:B:3	CP p.7	
Building intensities?	iv:C:3	In progress	iv:p.12	(8.1)	p. 42	iv:B:3	In progress	LU:p.2-11, 2-12
Population & employment forecasts?	iv:C:3	iii:p.23	iv:p.11	Appx.	p. 11	iv:C:1	pp.1. 7-8	LU:p 2-2
Urban levels of service?	In progress	In progress	In progress	In progress	In progress	In progress	In progress	CF, T3-14
Consistent with special districts?	In progress	N/A	vi:CF	Tech Supt.	p. 81; IM70	CF	In progress	In progress
Consistent with County?	In progress	In progress	vi:D	Tech Supt.	p. 89; IM70	CF	In progress	N/A
Hierarchy of centers?	iv:11	iv:p.10	iv:C	(6)	p. 38, IM40	iv:E:(4)	In progress	CFP 1-3
Criteria for annexation?	iii:C:2	i.C	iii:B	(11.9)	p.123; IM99	iii:F:(1-3)	In progress	Annexation Element
Urban reserve areas & policies?	In progress	In progress	In progress	In progress	In progress	iv:D	In progress	In progress
Consistent with county?	iii:B	iv:p.5	iii:C	(11.8)	Tech. Supt.	iii	In progress	In progress
Demonstrated need?	iii:B	iv:p.5	iii:C	Appx.	Tech. Supt.	iii	In progress	In progress
Vacant buildable land inventory?	iv:G	Tech Supt.	Insert	Tech. Supt.	Tech. Supt.	iv:	Table 5	LU: pg 2-15
Goals & Policies of Shoreline MP?	N/A	In progress	N/A	In progress	Adopted Shorelines Ordinance	SMP/CP Pii2	N/A	Environ.Chapter
Implementation strategy?	iii:C	In progress	i.D	In progress	Each element	iii:E,F	p.20	RRL:p 4-18
Consistent w/ CWPPs?	In progress	In progress	In progress	In progress	Plan doc, new Pol 1-14, 78	CP iii	In progress	CWPP 11.1

(-) Goal or Policy Number, p. page number, Pol: Policy number, LU: Land Use Element, RRL: Rural and Resource Lands Element, H: Housing Element, CF: Capital Facilities Element, Pks: Parks Recreation, Open Space Element, T: Transportation Element, CP: Comprehensive Plan

Res. Doc.: Resource Document, Tech. Supt.: Technical Support, VMC: Vancouver Municipal Code

Table 75. Conformance with Housing Element Requirements of the GMA

GMA Requirement	Battle Ground	Camas	La Center	Ridgefield	Vancouver	Washougal	Yacolt	Clark County
Housing inventory & analysis?								
Existing	vii:B	v:2-7	vii:B	In progress	Tech. Supt.	vii:A,B,C	CP p.20	H pg 5-2
Projected needs	vii:C	v:10-12	In progress	Tech. Supt.	Res. Doc.	vii:D	p.6,(7)	Lu pg 5-11
Goals, policies, objectives?								
Preservation	vii:D:(2)	v:12	vii:C:(3)		p.65	vii:E:(2)	(7-7) p.22	H: pg 1-1
Improvement	vii:D:(2-B)	v:12	vii:C:(6)	(8.10)	p.65	vii:E:(2-B)	(7-7) p.22	H: pg 1-6
New development	vii:D:(1)	In progress	vii:C	(8)	p.63	vii:E:(1)	p.22	H: pg 1-7
Affordable housing	vii:D:(1)	v:12	vii:C:(1)		p.64	vii:E:(1)	(7) p.22	H: p 5-16
Sufficient land identified for:	iv:H:(3), Exhibit iv	H:12						
Government-assisted?	iv:H:(3),vii: D:(1)	H:12	vii:C	(8)	Tech. Supt.	vii:E:(1) Exh. 4, Table 4-19	(7)	H: pg 5-14
Low income?	iv:H:(3),vii: D:(1)	H:12	vii:C	(8)	Tech. Supt.	vii:E:(1) Exh. 4, Table 4-19	(7)	H: pg 5-14
Middle income?	iv:H:(3),vii: D:(1)	H:12	vii:C	(8)	Tech. Supt.	vii:E:(1) Exh. 4, Table 4-19	(7)	H: pg 5-14
High income?	iv:H:(3),vii: D:(1)	H:12	vii:C	(8)	Tech. Supt.	vii:E:(1) Exh. 4, Table 4-19	(7)	H: pg 5-13
Manufactured?	iv:H:(3),vii: D:(1)	H:12	vii:C	(8)	Tech. Supt.	vii:E:(1) Exh. 4, Table 4-19	(7)	H: pg 5-23
Multi-family?	iv:H:(3),vii: D:(1)	H:12	vii:C	(8)	Tech. Supt.	vii:E:(1) Exh. 4, Table 4-19	(7)	H: pg 5-6
Group homes/foster care?	iv:H:(3),vii: D:(1)	H:12	vii:C	(8)	p.66	vii:E:(1) Exh. 4, Table 4-19	(7)	H: pg 5-14
All economic segments?	iv:G:(3),vii: D:(1)	v:13-14	vii:C:(1)	In progress	p.63	vii:E:(1)	(7) p.22	H:, pg 5-1, 5-2
Condition of existing housing?	In progress	v:5-6	vii:B:p.31	In progress	p.65	vii:C	H	H: pg 5-12
Housing assistance needs?	vii:C	v:10-12	vii:C	In progress	p.67,63,66	vii:D	p.21	H: pg 5-8
Financing?	vii:C	v:13	vi:	In progress	p.70	vii:D	p.21	H: pg 5-7, 5-16, 5-23
Implementation strategy?	vii:D:(6)	In progress	In progress	In progress	H	iii,vii:E:(1)(2)	CP p.20	H: pg 5-18
Consistency w/ CWPPs?	In progress	In progress	In progress	In progress	Plan doc, new Pol 20-28, 78	CP iii	In progress	CWPP 2.1

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Table 76. Conformance with Housing Element Requirements of the Countywide Planning Policies

Requirement	Battle Ground	Camas	La Center	Ridgefield	Vancouver	Washougal	Yacolt	Clark County
Housing inventory & analysis?								
Existing	vii:B	v:p.2-7	vii:B	In progress	Tech. Supt.	vii:A,B,C	pp.20-22	H: pg 2-2
Projected needs	vii:C	v:p.10-12	In progress	In progress	Tech. Supt.	vii:D	In progress	H: pg 5-11
Sufficient land identified for:	iv:Exhibit IV							
Government-assisted?	vii:D:(1),iv:H:(3)	H:12	vii:C	In progress	Tech. Supt.	vii:E:(1) Exh. 4, Table 4-19	(7)	H: pg 5-14
Low income?	vii:D:(1),iv:H:(3)	H:12	vii:C	In progress	Tech. Supt.	vii:E:(1) Exh. 4, Table 4-19	(7)	H: pg 5-14
Middle income?	vii:D:(1),iv:H:(3)	H:12	vii:C	In progress	Tech. Supt.	vii:E:(1) Exh. 4, Table 4-19	(7)	H: pg 5-14
High income?	vii:D:(1),iv:H:(3)	H:12	vii:C	In progress	Tech. Supt.	vii:E:(1) Exh. 4, Table 4-19	(7)	H: pg 5-13
Manufactured?	vii:D:(1),iv:H:(3)	H:12	vii:C	In progress	Tech. Supt.	vii:E:(1) Exh. 4, Table 4-19	(7)	H: pg 5-13, 5-23
Multi-family?	vii:D:(1),iv:H:(3)	H:12	vii:C	In progress	Tech. Supt.	vii:E:(1) Exh. 4, Table 4-19	(7)	H: pg 5-6
Group homes/foster care?	vii:D:(1),iv:H:(3)	H:12	vii:C	In progress	p.66	vii:E:(1) Exh. 4, Table 4-19	(7)	H: pg 5-14
Special needs?	vii:D:(1),iv:H:(3)	H:12	vii:C	In progress	p.66	vii:E:(1) Exh. 4, Table 4-19	(7)	H: pg 5-8
Jobs/housing balance?	vii:D:(1-B),(3)	x:p.5			p. 15	vii:E:(3)	(7)	H: pg 5-12, 5-13
Job site/housing link?	vii:D:(3)	v:p.12, x:p.5	vii:A	(8.4)	p.58, IM58	iv:F:(4.5)	p.8:(3)	H: pg 5-12, 5-13
Transportation/housing link?	iv:H:(7)	vi:p.15-17	vi:p.29-30	(8.4)	p.99	iv:F:(6)	p.8:(3)	H: pg 5-1
Public facilities/housing link?	ix:D:(1)		vii:C		p.105	vii:13 (1-A)	p.3	H: pg 5-1
Flexibility?								
Infill	vii:D:(1)	v:p.12	vii	(8.10)	p.57	vii:D:(2-A)	(7-5)	H: pg 5-20
Reuse/rehabilitation	vii:D:(2)	v:p.12	vii:C:(6)	(8.10)	p.57	vii:D:(2-B)	(7-7)	H: pg 5-21
Preservation	vii:D:(2),iv:H:(3-D)	v:p.12	vii:C:(4)		p.57	vii:D:(2)	(7-7)	H: pg 5-21
Other								
Maximum & minimum lot sizes?	iv:F		iv:C	(8.1)	Imp. program	iv:F:(3)	p.9 LU	
Housing assistance?	vii:C	v:p.10-12	In progress	In progress	p.66-67	vii:D	p.20	H: pg 5-8
Mitigate impacts of new fees/regs?	vii:D:(1)	In progress	In progress	In progress	IM57,IM51	vii:D:(1)	In progress	H: pg 5-13
Financing?	vii:C	v:p.13	In progress	In progress	p.70	vii:D	p.21	H:pg 5-7,5-16,5-23

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Res. Doc.: Resource Document, Tech. Supt.: Technical Support, VMC: Vancouver Municipal Code

Table 77. Conformance with Utilities Element Requirements of the GMA

GMA Requirement	Battle Ground	Camas	La Center	Ridgefield	Vancouver	Washougal	Yacolt	Clark County
Integrated with land use element?		viii:p.1	p.10	CF:p.2	p.78-81	x:D:(1-B5)		CF: pg 6-1
Location & capacity of existing utilities?								
Electrical	ix:(Exhibit ix)	viii:p.21	vi:	In progress	CF	x:B:1	p.38	In progress
Telecommunication	ix:C	In progress	vi:	N/A	CF	x:B:3	N/A	CF: pg 6-9, 6-18
Natural gas	ix:(Exhibit ix)	viii:p.22	vi:	In progress	CF	x:B:2	CF	In progress
Other					CF			
Future capacity needs?								
Electrical	ix:C	viii:p.23	vi:	In progress	CF	x:C	CF	In progress
Telecommunication	ix:C	viii:p.23	vi:	In progress	CF	x:C	N/A	In progress
Natural gas	ix:C	viii:p.23	vi:	In progress	CF	x:C	CF	In progress
Other					CF			
Proposed location?								
Electrical	ix:C	viii:p.23	vi:	In progress	CF	x:C	CF	In progress
Telecommunication	ix:C	viii:p.23	vi:	In progress	CF	x:C	N/A	In progress
Natural gas	ix:C	viii:p.23	vi:	In progress	CF	x:C	CF	In progress
Other								
Essential public facilities evaluation?		viii:p.9	vi:C:p.30	In progress	p.89	x:D	In progress	In progress
Countywide or statewide nature?	ix:D:(1)	In progress	vi:C	In progress	p.89	x:D	In progress	CF: pg 6-19
Local criteria for siting utilities?		In progress		In progress	In progress	In progress	In progress	In progress
Consistent with land use element	ix:D	In progress		In progress	p.78-81	x:D:(1-B)	In progress	In progress
Public service obligations	ix:D	In progress	vi:C	In progress	p.79	x:D:(2-3)	In progress	In progress
Impact on utility's system	ix:D	In progress		In progress	p.79	x:D:(2-3)	In progress	In progress
Design/system uniformity balance	ix:D	In progress		In progress	p.79	x:D:(2-3)	In progress	In progress
Policies?								
Joint transp/utility rights-of-way	ix:D:(3-A)	In progress		In progress	T	x:D	In progress	In progress
Road maintenance notification	ix:D:(3-A)	In progress		In progress	T	x:D	In progress	In progress
Utility permit/devel. proposal timing	ix:D:(3)	In progress		In progress	T	x:D	In progress	In progress
Consistent with regional plans?	ix:D:(1)	In progress	vi:C	In progress	p.94	x:D:(1)	p.50	CF: pg 6-29
Consistent with County (cities)?	ix:D:(1)	In progress	vi:C	In progress	p.94	x:D:(1)	p.50	CF: pg 6-27
Consistency w/ CWPPs?	In progress	In progress	In progress	In progress	Plan doc, new P 40-68, 78	CP viii	In progress	CWPP 6.1

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Table 78. Conformance with Utilities Element Requirements of the Countywide Planning Policies

