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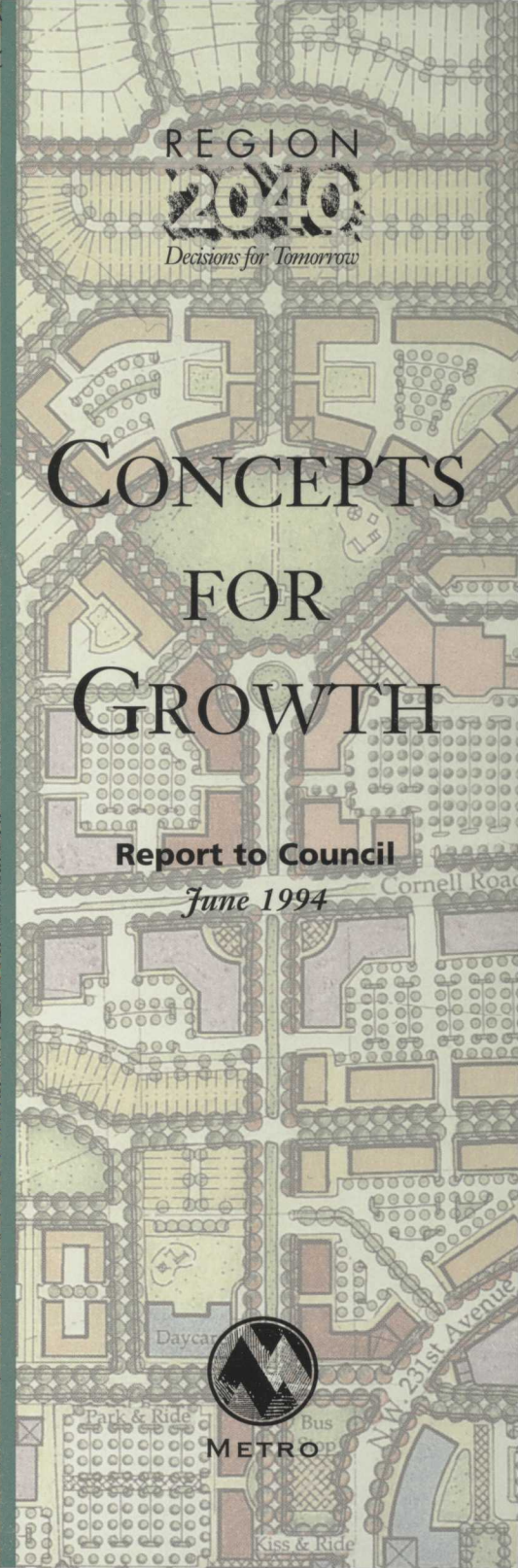
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REGION
2040
Decisions for Tomorrow

CONCEPTS FOR GROWTH

Report to Council
June 1994





METRO

It is with a good deal of pleasure and anticipation that I forward this staff report on Region 2040. Pleasure because this phase of the process is nearing completion and anticipation of response from citizens, formal advisory groups and the Metro Council.

In many ways this is already a work whose authorship extends far beyond our planning staff. The project management committee, user groups, policy and technical advisory committees, and the council and its committees have all made valuable input. Citizens have also contributed, some individually and some in groups.

The 2040 process has been exemplary in responding to changing demands and adaptation to new information and mandates. It, like any ambitious planning effort (and planning for 50 years is certainly ambitious), runs up against the limits of planning.

Nowhere has this been more obvious than on the question of whether the region should grow. While staff have attempted to develop as much information as feasible about the causes and effects of growth and the experiences of others in regulating it, they have not been able to bring the question to closure. This is as it should be. Whether the region grows or not is not a decision that lends itself to planners' rational tools. All of us need to resolve this question in accordance with our personal and political values.

This report is being released in conjunction with a tabloid going to every household in the region and a video that is very widely available. When we have public response, as well as more feedback from local governments and stakeholders, it will be my task to present a recommended preferred alternative for managing growth in the region. I expect that recommendation to go to the Metro Council in early September of this year.

It is very important that this council act to bring this phase of long range regional planning to closure. In early 1995 Metro will need to adopt a Regional Transportation Plan and identify urban reserves as the first elements of the newly required Regional Framework Plan. Failure to act by this council would likely result in substantial delays that put the region at risk of having lost the window of opportunity to get ahead of the curve on population growth. As it is, by the time the Regional Framework Plan is adopted at least two more years will have passed. We simply can't wait. 2040 will give us the information we need, including both technical data and analysis and an expression of the values held by our residents.

Your job is to be sure this work does represent your values and tell us which choices you are willing to make, support and pay for. Let the planning staff, me and your council member know what you think. Also contact your city and county officials. They will continue to help make these vital decisions.

Rena Cusma
Executive Officer

The preparation of this report has been financed in part by funds from the U.S. Department of Transportation, under the Mass Transportation Act of 1964, as amended.

Metro

Metro is the directly elected regional government that serves the 1.1 million residents in the urban and suburban portions of Clackamas, Multnomah and Washington counties, as well as those in the 24 cities of the region including: Beaverton, Cornelius, Durham, Fairview, Forest Grove, Gladstone, Gresham, Happy Valley, Hillsboro, Johnson City, King City, Lake Oswego, Maywood Park, Milwaukie, Oregon City, Portland, Rivergrove, Sherwood, Tigard, Troutdale, Tualatin, West Linn, Wilsonville and Wood Village.

Metro is responsible for the regional aspects of transportation and land use planning; regional parks and green spaces; solid waste management; operation of the Metro Washington Park Zoo; and technical services to local governments of the region. Through the Metropolitan Exposition-Recreation Commission, Metro manages the Oregon Convention Center, Civic Stadium, the Portland Center for the Performing Arts and the Expo Center.

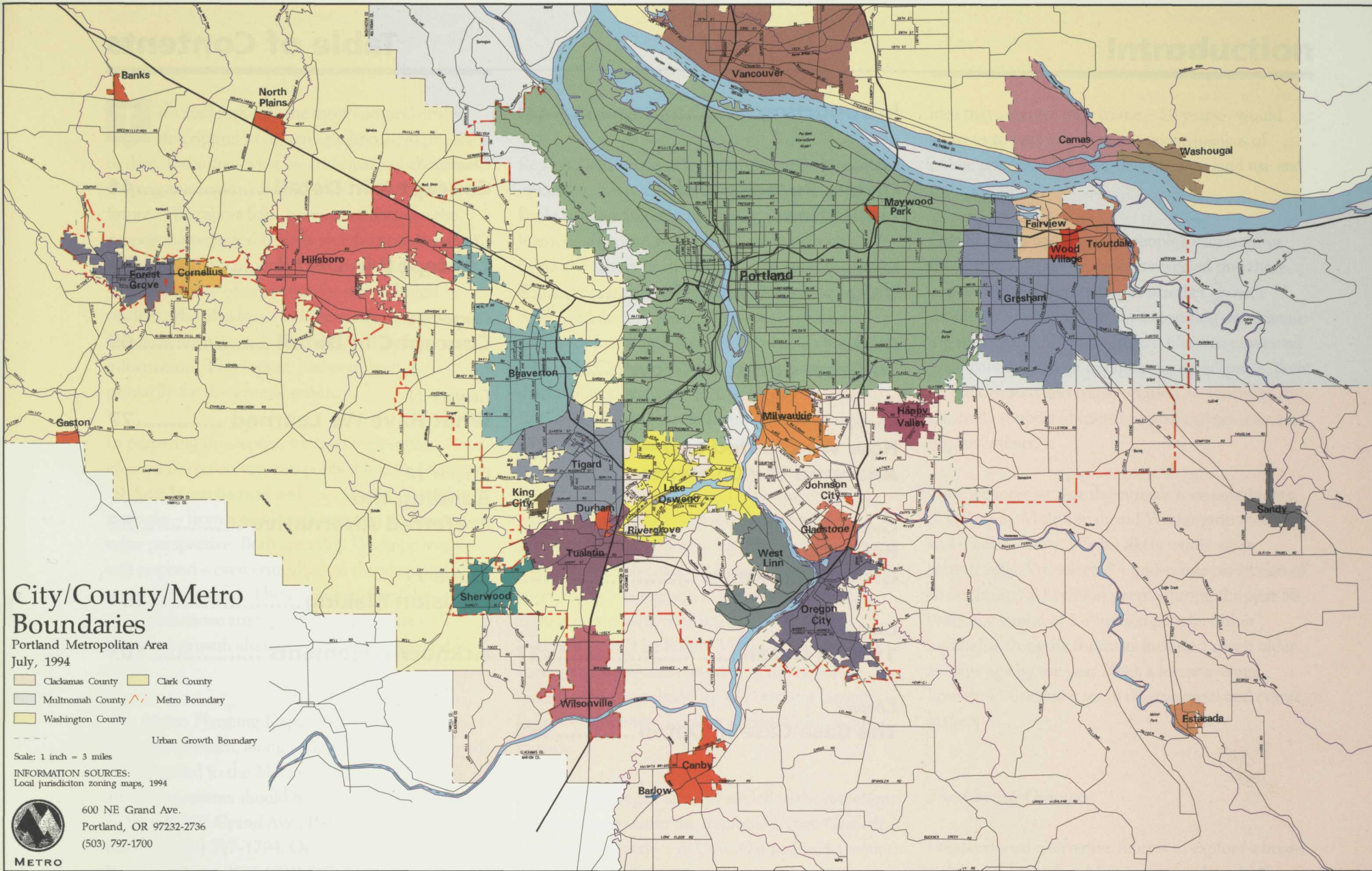
Metro is authorized by Chapter 268 of the Oregon Revised Statutes and the Metro Charter adopted by the citizens of the region in November 1992. Metro is currently governed by a 13-member council and an executive officer. Councilors are elected from districts and the executive officer is elected regionwide.

Executive Officer

Rena Cusma

Metro Councilors

District 1	Susan McLain
District 2	Jon Kvistad
District 3	Jim Gardner
District 4	Richard Devlin
District 5	Mike Gates
District 6	George Van Bergen
District 7	Ruth McFarland
District 8	Judy Wyers, presiding officer
District 9	Rod Monroe
District 10	Roger Buchanan
District 11	Ed Washington, deputy presiding officer
District 12	Sandi Hansen
District 13	Terry Moore



City/County/Metro Boundaries

Portland Metropolitan Area
July, 1994

- Clackamas County
- Clark County
- Multnomah County
- Washington County
- Metro Boundary
- Urban Growth Boundary

Scale: 1 inch = 3 miles
 INFORMATION SOURCES:
 Local jurisdiction zoning maps, 1994



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This staff report is the most comprehensive description of Metro's Region 2040 program to date. It outlines what we have learned about shaping this region's land-use and transportation future. The report falls somewhere between the supporting technical reports and the materials Region 2040 has produced for the general public. There is plenty of substance for our technical readers, who also may read the many supporting technical documents if they would like additional information. This report, however, is written primarily for the general public.

In preparing this report, we used information gleaned from two sources: public input and technical data. It can be read and responded to from both outlooks – from a technical viewpoint and from a value perspective. Both are valid. We hope that you will respond – even critically – to the ideas and analyses presented. These comments will be invaluable as we attempt to test and create a preferred growth alternative that meets the public's needs.

The Metro Planning Department produced this staff report which, along with public comments, will be forwarded to the Metro Council for consideration. Comments should be addressed to Region 2040, 600 NE Grand Ave., Portland, OR 97232 or faxed to (503) 797-1794. Or you may call us at the Region 2040 hotline, (503) 797-1888, and record your opinions, which will be compiled and forwarded to the Metro Council.

Report Overview

Region 2040 began as an excursion into the unknown. No one has ever tried to gauge what could happen 50 years from now. But we have learned much and want to share that with you. We begin the report by discussing what we have learned about the growth concepts and what we believe works and doesn't work. Then we suggest building blocks for building a preferred alternative for the region. In Chapter 12, we suggest a way to build that preferred alternative. As you read this report, **think about what works, what you like, and what you don't like.**

Region 2040 is one of several planning efforts at Metro. Region 2040 is intended to provide a substantial contribution to the Regional Framework Plan mandated by Metro's home-rule charter, approved by the region's voters in 1992. Region 2040 is particularly connected to creating the Future Vision. The Future Vision, which will be a conceptual statement considering the region's quality of life, sustainability and carrying capacity, is being developed by a citizen Future Vision Commission.

Region 2040 began as a way to define the directions that Metro set out in the Regional Urban Growth Goals and Objectives (RUGGOs) and to determine how Metro should best manage its urban growth boundary. Region 2040 was initiated based on the

idea that a longer time frame – 50 years – would allow us to better explore the consequences of public policies. Our focus has been on land use and transportation.

Our first step was to gauge people's values about their region. Random surveys revealed that there was no clear consensus about whether growth should be accommodated by expanding or maintaining the urban growth boundary. Citizens expressed great concerns about maintaining open spaces, their neighborhoods and transportation accessibility; they generally supported transit improvements over road improvements.

Next we forecast that the current four-county area (Clackamas, Multnomah and Washington counties and Clark County, Wash.) likely would grow substantially. We selected a mid-range projection of an additional 1.1 million people during the next 50 years, for a total of 2.5 million people. Other highlights from the forecasts include a much older average age by the year 2040, a lower average household size and a more diverse racial and ethnic makeup.

The Growth Concepts

We developed alternative futures to explore a broad range of choices. In addition, we developed a "base case" to understand what the consequences would

be if we continued growing as we have in recent years. We assumed that the existing comprehensive plans and zoning inside today's UGB wouldn't change and that any growth that couldn't be accommodated within the present UGB would expand the boundary. We calculated that, under the base case, we would need to expand the UGB by about 120,000 acres – a 50 percent increase from today. We assumed that three new highways (the Sunrise Corridor, the Mt. Hood Parkway and the Western Bypass) would be built.

In contrast to the base case, the three growth concepts (called Concepts A, B and C) recognized that current, but not yet implemented local, state and federal policies would change land-use and transportation patterns.

We built Concept A to accommodate some growth by expanding the present UGB, while also creating more compact development along light rail and bus routes. Concept A assumed:

- 55,000 acres would be added to the UGB.
- 74 percent of the homes would be single-family and 26 percent would be multi-family.
- 4,500 acres of buildable land would be set aside for open spaces.
- Three proposed new highways and a radial high-capacity transit system would be built.

In contrast, Concept B assumed there would be no expansion of the urban growth boundary, instead

creating more compact development and a more efficient use of the land and transportation systems. We assumed under Concept B:

- There would be no new highways.
- 60 percent of the homes would be single-family, while 40 percent would be multi-family.
- 7,000 acres of buildable land would be set aside as open space.
- There would be a circumferential as well as a radial light-rail system.
- Growth would be accommodated in centers along proposed and existing high-capacity transit lines and would be concentrated along corridors where frequent bus service was proposed.
- Additional density would occur in undeveloped lands within the present urban growth boundary.

Concept C became known as the “satellite city” concept because it recognized that neighboring cities outside the metropolitan region could be considered as potential areas for growth. Concept C we assumed:

- As much as one-third of the growth of the region would be located in neighboring cities such as Sandy, Estacada, Canby, Newberg, North Plains and Scappoose.