Requirement	Battle Ground	Camas	La Center	Ridgefield	Vancouver	Washougal	Yacolt	Clark County
Develop policies and incentives to:								
Eliminate private utilities (urban)?		viii:p.20	vi:p.30-31		p.84	x:		
septic systems		viii:p.20	vi:p.30-31	(10.3)	p.84			CF: pg 6-6
private wells		viii:p.20	vi:p.30-31	(10.3)	p.84			CF: pg 6-6
Encourage connection to public water & sewer?		viii:p.20	vi:D	(10)	LU:pp.113-114, p.84		(8)	CF: pg 6-6
Extend sewer only with annexation (unless health hazard exists)?		viii:p.20	vi:D:(11)	(10.1), (11.6)	p.101		p.47	CF: pg 6-6
Extend utilities throughout urban areas?								
Public sewer		viii:p.20	vi:D:(11)	CF Ch.3 p.14	p.85	iii:E:(1-C)		CF: pg 6-6
"Adequate" public water system		viii:p.20	vi:D:(11)	CF Ch.2 p.8	LU:p.131	iii:E:(1-C)		CF: pg 6-6
Adequate public water in rural areas (where appropriate?)		viii:p.20	N/A		NA	CF		CF: pg 6-6
Limit wells in rural areas?		viii:p.20	N/A	CF Ch.2 p.3	NA	CF		CF pg 6-6
Septic inspection/maintenance program?		viii:p.20	vii:p.30-31		p.89			CF: pg 6-6
Proof of adequate water supply before development?			vi:D:(11)				CF p.39-43	CF: pg 6-6
Consistent with County (cities)?		viii:p.20	vi:B	(10.3), (10.4)		iii:E	(8-4)	CF: pg 6-27
Consistent with comp. & land use plans?		viii:p.20	vi:B	CF Ch.1 p.2		iii:E,F	(8-4)	CF: pg 6-6
Maximize efficiency & cost-effectiveness?	ix:D:(2),(3)	viii:p.20	vi:B	(10.3)	p.131			
Consensus on current & future services?	not available	viii:p.20						

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Table 79. Conformance with Capital Facilities Element Requirements of the GMA

GMA Requirement	Battle Ground	Camas	La Center	Ridgefield	Vancouver	Washougal	Yacolt	Clark County
Inventory of public capital facilities?								
Location & capacity for existing:								
water system		viii:p.10	vi:C:b	Appx., CF	Res. Doc.	ix:	CF	CF pg 6-2
sanitary sewer		viii:p.14	vi:C:a	Appx., CF	Res. Doc.	ix:		CF: pg 6-6
stormwater		viii:p.20	vi:C:c	Appx., CF	Res. Doc.	ix:	CF	CF: pg 6-9
schools		viii:p.2	vi:C:e		Res. Doc.	ix:		CF: pg 6-10, 6-12
parks & recreation	v:	vii:p.2	x:C		Res. Doc.	v:	CF	P: pg 6-11
police		viii:p.6	vi:C:h		Res. Doc.	ix:		CF: pg 6-13
fire		viii:p.4	vi:C:g		Res. Doc.	ix:		CF pg 6-11
Establish level of service standards?		viii	vi:D	CF	CF	N/A	CF	CF: pg 6-1
Forecast of future needs?								
Proposed locations		viii	vi:C	CF	CF	ix:	CF	CF: pg 6-2, 6-9
Proposed capacity		viii	vi:C	CF	CF	ix:		CF: pg 6-2, 6-9
Industrial areas outside UGA?					NA	ix:		(part of Plan Update)
Financing, six-year plan?		viii:p.12-13	vi:	CF	CF	ix:	CF	CF: pg 6-2, 6-9
Siting Essential Public Facilities?					New Pol 63	LU CP iv		CF:E
Consistent with land use element?		viii	iii:B	CF	p.81	ix:	CF	CF: pg 6-17
Consistency w/ CWPPs?					Plan doc, new Pol 40-68, 78	CP iii		CWPP 6.1 (-l)

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Table 80. Conformance with Capital Facilities Element Requirements of the Countywide Planning Policies

Requirement	Battle Ground	Camas	La Center	Ridgefield	Vancouver	Washougal	Yacolt	Clark County
Establish level of service standards?								
Urban		viii	vi:D	CF	CF:p.10	x:	CF	CF: pg 6-2
Rural	N/A	N/A	N/A	N/A	N/A	N/A	p.5	CF: pg 6-2
Coordinated with land use plans?		viii:p.1	iii:B		CF:p.14	ix	CF	CF: pg 6-17
Location standards?								
Urban Growth Areas		viii:p.20		CF	p.85	CF	(8)	CF: pg 6-1
Urban Reserve Areas					p.85		N/A	CF: pg 6-1
Rural areas	N/A	N/A	N/A	N/A	p.85	N/A	(8)	CF: pg 6-1
Maximize efficiency & costs effectiveness?			vi:B	CF	p.78			
Concurrent with GMA?		viii:p.1	vi:D		CF:p.14		p.3	CF: pg 6-1
Coordinated with County (cities)?								
Existing service		viii:p.20	iii:B	CF	CF	CF:7	(8)	CF: pg 6-5
Future service		viii:p.20	iii:B	CF	CF			CF: pg 6-5
Range of services in urban area		viii:p.20	vi	CF	CF			CF: pg 6-5
Implement adopted comp. plans			vi:C	CF	CF			
Process to reevaluate land use element if funds are insufficient?			vi:C:p.30, iii:B(5)		CF		(8)	
Impact fees?			iii:B	CF	CF	CF:2	(8-6)	
Financing?		viii	vi:C:p.30	CF	CF	CF:2&4	CF	CF: pg 6-9
State/regional facilities plan?					p.89			
Future needs identified?		viii	vi:C:p.30	CF	CF		CF	CF: pg 6-2

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Table 81. Conformance with Transportation Elements Requirements of the GMA

GMA Requirement	Battle Ground	Camas	La Center	Ridgefield	Vancouver	Washougal	Yacolt	Clark County
Land use assumptions identified?		T:12	T		Tech Supt.		p.10	
Inventory of existing:								
Air transportation facilities?	T:p.18		N/A	N/A	T	T:p.18	N/A	T pg 3-12
Water transportation facilities?			N/A	T	T	T:p.18	N/A	T pg 3-11
Land transportation facilities?	T:p.12	vi:p.3-4, VI:11	T	T	T	T:p.1-5	CF:p.4	T pg 3-4
Transit alignments?	T:p.12	vi:11	T	T	T	T:p.14	CF	T pg 3-6
Est. traffic impacts to state-owned facilities?					MTP			CP update will provide
Maps?	T	vi:11	T	T	Res. Doc.	T:VOL ii	p.11	CP: Fig A-1 to A-4
Establish level of service standards?	T:pp.12, 16; Appx. A	vi:8	T	(9.1)	T:P102	T:p.8-11	CF; CP p.26	T pg 3-10
Regional LOS for arterials					MTP	T:VOL ii		Ch:12.41
Regional LOS for transit					MTP	T:VOL ii		T:p3-8
Highways of state-wide significance					MTP	T:VOL ii		*
Other state highways								
Local streets								
System expansion & maintenance to be in compliance w/LOSs?	T:pp.20-21	T:25	T	T	T:P104	T	CF	T pg 3-7
Traffic forecast (min. 10 years)?								
Vehicular	T:pp.41-43	T:14	T	Appx.	Res. Doc.	T:p.27	T:p.13	T pg 3-7
Transit	T:p.44	T:14	T	Appx.	Res. Doc.	T:p.26	T:p.25&30	T pg 3-7
Bicycle & pedestrian	T:p.44	T:14		Appx.	Res. Doc.	T:pp.27-28	T:p.25&30	T pg 3-7
Existing & future needs?	CF		T		T	T:pp.30-35	T:p.6, CF:p.4	T 3-10, 3-26
Financing?			T					
Analysis (existing & projected)	CF:1-13	6 yr. road	6 yr. road	6 yr. road	p.111		CF:p.4, T:p.9	T 3-24, 3-25
Multi-year financing plan?	CF:1-13	6 yr. road	6 yr. road	6 yr. road	CF		CP p.31	T 3-24, 3-25
If funding shortfalls, additional funding sources identified?					IM97, IM98, Visions Vol. III doc pp.32-41, Visions Vol I pp. 389-392, TSP working docs	T:VOL ii		T pg 3-26, CP Upate-T
Intergovernmental coordination & impact assessment?	CF	T	T	(9.3)	Tech Supt.***	T:VOL ii	T	
Demand management strategies?	CF	T		(9.2)	p.100			T pg 3-4

GMA Requirement	Battle Ground	Camas	La Center	Ridgefield	Vancouver	Washougal	Yacolt	Clark County
Goals & policies?								
Roadways		T	T	(9)	p.96-111		(9); CP pp.31-32	
Transit (fixed-route & demand resp)		T	T	(9)	p.96-111		(9); CP pp. 31-32	
Bicycle & pedestrian		T	T	(9)	p.96-111		(9)	
Port facilities (air, water, etc.)		T	N/A		p.105		N/A	
Rail (passenger & freight)		T	N/A		p.106		CP p.30	
Freight mobility (truck, barge, rail)		T	N/A		p.96-111		N/A	
Concurrency					VMC 11.95	T:VOL ii		T pg 3-1, 3-2
Consistent with land use element?	T:p.3	T:21	T	T	p.94, 97, 98	iv:p.19	pp.9; CP p. 23	T pg 3-1
Consistent with regional transp plan?	T:p.4	T:21	T	(9.1)	p.110	iv:p.19	p.9	T pg 3-1
Consistent with County (cities)?	T:p.4	T:21	T	(9.1)	p.110	iv:19	p.9	T pg 3-1
Compliance with Clean Air Act?					IM23			
Public involvement?			ii:B		Intro.			

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Table 82. Conformance with Transportation Element Requirements of the Countywide Policies

Requirement	Battle Ground	Camas	La Center	Ridgefield	Vancouver	Washougal	Yacolt	Clark County
Integrated/part of regional system?	T	vi:p.1	T	(9.1)	p.104, IM86	iv:F:6	p.9:(4)	T
Coordinate with County, MPO & cities to establish consistent:							p.9:(4), (9)	
Roadway standards	T:p.37	vi:p.2	T	(9.1)	IM43	iv:F:6	CP pp.26-28	T
Level of service standards	T:Appx A	vi:p.2	T	(9.1)	p.102	T:p.8-11, A-1	CP pp.27-28	T
Functional classifications	T:p.35	vi:p.2	T	T	IM43	T:p.8-11	CP pp.27-28	T
Coordinated, multi-modal system?								
Roadways	T:pp.10-12	T	T	(9.1)	p.96	T:p.35	CP p.29	T PG 3-2,3-3
Public transit routes		T	T	(9.1)	p.96-111	iv:F:6	CP p.30	T pg 3-6
Bicycle paths	T:pp.35-39, 44	T	T	(9.1)	p.96-111	T:p.18	CP p.30	T pg 3-13
Pedestrian paths	T:pp.35-39, 44	T	T	(9.1)	p.96-111	T:p.18	CP p.30	T pg 3-13
Carpools/HOV lanes			T	(9.1)	p.96-111			T 3-4, 3-8
Other					p.96-111			
Coordinated with land use plan?								
Transit corridors		T:21	N/A		p.96-111	iv:F:6	p.25&30; p.9:(4)	T pg 3-6
Commercial nodes		T:21	N/A		p.60	iv:F:6	p.25&30; p.9:(4)	T 3-21
Mixed land uses		T:21	N/A		p.61	iv:F:6	p.25&30; p.9:(4)	T pg 3-21
Development standards that support alternative transportation modes?		LU	iv:C		p.96-111		CP	Partnership Plan
Connections btw/ Urban/Rural Ctrs?			T		p.110		CP pp.24-26	
Major inter-modal transp corridors?	N/A	N/A	N/A	N/A	p.104-106	N/A	N/A	
Transportation demand mgmnt.		vi: p.8-18		(9.2)	p.100		T:pp.25-30	T pg 3-4
Assess & minimize impacts?				(9.3)				
Environmental					T		(9)	
Financial					T		p.9(4)	
Social					T			
Park-and-ride facilities?			v:D	(9.8)				
Regional corridors					p.100		CP p.30	
Rural centers	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Consistent w/ state/federal legisltn.?	T:pp.1-5		pp.2-3		p.111			

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Table 83. Conformance with Critical Areas Requirements of the GMA

GMA Requirement	Battle Ground	Camas	La Center	Ridgefield	Vancouver	Washougal	Yacolt	Clark County
Critical Areas identified?								
Wetlands	ii:	iii:p.7	Plan Map	Plan Map	Res. Doc; VMC 20.50	ii:c:2:a	p.6	Figure 3
Aquifer recharge areas	ii:	iii:p.8	Plan Map	Plan Map	Res. Doc, VMC 14.26	ii:c:2:b	p.6	Figure 6
Fish & wildlife conservation areas	ii:	vii:p.9	N/A	N/A	Res. Doc and VMC 20.59.900	ii:c:2:c	p.6	Figure 2
Flood hazard areas								
100-year	ii:	iii:p.8	Plan Map	Plan Map	Res. Doc and VMC 20.51	ii:c:2:d	p.6	Figure 5
500-year	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Geological hazards						ii:c:2:e		
steep slopes	ii:	iii:p.9	Plan Map	Plan Map	Res. Doc and VMC 20.52	Exhibit 2D	LU:p.6-9	Figure 7, 8
landslides	ii:	iii:p.9	Plan Map	Plan Map	same	Exhibit 2D	LU:p.6-9	Figure 7, 8
earthquakes	ii:	iii:p.9	Plan Map	Plan Map	same	Exhibit 2D	LU:p.6-9	Figure 7, 8
volcanoes	ii:	N/A	N/A	N/A	N/A	N/A	N/A	
erosion	ii:	iii:p.9	Plan Map	Plan Map	Res. Doc and VMC 14.24	Exhibit 2D	LU:p.6-9	Figure 7, 8
Open space corridors identified?		vii: p 7-3			Pol 27			P
Best available science policies?					New Pol 29-39			
Measures to protect anadromous fisheries?					New Pol 29-39			
Policies to protect?								Goal 2-2; Policy 2.2-1 to 2-2.3
Wetlands	ii:D	iii:p.7, vii:p.7	iv:C	(7.2)	Pol 22, VMC 20.75	ii:C:3	p.9:(5)	Goal 2-1
Aquifer recharge areas	ii:D:(1-B)	iii:p.7, vii:p.7	iv:C	Map	Pol 21, VMC 20.75	ii:C:3	p.7:(1-3),p.9:(5)	Goal 2-1
Habitat conservation areas	ii:D:(5)	iii:p.7, vii:p.7	iv:C	N/A	Pol 18, VMC 20.75	ii:C:3	p.9:(5)	Goal 2-1
Flood hazard areas	ii:D:(4)	iii:p.7, vii:p.7	iv:C	Map	Pol 19, VMC 20.75	ii:C:3	p.9:(5)	Goal 2-9
Geological hazards	ii:D:(4)	iii:p.7, vii:p.7	iv:C	(8.2)	Pol 19, VMC 20.75 & 20.99	ii:C:3	p.9:(5)	Goal 2-9
Consistency w/ CWPPs?								

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Table 84. Conformance with the Critical Areas Requirements of the Countywide Planning Policies

Requirement	Battle Ground	Camas	La Center	Ridgefield	Vancouver	Washougal	Yacolt	Clark County
Countywide Policies								
Critical areas identified?	ii:	iii:p.7-10			Res Doc & VMC 20.50-.52, 20.55, 20.59, 14.24, 14.26	Exhibit 2D	pp.6, 13	Figure 1
Protection policies?	ii:D	iii:p7, iv:p.7	iv:C,vi:D	(7)	same	ii:C:3	p.9:(5)	LU: pg 2-8
Acquisition program?	ii:D:(6),V:E:(2)		x:	(7.3)	Pol 26, VMC 20.55, parks acq. prog.	ii:C:3:(7-A),V:E:(3-D)	p.9:(5-1)	
Framework Plan Policies								
Critical areas as open space?	v:D,E	vii:p.9	iv:C, ix:E	(7.1)	Pol 26, VMC 20.66, 20.75	ii:C:3:(5)	p.9:(5-1)	LU:p 2-6
Continuous system of open space?	v:D,E	vii:p.8	x:	(7)	P 32, VMC 20.55	v:E:(4),(5)	p.9	
Ensure new development protects?	ii:D:(4)	iii:p.7-10	iv:C		P 19, VMC 20.75, 20.96	ii:C:3:(4)	p.9	FWP pg 1-14
Maximize protection/minimize cost?		iii:p.7-10				ii:C:3:(3)	p.9	
Consistent wetlands definitions?	ii:D:(1-H)	iii:p.7-10	iv:C		VMC 20.75	ii:C:2:a	p.9	LU pg 2-6
Aquifer recharge area protection?	ii:D:(1-B)	iii:p.8	iv:C		Pol 21, VMC 20.50, SMP	ii:C:2:b	p.7:(1-3)	LU pg 2-7
Revise dev. code for sensitive lands?	ii:D				IM 21and VMC 20.50-.52, 20.55, 20.59, 14.24, 14.26			
Ground/surface water quality protection?	ii:D:(1)	viii:p.10	iv:C, vi:D		Pol 21-22, VMC 14.24, 14.25	ii:C:3:(1)	CF:p.45	LU:p. 2-1, 2-2
Habitat preservation programs and policies?	ii:D:(5)		iv:C		Pol 18, VMC 20.75, 20.96, Title 21(SEPA), SMP	ii:C:3:(4),(5)	p.9:(5)	LU:p.2-6

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Table 85. Conformance with Rural Element Requirements of the GMA

GMA Requirement	Battle Ground	Camas	La Center	Ridgefield	Vancouver	Washougal	Yacolt	Clark County
Identify rural lands?	NA	NA	NA	NA	NA	NA	NA	RRL: pg 4-2
Identify future population permitted to live/work on rural lands?	NA	NA	NA	NA	NA	NA	NA	RRL: pg 4-3
Adopt development policies?								
Types of uses permitted	NA	NA	NA	NA	NA	NA	NA	RRL: pg 4-9
Variety of development densities:								
residential	NA	NA	NA	NA	NA	NA	NA	?
commercial	NA	NA	NA	NA	NA	NA	NA	RRL: pg 4-4
industrial	NA	NA	NA	NA	NA	NA	NA	RRL pg 4-4
Define rural gov't services	NA	NA	NA	NA	NA	NA	NA	RRL pg 4-1
Appropriate buffers for land of long-term comm'l significance:	NA	NA	NA	NA	NA	NA	NA	
agricultural	NA	NA	NA	NA	NA	NA	NA	RRL: pg 4-4, 4-5-,4-6
forest	NA	NA	NA	NA	NA	NA	NA	RRL pg 4-5
mineral resource	NA	NA	NA	NA	NA	NA	NA	RRL: pg 4-5
Development at UGA boundary	NA	NA	NA	NA	NA	NA	NA	
Policies to preserve rural character?								
Critical areas	NA	NA	NA	NA	NA	NA	NA	RRL:pg 4-4
Agric, forest, & mineral res. uses	NA	NA	NA	NA	NA	NA	NA	RRL pg 4-5
Recreation	NA	NA	NA	NA	NA	NA	NA	Goal 4.1
Scenic resource acquisition	NA	NA	NA	NA	NA	NA	NA	Policy 4.3.9
Environmental protection	NA	NA	NA	NA	NA	NA	NA	RRL: pg 4-18
Consistency w/ CWPPs?								RRL:E Goal 4.1

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Table 86. Conformance with Rural Element Requirements of the Countywide Planning Policies

Requirement	Battle Ground	Camas	La Center	Ridgefield	Vancouver	Washougal	Yacolt	Clark County
Identify land for existing rural development?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
For future rural development?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL: pg 4-13
Recreational uses?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Preserve open space	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL: pg 4-4
Environmentally sensitive	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL: pg 4-4
Comm'l development in rural centers?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL: pg 4-4
Large minimum lot sizes (residential)?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL: pg 4-3
TDR or similar program?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL pg 4-18
Master-planned resort criteria?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL: Policy 4.1.4, pg 4-2
Self-contained sanitary sewer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL: Policy 4.1.4, pg 4-2
Adequate public water	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL: Policy 4.1.4, pg 4-2
Preserve scenic/cultural resources	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL: Policy 4.1.4, pg 4-2
Focus on short-term visitors	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL: Policy 4.1.4, pg 4-2
Full range of recreational amenities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL: Policy 4.1.4, pg 4-2
No adverse impact to resource land	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL: Policy 4.1.4, pg 4-2
Preserve sensitive lands	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL: Policy 4.1.4, pg 4-2
Nearby employee housing	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL: Policy 4.1.4, pg 4-2
Comply w/ development standards	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL Policy 4.1.4, pg 4-2
Cluster new development w/i resort or designated rural center?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL Policy 4.1.4
Affordable housing?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	H pg 5-16

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Table 87. Conformance with Resource Lands Element Requirements of the GMA

GMA Requirement	Battle Ground	Camas	La Center	Ridgefield	Vancouver	Washougal	Yacolt	Clark County
Designate natural resource lands of long-term commercial significance?								
Agricultural	ii:B	iii:p.11	N/A		N/A	ii:B:2:a	N/A	RRL: pg 4-6
Forest	ii:B	iii:p.11	N/A		N/A	ii:B:2:b	N/A	RRL: pg 4-5
Mineral resource	ii:B	iii:p.11	N/A		N/A	ii:B:2:c	N/A	RRL: pg 4-7
Use of new information from DNR?								CP Update
Meet min. state criteria for designating resource lands?								CP Update
Encourage conservation of forest & agricultural lands?								
Development regulations to assure conservation?	N/A	N/A	N/A		N/A	ii:B:3:(1)	N/A	RRL: pg 4-6
Discourage incompatible uses?								RRL:E:Goal 4.5
Review previous designations?								
Consistent with comp. plans	N/A	N/A	N/A		N/A	ii:B:3:(1)	N/A	RRL: pg 4-2
Compatible with adjacent lands?								
agriculture	N/A	N/A	N/A		N/A	N/A	N/A	RRL: pg 4-6
forest	N/A	N/A	N/A		N/A	N/A	N/A	RRL: pg 4-5
mineral resources	N/A	N/A	N/A		N/A	ii:B:3:(1)	N/A	RRL: pg 4-5
No designation within UGA without transfer/purchase of development rights program?	N/A	N/A	N/A		N/A		N/A	N/A

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Table 88. Conformance with Resource Lands Element Requirements of the Countywide Planning Policies

Requirement	Battle Ground	Camas	La Center	Ridgefield	Vancouver	Washougal	Yacolt	Clark County
Policies to preserve/protect resources?								
Agricultural (WAC 365-190-050)								
WAC 365-190-050 currently used or designated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Forest (WAC 365-190-060)								
WAC 365-190-060 currently used or designated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Encourage conservation & protect large parcels w/ prime agricultural soils?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL: pg 4-6, 4-16
Standards for compatible land uses?								
Agricultural	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL: pg 4-6
Forest	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL: pg 4-5
Mineral resource	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL pg 4-5
Review cluster resid. development?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Programs/incentives for property owners?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL: pg 4-18, Policy 4.1.15
Best management practices								
Agricultural operations	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL: pg 4-6, 4-11
Forest operations	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL: pg 4-6, 4-11
Mineral operations	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL: pg 4-6, 4-11
Buffers between resource lands and urban & rural uses?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL Policy 4.3.6, 4.3.11
Right-to-farm/harvest ordinances?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RRL pg 4-18, 4-19
Conversion not justified by available utilities/public facilities?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

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1. Consistency of the Alternatives with Plan Policies

The tables in the previous section identified the measures that each jurisdiction has or proposes to have in their plans and ordinances to address the requirements of GMA and the Countywide Planning Policies. However, those tables do not address how the alternatives with their proposed UGA expansions affect or are consistent with Countywide Planning Policies and local comprehensive plan policies. Not all policies are affected or need to be discussed, but as part of the decision-making process to select a Preferred Alternative, it is important to understand how the alternatives relate to policies for expanding the UGAs. In addition, because GMA requires communities to be able to fund the infrastructure for the land uses proposed over the life of the comprehensive plan, how the UGA expansions affect policies for transportation is also important. Inconsistencies with applicable policies raise policy implications; that is, what changes need to be made to either alternatives (in choosing or developing a Preferred Alternative) or to policies to fix the disconnection.

a. Relationship of the Alternatives to Countywide Planning Policies for UGA Expansion

Below are the Countywide Planning Policies that relate to UGA expansions (proposed language that is part of the County's comprehensive plan update is <u>underlined</u>). A brief discussion of how the alternatives are consistent with a policy or group of related policies is provided.

1.1 Countywide Planning Policies

a. The County, municipalities and special districts will work together to establish urban growth areas within which urban growth shall be encouraged and outside of which growth may occur only if it is not urban in nature. Each municipality within the County shall be included within an urban growth area. An urban growth area may include territory located outside of a city if such territory is characterized by urban growth or is adjacent to areas characterized by urban growth.

The County, the cities, and the special districts have collaborated in the growth management plan update process. Alternative 4 particularly represents the cities' perspectives on how they would accommodate future growth. All alternatives except Alternative 3 would expand into areas currently characterized by varying degrees of rural land use. Alternatives 1 and 5 propose expansion onto rural land that is not contiguous with current UGAs at the La Center Junction area next to I-5.

b. Urban growth areas shall include areas and densities sufficient to permit the urban growth that is projected to occur in the County for the succeeding 20-year period.

All alternatives are consistent with this policy.

c. Urban growth shall be located primarily in areas already characterized by urban growth that have existing public facility and service capacities to adequately serve such development, and second in areas already characterized by urban growth that will be served by a combination of both existing public facilities and services that are provided by either public or private sources. Urban governmental services shall be provided in urban areas. These services may also be provided in rural areas, but only at levels appropriate to serve rural development.

Urban governmental services include those services historically and typically delivered by cities, and include storm and sanitary sewer systems, domestic water systems, street cleaning services, fire and police protection, public transit services, and other public utilities not normally associated with non-urban areas.

No alternatives propose expanding urban levels of service to areas outside proposed expansion areas. All alternatives propose to eventually provide urban services to the expanded and/or existing UGAs; however, compliance of the alternatives with concurrency requirements for public facilities is dependent on the timing and costs of providing those services. Since costs for capital facilities and public services are expected to exceed projected revenues over the next 20 years, the more costly alternatives are less in conformance with this policy than the least costly alternatives. Costs are addressed in the public facilities and utilities section of this DEIS.

d. An urban growth area may include more than a single city.

Not applicable.

e. Urban growth is defined as growth that makes intensive use of land for the location of buildings, structures, and impermeable surfaces to such a degree as to be incompatible with the primary use of such land for the production of food, other agricultural products, fiber, or the extraction of mineral resources.