- That the three proposed new highways would be constructed.
- About 69 percent of the homes would be single family and 31 percent would be multi-family.
- 4,500 acres would be protected as open space.
- There would be a fairly moderate level of high-capacity transit.

What We Have Learned

We learned that how we use land can provide answers to problems, especially on the local level, but it does not solve all concerns. We discovered that none of the growth concepts standing alone would work as a preferred growth management strategy. Each has good and bad characteristics and it makes sense to consider aspects of each concept when devising a growth strategy.

We also learned that traffic congestion increases in all of the futures we examined, although there are ways to minimize that congestion. We discovered that there are practical limits to density. From citizens, local governments and stakeholders we learned that it would be very difficult and expensive to make major expansions to the urban growth boundary.

We learned about the desirability of having a job and housing balance and of having distinct communities with their own identities. We did not learn much about housing costs, sense of community or

how to enact some changes. We hope to learn much more about these as we develop the Regional Framework Plan.

Building Blocks for a Preferred Alternative

Using what've learned from our technical analysis and from discussions with governments, stakeholders and citizens, we have identified some building blocks necessary for constructing a preferred alternative. These building blocks include: satellite cities that are separated by greenbelts and urban reserves, greenspaces and natural areas within urban areas, compact development in centers around high capacity transit stations, and development along transit corridors that is accessible for transit use, bicycling, walking and driving.

Transportation building blocks include networks of major arterials and highways, as well as collectors and local streets. Light rail provides the foundation upon which the region structures its anticipated growth.

These building blocks help formulate a list of tradeoffs that illustrates our choices between expanding the urban growth boundary by 40,000 acres or creating more compact land-use patterns.

Public Response

The last chapter of this report describes how the Metro Council will make its decision, how local governments and advisory groups will participate, and how you can be involved. Making this decision is the next evolutionary step and likely will be controversial. It most assuredly will be the most important decision this region has faced in recent years.

The most controversial question to emerge through this whole process has been whether we need to grow at all. We have tried through a number of ways to shed light on this question. We have consulted experts and looked at other communities that have tried to restrict growth.

For our part, as Planning Department staff, we have concluded that the question of whether to allow, encourage, or discourage growth is one that the public and ultimately the Metro Council should answer. The issue involves underlying fundamental values that cannot be quantified or analyzed by using technical data. We don't deny the importance of this question of no- or slow-growth, but we cannot as a staff do more than point out potential choices and consequences.

In fact, that is what this report is about – choices and consequences. We have explored many aspects of urban form and how to serve it with transportation and other services. We now look to you to apply your values and tell us what you think.

Origin, Purpose and Limitations

Region 2040 is the Metro planning program that describes the regional agency's current long-range planning effort. Region 2040 is related to many other ongoing planning efforts, such as those involving transportation planning, preserving our natural and open spaces, developing regional policies that improve emergency preparedness, and projecting trends in population and employment.

A Historical Perspective

Metro began in 1978 when the voters in Multnomah, Washington and Clackamas counties approved the idea of an elected regional government to oversee issues that transcend traditional city and county boundaries. The state legislation creating Metro required the adoption of “regional goals and objectives.” The goals and objectives of Metro’s predecessor, the Columbia Region Association of Governments, continued in place after Metro was formed. The Metro Council, working closely with local governments, adopted the Regional Urban Growth Goals and Objectives (RUGGO) in September 1991 after months of public meetings.

In addition to mandating the adoption of goals and objectives, the state legislation also gave Metro the authority to compel the region’s cities and counties to change their plans if they conflicted with issues of

“regional significance.” Through their representatives on Metro advisory committees, the cities and counties indicated that while the directions set in the RUGGOs were appropriate, they were not specific enough. Accordingly, local representatives recommended that additional work be done to further define the goals and objectives. As a result, Region 2040 was begun to develop specific policies about land-use and transportation planning.

An important tool in managing regional growth is the urban growth boundary (UGB), a line that defines the portion of the region that is – or can be – urban. Adopted originally in 1979, the 364-square-mile area includes 24 cities and the urban portions of Clackamas, Multnomah and Washington counties. State law requires that enough land be available inside the UGB to meet the expected need during the next 20 years. The supply is checked periodically and land is to be added within the boundary. In addition, the RUGGOs and state regulations require “urban reserves,” or areas of land outside the UGB held in reserve for an additional 30 years. The underlying reasons for this 50-year examination of growth management policy include making sure there is an adequate land supply and enough public services available for that land. In addition, RUGGOs require that we examine the relationship between transportation and land use.

The Metro Charter

When Region 2040 began, it was unclear how extensive the project would be. We knew it would include an examination of urban growth boundary transportation issues. The 1992 Metro Charter, however, was unequivocal in what it expected from Metro’s planning programs.

The first requirement of the charter, approved by nearly two-thirds of the voters in November 1992, was to develop a Future Vision. The “vision” must address all factors that make our region livable: accommodate growth without sacrificing quality of life, preserve natural areas, and maintain air and water quality. It is being prepared by the Future Vision commission and will be forwarded to the Metro council in early 1995. The charter calls for the Future Vision to take the carrying capacity of the region into account. While not a regulatory document, the vision provides an important basis for shaping the long-term goals of our region.

The second major charter requirement is that Metro adopt a Regional Framework Plan. This document will be thorough, requiring that Metro develop and adopt a regional plan containing elements of the urban growth boundary and transportation. It also will address elements such as “housing density,” “urban design,” “open space” and “water supply” and will provide specifics about how local plans must comply with these and other

Charter Requirements – Excerpts

(1) Future Vision

(a) Adoption. The council shall adopt a Future Vision for the region . . .

(b) Matters Addressed. The matters addressed by the Future Vision include, but are not limited to: (1) use, restoration and preservation of regional land and natural resources . . . (2) how and where to accommodate the population growth for the region while maintaining desired quality of life . . . and (3) how to develop new communities and additions to the existing urban areas in well-planned ways.

(c) Development. The council shall appoint a commission to develop and recommend a proposed Future Vision . . .

(2) Regional Framework Plan (RFP)

(a) Adoption. The council shall adopt a regional framework plan by Dec. 31, 1997 with the consultation and advice of the Metro Policy Advisory Committee (MPAC) . . .

(b) Matters addressed. The regional framework plan shall address: (1) regional transportation and mass transit systems, (2) management and amendment of the urban growth boundary, (3) protection of lands outside the urban growth boundary for natural resources, future urban or other uses, (4) housing densities, (5) urban design and settlement patterns, (6) parks, open spaces and recreational facilities, (7) water sources and storage, (8) coordination, to the extent feasible of Metro growth management and land-use planning policies with those of Clark County, Wash. and (9) planning responsibilities mandated by state law. The regional framework plan shall also address other growth management and land-use planning matters which the council, with the consultation and advice of MPAC, determines are of metropolitan concern and will benefit from regional planning. To encourage regional uniformity, the regional framework plan shall also contain model terminology, standards and procedures for local land-use decision making . . .

(c) Effect. The regional framework plan shall: (1) describe its relationship to the Future Vision, (2) comply with applicable statewide planning goals, (3) be subject to compliance acknowledgment by [LCDC] or its successor and (4) be the basis for coordination of local comprehensive plans for implementing regulations.

(e) Implementation. To the maximum extent allowed by law, the council shall adopt ordinances: (1) requiring local comprehensive plans and implementing regulations to comply with the [RFP] within three years after [RFP] adoption, (2) requiring the council to adjudicate and determine the consistency of local comprehensive plans . . . (3) requiring [local jurisdictions] to make local . . . decisions consistent with the [RFP] . . . and (4) allowing the council to require changes in local [plans] to [conform with] the [RFP].

elements. The Regional Framework Plan will be developed after Region 2040 is completed and with considerable input from local governments.

The Metro Charter, then, provides a number of effective planning tools necessary for developing growth management policies and implementations on a regional scale.

After charter adoption, Region 2040 was modified to assist in charter implementation. It was designed to be the first in a series of decisions to explicitly address full charter implementation, and will be embodied in a revised RUGGO document. When the Metro Council chooses a preferred concept for urban growth this fall, it will be a new step in the evolution of our regional planning. While the final results won't be felt for a few years, it sets us on the path toward shaping our future.

The Evolution of Region 2040

Region 2040 has evolved considerably in its two years. Initially, its work program was general, becoming more specific as time progressed and as new information became available. Like many long-range, visionary efforts, this project needed to remain flexible to accommodate the public voices and technical data that shape our future growth management policy.

After hearing from participants of Metro's 1992 regional growth conference, it became clear that there were at least two choices about how we could grow. We could grow out, accommodating growth

by expanding the urban growth boundary, or we could keep the boundary where it is and grow up, increasing densities inside the boundary. A third option was suggested to accommodate growth primarily inside the boundary but also in several targeted smaller towns just outside the UGB.

As we talked with citizens and local governments about the three concepts, two more ideas became apparent. First, we should forecast where current practices would take us. In other words, what would happen if the region continued to grow as it does now? This trend pattern was called the “base case.” The other idea was a direct result of public input. People asked why we had to grow at all . . . why couldn’t things stay the way they were? We added to our technical analysis a look at whether we must grow and if it was feasible to stop or slow growth.

Region 2040’s charge, then, has been to examine various concepts to determine how they could accommodate growth and what problems are associated with each growth concept. Underlying this work has been the desire to see if these growth principles and analytical tools would gain the support of citizens – both today and through future political and economic cycles.

Issues and Concerns Not Addressed

While Region 2040 is an ambitious effort to look into the future and address likely issues and conditions, there are many factors that it cannot feasibly address. It is important to be realistic about our ability to foresee the future. Revolutionary changes,

or single large-scale events, can have a significant impact on the future. Even if we believe they will happen we cannot predict outcomes.

Many experts, for example, predict telecommunications and computer breakthroughs in the next few years. These improvements will no doubt make substantial changes to our lives that could affect where we live, work and play. Significant improvements in transportation technology, such as in high-speed rail and aviation, also could occur within the next decade or two. These could greatly improve the travel times between our region and other parts of the country and the world, sometimes affecting our daily lives. Again, while such improvements may occur and have substantial impacts, predicting those effects is beyond the scope of this project.

Although the region has been very fortunate to have had few natural disasters, there are conditions that could affect – with barely a moment’s notice – how and where we live and work. Region 2040 also factors in a consistent rate of economic growth, despite the fact that our economy is cyclical.

Uncertainties abound in our future. That’s no secret. If we could predict what will happen tomorrow and 50 years from now, our task would be vastly simplified. The longer the time frame and the more variables there are, the more uncertain our projections become. For the purpose of Region 2040, we plan from what we know today. We believe we can provide a meaningful and useful range of tools for forming policy . . . but we also steadfastly believe we must remain flexible enough to make adjustments as the need arises.

The primary purpose of this planning effort is to preserve what people value as they face changes in their lifestyles and environment. To direct growth appropriately, we must have a grasp of how people want to live. The most vital question Region 2040 tries to answer is: What values do people share about how our region should be preserved and enhanced? And what is the consensus about how growth should be managed?

In this chapter, we examine what citizens have told us of their likes and dislikes about their neighborhoods and the region. Region 2040 has used several methods of asking for public input. We've also borrowed from work done by others seeking public opinion on similar issues. In addition, we have used preliminary work of the Future Vision Commission to help translate these likes and dislikes into values that characterize the region.

We used many tools to measure regional values, including a random sample regional survey, stakeholder interviews, local government workshops, open houses, two regional growth conferences, newsletters, written response cards, and other region-wide surveys conducted to determine people's values and their understanding of Metro issues. In addition, Metro Council and staff have used a Region 2040 speakers bureau to talk with and listen to civic, business and neighborhood groups about regional growth issues. We also have worked

extensively with the print and broadcast media to get the word out to the public about Region 2040.

We have converted respondents' likes and dislikes directly into a series of values and tradeoff statements. That effort has been guided in part by discussions with the Future Vision Commission and through the commission's preliminary values statement.

Specifics about individual responses and opinions are listed in this document's appendix. Paramount to the discussion of public involvement and the public's values is the assurance that people's voices have indeed been heard. The individual can and has made a difference. As we enter the final and most important phase of Region 2040 – the decision-making stage – public input becomes even more crucial.

What We Like About Our Region

In a regional survey people listed the convenience, accessibility and quietness of their neighborhoods as what they liked best. Attributes most often listed as positives were open space, scenic beauty and small-town atmosphere. A country or rural feeling, or large lots, was mentioned by 20 percent as desirable neighborhood qualities.

Stakeholders (key business and civic leaders), local governments and participants in public workshops all expressed value in livability, quality of life and the convenience of easy access to amenities in the region.

What We Dislike About Our Region

Survey respondents mentioned traffic congestion as a dislike three times more often than anything else, followed by a mention of too many people and the region growing too fast. People were concerned about transportation, public safety, land use, growth and environmental quality. Together, these accounted for 50 percent of mentioned dislikes.

Stakeholders complained about a congested transportation system, too much traffic in residential neighborhoods and too much reliance on the auto. Local governments and participants in public workshops lamented increasing traffic, crime, congestion and growth.

What We See in The Future

In the random survey, three times as many respondents (60 percent) thought our quality of life would get worse. The Oregon Business Council's Values and Beliefs Survey reveals a similar pessimism. A vast majority expected considerable growth (83

percent very likely and 14 percent likely), that it would bring problems, and that it was undesirable (35 percent very undesirable and 32 percent somewhat undesirable). Only 18 percent said such growth was very or somewhat desirable.

People listed increased crime, additional traffic congestion and a deteriorating environment as reasons for their pessimism about the effects of growth. Their biggest fears for Oregon were: overpopulation (14 percent), becoming like California (11 percent), environmental destruction (9 percent), crime and drugs (8 percent), uncontrolled growth (6 percent), loss of forest and trees (5 percent), lack of quality education (5 percent) economic problems (5 percent), loss of natural resources (5 percent) and a lack of future planning (4 percent).

Interestingly, stakeholders surveyed were more optimistic, with opinions about growth's effects more evenly divided to include positive aspects. They expressed a fear that getting around the region was becoming more difficult. Half of the stakeholders thought traffic congestion would get worse; half thought it would get better.

Local governments and public workshop participants were more divided on their views of the region's future. Reasons they thought the future would worsen included growth, crime and traffic congestion. Others thought that a growing environmental awareness and expanding economy would help improve the future.

Values

Overwhelmingly, we heard that what people in this region value most are our natural setting, being close to nature, and keeping the beauty and greenness of our surroundings. We value relaxed lifestyles, quiet safe neighborhoods and the friendliness of others. We greatly value our reputation as a place that cares about the environment. These values are consistent with the findings of the Oregon Values and Beliefs survey. When asked "What do you personally value about living in Oregon?" 39 percent said natural beauty and recreation; 14 percent said environmental quality; 19 percent said the people, attitudes or sense of community; 5 percent named friends and family, 7 percent said the weather and 16 percent had a combination of other responses.

The Future Vision Commission spent the last several months concentrating on people's values and ensuring those values are translated into regional livability. Commission members have emphasized the need to preserve communities as distinct and individual areas, to keep our connection with nature, and to maintain people's strong connection with their neighborhoods. The commission also strives to create a society that assures personal safety, communities with an openness and a maximum of individual liberty.

The work of the commission emphasizes that we value choice. The need for choice was especially apparent in the stakeholder and local government discussions. We believe that this region can afford to offer many options. It's a matter of making the

best series of decisions that will satisfy most of the values held by people. How, then, do we make the best choices?