Conversion of resource lands under each alternative is addressed in the Resource Lands section of this DEIS. Only Alternative 3 would not convert any resource land to urban land. However, regardless of alternative, all comprehensive plans protect resource lands from incompatible uses.

f. The County and cities shall review, at least every five (5) years, their designated urban growth area or areas in compliance with RCW 36.70A.215. The purpose of the review and evaluation program shall be to determine whether Clark County and its cities are achieving urban densities within Urban Growth Areas. This shall be accomplished by comparing the growth and development assumptions, targets and objectives contained in these policies (and in county and city comprehensive plans) with actual growth and development that has occurred.

1. Each municipality within Clark County shall annually provide to the County parcel specific information on land developed or permitted for building and development in three categories: residential, commercial, and industrial. The County and municipalities shall follow the guidelines specified in the Plan Monitoring Procedures Report for the collection, monitoring, and analysis of development activity and potential residential/employment capacity.

2. Clark County, in cooperation with the municipalities, shall prepare a Buildable Lands Capacity Report every five years, with the first report completed by September 2002. The report will detail growth, development, capacity, needs, and consistency between comprehensive plan goals and actual densities for Clark County and the municipalities within it.

3. The County and municipalities shall use the results of the Buildable Lands Capacity Report to determine the most appropriate means to address inconsistencies between land capacity and needs. In addressing these inconsistencies, the County and municipalities shall identify reasonable measures, other than adjusting urban growth areas, that will be taken to comply with the requirements of RCW 36.70A.215.

The *Clark County Buildable Lands Report* was developed by the County in 2001 and 2002. The report showed inconsistencies between assumptions in the 1994 growth management plans and experience of development between 1995 and 2000; however, there is sufficient land capacity to accommodate forecast growth in population and jobs to 2023. Only Alternative 3 proposes to accommodate growth by measures other than expanding the UGAs.

g. Population projections used for designating urban growth areas will be based upon information provided by the Office of Financial Management and appropriate bi-state/regional sources.

Population projections from the OFM were used in all alternatives.

h. Interagency Cooperation

The County and each municipality will work together to:

1) *establish Partnership Planning Subcommittees to develop an ongoing coordination program within the urban growth area;*
2) *provide opportunities for each jurisdiction to participate, review and comment on the proposed plans and implementing regulations of the other;*
3) *coordinate activities as they relate to the urban growth area;*
4) *coordinate activities with all special districts;*
5) *seek opportunities for joint efforts, or the combining of operations, to achieve greater efficiency and effectiveness in service provision; and,*
6) *conduct joint hearings within the urban growth areas to consider adoption of Comprehensive Plans in the Partnership Planning Process.*

These policies are unaffected by the proposed alternatives.

i. Coordination of land use planning and development

1) *The County and each municipality shall cooperatively prepare land use and transportation plans and consistent development guidelines for the urban area.*
2) *Comprehensive Plans must be coordinated. The comprehensive plan of each county or city shall be coordinated with, and consistent with, the comprehensive plans adopted by other counties or cities with which the County or city has, in part, common borders or related regional issues (ESHB 2929; Section 10). The city and the County shall play partnership roles in the production of plans which provide the opportunity for public and mutual participation, review and comment.*
3) *Urban development shall be limited to areas designated by the urban growth boundary.*
4) *Salmonids cannot distinguish between urban and rural boundaries, therefore resource protection and ESA concerns should be applied similarly in both urban and rural area settings.*

These policies are unaffected by the proposed alternatives.

b. Relationship of the Alternatives to Transportation Policies

The following summarizes how each alternative responds to transportation policies in the current comprehensive plans for Clark County, Battle Ground, Ridgefield, Camas, Vancouver, and Washougal.

Clark County: Countywide Planning Policies include the following:

Reducing reliance on single occupancy vehicle (SOV) transportation through a balanced transportation system

Alternative 1 does not achieve a reduction of SOV travel and actually has the lowest transit and non-motorized mode share of all alternatives. With the expansion of the UGAs into areas not currently served by transit nor within walking/bicycling distance of established community centers, this alternative is inconsistent with this goal.

Alternatives 2, 4, and 5 also have lower transit and non-motorized mode shares than Alternatives 3 or 3A, although not as low as alternative 1. Their vehicle miles traveled per household are similar or slightly higher than for Alternatives 3 or 3a. However, as with Alternative 1, many of the new areas of urban

development are outside of transit, walk, and bicycle accessibility, and are less consistent with this goal than Alternatives 3 and 3A.

Alternatives 3 and 3A serve to constrain growth within established UGAs and with a high level of transit, walk, and bicycle accessibility to trip destinations. Alternative 3A also increases walking access to and from the LRT loop. Both alternatives have a higher level of transit and non-motorized mode share than any alternative, with Alternative 3A having the highest non-SOV mode share. Both alternatives are consistent with this goal.

Coordinated planning of regional and bi-state transportation facilities in the context of air, land, and water resources

Alternative 1 would require a significant amount of roadway improvements as mitigation for increased congestion over all other alternatives. The high level of roadway widening required impacts land and water resources. Additionally, with the highest level of vehicle miles traveled, vehicle hours traveled, and delay for any alternative, it has the highest impact on air quality. Alternative 1 is inconsistent with this goal.

Alternatives 2, 4, and 5 also have higher levels of mitigation by roadway widening than Alternatives 3 and 3A, but less so than with Alternative 1. These would have impacts on land and water resources, but not nearly as significant as for Alternative 1. Alternative 2 has the second highest amount of delay of any alternative, which impacts air quality. Alternatives 3 and 3A have somewhat less mitigation than other alternatives. Alternative 3A provides LRT as an alternative to widening of SR-500, I-5, and I-205. If station-area reductions of the LOS/Concurrency standard are adopted (and less roadway widening is required for mitigation purposes) this alternative would have the least amount of impact on land resources.

Alternatives 2 through 5 have similar levels of vehicle hours traveled, vehicle miles traveled, and delay, and have similar impacts on air quality. As long as there is coordination regarding mitigation, levels-of-service, and station area planning, any of these alternatives could be considered as consistent with this goal.

Regional assessment of impacts of regional transportation facilities to maximize the benefits to the region and local communities

Any of the alternatives could support regional assessment of impacts. Alternative 1 would require a more coordinated assessment and project prioritization, due to its significantly higher congestion levels compared to other alternatives.

Implementation of Transportation System Management (TSM) strategies to optimize the efficiency of the current system

Alternative 1's extreme congestion may preclude TSM strategies from having a significant effect on reducing that congestion, although regional corridors may be helped. Alternatives 2, 4, and 5 serve to increase use of the system by attracting trips in the non-peak direction of travel. This is using land use as a pseudo-TSM strategy. For the most part this should be consistent with the TSM goal, except on corridors where traffic signal spacing may prevent effective traffic signal coordination as a TSM strategy, including NE 134th Street from NE 10th Avenue to NE 29th Avenue, Mill Plain Boulevard from NE 98th Avenue to SE 136th Avenue, SR-503 from NE 119th Street to Fourth Plain/SR-500, and Main Street in Battle Ground from SR-503 for approximately ½ mile east.

Implementation of Transportation Demand Management (TDM) strategies to reduce trip demand on the current system

TDM strategies could be implemented under any of the alternatives.

Consider development of transportation corridors for high capacity transit and adjacent land uses that support such facilities.

Alternative 3a is the only alternative that includes high capacity transit corridors. Alternative 3A serves to constrain growth within established UGAs and with a high level of transit, walk, and bicycle accessibility to trip destinations.

Alternative 3 also serves to constrain growth within established UGAs. While high capacity transit was not considered under this alternative, the housing and employment densities may create opportunities for implementation of high capacity transit.

La Center: La Center's transportation policies address moving people and goods into and out of La Center; pedestrian and vehicular circulation within City limits; on-street and off-street parking, including that related to the card rooms; public transportation (although C-TRAN no longer serves La Center with fixed route service); and pedestrian/bicycle trails.

The following are the impacts of each alternative related to La Center's transportation element and policies:

Provide for a balanced, multimodal transportation system within the La Center UGA.

With C-TRAN's removal of fixed route service to and from La Center in 2000, there is no transit service within walking distance of residences and businesses within La Center. Additionally, La Center Road between I-5 and La Center is currently designated a rural major collector by Clark County, and thus will not have dedicated bicycle and pedestrian facilities within its right-of-way; however, the countywide Bikeways and Trails Plan does indicate a regional, multi-use facility paralleling La Center Road, but no funding has of yet been identified to build it. La Center has been constructing sidewalks within the city limits, and has been planning for a trail along Breezee Creek, but no on-street bicycle facilities exist or are funded within city limits. This current and at least short-term future situation is inconsistent with La Center's multimodal and balanced transportation system goal, and at this time there are no plans for transportation improvements or transit service that would alleviate this inconsistency.

Coordinate on Regional transportation facilities with Clark County, WSDOT, RTC, and C-TRAN.

For La Center, these would include Pacific Highway, La Center road, the I-5/La Center interchange, as well as North Fork Road, Highland road, and Lockwood Creek Road. La Center could pursue coordination with other agencies under any of the alternatives.

Maintain LOS D at intersections on La Center Road/NW 319th Street, and at the I-5 interchange. Maintain LOS C at intersections on NW Pacific Highway, Bolen Street, East 4th Street, Aspen Avenue, 9th Street, North Fork Avenue, Highland Road, and Lockwood Creek Road. Apply standards to development proposals (concurrency). (These combine two goals).

Under all alternatives, La Center Road will be at LOS E or F and without widening to multiple lanes (including the La Center Bridge over the East Fork of the Lewis River) and providing intersection or interchange improvements at I-5, Timmen Road, and in the town core. It may not be financially feasible

to provide LOS D for the La Center Road corridor into town. If it is determined that neither the county nor La Center have sufficient funding in the Capital Facilities Plan to improve La Center Road, it is recommended that an LOS E policy be adopted for La Center Road from I-5 into the town core.

Alternative 1 has the highest level of vehicular travel and LOS E/F facilities of any alternative. It is unlikely that sufficient transportation funding will be available to pay for all of the mitigation needed to maintain LOS D or higher on regional facilities or Highways of Regional Significance. Without significant intersection widening, it will be impossible to maintain LOS C at the intersections specified in La Center's current plan. This land use alternative is inconsistent with La Center's LOS goal.

Alternatives 2, 4, and 5 all include significant development at the La Center Junction. It will be critical that interchange improvements be included in a Capital Facilities Plan for this area to maintain LOS D at the interchange.

Alternatives 3 and 3A both contain La Center's growth within the current UGB. This will increase traffic congestion within La Center. It will be unlikely that LOS C can be maintained under these alternatives. These alternatives are inconsistent with La Center's LOS C goal. It is recommended that the goal be changed to LOS D for these land use alternatives, and that a high level of pedestrian and bicycle facilities be included in the Capital Facilities Plan if either of these alternatives becomes the preferred land use alternative.

Discourage or prohibit driveways directly onto arterials, improve streets concurrent with development, and provide sidewalks for new developments (combination of three goals).

All of the land use alternatives would be consistent with these goals, as they are relevant to standards that would be applied to all new developments.

Coordinate with C-TRAN on establishing a park-and-ride and bus stops in La Center, and encourage the use of public transportation and/or carpooling.

With C-TRAN's removal of fixed route service to and from La Center in 2000, there is no transit service within walking distance of residences and businesses within La Center and thus no park-and-ride or bus stop facilities. This current and at least short-term future situation is inconsistent with La Center's transit goal, and at this time there are no plans for transportation improvements or transit service that would alleviate this inconsistency.

La Center should institute a Neighborhood Traffic (Calming) Program

Such a program could include speed bumps, traffic circles, other physical devices, as well as programs such as speed watch to reduce speeding on residential streets. If La Center dedicates funding for this program, all land use alternatives would be consistent with this goal. If there is no dedicated funding for a neighborhood traffic program, there will be differences in La Center's financially ability to fund neighborhood traffic calming projects based on the specific land use alternative.

Implement Traffic Impact Fees within the UGA.

All alternatives would likely be consistent with this goal. All alternatives would require interchange improvements at the I-5/La Center Junction, some of which WSDOT would likely request be TIF-funded. La Center does not have the ability to collect enough traffic impact fees within a six-year period (the maximum amount of time a jurisdiction can hold TIF funds before they need to be returned, with interest) to pay for the entire multi-million dollar cost of an interchange widening. However, funding sources at the state and federal level all favor projects which exceed minimum local match requirements and provide

for public/private partnerships (TIFs are considered private funding). Additionally, La Center likely could collect enough impact fees to provide for a small percentage (3 to 5 percent) of the interchange cost over a six-year period (and could likely find another project in its TIF area on which to spend the TIF funds if an interchange project is delayed or deferred). Thus, it is reasonable to include a small portion of TIF funds as part of the interchange project's local match.

Vancouver UGA: The Vancouver comprehensive plan and Mobility Management Element contain a wide variety of transportation policies and implementation measures. Rather than restate each and every policy and implementation measure, they will be grouped into general topic areas and the impacts of land use alternatives on these topic areas will be discussed.

Land Use Patterns: Promote land use patterns and site development practices which encourage multimodal (especially non-vehicular) transportation to work sites and for trips within the UGA, reduction in trip length and the number of vehicle trips made, and system efficiencies via TSM and TDM. Adopt LOS standards that encourage growth in urban centers and corridors as well as a multimodal transportation system. Coordinate parking standards to maintain neighborhood integrity, shared uses, and encourage economic development.

Alternative 1 serves to significantly expand Vancouver's UGA (and others' as well). It does not achieve a reduction of SOV travel and has the lowest transit and non-motorized mode share of all alternatives. LOS standards would likely need to be lowered as funding is inadequate to maintain current standards and to mitigate for the additional congestion resulting from this alternative. Lowering of these standards will not encourage transit use as there will be many areas of the UGA without transit service. Incompatible adjacent uses in the expanded areas will likely make shared parking infeasible. With the expansion of the Vancouver UGA into areas not currently served by transit nor within walking/bicycling distance of established community centers, this alternative is inconsistent with this policy.

Alternatives 2, 4, and 5 also have lower transit and non-motorized mode shares than Alternatives 3 or 3A, although not as low as Alternative 1. Their vehicle miles traveled per household are similar or slightly higher than for Alternatives 3 or 3a. However, as with Alternative 1, many of the new areas of urban development are outside of transit, walk, and bicycle accessibility, and are less consistent with this policy than Alternatives 3 and 3A.

Alternatives 3 and 3A serve to constrain growth within the established Vancouver UGA and with a high level of transit, walk, and bicycle accessibility to trip destinations. Alternative 3A also increases walking access to and from the LRT loop. Both alternatives have a higher level of transit and non-motorized mode share than any alternative, with Alternative 3A having the highest non-SOV mode share. Station area planning in Alternative 3A would be required to adequately promote efficient and shared parking facilities so as to encourage transit, walking, and bicycling while at the same time ensuring that commercial and office site parking does not infiltrate into adjacent neighborhoods. Both alternatives are consistent with this policy.

Multimodal Transportation System: provide for a multimodal and efficient transportation system which provides reasonable alternatives to automobile travel and roadway expansion. Discourage future transportation projects that will result in a significant increase in carrying capacity for single occupant vehicles. Continue efforts to construct a High Capacity Transit system within the Vancouver UGA. Give priority to inter-jurisdictional, multi-modal projects.

Alternative 1 would not help Vancouver to meet this policy. This alternative increases the amount of single-occupant vehicle travel countywide, including many highly congested regional corridors within the Vancouver UGA (see various discussions above). The lack of established density or community centers in this alternative make it unlikely that expansion of transit service would be financially feasible. The high

level of roadway capacity mitigation needed to offset the impacts of this alternative will likely reduce the amount of funding available for bicycle/pedestrian projects, which in turn results in bike/pedestrian improvements serving the UGA being highly unlikely. Alternative 1 is therefore inconsistent with this policy.

Alternatives 2, 4, and 5 all provide for new employment centers with the Vancouver UGA as well as in other areas in the county. Since these employment centers are not within current transit service areas, and are somewhat remote for bicycle and pedestrian access from residential centers, the transit and non-vehicular mode shares under these alternatives is low compared with Alternatives 3 and 3A (although higher than for Alternative 1). They do, however, serve to encourage traffic flow in the non-peak direction of travel, thus using existing roadway capacity and serving to increase the efficiency of the system. C-TRAN may find that extending fixed route service to serve these employment centers is financially viable, if employment centers are developed with transit- and pedestrian-oriented site designs.

These alternatives are somewhat consistent with the City's multimodal transportation policy, but would require implementation measures to ensure full consistency with this policy.

Alternatives 3 and 3A contain Vancouver's growth within the current UGA, and thus there are no significant employment centers outside of the existing UGA. As the city develops, trip destinations for shopping and school trips, along with some work commutes, may be within walking or bicycling distance and fully contained within the Vancouver UGA. C-TRAN may find it somewhat financially viable to provide additional fixed route service with the UGA as well. Alternative 3A's level of C-TRAN service would be dictated by agreements with Tri-Met with respect to operating the LRT loop line in that alternative. It is conceivable that redirecting C-TRAN's fixed route bus service to serve the LRT loop, combined with higher densities along the LRT line itself (thus residents within walking distance rather than transit distance of LRT service), may allow C-TRAN to provide additional service within the UGA. Alternative 3 does not have a high capacity transit system, but otherwise is consistent with the multimodal policy. Alternative 3A is fully consistent with the multimodal transportation policy.

Intercity Transportation: Support federal, state, and local programs to expand the level of air, water, and rail transport service to and from the region.

The policy regarding air, water, and rail transport relates to intercity transportation of people and goods, rather than movement within Clark County. None of the land use alternatives is inconsistent with this policy. Intermodal connections *within* Clark County may affect intercity transportation, however. For example, all land use alternatives add congestion to the state highway and regional transportation system within Clark County, which in turn affects the mobility of freight movement into and out of land, water, and air ports. Additionally, bus connections to the Amtrak passenger rail station in Vancouver is affected by congestion on the regional roadway system.

Access and Livability: Maintain and enhance the quality of existing roadways. Provide safe, attractive pedestrian facilities adjacent to arterials and streets within residential neighborhoods. Promote safe and secure terminal facilities for bicyclists, pedestrians, and transit users in activity centers and transit corridors. Ensure that the transportation needs of the physically challenged are met.

Regarding pedestrian and bicycle facilities, all alternatives could be consistent with this policy provided that transportation improvement projects all include pedestrian and bicycle facilities. Alternatives 1, 2, 4, and 5 have higher congestion levels on regional facilities than Alternatives 3 and 3A within and serving the Vancouver UGA. Mitigating for this congestion may result in roadway capacity projects outside of the Vancouver UGA competing with multimodal transportation improvements within the Vancouver UGA.

Alternatives 3 and 3A both contain growth within the current UGA, and both would allow for multimodal transportation projects to occur. Alternative 3A includes the LRT loop; however, the city would also need to fund walkway and bikeway projects feeding the LRT stations in order to fully utilize the LRT system. These walkway and bikeway projects would compete with other, non-LRT corridor transportation improvement projects for funding.

Regarding meeting the needs of the physically challenged, the city has adopted ADA-compliant design standards for new roadways as well as roadway reconstruction; thus, all alternatives are consistent with this policy.

Coordination: Ensure participation in the Vancouver/Portland area programs and planning efforts. Promote interagency coordination and multimodal systems.

The city currently participates in the Bi-State Transportation Committee, the I-5 Trade and Transportation Partnership Study, and other RTC and Metro efforts, to ensure regional coordination.

Financing: pursue all available funding and encourage multimodal transportation projects.

As stated above, Alternative 1 would likely result in mitigation projects that favor automobile trips, and thus is inconsistent with this policy. Alternatives 2, 4, and 5 also lend themselves to more auto-oriented mitigation than for Alternatives 3 and 3A, but also may present opportunities for public-private partnerships for transportation improvements, especially in the Discovery Corridor, which may help leverage federal and state funding. Additionally, these alternatives may lend themselves to transit projects and service which serve outlying employment centers, provided that new employment sites be transit-oriented in layout and along the same corridor (such as the Discovery Corridor concept in Alternative 5 which includes expansion of the Ridgefield Junction industrial/employment area). These alternatives are consistent with this policy. Alternative 3 enables the city to focus on multimodal transportation projects within the current UGA, and thus is consistent with this policy. Alternative 3A provides for a multimodal solution to work commutes (the LRT line); however, providing local matching funds and pedestrian/bicycle improvements to access LRT stations may reduce the amount of funding available for multimodal projects elsewhere. Alternative 3A is mostly consistent with this policy, but a revenue vs. capital cost analysis needs to be undertaken to evaluate the ability to fund and construct non-LRT related multimodal projects.

Yacolt: The Yacolt area does not show a significant increase in traffic volumes between existing and 2023. All roadway links and intersections are expected to be at LOS C or better conditions, consistent with Yacolt's adopted level-of-service policy.

Congestion on rural and regional roads linking Yacolt to the rest of Clark County are expected to experience increased congestion, especially in Alternative 1. This increased congestion will also serve to increase peak period travel times between Yacolt and urban centers such as Battle Ground and Vancouver.

Following is a discussion of the impacts of land use alternatives on Yacolt's Transportation policies.

Improve and maintain the town's road network and ensure coordination with the county and WSDOT on the regional network. Establish a regional transportation system. (Policies 9-1 and 9-2).

All alternatives add congestion to regional roadways which would serve Yacolt. Primarily, SR-503, which connects Yacolt to Battle Ground and Vancouver, will experience LOS E/F conditions from north of Battle Ground (near Lewisville) to SR-500/Fourth Plain in Vancouver. Congestion on SR-502 to I-5 (another route for Yacolt trips to reach the regional and interstate system) is prevalent in Alternatives 1, 2, 4 and 5. Without mitigation, these alternatives would be inconsistent with this Policy.

Coordinated planning of regional and bi-state transportation facilities in the context or air, land, and water resources (Policy 9-3).

All impacts on regional transportation facilities occur outside of the Yacolt UGA. See the Clark County discussion for regional facilities outside of the UGA.

Optimize use and efficiency of current roads (Policy 9-4).

All land use alternatives maintain the existing roadway system within the Yacolt UGA.

Establish roadway design and level-of-service standards (Policy 9-5).

All land use alternatives maintain LOS C or better within Yacolt.

Washougal: Washougal does not list policies in their Transportation element, but instead lists transportation improvement strategies by mode. This discussion will focus on the impacts of the land use alternatives on Washougal's ability to provide modal strategies.

Level-of-service: generally provide LOS C and D on city arterials, except for unsignalized urban arterials, which are allowed LOS E where they do not meet signal warrants.

Washougal should be able to maintain LOS D on most of its city arterials under all of the land use alternatives. The exception is the former SR-140 (15th Street), which will likely have several intersections at LOS E, including the intersection with SR-14. Mitigation may be necessary at SR-14 (an interchange), E Street (signal and intersection improvements), and potentially B and C Streets (signal and intersection improvements).

Pedestrian and bicycle facilities: construct sidewalks along all collector and arterial streets. Construct bicycle lanes along selected local, collector and arterial streets.

As providing sidewalks is a city street standard, all alternatives are consistent with this policy. Priority should be given to sidewalks along city principal arterials, such as 15th Street, E Street, and a pedestrian/bicycle crossing of SR-14 into the Port area.

Transit: maintain or expand fixed- and flexible-route service.

There is limited local and commuter transit service to Washougal. C-TRAN has scaled back service due to limited operating funds and low ridership. Publicly-funded pedestrian and bicycle projects in Washougal which improve access to transit should be given priority.

Battle Ground: The Battle Ground comprehensive plan includes two broad transportation development policies. Those policies address regional transportation system coordination and implementation of improvements to encourage use of Main Street services. Following is a discussion of the impacts of the land use alternatives on Battle Ground's transportation system.

All alternatives add congestion to the regional roadways that serve Battle Ground. SR-503 will experience LOS E/F conditions from SR-500 to Battle Ground under all alternatives. SR-502 will experience LOS E/F conditions under alternatives 1, 4, and 5. Sections of NE 72nd Avenue will also experience LOS E/F conditions under all alternatives. Mitigating these conditions will require regional coordination to identify the appropriate level of improvement and funding options.

Camas: The City's December 2002 draft Transportation Element includes several goals, policies, and strategies. The policies and strategies are grouped into general topic areas and the impacts of land use alternatives on these topic areas is discussed.

Provide a balanced transportation system that supports the land use vision for industrial, commercial, and residential uses.

Alternative 4 includes the preferred land use vision for most communities. Alternative 4, along with Alternatives 2 and 5, have lower transit and non-motorized mode shares than Alternatives 3 or 3A, although not as low as Alternative 1. Without mitigation, Alternative 4 would be inconsistent with this Policy.

Design and construct safe facilities that enhance the livability of Camas.

This goal contains several policies including improved traffic safety, protection against neighborhood cut-through traffic, and development of attractive streetscapes. If Camas dedicates funding for a neighborhood traffic program, all land use alternatives would be consistent with this goal. If there is no dedicated funding for a Neighborhood Traffic Program, all land use alternatives would be consistent with this goal.

High accident locations should be identified and safety improvements should be coordinated with WSDOT and Clark County. Specific revenue sources are available for safety improvements at high accident locations. The impact of the various land use alternatives on traffic safety will vary. Those alternatives that show significant congestion could exacerbate existing safety issues and create new safety issues. As congestion increases, driver's willingness to take risks increases. Drivers will accept shorter traffic gaps and seek alternate routes through neighborhoods. Alternatives 1, 2, and 4 have the highest levels of congestion and may increase safety issues. Alternative 3 has the lowest levels of congestion, followed by Alternative 5 and 3a.

Create an efficient system that limits congestion, reduces percentage of trips by SOVs, and reduces number and length of trips.

Alternative 1 does not achieve a reduction of SOV travel and has the lowest transit and non-motorized mode share of all alternatives. LOS standards would likely need to be lowered as funding may be inadequate to maintain current standards and to mitigate for the additional congestion resulting from this alternative. Lowering of these standards will not encourage transit use as there will be many areas of the UGA without transit service. This alternative is inconsistent with this policy.

Alternatives 2, 4, and 5 have lower transit and non-motorized mode shares than Alternatives 3 or 3A, although not as low as alternative 1. Their vehicle miles traveled per household are similar or slightly higher than for Alternatives 3 or 3a.

Coordinate with applicable agencies in planning road improvements and completing road maintenance.

Most impacts on regional transportation facilities occur outside of the Camas UGA. See the Clark County discussion for regional facilities outside of the UGA.

Ridgefield: Coordinate with Clark County to develop and implement transportation programs which reduce reliance on the SOV, encourage energy efficiency, recognize financial constraints, minimize neighborhood impacts, minimize environmental impacts, and implement TDM programs.