Preferences

Throughout the Region 2040 process, we have tried to emphasize the notion that we can't have everything. To achieve certain goals, we must give up others. It's a matter of choosing which goals are the most important and making tradeoffs. To determine what tradeoffs people are willing to make, several sources were asked questions such as:

- Should growth occur in existing neighborhoods and business districts or in new areas?
- Should investments be made in roads for cars or in mass transit?
- Should future business and commercial development occur at typical suburban densities or be focused in a few higher density centers outside of downtown Portland?
- Do you prefer to live close enough to work to walk or bicycle, or do you prefer living in a wholly residential area separated from work?
- Should residential and commercial areas be mixed together so that it's possible to walk or use bikes, or should those areas be kept separate?

- Should there be a public policy to encourage affordable housing, or should we let the market determine housing prices?

For each of these choices, respondents were given a range to indicate their preference.

Results of the random survey show strong support for investment in transit over roads and a preference for growth in developed areas over new areas (both of these findings are consistent with the Values and Beliefs Survey). The survey also revealed a slight preference for more concentrated versus suburban-style growth and for public policies to encourage more affordable housing. Living and working in the same areas was evenly divided, and the desire for mixed use versus single use was nearly evenly divided.

Opinions about the tradeoffs covered the spectrum – indicating that a successful growth management policy will need to include a range of options. There was most agreement on the tradeoff involving building roads for cars versus building additional transit systems, with only 14 percent saying building roads was significantly more important than transit. In each of the other tradeoffs, the range of responses was more diverse. In three of the tradeoffs, the mid-range answers outnumbered strong preferences for either choice. (See Figure 2.1)

This range of responses signal that a successful regional plan must provide for a balance in public policy and choices for individuals where possible.

Figure 2.1 Random Telephone Survey

Do you favor:		Preference Results	
Investing in ...	Roads 14%	Both 35%	Transit 51%
Growth in ...	Developed Areas 44%	Both 43%	Non-Developed Areas 13%
Development of ...	Suburban Type 28%	Both 43%	Downtown Type 29%
Living/working in ...	Same Area 27%	Both 42%	Separate Areas 30%
Zoning of ...	Mixed Uses 32%	Both 40%	Separate Uses 28%
For affordable housing...	Public Policy 37%	In between 32%	No Public Policy 32%
Total Respondents: 397			

Results of stakeholders interviews showed they thought there should be choices to meet competing needs. Stakeholders were in the middle of the range on the transit versus auto issue, favored growth in existing areas, liked more dense growth outside of downtown Portland, preferred living and working in the same area, and were more favorable to mixed use centers and public policies to affect affordable housing. (See Figure 2.2)

The results of local government surveys more closely mirrored those of stakeholder interviews than the random sample of the public in most respects. (See Figure 2.3)

Results of the tradeoff questions from four public workshops conducted in November 1992 are represented in Figure 2.4.

Other randomly selected responses included those from a Citi-Speak survey that asked about holding versus expanding the urban growth boundary, a question similar to the tradeoff on building in existing developed areas versus in new areas. The results were almost evenly divided between expansion of the boundary (36 percent), retaining the present boundary (34 percent), undecided (28 percent) and other (2 percent).

Self-selected and motivated responses came from 550 people who took the time to write and send comments responding to the fall/winter issue of the Region 2040 Update. People responding to that newsletter often mentioned support for transit, particularly light rail. Those people also indicated a preference for preserving and enhancing greenspaces. People desiring a lower density in neighborhoods tended to oppose Concept B, while those who advocated conservation of resource lands

Figure 2.2 Stakeholder Interviews

Do you favor:		Preference Results		
Investing in ...	Roads 4%	Both 60%	Transit 36%	
Growth in ...	Developed Areas 47%	Both 36%	Non-Developed Areas 17%	
Development of ...	Suburban Type 21%	Both 35%	Downtown Type 44%	
Living/working in ...	Same Area 49%	Both 35%	Separate Areas 16%	
Zoning of ...	Mixed Uses 48%	Both 42%	Separate Uses 10%	
For affordable housing...	Public Policy 46%	In between 40%	No Public Policy 14%	
Total Respondents: 53				

Figure 2.3 Local Government Survey

Do you favor:		Preference Results		
Investing in ...	Roads 11%	Both 47%	Transit 42%	
Growth in ...	Developed Areas 49%	Both 41%	Non-Developed Areas 9%	
Development of ...	Suburban Type 18%	Both 58%	Downtown Type 25%	
Living/working in ...	Same Area 43%	Both 38%	Separate Areas 19%	
Zoning of ...	Mixed Uses 38%	Both 42%	Separate Uses 20%	
For affordable housing...	Public Policy 39%	In between 36%	No Public Policy 25%	
Total Respondents: 83				

supported it. People who believed in maintaining and developing a strong community identity generally supported Concept C.

Metro’s 1993 regional growth conference (attended primarily by people who are involved in planning issues) endorsed by a 3-1 margin transit over roads, growth in developed areas, mixed-use development and public policies to encourage affordable housing. They favored by 3-2 a concentrated, more downtown-like growth over suburban-style growth. In addition, a majority indicated support for maintaining the urban growth boundary, promoting infill and development, increasing densities along transit corridors and developing mixed-use centers.

Examples of Commonly Perceived Tradeoffs

What we like as individuals is not always possible for us to enjoy collectively. For instance, a few of us can live on large lots tucked into quiet places only five minutes from downtown, but we can’t all do that. Dilemmas such as these mean that we must make choices.

Below are some of the key dilemmas we face in planning for regional growth. They are quotes of no one particular person; instead, they reflect statements we’ve heard during the Region 2040 process.

“I don’t want to sprawl, but I don’t want my neighborhood to change.”

It seems clear that the region has strong values relating to the environment and closeness to nature. On one hand, most people want to preserve farm and forest land and seem to support policies that retain open space. On the other hand, it's difficult to keep those natural, open areas as we grow unless we build our homes and businesses closer together. Many people want to live in low-density residential areas with lots of elbow room. The choice between sprawling outward (thus using up valuable open space) and creating higher densities in their neighborhoods is perhaps the most basic dilemma people face.

"I like transit but I mostly drive my car."

Another strongly held value is for accessible, convenient alternatives to the auto. This is true even though most trips (about 89 percent) are by car, with the other trips made by transit, walking and biking. Although most trips are by car, many people occasionally use transit. About 10 percent of residents say they are frequent users of Tri-Met, about 30 percent use it at least twice a month, and 45 percent use it at least once a year.

People have expressed a strong preference for transportation solutions that do not involve expanding automobile facilities. Most support is expressed for light rail, although buses, walking, biking and car pooling all receive support. An obvious conclusion, then, is that people likely will support non-auto transportation methods only if there is a balance between those methods and cars.

Figure 2.4 Public Workshops

Do you favor:		Preference Results	
Investing in ...	Roads 9%	Both 44%	Transit 47%
Growth in ...	Developed Areas 53%	Both 39%	Non-Developed Areas 8%
Development of ...	Suburban Type 21%	Both 39%	Downtown Type 40%
Living/working in ...	Same Area 50%	Both 34%	Separate Areas 16%
Zoning of ...	Mixed Uses 48%	Both 41%	Separate Uses 11%
For affordable housing...	Public Policy 37%	In between 39%	No Public Policy 24%
Total Respondents: 64			

It would be folly to expect people to stop using their cars entirely; instead, we must create an alternative transportation system that allows people to choose among and use a variety of safe, convenient and affordable methods to get where they need to go.

"I don't want to grow, but I like a good economy"

People seem to blame growth for a deteriorating environment even though there are many other causes. Asked to choose between a clean environment and economic growth, most choose a clean environment. But it is the effects of bad, poorly managed growth that wreak havoc on natural resources. A successful regional growth strategy must provide a mechanism for a good economy and mitigate most of the negative aspects of growth if possible. When forced to choose, most respondents favored the environment over the economy, but they obviously don't like the choice. A successful

growth strategy should provide a mechanism for a good economy and mitigate most of the negative aspects of growth.

The Connection Between Values and Tradeoffs

The solution to these tradeoffs is not found in either extreme. These three examples of tradeoffs provide an opportunity for a dialogue that illustrates some of the choices we must make for the future.

Region 2040 will involve tradeoffs among all the values we hold. If the Metro Council were to adopt a growth management policy based purely on technical information, the decision would be relatively easy. But a decision of this magnitude – one that affects everyone's lifestyle and personal beliefs – cannot and should not be made in a vacuum without values. True, the technical informa-

tion gives us the tools for achieving workable solutions, but the final decision must be made based largely on what we cherish as a group and as individuals.

As the Region 2040 program progressed, an important theme emerged in which some people asked the question: Why do we have to grow? Rather than simply accommodating growth, is there anything we can or should do to slow or stop regional growth?

We responded to those concerns by adding a “slow growth/no growth” component to our Region 2040 analysis. We retained a consultant to help us evaluate this issue and brought in experts from around the country to advise us. We gathered technical data, listened to focus groups, and examined other communities that have used this growth-control approach – all in an attempt to examine the realities and consequences of stopping or slowing growth.

Some felt that Metro’s approach had a distinct bias favoring growth and that the Region 2040 concepts, in many ways, were more similar than different, as they all had a common assumption – accommodate growth. Another concern we heard was that some people felt our population projections were too high . . . that the numbers were artificially inflated to prove a point about the need to accommodate growth.

The population projection used – 1.1 million additional people in the four-county region – was not pulled out of thin air. It, in fact, represents the mid-range of 36 separate population projections

that factored varying birth rates, death rates and immigration within the region’s historical ranges. Bear in mind also that our economic forecasters emphasize that projecting 50 years ahead is not an exact science, given the many unforeseen variables that could occur.

We used the mid-range projection (615,000 was the low end of the range and 1.4 million was the high end) so that we could use one number on which to base the land-use, transportation and other planning assumptions of the growth concepts. The issue of whether that forecast growth should be accommodated was a question that deserved serious examination.

Some citizens asked us to include a separate growth concept to address the effects of stopping or slowing growth. One of the fundamental issues that Region 2040 addresses, however, is urban form, specifically, the urban growth boundary. It was concluded that a no- or slow-growth approach would not result in a different urban form. Instead, it made more sense to examine each of the growth concepts and the base case with an eye toward determining how they would be affected by a no- or slow-growth policy.

Members of the building and development community stated that a no- or slow-growth policy would negatively affect the economy of the region and its ability to pay for the quality of life factors everyone enjoys.



Growth requires public infrastructure

The Metro Council concluded that the concerns cited from all perspectives were valid but that there wasn’t enough information about the effects of slowing or stopping growth. As a result, we have examined the no-growth issue from two perspectives: the first, a legal analysis and an examination of the factors that cause growth, and the second an assessment of the policies that might be used to affect growth and the ramifications of those policies.

The Legal Side

The legal analysis drew several important conclusions. First, the U.S. Constitution guarantees the right to travel and migrate, so we can’t directly prohibit people from settling here. Second, policies that stop growth by limiting development because of a shortage of public facilities do not necessarily violate the federal constitution. The courts have

carefully monitored such policies to make sure there was no class or race discrimination involved. In addition, the impacts of growth limits on neighboring jurisdictions must be analyzed.

Oregon law, however, is much more restrictive in its ability to limit growth. Metro's planning policies must adhere to state law, which requires that local and regional governments both anticipate and plan to accommodate growth. Local or regional ordinances limiting the number of building permits or enforcing a certain population limit probably would violate several provisions of Oregon's moratorium and public facilities planning laws.

Causes of Growth and Policy Analysis

There were two major focuses of this study, whose primary purpose was to examine in detail the policy issues associated with controlling growth. First, we asked focus groups to define their concerns about regional growth. Second, we conducted an analysis of other cities or regions that have tried to limit growth and analyzed the effects on our region if we did the same. The analysis of growth examined such factors as location, resource availability, concentration of work force and economies of scale. Basically, growth will occur (in the absence of impediments) as long as an area is relatively more attractive than others as a place to make a living and to enjoy natural features and social amenities.

It follows that if a region wished to slow or stop growth it would be necessary to make itself less

attractive on one or more of the attractor dimensions or enact specific policies to impede growth. To determine the effects of slow-growth and no-growth policies, the consultants analyzed the experience of other cities or regions that have tried to limit growth.

Growth Concerns

Metro and our consultant conducted four focus groups in December 1993. Two focus groups (the no- or slow-growth groups) consisted of citizens or members of various interest groups who were concerned about the effects of growth. The other two groups (the respondent groups) included people who supported growth or saw no reasonable alternative.

Some concerns expressed by the no- or slow-growth group included:

- Additional growth will result in unacceptable levels of service for existing public facilities (streets, highways and freeways, schools, water supplies and other public services) because growth will outstrip the ability to provide sufficient additional facilities in a timely way.
- Growth is being substantially subsidized by existing residents, particularly through property taxes and public utility fees.
- Today's scarce natural resources (open spaces, the airshed, water quality, etc.) will become

further degraded and overburdened, and the carrying capacity of the region will become exhausted.

- The larger the population, the worse the quality of life will become on indices such as increased crime, pollution and noise.
- More people mean a more complex region, which will reduce personal freedom, require more regulation and dictate more complex governmental and social organizations and conventions.
- Recent growth uses more resources per capita than in past development, such as more land per house and more driving per person.
- Growth places increasing pressures on the public health system.

The respondent group expressed the following concerns:

- Slowing growth likely would result in unacceptable consequences including higher housing costs and employment or economic conditions that could quickly and substantially lower living standards.
- A no- or slow-growth policy would ignore potential positive results of growth, including more people to support cultural events and better private sector services.

- Stopping or slowing growth is elitist, favoring those who currently live in the region and slamming the gate on all others.
- No- or slow-growth is unfair because it would affect lower economic classes the most.
- Trying to slow growth will not work and will divert time and energy from the root issue – protecting the region’s quality of life.
- No- or slow-growth is not legally possible.

In general, the division of opinion on growth can be characterized as having either an economic or ecological philosophy. For example, those taking the economic (advocating growth) viewpoint argue that a free market is the best way to allocate scarce resources. If a resource is scarce (supply is less than demand), the price of that resource increases and the resource is used more efficiently. The ecologist viewpoint argues that every resource has a maximum capacity and can refer to specific examples where capacities have been exceeded and resources exhausted (sometimes for generations or permanently). That view says there are many resources treated as “free” goods – such as clean air, quietness, fish and wildlife habitats – that should be viewed as priceless.

The differences between the economist and the ecologist may have been best summarized as follows: “for each new person, the economist sees two more hands to help and the biologist sees another mouth to feed” (Mann, *Atlantic Monthly*, February 1993).

While the methods of these two philosophies may be quite different, they have surprisingly similar goals: namely, a higher quality of life. One bridge between the two worlds is a concept known as the second paycheck. This refers to the intangible benefits of living in a vibrant metropolitan area located in a beautiful natural setting.

The first paycheck is monetary, while the second is the value of clean air, safety, recreational opportunities, ready access to cultural events and many other highly cherished features. Lending support to the second paycheck theory is the Oregon State Employment Division’s 1993 In-Migration Study, which says households moving to the state took an average income reduction of \$4,741 per year.