Alternative 1 does not move Ridgefield toward meeting this policy. This alternative increases the amount of single-occupant vehicle travel countywide, including many highly congested regional corridors. The lack of established density or community centers in this alternative make it unlikely that extending transit service to areas within the UGA not currently covered by transit would be financially feasible. The high level of roadway capacity mitigation needed to offset the impacts of this alternative will likely reduce the amount of funding available for bicycle/pedestrian projects, which in turn results in bike/pedestrian improvements serving the UGA being highly unlikely. Alternative 1 is therefore inconsistent with this policy.

Alternative 5 provides for new employment centers in the Urban Reserve areas north of Ridgefield. Since these employment centers are not within current transit service areas, and are somewhat remote for bicycle and pedestrian access from residential centers, the transit and non-vehicular mode shares under this alternative is low compared with Alternatives 2, 3, 3A, and 4 (although higher than for Alternative 1).

Alternative 5, however, serves to encourage traffic flow in the non-peak direction of travel, thus using existing roadway capacity and serving to increase the efficiency of the system. C-TRAN may find that extending fixed route service to serve these employment centers is financially viable, if employment centers are developed with transit- and pedestrian-oriented site designs. Alternative 4 also encourages non-peak traffic flow to Battle Ground and to a lesser extent the Ridgefield Junction area, but not to the extent of Alternative 5.

Alternatives 3, 3A, and 4 contain Ridgefield's growth within the current UGA, and thus there are no significant employment centers outside of the existing UGA. Because most of the growth is contained within the existing UGA, trip destinations for shopping and school trips, along with some work commutes, may be within walking or bicycling distance and fully contained within the Ridgefield UGA. C-TRAN may still find it financially infeasible to provide additional fixed route service within the UGA unless development standards were modified to increase density around transit stops and the Ridgefield Park-and-Ride.

Alternative 2 would add additional land for housing to the UGA. The housing would be in close proximity to Ridgefield Junction area which is slated for employment growth. The additional housing may provide opportunities for more trip destinations for shopping and school trips, along with some work commutes to be fully within the UGA. This could make walking and bicycling trips more feasible and provide for shorter driving trips.

Regarding environmental impacts, Alternative 1 would require a significant amount of roadway improvements as mitigation for increased congestion over all other alternatives. The high level of roadway widening required serves to impact land resources. Additionally, with the highest level of vehicle miles traveled, vehicle hours traveled, and delay for any alternative, it has the highest impact on air quality. Alternative 1 is inconsistent with this goal.

Alternatives 2 and 5 also have higher levels of mitigation by roadway widening than Alternatives 3, 3A, and 4, but less so than with Alternative 1 or Alternative 4. These would have impacts on land and water resources, but not nearly as significant as for Alternative 1. Alternative 2 has the second highest amount of delay of any alternative, which impacts air quality. Alternatives 3 and 3A have somewhat less mitigation than other alternatives. Alternative 3A would likely have the least amount of impact on land resources.

Alternatives 2 through 5 have similar levels of vehicle hours traveled, vehicle miles traveled, and delay, and have similar impacts on air quality. As long as there is coordination regarding mitigation and levels-of-service, any of these alternatives could be considered as consistent with this goal.

The high level of roadway capacity mitigation needed to offset the impacts of this alternative will likely reduce the amount of funding available for carpooling/vanpooling programs or projects. Alternative 1 is therefore inconsistent with the TDM policy.

Level-of-service: generally provide LOS C and D on city arterials, except for unsignalized urban arterials, which are allowed LOS E where they do not meet signal warrants.

Ridgefield should be able to maintain LOS D on most of its city arterials under all of the land use alternatives. The exception is SR-501 (Pioneer Street), which will likely have several intersections at LOS E/F, including the intersection with S-5. Mitigation will be necessary at SR-5 (an interchange), and other intersections in the Ridgefield Junction area.

Coordinate with C-TRAN in providing service, stops, and park-and-ride facilities.

C-TRAN currently provides AM and PM commuter service between the Ridgefield Park-and-Ride facility and the Salmon Creek Park-and-Ride. The Ridgefield park-and-ride facility is located in the NE quadrant of the I-5 interchange. The limited nature of the roadways serving the facility and the current lack of housing and employment near the facility do not allow for convenient and safe walking or bicycling access. At this time there are no plans for transportation improvements or new transit service. This current and at least short-term future situation is inconsistent with the City's goal.

All alternatives provide for urban-scale development at the Ridgefield/I-5 junction. With development at the junction, it would be likely that the existing park-and-ride facility could be enhanced to better serve both Ridgefield resident commuters as well as those commuting to jobs at the Junction. Additionally, if the Ridgefield junction development density and site layouts are implemented so as to be transit- and pedestrian-oriented and have incentives or requirements for employer-based carpooling and vanpooling programs, C-TRAN may find that extending fixed route service to serve the Junction as well as continuing to and from the town core may be financially viable, especially coupled with service along the I-5 north corridor serving the Discovery Corridor and La Center Junction employment centers. These alternatives are thus consistent with this goal.

Minimize neighborhood congestion and encourage safety

This goal contains several policies including improved traffic safety, protection against neighborhood cut-through traffic, and development of attractive streetscapes. If Ridgefield dedicates funding for a Neighborhood Traffic Program, all land use alternatives would be consistent with this goal.

All alternatives provide for industrial and commercial development at Ridgefield Junction. Typically, traffic calming is not implemented within areas with these land uses, except where desired by the developer as part of site design. There will be little need for Ridgefield to extend a neighborhood traffic program to the Junction. If housing is built near the interchange and is served by public streets, the City should extend a neighborhood traffic program to the Junction. These alternatives are consistent with this goal.

C. Concurrency

1. Setting

Concurrency refers to the relationship of new development to the availability of public facilities and services. Concurrency requirements have been enacted by local governments around the country to ensure that public facilities and services—typically transportation, water, sewer, parks, and schools—are not overburdened by the impacts of new development. Concurrency requirements also ensure that new residents have adequate public services and facilities available to them when they move into new developments.

The GMA requires all local jurisdictions "to ensure that those public facilities and services necessary to support development shall be adequate to serve the development at the time the development is available for occupancy and use without decreasing current service levels below locally established minimum standards."

The GMA deals with concurrency at two levels. At the regulatory and project level, a community must be able to demonstrate its ability to finance the capital facilities it needs to meet its planned land use. If the community does not have the financial ability to serve its planned loads or facility needs, it must reexamine its land use assumptions. Concurrency at the regulatory level is specified in the capital facility element of the comprehensive plan. At the project level, concurrency requires that adequate facilities must be available (or planned and financed to be in place) within a reasonable time, typically three to six years. If not, the project cannot be approved.

The concurrency requirement is mentioned at several points in the GMA. It defines public facilities as streets, roads, highways, sidewalks, street and road lighting systems, traffic signals, domestic water systems, storm and sanitary sewer systems, parks and recreational facilities, and schools. Public services include fire protection and suppression, law enforcement, public health, education, recreation, environmental protection, and other governmental services. However, the GMA specifies that only transportation, water, and sewer facilities must be reviewed by local jurisdictions for concurrency. Including concurrency requirements for other facilities is optional.

The GMA establishes specific concurrency requirements for transportation. Comprehensive plans must establish minimum levels of service, identify transportation facilities needed to meet these levels of service, and locate funding sources to pay for the necessary facilities. The GMA defines concurrency for transportation as "…improvements or strategies that are in place at the time of development, or that a financial commitment is in place to complete the improvement of strategies within six years."

In 2000, Clark County reviewed its transportation concurrency program and made it more corridor based. The County's original program, begun in 1994, focused solely on operations and levels of service (LOS) at intersections. The new concurrency system established LOS standards for 34 concurrency corridors and procedures to ensure those standards are met before new development is approved. The County's current program involves a three-step approach. The first step is the requirement to meet minimum travel speed standards for the 34 designated concurrency corridors. The next step is to set LOS standards for signalized intersections within the concurrency corridors. The third step relates to operations at unsignalized intersections. The availability of transit, sidewalks, bike lanes, and other travel modes is not taken into account in the concurrency program. The County is currently reviewing its concurrency requirements for transportation.

Clark County and each of the cities has established concurrency requirements for water, sewer, and transportation. The following section looks at how each of the alternatives under consideration would impact concurrency management for water, sewer, and transportation facilities.

2. Alternative 1

Alternative 1 would result in the largest expansion of UGAs—around 28,000 acres—of any of the alternatives. Most of this growth would occur north along I-5 and between Battle Ground and Vancouver. Alternative 1 would also result in the largest increase in county population, around 160,499 residents by 2023.

A more dispersed growth pattern and the large increase in population would make concurrency management more difficult and costly under this alternative. The location, timing, and pattern of growth directly relate to the cost of providing services and infrastructure. Generally, as new development spreads out from existing urban areas, the cost of providing and maintaining public services increases. For water provision, a more dispersed growth pattern would increase the length of transmission lines and, therefore, increase the cost of providing water to residents and businesses. Much of the area that would be added to UGAs is outside current sanitary sewer service boundaries and would require the extension of sewer mains to these areas.

Alternative 1 has the highest amount of congestion, delay, and LOS E/F lane miles of any alternative. LOS E and F may have major impacts on transportation concurrency and regional planning efforts. Under this alternative, I-5 and I-205 would operate at LOS F conditions at peak hours. Almost all freeway, expressway, and major arterial corridors in the southern half of the county would be congested during peak hours. Congestion would affect traffic circulation within urban areas and FPIAs. It can be expected that, because this alternative would involve significant congestion and traffic delays, meeting current transportation concurrency requirements would be more difficult. Maintaining service levels similar to LOS D would require substantial mitigation.

3. Alternative 2

Alternative 2 would see a less extensive expansion of UGAs, and much of this growth would occur in areas designated as urban reserve areas. Water and sanitary sewer service providers have included eventual urbanization of much of this area in their planning to date; therefore, meeting concurrency requirements for water and sewer under this alternative would likely be less difficult than under Alternative 1. However, because this alternative would involve the extension of water transmission lines and sewer mains to portions of new UGAs, its costs would likely be greater than those associated with Alternative 3, which relies largely on the capacity of existing facilities.

Other than Alternative 1, this alternative has the highest number of congested lane miles. It also has the highest average trip length for both work and non-work trips of any of the alternatives. As with Alternative 1, major north-south corridors that would be congested (LOS E/F) include I-5, I-205, 72nd Avenue, SR-503, 162nd Avenue, and portions of Ward Road/182nd Avenue. Congestion would affect mobility between major destinations and the FPIAs and traffic circulation within urban areas and FPIAs. To maintain service levels similar to LOS D, this alternative would require substantial mitigation. Similar to Alternative 1, meeting current concurrency requirements for transportation under Alternative 2 would present significant challenges in some areas.

4. Alternative 3

Meeting current concurrency requirements for water, sewer, and transportation would likely be least problematic under Alternative 3, since it involves no expansion of urban growth areas onto undeveloped lands. It would not require planning and construction of new public water or sewer facilities beyond the area already covered in provider plans. This alternative would make the most efficient use of existing systems. Some sewer and water mains would have to be replaced over the 20-year life of this alternative to support more intensive development, and new wells and water and sewage treatment capacity would eventually be required.

Alternative 3 has the lowest number of congested lane miles of any of the alternatives. Routes connecting the Vancouver UGA to outlying UGAs would experience some congestion, but not as much as under the other alternatives. Overall mobility for this alternative is better than the other alternatives. Alternative 3 would not affect traffic circulation within the urban areas and FPIAs as greatly as the other alternatives. However, segments of some major corridors within the Vancouver area, most notably I-5 south of 99th Street, would see significant congestion during peak hours of travel. Vancouver is addressing this issue Because it would generally impact LOS standards less, this alternative would present less of a challenge to jurisdictions in meeting concurrency requirements for transportation.

5. Alternative 4

Alternative 4 would also involve a large expansion of existing UGAs, primarily in the Battle Ground area and an area between Battle Ground and Vancouver. Concurrency management for sewer would perhaps be most challenging in Battle Ground because there would be a large expansion of the service area to areas with no collection or treatment systems. CPU has made some improvements to the water system in the area, but the cost of water service would also be substantial. The areas proposed for inclusion in the Camas and Ridgefield UGAs are already within water service areas and are included in their system plans. Vancouver currently has no plans for extending water lines into a portion of its proposed expanded UGA.

To maintain transportation service levels similar to LOS D, this alternative would require less mitigation than Alternatives 1, 2, and 5, but more than Alternative 3, largely because peak traffic flows on corridors serving employment centers are more balanced. Because overall mobility is better under this alternative and because it impacts LOS less, meeting current transportation concurrency requirements would generally be less problematic than under Alternatives 1, 2, and 5.

6. Alternative 5

Alternative 5 would see an expansion of UGAs of 12,303 acres. This alternative would direct most growth to an area along the I-5 corridor and focus on industrial and commercial uses to better balance jobs and housing in the county. Most of the area proposed for addition to UGAs is not currently served by public sewer or water systems. New facilities would be needed for the La Center Junction area, Ridgefield Junction area, and the area north of the fairgrounds. Because the terrain along and west of I-5 is hilly and criss-crossed with ravines, pump stations would be required to move water and sewage over hills and streams; pump stations would add to facility construction costs and might pose more of a challenge to achieving concurrency in these areas.