Quality of life is not a static measure, nor is it completely within our control. It is related to other regions in the country and throughout the world. If the quality of life in one region goes down, the relative quality of life in another regions may go up, making that area more attractive to newcomers.

Throughout our Region 2040 discussions, we’ve heard some people say they don’t want the region to grow and be filled with people moving here from out of state. But it’s important to remember that the population growth projections include three components – birth rates, death rates and immigration. About two-thirds of our projected growth is from migration to the region. The other one-third is from residents having children and living longer.

No- or slow-growth proponents in the focus groups were asked if they supported stopping growth completely. Most said they did not support a total stop and agreed that it would be difficult to achieve. In addition, many said that although they did not support completely halting growth, they believed that growth pressures were so serious that a large reduction in the growth rate seemed to be the only solution.

The no- or slow-growth group then was asked for methods or policies it would recommend to slow or stop growth. Figure 3.1 summarizes the responses.

In addition to these specific suggestions from the focus groups, our economic consultant identified three general levels of policies that would slow or stop growth: limiting the supply of land for development, increasing the cost of development and increasing the cost of living.

Those policies, if implemented sufficiently to affect people both inside and outside the region, likely would have a substantial impact. Making the region less attractive to outsiders also would mean a less livable community for those who already live here. If we declared a building moratorium, for example, the price of existing structures likely would rise. (Bear in mind that Oregon law does not allow moratoriums to control growth.) People moving to housing outside the moratorium boundary would result in more miles traveled.

This is not to say that the three general policies carry only negative effects. There are, however,

Figure 3.1 Suggested Policies to Stop or Slow Growth

Restrict New Development

- Adopt moratoriums on new development.
- Limit new development to the carrying capacity of the environment, regional quality of life standards, or infrastructure capacity.
- Make new development pay the full cost of providing all of its public services.
- Amend system development charges to fully cover the all of the costs of new growth for expanding roads, water, sewer, school capacity, parks and all other public facility costs.
- Stop subsidizing growth
- Cease economic development efforts to promote the region.
- Eliminate tax incentives for locating in the region.
- Encourage growth in satellite cities.
- Divert regional growth to cities outside of Metro's UGB.

Do Nothing

- Refuse to build new infrastructure, expand capacity or provide additional services to accommodate new development.
- Let sprawl, congestion, and pollution make the region less desirable.

Public Education

- Teach people to use fewer resources.

Miscellaneous

- Stop public improvements (e.g., stop dredging the Columbia River)
- Limit the number of flights to Portland International Airport
- Limit the total number of vehicles allowed in the region.

Source: Evaluation of No Growth and Slow Growth Policies (ECO NorthWest), 1994

costs attached to them, and it's unlikely policies could be crafted to influence only those considering moving to the region and not affect today's residents.

The Experience of Others

An important component to learning about no- or slow-growth is to see what other communities have done. Our analysis shows that there are mixed results. Most efforts have been city-wide, rather than regional. The experience in the United States has been largely unsuccessful, instead only diverting growth elsewhere in the region. Results include less efficient and convenient patterns of development, higher housing and land prices, and lower real wages.

One of the most successful growth control policies is in Seoul, South Korea, where a strict greenbelt around the city prohibits sprawl. The growth policy there imposes restrictions on housing, disincentives to creating new jobs and incentives for creating jobs in other cities in South Korea. Even so, growth pressure remains in Seoul and housing costs are high.

Conclusions

It is difficult to forecast the effects of slow growth because there are too many unknown variables. This does not mean that concerns about growth are invalid. We should continue to address these questions: How can we mitigate the effects of growth, how much does it cost and how can we make sure those who benefit from growth pay their share of the costs?

How We Created and Analyzed the Concepts

Population Projections

The first step in long-range planning is to forecast population and employment growth. Forecasting regional growth for 50 years is difficult to do and depends a great deal on the assumptions made about the basic factors of population growth. The methods and assumptions we used are described in detail in *The Regional Forecast*, Metro, November 1993.

We selected a forecast based on the mid-range of birth rates and migration rates. For the four-county area (Clackamas, Multnomah, Washington and Clark counties), the 1990 population of about 1.4 million would increase to about 2.5 million – about 1.1 million additional people by the year 2040. We further projected that the urban area on the Oregon side would grow by 389,000 households or 766,000 people. Currently, there are 1.1 million people who live in the metropolitan region.

Creating the Concepts

We began developing the regional growth concepts in the spring of 1992 to illustrate the choices we face in the future. In discussing the options for regional growth, the region's future urban form (the physical shape of the region itself, how it will look and how its boundaries will be defined) emerged as the key component, particularly since Metro

manages the urban growth boundary. We also were influenced by what our April 1992 random telephone survey revealed about people's concerns. Many of those surveyed said they were concerned about density, while others said they disliked the notion of sprawl or expanding the UGB.

Clearly, there were two basic choices to expand the boundary (called Concept A) or keep the boundary intact (Concept B). A third option (Concept C) emerged that added a "satellite city" concept.

Concept A was designed to show how the region could develop if current development methods continued. It would expand the UGB, based on preliminary information developed by Metro's Data Resource Center that identified areas adjacent to the boundary easiest to provide with services while also avoiding farm lands.

Concept B would keep the current urban growth boundary while providing the most intensive transit system and a more compact and efficient use of land.

Concept C showed the development of satellite cities in three parts of the region, with other possible sites indicated as well. A significant amount of growth would be directed toward the satellite cities with the remainder going into the existing urban growth boundary.



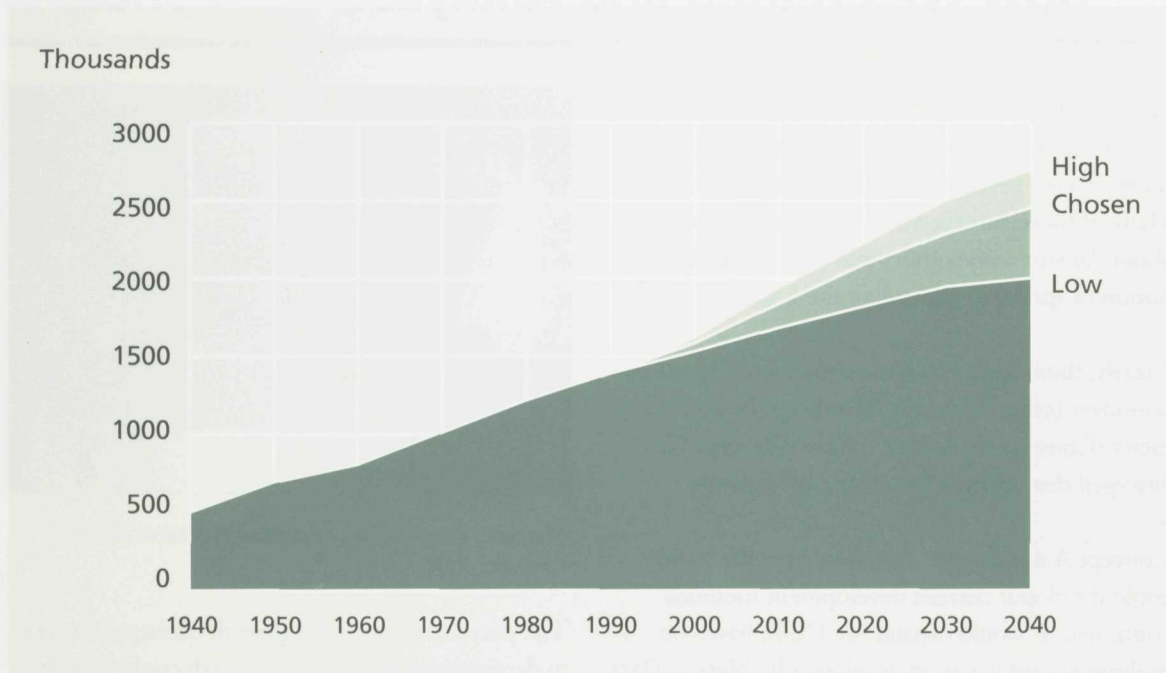
Planners, businesses and community leaders discuss Concepts A, B and C.

The purpose of using the growth concepts was not to demonstrate exactly how growth could be accommodated, but instead to show in very general ways where growth was likely to occur under each concept. We produced and distributed a tabloid to about 20,000 people that outlined these general concepts. The publication and resulting discussion centered on: Is this a reasonable range of choices?

We refined the concepts as we progressed in Region 2040, taking into consideration public concerns and comments and new technical information.

First we learned that Concept A, whose primary purpose was to explore the possibilities of UGB expansion, also needed to address specific planning requirements (e.g., the state Transportation Planning Rule, air quality standards, the RUGGOs and

Figure 4.1 Population Forecasts: High, Low and Chosen Ranges



other new policies that had been adopted). Since this is different from what we have been doing in the past, there was a need to develop a frame of reference on which to compare the growth concepts. Called the “base case,” this frame of reference examined what would happen to the region if we continued our past growth policies and practices.

In addition, people told us they wanted to explore the issue of whether we should accommodate growth at all. They asked that a no-growth or slow-growth choice be included (see Chapter 3 for additional information). And last, people questioned the location of the satellites in Concept C. They

maintained that, instead of starting new towns, it made more sense to direct growth to existing neighboring communities. We selected Sandy, Estacada, Canby, Newberg, North Plains and Scappoose as candidates, because they were established towns near the boundary on major state highways.

Each concept was designed to be quite different from the others so that ideas could be tested in different settings and in different contexts. We wanted to examine each concept to the fullest extent possible, to see what worked and what didn't.

The concepts were not intended as 50-year regulatory plans to be implemented. Instead, they served as a tool to calculate consequences. Most importantly, the concepts were designed to allow us to identify tradeoffs so that people can decide how best to realize those regional values that are most important to them.

Analyzing the Concepts

A fundamental issue for any decision is “On what basis will the decision be made?” We concluded that the decision was primarily one of choosing options that maximize our values informed by the technical analysis.

Decisions based on values must be made in concert with valuable analytical information. Toward that end, we used tools we called “descriptive indicators” to explore how each growth concept would perform under certain guidelines or goals. Working with local governments and the Metro Council, we developed a list of indicators that, while not exhaustive, represents some critical issues the region faces in deciding upon a growth management policy that best ensures high livability.

We were able to analyze the following measures: land use, transportation, air quality, employment, social stability, housing, and water, sewer and stormwater

Air Quality

The RUGGOs state that “visibility of the Cascades and the Coast Range from within the region should be maintained.” It is a clear indication of the region’s desire to remain a livable place with visual connections to the natural landscape.

Additionally, the federal and state governments have specific standards that must be met and which lend themselves to quantifiable means of predicting growth concept performance. Although air pollution is a vastly complex subject, three basic pollutants have been modeled for performance. Volatile organic compounds (VOCs) are a group of chemicals which include primarily petroleum based products and tend to vaporize at relatively low temperatures. Once in a gaseous state they become the basic element in the complex atmospheric reaction that produces ground-level ozone. Vehicle exhaust fumes, fumes from oil-based paints, cleaning fluids and other like products are included in this class. In addition, oxides of nitrogen (NOx), by-products of combustion, are also an air pollutant that is of major concern, as is carbon monoxide (CO), another byproduct of combustion.

The transportation aspects of air quality estimation was completed using the latest version of EPA’s source emission model, MOBILE 5a. Metro uses the output of MOBILE 5a in conjunction with its transportation model to predict on-road transportation generated air pollution for the region. VOCs, CO and NOx emissions from transportation sources were computer modeled by coupling the transportation model with the MOBILE 5a model.

Following chapters describe the predicted performance of the alternative growth concepts.

Other pollution sources, including point sources (primarily industrial sources), area sources (lawnmowers, miscellaneous 2 stroke gas engines, fumes from paints and fluids, etc.), non-road vehicle sources (boats, off-road vehicles, etc.) were estimated by state DEQ staff using assumptions and methods outlined in the Governor’s Clean Air Task Force Report to predict total VOC emission levels for the region to the year 2040. These forecasts were based on rates of pollutant generation per person or employee. Major reductions in pollution rates were assumed to occur because of significant regulatory actions consistent with the Task Force final recommendations.

The Portland region is classified as a “non-attainment” area for ozone (VOC and NOx) and carbon monoxide (CO). NOx reductions are more difficult to achieve. Typical strategies to reduce NOx include reducing vehicle miles traveled, requiring air pollution controls on combustion sources, and implementing air pollution controls on industry and on non-road sources such as lawn mowers and outboard motors.

Housing

A critical concern for the long-term quality of life of the region is the cost of housing. Many people have asked about the likely impact of each growth concept on housing costs.

Metro and our economic consultant studied how each zone or area within the region appeared to accommodate market forces. We used the geographic allocation of growth in the base case as the best representation of market forces. The base case used the growth patterns between 1985 and 1990 as the basis for projecting market demand. Our computer model then indicated how well or poorly Concepts A, B and C were able to respond to the demand for residential land. We also factored in transportation accessibility for each zone, using congestion projections for the year 2040.

In addition, we looked at the need for providing housing for low-income and homeless people. We discussed this important issue with representatives from area human services organizations who recommended regarding low-income housing as part of any growth policy analysis.

Employment

A strong economy is a basic consideration for any region, allowing its residents to live and provide for themselves as well as to support necessary public services. Accurately estimating economic impacts for a 50-year period is impossible given possible changes in technology, public policies, infrastructure and markets (regional, national and international).

Using a computer model, we examined the two basic sectors of the economy (retail and non-retail), the number of employees currently employed in each sector, the historic growth rates of each sector,



Parks and open space within the metropolitan area provide an essential amenity.

land consumption per employee, and a projection of demand and supply for land in the region's urban areas.

The model was designed to predict inequities in the demand-supply balance – areas where supply was projected to be significantly less than demand, or where supply was projected to be considerably higher than demand. Each growth concept was analyzed for its ability to accommodate employment growth.

A report prepared by ECO Northwest, *Region 2040: Housing and Employment*, provides a detailed description of the methods, assumptions and results of this modeling. In addition, there is a commodity flow and requirements study being completed under the direction of the Port of Portland, with participation and financial support from Metro. This study will provide a historical market assessment of commodity flows, project future trends and cargo flows and identify the implications for the regional growth concepts and their transportation infrastructures.

A jobs housing “balance,” estimated in 2040 at 1.40 jobs per household in the region, is a gauge of employment location relative to household location. Employment location provides a destination for persons other than the employee, therefore a balance indicates access for households to services as well as jobs. Jobs housing balance can be analyzed at sub-regional and smaller district levels corresponding to different criteria. The population and employment allocations in the concepts offered an opportunity to examine jobs housing balance for the sub-regions and the design configurations.

Social Stability

Social stability has to do with families, communities, schools and other institutions. It has to do with patterns of interactions among neighbors. Certainly employment opportunities are a large part of social stability, but if the local work force is not skilled enough, workers still may remain underemployed or unemployed if skilled workers from outside the region fill the jobs. Unemployment projections for a 50-year period simply are unreliable and therefore not available as an indicator of social stability.

Sometimes when employment or other familial and social structures fail, two public services – law enforcement and social services – are called upon to provide basic responses. To address this issue, we asked public safety officials (including law enforcement, fire fighting and emergency medical response officials) and human service representatives to tell us the likely consequences of the growth concepts. A detailed compilation of responses is contained in

Creating and Using Descriptive Indicators: Non-Quantifiable Issues.

Transportation

Metro's travel demand forecasting model is designed to project a range of transportation behaviors and effects. These include overall travel of persons in the region, pedestrian and bicycle travel, road system performance in terms of travel speed, time and volume, and levels of transit service and ridership.

The model is calibrated with current travel behavior and preferences and uses a mathematical formula to estimate how many trips are made between the households in the region and “attractors,” or the jobs, shops, schools and other destinations that are the purpose of travel. The model then estimates the percentage of travel by car, transit, bike or walk, and selects routes considering distance, congestion and other factors. While the modeling is not perfect, it is a state-of-the-art method of predicting travel behavior.

Transportation forecasting data was applied to each growth concept to see the likely transportation ramifications. The best way to learn from the results is to look at the relative differences or trends among the concepts, rather than focusing on specific travel forecasting numbers.

For a better understanding of the model, see *The Phase III Travel Demand Forecasting Model: A Summary of Inputs, Algorithms and Coefficients*,

Metro, 1994, and *South/North Transit Corridor Study; Expert Review Panel: Travel Demand Forecast Methodology Meeting*, Metro, 1992.

Density

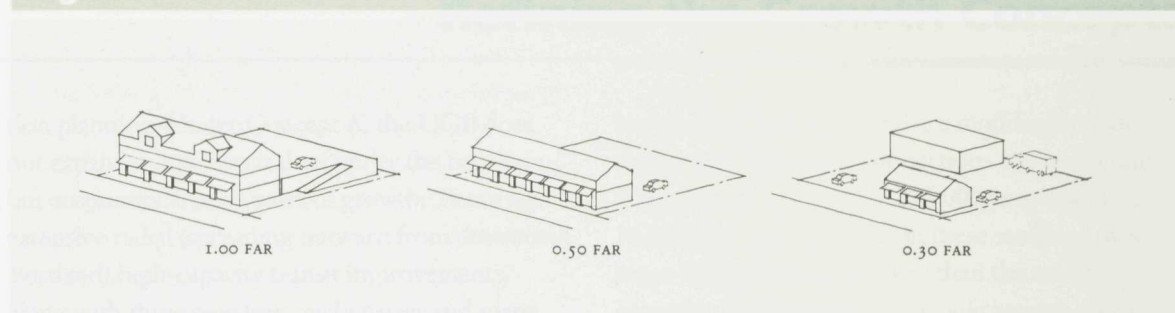
Another important factor we examined was the level of density inherent in each growth concept. We compared existing parcels of vacant and buildable lands with possible changes in density and zoning. This data is available for each growth concept, with summaries of the projected densities in more than 1,000 zones in the region.

Density measures we used were total persons per acre (includes employees and residents), floor-area ratios, average lot sizes and housing units per acre. In addition, we selected eight sites in the region (out of 29 sites nominated by local governments) for our urban design study, whose purpose was to consider what design and development changes would need to occur if the growth concepts were put into place in those particular locations. These analyses are available in a separate report, *Regional Design Images* by Calthorpe Associates.

Parks and Open Space

In analyzing the effects of the growth concepts on open space and parks, we designed Concepts A and C to have 4,500 acres of buildable land held aside for parks and open space within the current urban growth boundary. We assumed wetlands, steep slopes and flood-prone soils would not be devel-

Figure 4.2 Floor-area Ratio



oped. In Concept B, which does not expand the boundary, we designed the concept to have 7,000 acres of buildable land to be reserved for open spaces since it requires higher densities.

Location of Growth

As we did in examining parks and open space, we also made several predictions about location of growth based on some inherent assumptions. We produced statistics about the amount of growth accommodated within the existing urban growth boundary, the percent of growth assumed to be accommodated by redevelopment, the amount of growth accommodated by infill of existing vacant parcels within the present urban growth boundary and the amount of agricultural and exception lands assumed to be developed for each growth concept.

Public Facility

The final entry on the list of descriptive indicators, the consequences of growth on public facilities, is in

many ways one of the most important. Major public improvements – including water, sanitary sewer and stormwater facilities – are important considerations when considering our regional future. In the best of all worlds, detailed master plans for each public service would be prepared, along with associated capital and operating costs. This effort alone would take engineers several million dollars and probably a year's time. While such an effort would provide useful information, much of it would be irrelevant since many of the facilities would not be built. For example, if the region concludes it must move the urban growth boundary, engineering costs for increasing density would be wasted; conversely, if we do not expand the boundary, expansion plans would not be used.

So Metro, working with an engineering consultant and the water, sewer and stormwater drainage providers in the region, worked together to estimate the relative effects of the growth concepts on public facilities. The conclusions of the service providers are documented in *Water Descriptive Indicators Final Report* and results are summarized for each growth concept in the following chapters.

Refining the Growth Concepts

This chapter provides an overview of the principles we used to design and analyze Concepts A, B and C, as well as to create and refine the base case. In Phase I of Region 2040, the concepts and base case represented basic approaches to handling growth but contained few details. In Phase II, as described in this chapter, we designed the concepts in detail to help us test what ideas would and wouldn't work.

We developed the base case by using a computerized "spatial allocation model" (SAM) to estimate what the growth pattern might look like if past development practices continued. The most notable characteristic of the base case was the expanding urban growth boundary. Under the base case, the UGB would expand every five years to allow for enough vacant land to provide a 20-year buildable land supply inside the boundary. The base case also maintains current planning, zoning and density standards. It contains freeway and transit improvements that match past spending schedules, but it does not recognize current public policy or regulatory requirements (such as the Transportation Planning Rule, state and federal air quality standards and the RUGGOs).

Unlike the base case, Concept A seeks to meet federal, state and regional policies by preserving prime farm and forest lands, meeting transportation and air quality goals, and trying to reach regional objectives for integrating land-use and transporta-

tion planning. Under Concept A, the UGB does not expand as much as it does under the base case, but accommodates 50 years of growth. There are extensive radial (spreading outward from downtown Portland) high-capacity transit improvements, along with three new freeway bypasses and many arterial roadways. We adjusted land uses along transit corridors to provide both housing and jobs. The small cities that become satellites in Concept C were assumed to grow by 70,500 people and 33,400 jobs.

Concept B does not expand the boundary at all and attempts to meet the same public policy goals as Concept A. It tests the notion of increasing densities along corridors and in centers with densities above the levels in Concept A to accommodate growth within the UGB. It also accommodates the expected 50-year demand for population and employment but does so by relying heavily on increased density from that in existing comprehensive plans and through redevelopment. Concept B accordingly also uses a much denser network of land use and transit corridors. It does not improve freeways in the region's outer areas, instead providing arterial improvements and placing an emphasis on an internal roadway network. The satellite communities would grow at the same rate as in Concept A.

Concept C recognizes neighboring or satellite cities in its design. It uses a transportation network similar to the one in Concept A. Three new freeways are

included in Concept C and are modified so that they provide adequate connections to the satellite cities. Under Concept C, 295,000 people and 163,000 jobs would locate in these satellite cities, more than four times greater than the other concepts. Each satellite city would receive about 40,000 people and 20,000 jobs more than the other concepts. Concept C provides for a much smaller expansion of the Metro UGB. While Concept C and Concept A would have the same population inside the current UGB, Concept C's growth would be more concentrated in existing regional centers, such as central Beaverton, Gresham and Tigard. However, C has the lowest amount of growth in downtown Portland of any of the concepts.

Allocating Population and Employment

We used two different methods (one for the base case and another for the three growth concepts) to determine where population and employment would go in the year 2040.

We used SAM for the base case to locate growth based on people's preferences during the last 10 years. The computer mirrored the choices most commonly made, considering factors such as accessibility and surrounding household income. We added land to the model as needed. Within the UGB, we used the densities allowed by the comprehensive plans, minus lands deemed unbuildable.

Clark County, Wash., was included in the base case allocation and received 272,000 additional residents and 110,000 new jobs. We assumed the resulting Oregon side of the allocation in all the subsequent concept designs. The base case was the result of the computer's allocation, with a minimal amount of human intervention.

In contrast, we had specific urban design policies in mind as we allocated population and employment for each of the three concepts. Features such as regional centers and transit corridors were laid out on a regional map according to each concept's primary characteristics, including: developed land, natural features, vacant land, roads and transit service, property lines and present comprehensive plan designations. Next, we captured this information in the Regional Land Information System (RLIS), Metro's computer mapping system, so that we could use this important tool to analyze the concepts.

We assumed changes in existing zoning as necessary to allow for more mixed-use and higher density where appropriate. We assumed some additional redevelopment would take place and modeled this by adding additional employment and households to the centers. In each case, we used the same amount of growth during the modeling, although the distribution of growth was quite different in each concept.

To help in our analysis, we analyzed the 1990 region in the same way, so we could compare the concepts to today's conditions. Our analysis compared data on factors that include: acreages, new and existing

(1990) households and employment, measures of density, regional population and employment location or distribution, and comprehensive plan designations.

For a detailed technical report on the concept modeling see *Concept Growth Allocations* by Stuart Todd, 1994.

Concept Design Types

Region 2040 used a common set of regional "design types" to compare the concepts with the base case and existing conditions in 1990, including:

- Central city
- Regional centers
- Sub-regional centers
- Commercial nodes
- Main streets
- Transit corridors
- Other land
- New UGB
- Satellite cities

We used these design types to look at today's regional form and to compare each of the types within the base case and the three concepts. As an example, regional centers in Concept C were much denser than in Concept B or Concept A, and there was higher transit ridership along transit corridors in Concepts B and C than in Concept A.

In analyzing the three concepts, we changed the zoning to suit the concepts – basically higher

density and mixed-use zoning in centers and transit areas. In the base case and the 1990 analysis, we kept the existing zoning. Below are some descriptions of these design types and how they were used to analyze the concepts and the base case.

Central city – This refers to Portland's downtown commercial business district, Lloyd Center and the central eastside district. As one might expect, the central city area contains the highest intensity in the region for both employment and housing. The floor area ratio (FAR) – which measures the ratio between the building floor area and the size of the lot it is on – in the downtown was quite high (6:1), with buildings reaching 10 to 20 stories high. The central city also was characterized by the highest transit access in the region, with light-rail or high-frequency bus access (within 1/4 mile) with a corresponding high number of pedestrians. Zoning was mixed use with a density that allowed up to 420 persons per acre.

Regional centers – These are the region's large retail and employment areas, including: Gresham, Beaverton, Hillsboro, Tigard and Clackamas Town Center. These centers concentrated development to within one-quarter mile of transit stations. They contained lower densities than the central city. The FAR in these secondary centers was between 1.5:1 and 2:1, with buildings two to four stories high. These regional centers were served directly by high-capacity transit service (expected to be light rail), with high intensity employment and housing nearby. The pedestrian amenities also were high. Zoning here was changed to mixed use, with permitted densities of 100 to 150 people per acre.

Sub-regional centers – These are smaller centers expected to be served by major transit improvements in the future, containing moderate intensity mixed-use employment and housing development. The light-rail station areas define the characteristics of these centers using the same quarter-mile distance as the regional centers. The FAR for sub-regional centers was about 0.5:1 to 1:1. The new development here was one to four stories high. Examples of sub-regional centers include downtown Oregon City, Forest Grove, Milwaukie and the Gateway/I-205 mall area. The pedestrian amenities were high, with zoning that allowed mixed use at 70 persons per acre.

Commercial nodes – These are fairly small centers on transit corridors (either light rail or another high-capacity system) located within one-half mile from each station site. The FAR was about 0.5:1, with less intensive employment and a predominance of neighborhood retail businesses. These centers typified existing commercial retail centers but added some redevelopment and transit to intensify the use and access. Zoning here allowed 40 to 70 people per acre with mixed use only.

Main streets – These represented traditional older neighborhood commercial streets that served both larger districts (several square miles), as well as an immediate neighborhood that people could easily get to by using transit, walking or biking. A typical example of a main street is Southeast Milwaukie in Westmoreland. Main street development was defined as being just one-half or one block deep. We assumed that main streets to emerge through redevelopment of existing uses in older areas or

through new planned development. The FAR was 0.75:1, with one- to three-story buildings. Main street development stretched as many as 10 to 20 blocks, with high pedestrian and bike amenities. Zoning allowed a combination of multi-family, attached single-family, some light industrial and 20 to 70 people per acre.

Transit corridors – These corridors were defined as being highly accessible to transit, within three-and-a-half blocks of a bus route, with bus service every 10 minutes during peak commuting hours. The corridors covered a variety of zoning types, and the densities varied according to the neighborhood it was in. They had limited mixed uses: neighborhood commercial services were mixed with traditional residential uses, and light industrial areas were mixed with housing. In general, residential zoning allowed for higher densities. Row houses with 12 units per acre or multi-family units at up to 40 units, while existing single-family neighborhoods tended to remain at existing densities. Zoning allowed small lot, single-family, attached single-family, multi-family, mixed use (different scales), light industrial and variations of 15 to 70 people per acre.

Other – The largest acreage of any design type, land in this category included development that was less (most of it much less) transit accessible, in general was zoned single use (single-family, commercial, industrial, etc.) and had lower overall densities. Changes to these areas included smaller lot sizes, downsized multi-family located away from transit corridors, less intensive commercial office areas, industrial areas and 10 to 60 people per acre.

New UGB areas – These areas represented lands added to the existing UGB to accommodate the growing population. New UGB lands in the three concepts were almost entirely residential but include some 10-minute corridors and commercial nodes. The new UGB areas included state-defined “exception lands” (land zoned for development in these areas are residential lots with areas from one-half to five acres and were “excepted” from protection as farm or forest land) and large-parcel farmland. The zoning here was designated for single-family small-lot size, planned-unit development (mix of different housing with minor commercial allowance) and some neighborhood commercial.

Satellite cities – In using satellite cities as design types, we designated the nearest neighboring cities to the metro area that were along state highways. As indicated by recent growth rates and commuting patterns, these communities are expected to be likely recipients of growth pressures. They are all accessible by major roadways or freeways and some could have commuter rail. The satellites were considered to be relatively self-contained communities with balanced housing and employment. The satellite cities identified in the three concepts were Scappoose, Sandy, Estacada, Canby, Newberg and North Plains.

Concept Perspective

These concepts were useful in enabling us to learn a great deal about urban form, transportation and infrastructure and peoples’ attitudes and values about growth. But they also served as valuable tools

or measurements for studying specific aspects of growth management, such as the density needed to accommodate population projections and ways to distribute that population. However, the concepts were only test vehicles, albeit valuable ones. They should no more be considered as adoptable plans than a prototype car that has been stressed to find the limits of its design.

Existing Conditions

We cannot have a meaningful discussion about Concepts A, B, C and the base case without examining what the region looks like today, or rather, in 1990 when the last U.S. Census data was taken. As discussed in Chapter 5, we developed this method of describing 1990 so that it could be compared more directly with the concepts. Our future urban form hinges largely upon what already has occurred. That is, how and where we grow during the next 50 years already is determined somewhat by the past 150 years, as the region has developed into an urban area.

Our examination of the region in 1990 shows that densities here are about average for metropolitan areas in the western United States. We average

about 3,000 people per square mile, compared to 1,200 in Nashville, Tenn., or Norfolk, Va., and 4,300 in the San Francisco bay area and 5,600 in Los Angeles region. We have a much lower density than the region of Toronto at 7,500 people per square mile.