Similar to Alternative 4, the higher employment levels under Alternative 5 would serve to balance peak traffic flows on I-5 and I-205 and other major transportation facilities. To maintain service levels similar to LOS D, this alternative would require more mitigation than Alternatives 3 and 4, but less than Alternatives 1 and 2. Traffic along SR-503 and 72nd Avenue would present the greatest challenge to transportation concurrency management, as these facilities would experience significant increases in traffic. Overall, Alternative 5 would likely present greater challenges to meeting current transportation concurrency requirements than Alternatives 3 and 4.

7. Mitigation Measures

To help implement concurrency management programs, local jurisdictions should consider the following measures:

- Revise the proposed UGA to reduce the area requiring service extensions.
- Establish LOS standards for all public facilities and services that the jurisdiction has designated to meet concurrency requirements.

- Establish procedures and criteria for the permitting process to evaluate the impact of new development on the levels of service of public facilities and services.
- Design public facilities that are efficient, cost-effective, and appropriate to the area.

D. Fiscal Impacts

The GMA requires CWPPs to include an analysis of fiscal impact (RCW 36.70A.210(3)(h)). As noted in the SEIS for the 1994 comprehensive plans for the County and local cities, the statutory requirement is brief and general. Subsequent conclusions by the Central Puget Sound Growth Management Hearings Board appeared to establish minimum requirements for fiscal analysis that included an assessment by local jurisdictions of anticipated costs versus revenues based on designated UGAs. There does not appear to be criteria for determining whether a particular assessment is adequate.

In the past Clark County has dispersed its capital improvements expenditures throughout the county providing partial solutions to many areas, but not complete solutions to priority areas. It is clear that existing revenue streams are not sufficient to keep up with demands for public services and facilities. Transportation concurrency policy has led to denial of projects in some corridors; park acquisition and improvements are not keeping up with population and employment growth; schools heavily rely on portable facilities, etc.

As a part of updating the comprehensive plan and planning for a better balance of jobs to population, the County has elected to pursue a more strategic approach to investment of public funds to better prioritize funding for capital improvements. The goal is to obtain "fully-served" land where all public facilities meet or exceed standards in areas planned for employment development. Experience shows that the market responds well to "shovel ready" sites at which development can begin as soon as plans and approvals are completed. Consequently, a very focused analysis was conducted to first identify potential investment areas (the FPIAs) and then develop conceptual plans and cost estimates for making them ready to build (recognizing that full build-out of all the areas will take many years and elected officials will determine the timing for improvements).

The results of estimating the costs of water, sewer, and transportation improvements for serving the UGAs proposed under each alternative were presented in the capital facilities section of this DEIS. The following sections discuss the potential fiscal impacts of water, sewer, and transportation improvements based on the proposed alternatives.

1. Fiscal Impacts of Water, Sewer, and Electricity Improvements

Unlike transportation systems, water and sewer costs are largely funded by business and residential development incrementally extending lines and paying meter fees and other system development ("hook-up") charges. Plans for new transmission and/or treatment facilities are based on planned land uses and funded through a number of mechanisms, including bonds. Debt used to fund improvements is paid back through future user fees. This system of paying for major improvements up front and recovering the costs later is necessary because the improvements need to be in place before development can occur and because of the long lead time needed to build the major improvements.

A review of the comprehensive planning documents for the various water and sewer utilities and discussions with staff in each show that some water and sewer providers have recently built water supply and sewage treatment plants in response to the growth forecasts of the 1994 comprehensive plans and are now awaiting the connections that will recoup the cost of these investments. If growth does not occur, they will need to raise rates or find other income to pay for these facilities. Consequently, utility providers may have more difficulty recovering costs to the extent that the proposed land use pattern under each alternative is less than the pattern proposed in the 1994 comprehensive plans. This leads to one basic

conclusion that Alternative 3, which retains the basic land use pattern of the 1994 plan, could have the least fiscal impact, particularly in the short term. However, this does not necessarily mean that the fiscal impacts of other alternatives that propose UGA expansions could not be accommodated. Timing, location, and types of uses proposed all factor into the ability of the providers to bond, construct, and recover the costs for improvements not currently planned.

Depending on the shape of new urban growth areas, some potentially expensive issues may arise. The Salmon Creek Wastewater Treatment Plant serves Hazel Dell Sewer District as well as Battle Ground, Orchards, Cedars, and Meadow Glade areas. The treatment plant and the interceptor sewer are not currently sized for the amount of growth anticipated in both the Discovery Corridor and the Battle Ground FPIAs. Either the interceptor sewer and the plant could be expanded (approximately $40 million), Battle Ground could build a new treatment plant (approximately $10 million), or an agreement may be reached with the City of Vancouver to build new interceptors and shift some of the sewage treatment burden to one or more of their plants that have some capacity.

2. Transportation Costs

Transportation costs cannot be recouped in the same way as costs for water and sewer service. In the past, the gap between funding for transportation improvements and the need to maintain concurrency levels of service on roadways has resulted in development moratoriums in some congested corridors of Clark County. The purpose for looking at the FPIAs as part of the comprehensive plan update was to identify where limited funds might best be invested to achieve the policy goals for economic development in Clark County and maintain the county and city concurrency levels of service. All alternatives would require significant investments in the transportation system to maintain LOS D.

Funds for county and city transportation improvements come from several sources:

- Portions of property taxes passed through the County's Road Fund
- Real estate excise taxes (REET)
- Sales taxes
- Traffic Impact Fees
- Frontage improvements and other private developer contributions
- Motor vehicle fuel taxes
- Federal and state grants
- WSDOT

Table 89 shows the projected costs of the projects that would be needed to maintain LOS D on the roadways under each alternative, by jurisdiction. The local agency costs are broken out by approximations of local share, expected grant and private funding. WSDOT estimates are also provided. Local agency funding includes current road and street funds, potential local option tax revenues, and other locally-adopted matching funds. Private funding includes developer proportionate share contributions to mitigation projects, traffic impact fees, latecomers' reimbursement fees, and required frontage improvements. It should be noted that the calculations assume that some form of regional traffic impact fee is adopted to help pay for interurban transportation corridors, such as NE 50th Avenue and NE 72nd Avenue, that travel through rural areas but require widening (for mitigation purposes) due to growth in outlying urban areas under specific land use alternatives.

Table 89. Projected Transportation Costs

2003-2023	Total Costs by Alternative					
Jurisdiction	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 3a**	**Alternative 4**	**Alternative 5**
Clark County						
Road Fund	$ 382,445,000	$ 290,475,000	$ 199,945,000	$ 200,955,000	$ 349,305,000	$ 360,575,000
Grant County	$ 80,485,000	$ 63,645,000	$ 63,295,000	$ 59,085,000	$ 78,485,000	$ 78,485,000
Private County	$ 157,425,000	$ 130,420,000	$ 117,025,000	$ 117,025,000	$ 136,675,000	$ 136,795,000
WSDOT						
Road Fund	$ 978,940,000	$ 811,340,000	$ 716,340,000	$ 776,340,000	$ 848,940,000	$ 808,940,000
Grant WSDOT	$ 375,970,000	$ 375,970,000	$ 365,970,000	$ 375,970,000	$ 375,970,000	$ 375,970,000
Vancouver						
Road Fund	$ 112,205,000	$ 111,705,000	$ 107,955,000	$ 104,045,000	$ 110,165,000	$ 112,205,000
Grant Vancouver	$ 65,435,000	$ 65,235,000	$ 64,935,000	$ 58,985,000	$ 65,435,000	$ 65,435,000
Private Vancouver	$ 80,985,000	$ 76,710,000	$ 74,335,000	$ 79,095,000	$ 76,225,000	$ 80,985,000
Battle Ground						
Road Fund	$ 23,520,000	$ 23,520,000	$ 18,220,000	$ 18,220,000	$ 23,520,000	$ 23,520,000
Grant Battle Ground	$ 2,790,000	$ 2,790,000	$ 2,690,000	$ 2,690,000	$ 2,790,000	$ 2,790,000
Private Battle Ground	$ 14,040,000	$ 14,040,000	$ 14,040,000	$ 14,040,000	$ 14,040,000	$ 14,040,000
Ridgefield						
Road Fund	$ 28,340,000	$ 21,050,000	$ 16,500,000	$ 16,500,000	$ 16,500,000	$ 28,340,000
Private Ridgefield	$ 39,260,000	$ 26,740,000	$ 22,190,000	$ 22,190,000	$ 22,190,000	$ 39,260,000
Grant Ridgefield	$ 13,310,000	$ 13,310,000	$ 13,310,000	$ 13,310,000	$ 13,310,000	$ 13,310,000
La Center						
Road Fund	$ 14,540,000	$ 14,540,000	$ 11,640,000	$ 11,640,000	$ 14,540,000	$ 14,540,000
Private La Center	$ 5,130,000	$ 5,130,000	$ 5,130,000	$ 5,130,000	$ 5,130,000	$ 5,130,000
Grant La Center	$ 1,580,000	$ 1,580,000	$ 1,580,000	$ 1,580,000	$ 1,580,000	$ 1,580,000
Other						
Road Fund	$ 27,980,000	$ 27,980,000	$ 27,980,000	$ 227,980,000	$ 27,980,000	$ 27,980,000
Private Other	$ 16,920,000	$ 16,920,000	$ 16,920,000	$ 16,920,000	$ 16,920,000	$ 16,920,000
Grant Other	$ 14,750,000	$ 14,750,000	$ 14,650,000	$ 214,650,000	$ 14,750,000	$ 14,750,000
TOTAL	***$2,436,050,000***	***$2,107,850,000***	***$1,874,650,000***	***$2,336,350,000***	***$2,214,450,000***	***$2,221,550,000***

3. Mitigation

Local jurisdictions could make the following adjustments to reduce potential adverse fiscal impacts.

- Eliminate certain proposed projects based on needs assessments and community priorities.
- Aggressively seek alternative funding sources from federal, state, and local grant programs.
- Establish appropriate impact fees for new development to offset the costs of providing additional public facilities and services.
- Implement user fees for appropriate public facilities and services.

E. Annexation and Incorporation

1. Setting

Annexation is the process of adjusting municipal boundaries to bring adjacent unincorporated areas into an existing city. Proper annexation can prevent the growth of separate fringe areas that may produce a complex pattern of government by multiple jurisdictions—city, county, and special districts—that can lead to administrative confusion, inefficiency, duplication of services, and excessive costs. Annexation is often seen as preferable to incorporation—the creation of a new city—because new incorporations in urban areas may cause conflicts of authority, the absence of cooperation, duplication of facilities, and an imbalance between taxable resources and municipal needs.

The intention of the GMA is that urban development occur within cities or UGAs, which are areas that are designated to eventually become cities, either through annexation or incorporation. The transition of these areas from unincorporated to incorporated areas requires the cooperation of staff and policy makers from the County, cities, towns, and special districts. In order to achieve this level of cooperation, the Clark County Community Framework Plan (CFP) requires each jurisdiction within the county to plan for annexation and incorporation within UGAs.

Specifically, the CFP requires cities to (1) establish criteria for annexation or incorporation within a UGA, (2) develop an inter-jurisdictional analysis for the assessment of fiscal and other impacts related to annexation, and (3) provide a coordinated plan for the provision of urban services and facilities within the area to be annexed or incorporated. In compliance with the GMA, the CFP does not allow cities or towns to annex territory outside designated UGAs. This includes those lands designated as urban reserve areas.

2. Conformance with Annexation and Incorporation Requirements

The annexation or incorporation of lands within each city's UGA is a key element in the transition of these lands to urban densities and levels of service. Regardless of which alternative is selected, policies established by the CFP and countywide planning policies would continue to define the overall annexation and incorporation process that jurisdictions must follow. The particular goals and policies of each city's comprehensive plan that relate to annexation and incorporation would also continue to guide and define that jurisdiction's annexation process. The City of Vancouver is currently reviewing and updating the annexation portion of its comprehensive plan.

The methods by which cities may annex territory are also governed strictly by state law, and they vary somewhat based on city classification. In March 2002, the Washington State supreme court determined that cities may no longer annex territory based on petitions signed by property owners in areas proposed for annexation (the petition method of annexation). The primary means for annexing territory will now be the election method.

Since the petition method has been the primary method of annexation used by cities, its legal demise creates some uncertainty for cities in annexing territory. The election method, with which most cities have little experience, could make annexation more difficult for jurisdictions for the following reasons: (1) it requires that there be voters to have an annexation election, which presents a problem for annexing property on which no voters live—vacant and undeveloped property or property that is not in residential uses. Annexation elections are conducted only in the area proposed for annexation and those who own property within this area but do not live there would not be able to vote in the election. This means it would be very difficult to annex vacant and non-residential property; (2) the election method of annexation could make annexation more expensive for cities, since elections cost money and cities are responsible for the entire cost of annexation elections, regardless of the outcome. Costs would be dependent on many variables, including the particular method of voting that is used.

Those alternatives that expand UGAs—Alternatives 1, 2, 4, and 5—would increase the amount of land that would eventually be annexed or incorporated. Alternative 3, which accommodates all new growth and development within existing urban growth areas, would not. The challenge of annexation is to extend city services to annexed neighborhoods where such services are needed without eroding existing service levels for established neighborhoods. Annexation also involves close cooperation between the County and cities in order to bring about a smooth transition in services. These challenges would be even greater under those alternatives that add a substantial amount of land to urban growth areas.

3. Mitigation

To mitigate impacts, the County and cities could:

- Continue to review and update, if necessary, policies and guidelines for annexation and incorporation within UGAs so that these policies reflect current growth and development trends.
- Assure that the annexation and incorporation process is coordinated among different levels of government—county, cities, special districts.
- Encourage local jurisdictions to establish inter-jurisdictional agreements for the provision of urban services within UGAs in a way that meets the goals of comprehensive plans.