Not surprisingly, the most compact area in the region is downtown Portland, which is 10 times denser than anywhere else in the region. Next are the older main streets in Portland neighborhoods and in traditional downtowns such as Hillsboro. These developments are good models of future mixed use and transit supportive designs.

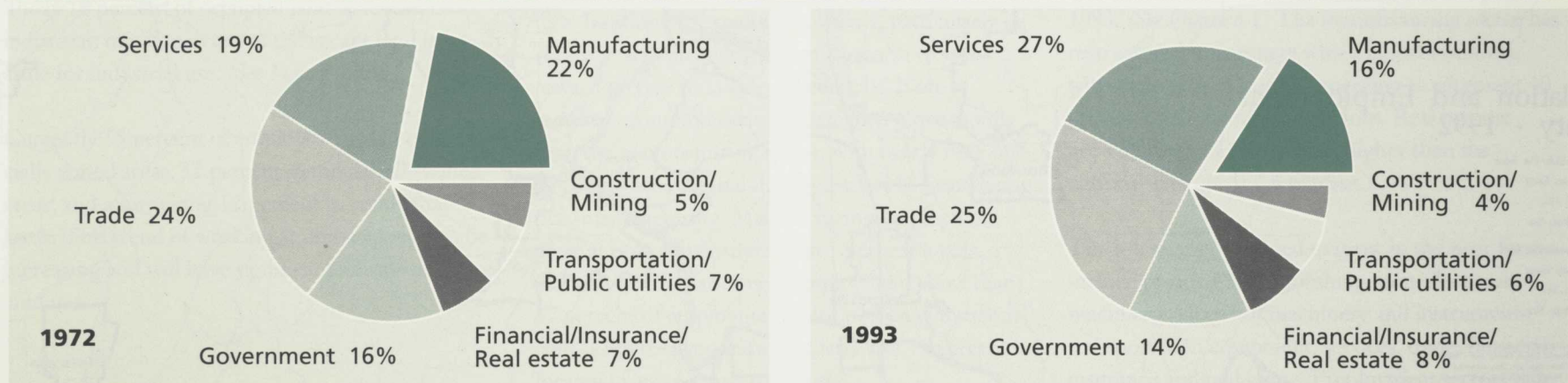
We can point to a distinct shift in development styles and street patterns beginning about 1960. Before this time neighborhoods had through streets

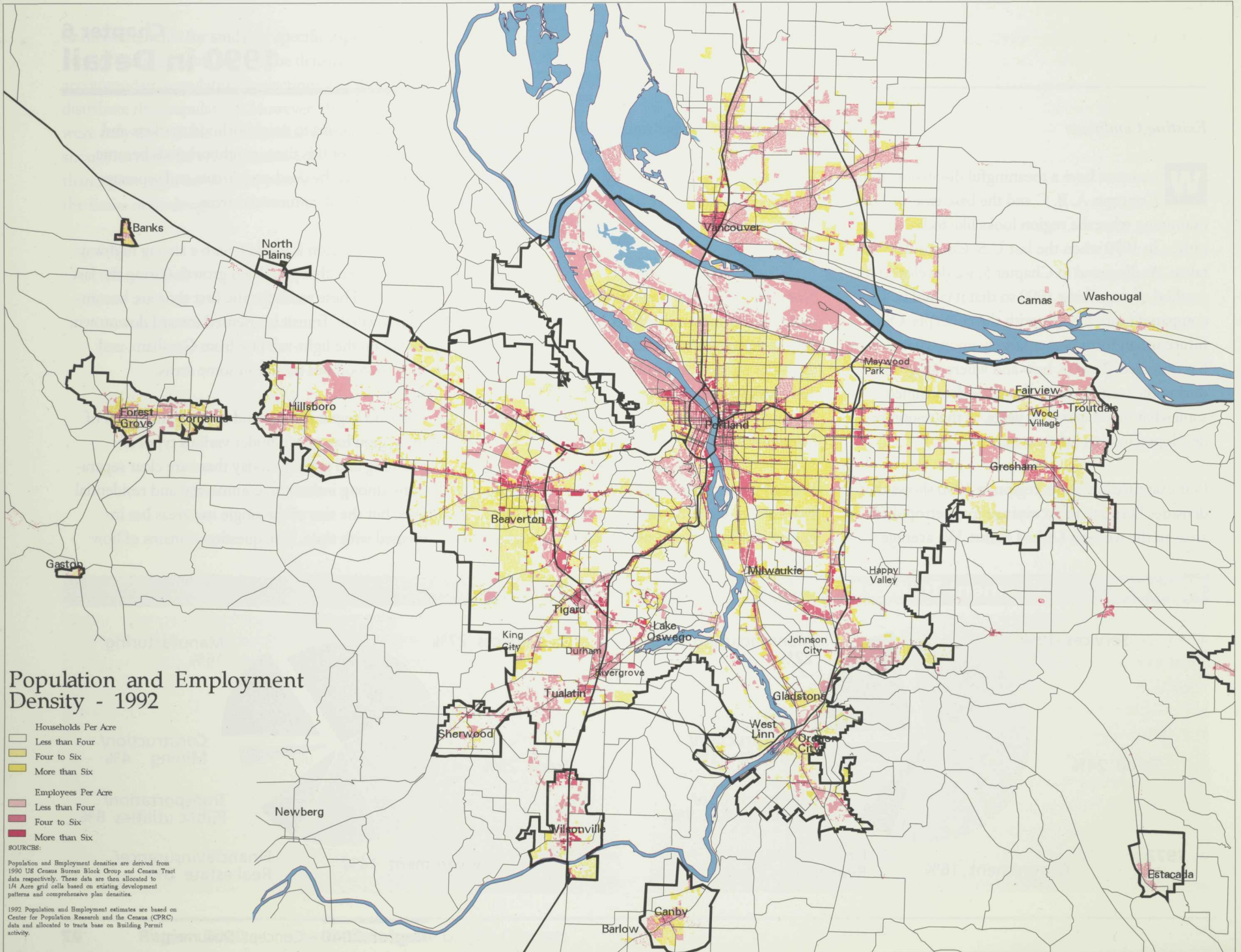
and connections to neighborhood markets and schools. After this time, neighborhoods became characterized by dead-end streets and separate residential and commercial areas.

Today the region is marked with a strong highway network, one that paralleled growth during the last 40 years. These roads for the first time are becoming crowded. Transit is oriented toward downtown, including the light-rail line from Gresham, and there is good bus service in some areas.

Portland began zoning land in 1919 and much of the region has grown under various types of planning and zoning. Today there are clear separations among industrial, commercial and residential uses, but the size of the single use areas has increased with time. The question remains of how

Figure 6.1 Employment Trends 1972 and 1993





much will be retained or built upon, and how much will be made entirely new as the regional landscape is defined during the next 50 years.

Recent Trends

It's worth reviewing recent trends in growth and the economy to see what clues we can glean about how policy and market actions during the last 20 years could relate to today's urban form issues.

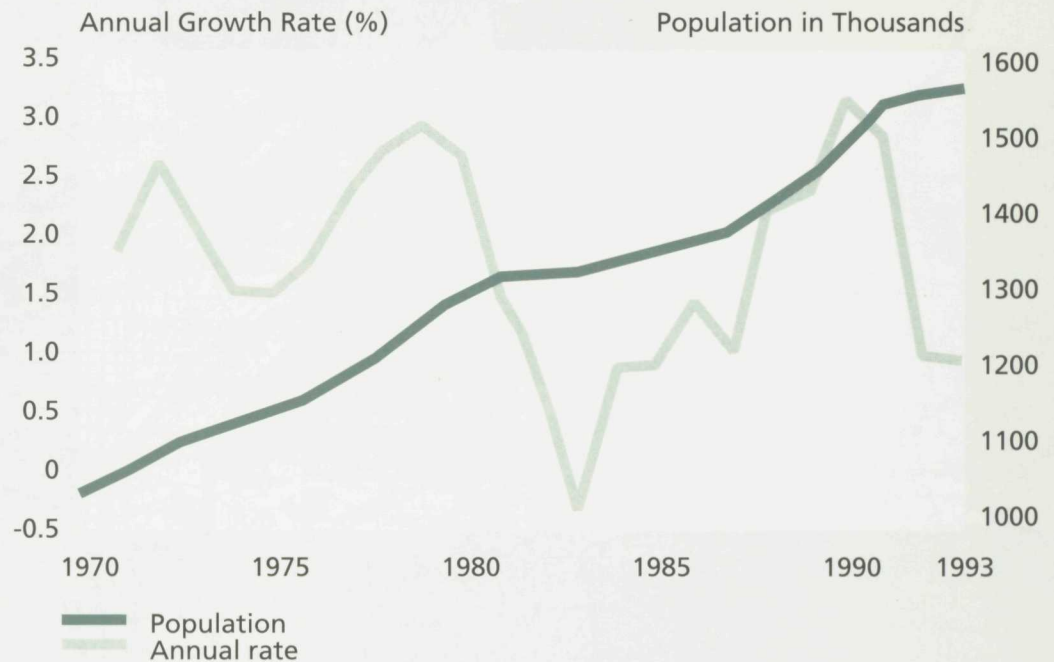
Planning and Zoning

When we look at today's city and county plans we see distinct differences between the plans and what has actually been built. For example, 20 percent of the vacant land is zoned for small-lot homes (5,000 square foot lots), whereas 35 percent of the already developed land is used for small-lot single-family.

A similar gap exists between land planned for industrial use and land actually used for industry. Today 16 percent of occupied land is developed as industrial, but 27 percent of the vacant land is set aside for industrial use. (See Figure 6.6)

Currently 55 percent of employment is in commercially zoned areas, 32 percent in industrially zoned areas, and a surprising 12 percent in residential areas. This trend of working at home appears to be increasing and will have significant affects on future land use.

Figure 6.2 1970 to 1993 Population and Growth Rate



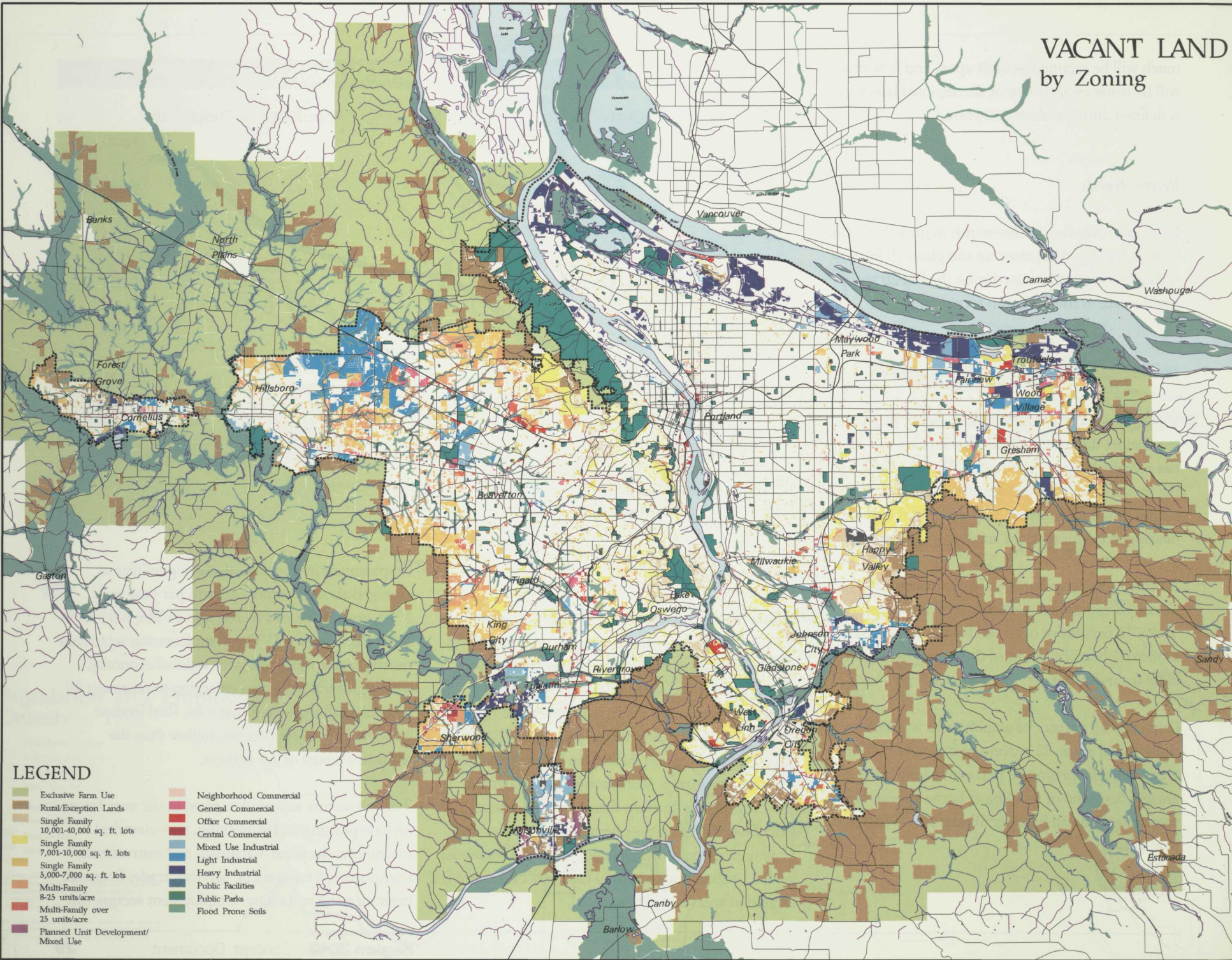
Employment Trends

A diverse jobs base and strong population growth have bolstered the region's economy, particularly in recent years, mirroring national growth trends toward service and trade-related jobs. Non-manufacturing industries have grown more rapidly than the manufacturing sector, with nearly nine out of 10 new jobs created during the last 23 years being non-manufacturing. Manufacturing employment grew at only a little more than 1 percent a year. Current (1990) patterns of employment show that 57 percent of employment is located on commercial land, 32 percent on industrial land and 11 percent is located in areas zoned residential.

Employment in non-manufacturing industries averaged about 3 percent growth per year since 1970, growing from 390,200 jobs to 746,300 jobs in 1993. (See Figure 6.1) The manufacturing sector has restructured to compete with a global economy, with high-tech industries emerging to represent 40 percent of all manufacturing jobs. Real income grew at a rate of 3.3 percent, higher than the national average of 2.6 percent.

The job sectors expected to grow in the near future include printing and publishing, non-electrical machinery, electrical machinery and instruments, transportation equipment, services, trade, financial, insurance and real estate. Employment sectors that

VACANT LAND by Zoning



LEGEND

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Exclusive Farm Use | Neighborhood Commercial |
| Rural/Exception Lands | General Commercial |
| Single Family
10,001-40,000 sq. ft. lots | Office Commercial |
| Single Family
7,001-10,000 sq. ft. lots | Central Commercial |
| Single Family
5,000-7,000 sq. ft. lots | Mixed Use Industrial |
| Multi-Family
8-25 units/acre | Light Industrial |
| Multi-Family over
25 units/acre | Heavy Industrial |
| Planned Unit Development/
Mixed Use | Public Facilities |
| | Public Parks |
| | Flood Prone Soils |

show a flat, but stable trend are food processing, primary and fabricated metals, transportation and public utilities and construction. Employment sectors expected to decline in the near term include textiles and apparel, lumber and wood products, paper and pulp, and state and local government.

Regional Population Growth

Our regional population growth rate has fluctuated in recent years, largely reflecting national economic trends. Dips in growth have corresponded to national recessions, such as those seen in the early 1980s and early 1990s. Upswings in our population growth occurred in the late 1970s and late 1980s and coincided with a strong national economy. (See Figure 6.2.) This region's growth rate averages around 1.5 percent, reaching as high as 3 percent at times.

Land Use

Today there are 234,000 acres inside the urban growth boundary, 53,000 acres of which are vacant land and 119,000 acres are developed. The remainder is in streets, parks, rivers and other land uses. The 53,000 acres of vacant land is primarily (97 percent) in the "other" category, meaning single uses that are low density. Two percent of the vacant land is in commercial nodes. Transit corridors claim the remaining 1 percent of available vacant land.

When the region is divided up by the concept design types, 74 percent of the region falls into the

Figure 6.3 1990 Households and Employment Distribution

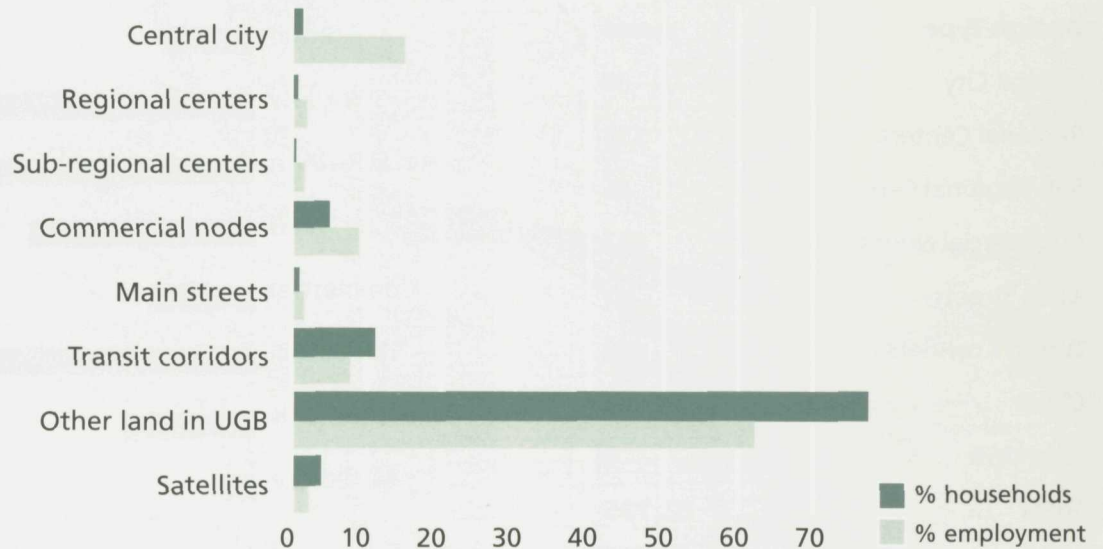
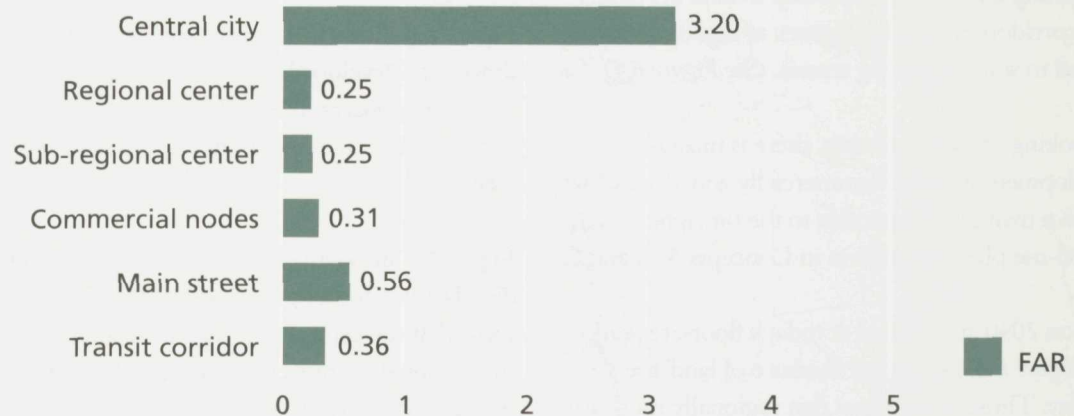


Figure 6.4 1990 Floor-area Ratios



**Figure 6.5 1990
Buildable Acres by Design Type**

Design Type	Acres
Central City	39
Regional Centers	133
Sub-Regional Centers	36
Commercial Nodes	997
Main Streets	7
Transit Corridors	460
Other	52,063
New UGB	0
Total	53,735
Redevelopment Component	0

“other” category, which means low-density residential, commercial and industrial development. The remaining 26 percent of development is in centers and corridors at varying degrees of higher densities, served to some extent by transit. (See *Figure 6.5*)

In looking at today’s zoning, there is mixed-use development in some commercially zoned areas but not in a manner comparable to the outright mixed-use plan designation in Concepts A, B and C.

Region 2040 also looked at today’s floor-area ratios (see *Figure 6.4*) as another measure of land-use density. Those ratios show that regionally there are nearly nine people per acre, in mainly low-density developments.

Figure 6.6 Vacant and Developed Land in 1990

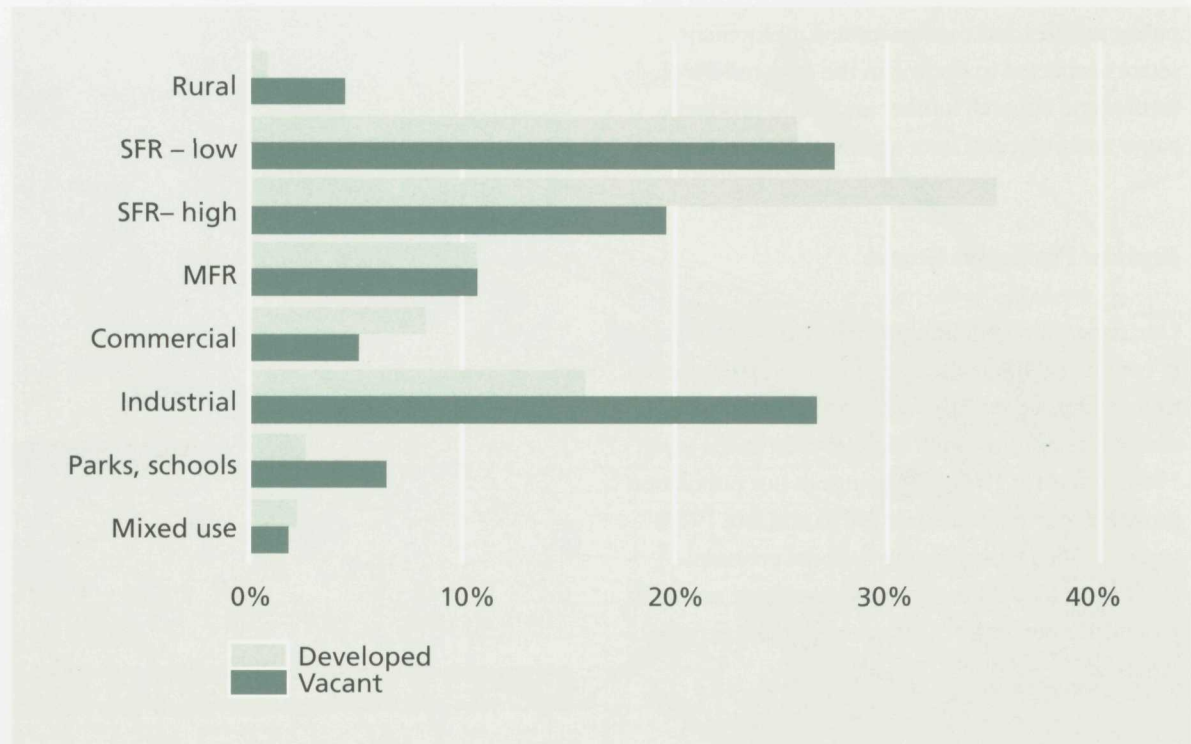




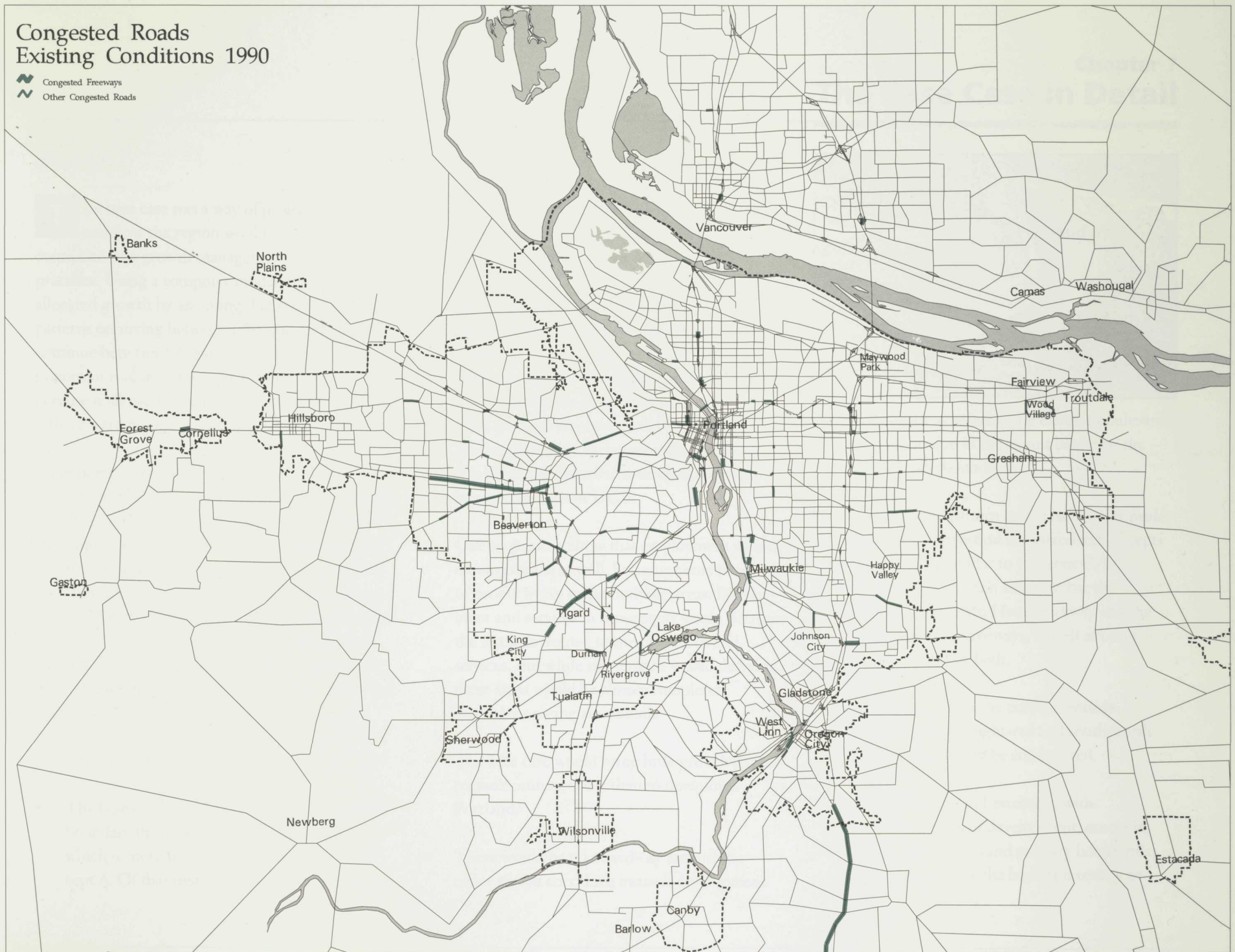
Figure 6.6 shows the current zoning as broken down into developed and vacant land. We found that there appears to be more than enough vacant industrial land but not enough vacant single-family land.

Figure 6.3 shows the housing and employment distributions by design types in 1990. The numbers show that the central city, regional centers and sub-regional centers emphasize employment. The commercial nodes and main streets represent a mix. Transit corridors and “other” emphasize residential development.

Our regional form today has successful centers and corridors and a variety of neighborhoods and communities from relatively rural to highly urban. Most of the travel is done by car, although there are some notable exceptions in older areas and in some suburban downtowns. The current region enjoys a high approval rating among its residents, suggesting that a successful plan would be one that retains many of today’s most cherished features.

Congested Roads Existing Conditions 1990

-  Congested Freeways
-  Other Congested Roads



Summary

The base case was a way of projecting where and how the region would grow if we continued past growth management policies and practices. Using a computer model, the base case allocated growth by assuming that the development patterns occurring between 1985 and 1990 would continue between 1990 and 2040. It served as an important tool in analyzing Concepts A, B and C because it allowed us to predict what would happen if there were no new growth management policies.

An important component of the base case was that it looked at the land supply and demand in five-year increments. When there no longer was a 20-year land supply within the urban growth boundary (as required by our current law and practice), the base case moved the boundary outward. That is, it kept a rolling 20-year supply of land that was placed within the UGB, but not necessarily developed. In addition, when congestion occurred, we programmed the computer to widen the road, up to a limit of five lanes for arterials and six for freeways.

Key attributes of the base case:

- The base case would expand the urban growth boundary by 52 percent, or 121,000 acres, which is more than twice as much as in Concept A. Of that total, 98,000 acres would be

vacant buildable acres, 38,000 acres would be in exception lands and 64,000 acres would be in exclusive farm use. The base case calls for converting three times as much farmland into urban uses as in Concept A.

- Today's urban growth boundary would expand to North Plains, halfway to Sandy, halfway to Newberg and several miles northwest on Highway 30. The spread is even more extensive if we consider the development of exception lands (two- to five-acre parcels) in rural Washington and Clackamas counties, which would extend the urban area up to 10 miles beyond the current UGB.
- Our projections show that employment would move outward as well, bringing some benefits to people living in the outlying areas. Employment and services in those areas would decrease the distance needed to travel for jobs and services. But while trip lengths would decrease, these areas would be almost completely dependent on the automobile.
- The base case would bring little growth to the region's centers, other than to downtown Portland.
- There would be no mixed-use areas along major transit corridors; instead, development



would occur as zoned along existing boulevards and arterials and in the vacant land near the urban growth boundary.

- This dispersed pattern would have lower peak-hour traffic congestion compared to Concepts A and B and is similar to Concept C. In addition, the base case assumes that the Western Bypass, Mt. Hood Parkway and the Sunrise Corridor freeways, as well as other arterials, would be built.
- It also assumes that the current eastside light-rail, westside light-rail and south/north light-rail lines would be constructed.
- The base case is land extensive, with low-density strips of development, except in existing main streets and primary boulevards that currently allow the highest intensity of uses.