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GLOSSARY

ACRONYMS

ADA – Americans with Disabilities Act
AMR – American Medical Response
BCEG – Building Code Effectiveness Grading
BNSC – Burlington Northern & Santa Fe
BOCC – Board of County Commissioners
BPA – Bonneville Power Administration
C & D --
CAA – Federal Clean Air Act
CARA – Critical Aquifer Recharge Areas
CCC – Clark County Code
CCFD – Clark County Fire District
CCHR – Clark County Heritage Register
CFP –Community Framework Plan
CMAQ – Air Quality Improvement Program
CMC – Camas Municipal Code
CMS – Congestion Management System
CPU – Clark Public Utilities
CREDC – Columbia River Economic Development Council
CRESA – Clark Regional Emergency Services Agency
CTR – Central Transfer and Recovery Center
CWA – Federal Clean Water Act
CWPPs – County–wide Planning Policies
CWSP – Clark County Coordinated Water System Plan
DCD – Department of Community Development
DEIS – Draft Environmental Impact Statement
DEQ – (Washington State) Department of Environmental Quality
DGER – Division of Geology and Earth Resources
DNR – (Washington State) Department of Natural Resources
DOE – (Washington State) Department of Ecology
DS – Determination of Significance
EDSP – Economic Development Strategic Plan for Clark County prepared by CREDC
EIS – Environmental Impact Statement
EMS – emergency medical services
ESA – Endangered Species Act
ESD – (Washington State) Employment Security Department
FEIS – Final Environmental Impact Statement
FEMA – Federal Emergency Management Agency
FIRM – Federal Insurance Rate Map
FPIA – Focused Public Investment Area(s)
FVRLS – Fort Vancouver Regional Library System
FWS – Fish and Wildlife Service
GMA – Growth Management Act
H&CD – Housing and Community Development Plan
HCT – high capacity transit
HHW – household hazardous waste
HOV – high occupancy vehicle

HUD – U.S. Department of Housing and Urban Development
IPCC – United National Intergovernmental Panel on Climate
ISTEA – Intermodal Surface Transportation and Efficiency Act
ITS – Intelligent Transportation System
kVa – 1000 volt-amperes; the rating assigned to an electricity distribution transformer
LCMC – La Center Municipal Code
LCSCI – Lower Columbia Steelhead Conservation Initiative
LOS – level of service
LOS E/F – level of service rating of E/F (close to failing or failing level of service)
LRT – Light Rail Transit
MGD – million gallons per day
MHI – median household income
MPO – Metropolitan Planning Organization; regional planning organization required by federal regulations (for Clark County it is RTC).
MRCI – municipal, residential, commercial, and industrial
MTP – Metropolitan Transportation Plan
NAAQS – National Ambient Air Quality Standards
NHS – National Highway System
NMFS – National Marine Fisheries Service (now NOAA Fisheries)
NOAA – National Oceanic and Atmospheric Agency
NRCS – Natural Resource Conservation Service
NRHP – National Register of Historic Places
NSS – Highways of Statewide Significance
OCD – Office of Community Development, State of Washington
OFM – Office of Financial Management, State of Washington
PDX – Portland International Airport
PHS – Priority Habitat and Species Program
PIF – Park Impact Fees
PMSA – Primary Metropolitan Statistical Area
RCW – Revised Code of Washington
REET – Real Estate Excise Tax
RMC – Ridgefield Municipal Code
RTC – Southwest Washington Regional Transportation Council
RTPOs – Regional Transportation Planning Organization; created by GMA (RTC is the RTPO for Clark, Skamania and Klickitat counties.)
SCWTP – Salmon Creek Wastewater Treatment Plant
SEPA – State Environmental Policy Act
SIP – State Implementation Plan (for reducing air pollution).
SMA – Shoreline Management Act
SR – State Route, Washington
STE – Sensitive, Threatened and Endangered species
STEP – septic tank effluent pump
SWCAA – Southwest Washington Clean Air Agency
TDR – Transfer of Development Rights
TEA-21 – Transportation and Efficiency Act
TIF – Transportation Impact Fees
TSM/TDM – Transportation System Management / Transportation Demand Management
UBC – Uniform Building Code
UGA – urban growth areas
UP – Union Pacific Railroad
USDA – U.S. Department of Agriculture

VHT – Vehicle hours traveled
VMC – Vancouver Municipal Code
VMT – vehicles miles traveled
WAC – Washington Administrative Code
WDFW – Washington State Department of Fish and Wildlife
WMC – Washougal Municipal Code
WSDOT – Washington State Department of Transportation
WSRB – Washington State Surveying and Rating Bureau
WUCC – Water Utility Coordinating Committee

DEFINITIONS

Achievable density – the density of residential development (usually expressed as number of dwelling units per acre) that can actually be built, taking into consideration the required street dedications, setbacks, parking, and environmental constraints such as slopes, wetlands, etc.
Acre, gross – An acre of land measured including all land uses (i.e., streets, sidewalks, utility easements as well as buildable lots).
Acre, net – An acre of land calculated excluding all unusable spaces (i.e., streets, sidewalks, utility easements, drainage channels, etc.)
Affordable housing – Housing is considered affordable to a household if it costs no more than 30% of gross monthly income for rent or mortgage payments, or up to 3.0 times annual income for purchasing a home. This is the standard used by the federal and state government and the majority of lending institutions.
Arterial – a major street carrying the traffic of local and collector streets to and from freeways and other major streets. Arterials generally have traffic signals at intersections and may have limits on driveway spacing and street intersection spacing.
Average Daily Traffic – the weighted 24 hour total of all vehicle trips to and from a site Monday through Friday.
Built-out – Having no remaining vacant land; fully developed to the maximum permitted by adopted plans and zoning.
Capital Facilities Program – A program administered by a city or county government and reviewed by its Planning Commission, which schedules permanent improvements, usually for six years in the future to fit the projected fiscal capability of the jurisdiction. The program is generally reviewed annually, for conformance to and consistency with the adopted Comprehensive Plan.
Cluster Development – Development in which a number of dwelling units are placed in closer proximity than usual, or are attached, with the purpose of retaining an open space area.
Collector – A street for traffic moving between major or arterial streets and local streets. Collectors generally provide direct access to properties, although they may have limitations on driveway spacing.
Comprehensive Plan – a document consisting of maps, charts, and text which contains the adopting city or county's policies regarding long–term development. A comprehensive plan is a legal document required of each local government by the State of Washington. The required content of the comprehensive plan is described in RCW 36.70 and 36.70A, 36.70B, and 36.70C.
Concurrency – occurring at the same time. The Growth Management Act requires that adequate public services and facilities such as water, sewer, storm drainage, and transportation infrastructure is available at the time that new development is occupied and that the level of service for that infrastructure must meet standards set by the city or county.
Critical Areas – includes wetlands, sensitive fish and wildlife habitat areas, critical recharge areas for groundwater aquifers, and geologically hazardous areas (such as landslide areas, earthquake fault zones, and steep slopes), as defined by GMA.

Density – For residential development, density means the number of housing units per acre. For population, density means the number of people per acre or square mile.
Density, gross – Density calculations based on the overall acreage of an area, including streets, roads, easements, rights–of–way, parks, open space, and sometimes, other land uses.
Density, net – density calculations based on the actual area of land used, exclusive of streets, roads, rights–of–way, easements, parks and open space.
Determination of Significance – under SEPA, the written decision by the responsible official of the lead agency that a proposal is likely to have a significant adverse environmental impact and therefore an EIS is required.
Developable land – land that is suitable as a location for structures because it is free of hazards (flood, fire, geological, etc.), has access to services (water, sewer, storm drainage, and transportation), and will not disrupt or adversely affect natural resource areas.
Element – a component or chapter of the comprehensive plan. State law requires each city comprehensive plan to include five elements, which are land use, public facilities, utilities, transportation, and housing. Counties must also prepare a rural element. In addition, elements addressing recreation, conservation, and solar energy may be included at local option.
Extremely-low-income household – households earning 30 percent or less than the countywide median household income.
Flood Hazard Area – a lowland or relatively flat area adjoining inland or coastal waters that is subject to a one percent or greater chance of flooding in any given year. Also known as the 100 year flood area.
Floodplain – typically is the surface elevation of a water body during a 100-year storm event, includes the floodway and floodway fringe.
Floodway – an area within the floodplain where encroachments (e.g., by a structure) would cause the floodplain elevation to rise.
Floodway fringe – an area between the floodway and the outside limit of the flood plain where structures can usually be built.
Floor Area Ratio – the gross floor area permitted on a site divided by the total net area of the site, expressed in decimals to one or two places. For example, on a site with 10,000 net square feet of land area, a Floor Area Ratio of 1 to 1 (1.0:1.0) will allow a maximum of 10,000 square feet of building area to be built. On the same site, a FAR of 1.5 to 1.0 would allow 15,000 square feet of building to be constructed.
Growth management – the use by a community of a wide range of techniques in combination to determine the amount, type, and rate of development desired by the community and to channel that growth to into designated areas.
Growth Management Act – Washington State House Bill (HB) 2929 which was adopted in 1990 and amended several times since then.
High Occupancy Vehicle – a vehicle carrying more than two people.
Household – all persons living in a dwelling unit, whether or not they are related. Both a single person living in an apartment and a family in a house are considered a "household".
Household Income – The total of all the incomes of all the people living in a household. Households are usually described as very low income, low income, moderate income, and upper income.
Impact fee – a fee levied on the developer of a project by a city, county, or special district as compensation for the expected effects of that development. The Growth Management Act authorizes imposition of impact fees on new development and sets the conditions under which they may be imposed.
Implementation measure – an action, procedure, program or technique that carries out comprehensive plan policy.
Infrastructure – the physical systems and services which support development and people, such as streets and highways, transit services, water and sewer systems, storm drainage systems, airports, and the like.

Land absorption – when vacant land is developed or underdeveloped land is redeveloped.
Landscaping – planting (including trees, shrubs, and ground covers) suitably designed and installed and maintained to enhance a site or roadway permanently.
Level-of-Service (LOS) – a method of measuring and defining the type and quality of particular public service such as transportation, fire protection, police protection, library service, schools/education, etc. Transportation levels of service are designated "A" through "F", from best to worst. LOS A describes free flowing conditions; LOS E describes conditions approaching and at capacity; LOS F describes system failure or gridlock.
Low-income household – households earning between 51% and 80% of the countywide median income
Market factor – an amount used in calculating the needed supply of vacant and buildable land; the market factor represents an additional "cushion" of available land. It is intended to ensure that the land supply does not become so restricted that it causes an artificial rise in land prices.
Median income – the mid-point of all of the reported household incomes; half the households have higher incomes and half have lower incomes than the mid-point.
Middle-income household - households earning between 95 and 120% of the countywide median income.
Moderate-income household – households earning between 81 and 95% of the countywide median income.
Non-project action – an action that is different or broader than a single, site specific project. Includes adoption of plans, policies, programs, or regulations that contain standards controlling the use of the environment, or that will regulate a series of connected actions (WAC 197–11–704).
Open space – any parcel or area of land or water that is essentially unimproved and devoted to an open space use such as preservation of natural resources, outdoor recreation not requiring development of play fields or structures, or public health and safety (flood control).
Planning Commission – a group of people appointed by the City Council or County Commission to administer planning and land use regulations for the jurisdiction. State regulations governing the powers and activities of the Planning Commission are contained in RCW.

Poverty level – a set of money income thresholds that vary by family size and composition that the Census Bureau uses to detect who is poor. If the total income for a family or unrelated individual falls below the relevant poverty threshold, then the family or unrelated individual is classified as being "below the poverty level".

Resource lands – as defined by GMA, lands that may be used for commercial forest, agriculture, or mineral extraction industries. Cities and counties must identify these lands and develop policies to protect them as a part of growth management planning.
SEPA – the State Environmental Policy Act which requires that each city or county consider the environmental impacts of a proposed development before approval and incorporate measures to mitigate any expected negative impacts as conditions of approval.
Transfer of Development Rights (TDR) – a program that permits a property owner or developer to relocate development potential from areas where proposed land use or environmental impacts are considered undesirable to another site which can accommodate increased development beyond that for which it was zoned.
Upper income household – households earning over 120% of the countywide median income.
Urban Growth Areas – areas where urban growth will be encouraged. Counties and cities planning under GMA must cooperatively establish the urban growth areas and cities must be located inside urban growth areas. Once established, cities cannot annex land outside the urban growth area. Growth outside of urban growth areas must be rural in character.
Vehicle Miles Traveled – the average number of miles traveled by a vehicle in a given area. This is both a measure of trip length and of dependency on private vehicles.
very low income –households earning less than 50% of the countywide median income

Vision, Visioning – a collective and collaborative statement by citizens, elected and appointed officials and interested parties of their preference for what their community can and should be.
Water-quality limited stream – surface waters that have been identified as not meeting water quality standards and not supporting identified beneficial uses, as defined in Washington regulations (WAC 173-201A).
Zoning – a map and ordinance text which divides a city or county into land use "zones" and specifies the land uses and size restrictions for buildings within that zone.

APPENDIX – FIGURES

In the hard copy and online PDF versions of the document, figures follow this page.

In the CD version, figures are included as separate PDF files.

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AND ASSOCIATES INC.