- Development would occur primarily in a diffused ring that is moving outward and includes both housing and employment. This pattern is similar to that found in other areas of the West Coast, including the San Francisco Bay area, Los Angeles and Seattle.

Transportation

Two versions of the base case were modeled in the Region 2040 project. The first version included the three “freeway” routes (Western Bypass, Mt. Hood Parkway and Sunrise Highway), and the second version did not. The total lane miles in the base case road system represent an increase of 16 percent over 1990 – greater than any of the three growth concepts. At 9,575 service hours, transit for the base case is approximately twice that of 1990. Unlike the three growth concepts, the base case was not modeled with increased parking costs and improvement in the pedestrian environment.

With its extensive road system low-density development pattern, the base case would have less congestion than any of the growth concepts. Total VMT for the base case would be more than twice that of 1990, and would be higher than any of the growth concepts. The base case would not only fail to meet state-mandated VMT per-capita reductions, it would exceed 1990 VMT per-capita levels by 5 percent. Average commute time in the base case would increase to more than 11 minutes, an 18 percent increase over 1990.

The dense network of arterial streets in urban Multnomah County had the least congestion, and would require few capacity improvements in the model. However, even with major capacity improvements, the more widely spaced arterials in Washington County fail to match the performance of the Multnomah County grid.

New arterial connections (such as the Evergreen Parkway extension in Hillsboro) and major river crossings (such as the Rivergate crossing near St. Johns) attract a significant share of regional travel. The modeled demand for these facilities underscores the importance of considering such connections in the preferred growth concept.

While much of the existing freeway system would continue to function well, several freeway bottlenecks emerge in the modeling. However, overall congestion on the base case freeway system is less than in the three growth concepts.

A comparison of the “freeway” and “nonfreeway” versions of the base case shows that the three “freeway” bypass projects would primarily increase access to the urban fringe and do little to relieve congestion on existing routes. Though the Sunrise and Western bypass corridors do little to support regional centers, the Mt. Hood Parkway would significantly enhance housing and job growth in close proximity to the Gresham regional center.

The comparatively limited congestion in the base case can be attributed to the dispersed land-use pattern that was modeled, and a significantly larger road system. While most areas added to the UGB

in the base case were assumed to have a somewhat balanced mix of housing, jobs and services, the low development densities made transit service impractical in these areas. As a result, auto travel increases, with the base case VMT per capita growing by 5 percent over 1990 levels.



The non-auto share of regional travel for the base case would be about 7 percent of all trips – lower than any of the growth concepts. Bicycle and pedestrian travel in the base case would drop to less than 5 percent of all trips, a decrease from the 1990 share, and less than any of the growth concepts. The base case would also have lower transit ridership than any of the three growth concepts. Radial HCT routes, such as the Banfield and Westside MAX lines, would draw average weekday boardings of only 13,100 to 26,100 riders.

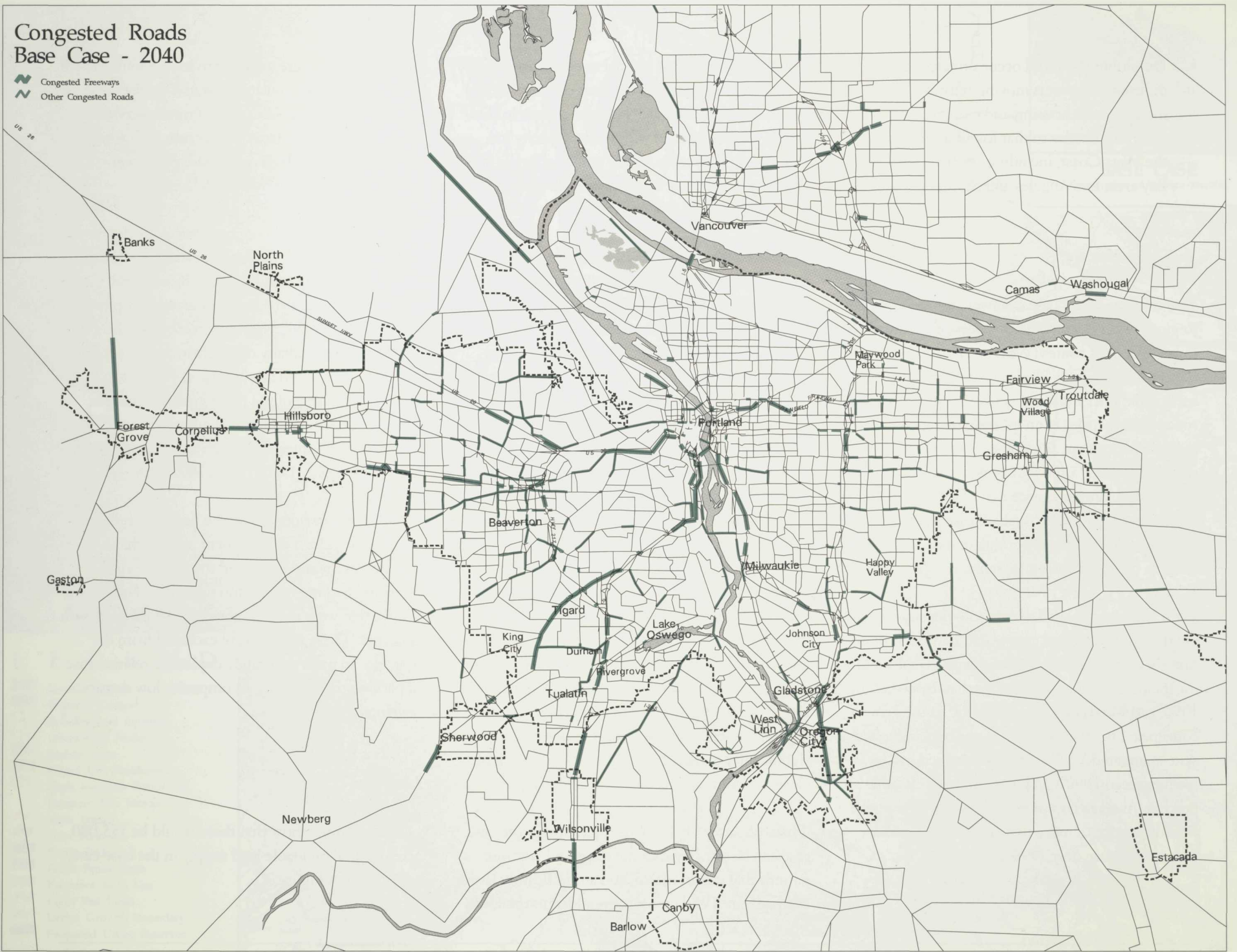
The low transit ridership in the base case reflects both the dispersed development pattern that was assumed in the modeling and the absence of increased parking factors and pedestrian factors (PEFs) that were used in modeling the three growth concepts. These factors were excluded from the base case to more accurately depict the relative ease of parking that typically accompanies low density development.

Land Use

Our projections show that there would be 155,000 acres of total buildable land supply in the base case, as outlined in Figure 7.1.

Congested Roads Base Case - 2040

-  Congested Freeways
-  Other Congested Roads



We found that the base case would increase the urban area by 70 percent, although it would accommodate only 9 percent of the region's total residential and employment development. When looking at development by design type, we found that 64 percent of the activity likely would fall into the "other" and "new UGB" categories, meaning primarily low-density residential and commercial. The remaining 36 percent of development would go into higher density locations along light rail, main streets, transit corridors and centers (see Figure 7.2). The base case assumes that any redevelopment would average the same density as the buildings that were replaced.

The base case densities by design type (see Figure 7.3) reflect total residential and employment space, expressed as floor-area ratios. The transit corridor and main street categories show densities comparable to today (one- to three-story buildings) and about the same as in Concepts A and C. The central city would remain dense and the major centers would have relatively low intensities compared to the other concepts. The regional density in 2040 would fall to eight people per acre, down from the density of nine people per acre in the 1990s.

Residential and employment distributions in the base case show that the central city, regional centers and sub-regional centers mainly would serve as employment bases with commercial nodes and main streets a mix of the two. New UGB land would be a mix of 86 percent residential and 14 percent employment – a notable increase in employment along the UGB compared to Concepts A or C.

Our purpose in creating and analyzing the base case was to discover the region's potential for urban sprawl. The base case would convert rural land at low densities, using less than 50 percent of the available land. However, it would replicate the current status of our urban growth boundary – much of the land in the current UGB is vacant and unused.

One reason for this is the need to maintain a buildable land supply inside the urban growth boundary, as required by state law. As the central areas become developed, the 20-year supply of vacant land would become a peripheral buffer spreading outward from the metropolitan area.

Air Quality

As with Concepts A, B and C, predicted transportation generated emissions for the base case for carbon monoxide and volatile organic compounds are less than those in 1990. In addition, the base case had higher predicted oxides of nitrogen from transportation generated sources in the year 2040 than in 1990, but not significantly higher than other concepts. (The base case had 94,000 kilograms per day, Concept A – 91,000 kilograms per day, Concept B – 84,000 kilograms per day and Concept C – 87,000 kilograms per day.)

Social Stability

Law enforcement, fire safety and emergency medical response representatives from the region

Figure 7.1 Base Case Buildable Acres by Design Type

Design Type	Acres
Central city	48
Regional centers	273
Sub-regional centers	41
Commercial nodes	2,284
Main streets	8
Transit corridors	4,924
Other	49,181
New UGB	98,214
Total	154,973
Redevelopment Component	0

agreed that we should avoid the base case because they believed that it would mean a drastic increase in service costs and response times.

Parks and Open Space

We did no in-depth analysis of public open space in the base case. We know, however, that the base case contains a 20-year land supply at the end of 2040 and that there would be a substantial amount of undeveloped land, although it would be held in private ownership.

Figure 7.2 Household and Employment Distribution

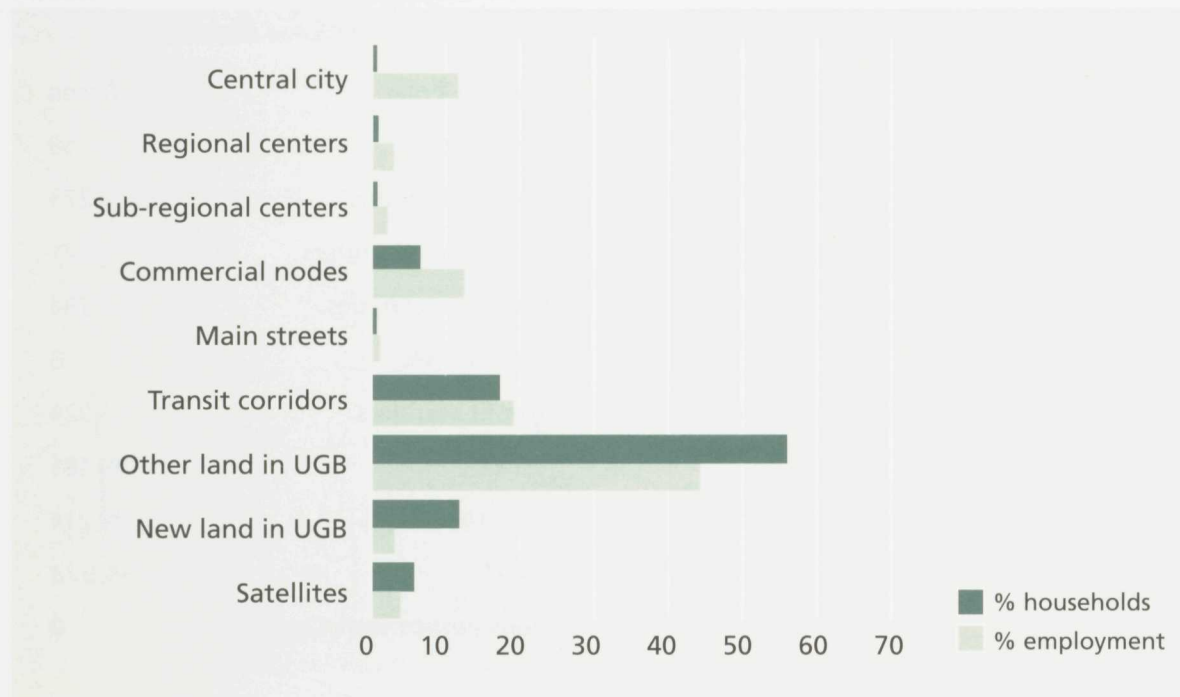
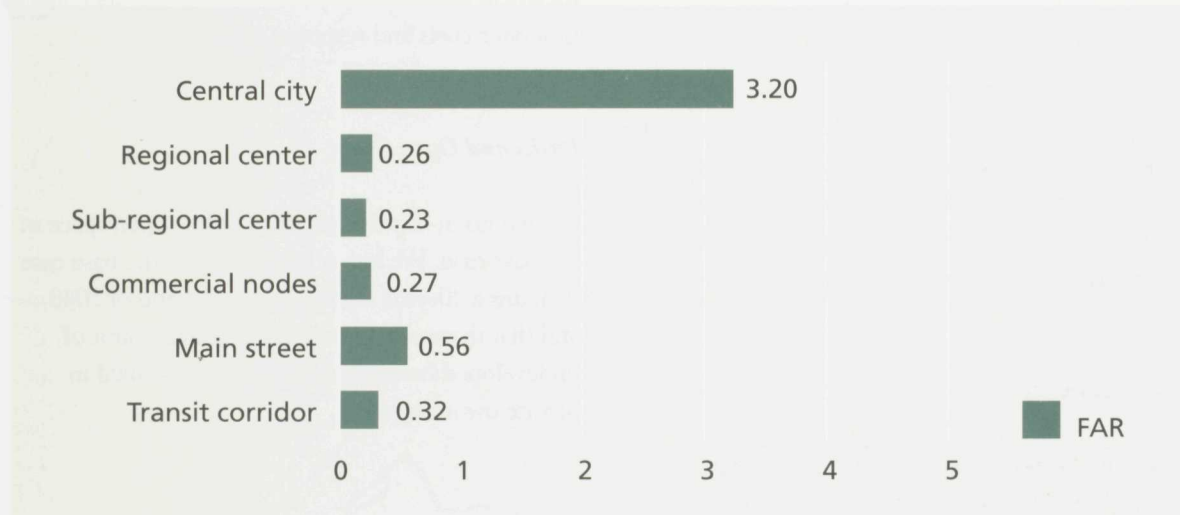


Figure 7.3 Floor-area Ratios



Water Facilities Consequences

Water, sewer and stormwater providers of the region concentrated on the potential impacts of Concepts A, B and C rather than on the base case. However, the base case is similar to Concept A in its impacts, only worse. These facilities would have to expand greatly to accommodate the expansion of the urbanized area.

Summary

The base case clearly shows what would happen if we continued to convert or expand the area as a primary means of dealing with growth. It also shows how much land is readily available for a doubling of the population. It fails to meet the state transportation goals for reduction of auto dependence, although its congestion was second lowest. It has the greatest expense for public facilities, and by far the greatest land consumption. The base case is useful mainly as a basis for comparison, and to point out the effect of continuing current trends.

Overview

The most salient feature about Concept A is that it would expand the current urban growth boundary by about 25 percent, providing substantial land for single-family homes while also attempting to address newly adopted state and federal transportation and air quality policies. Under our modeling of Concept A, existing neighborhoods don't experience significant change and new ones are added both inside and outside the current UGB.

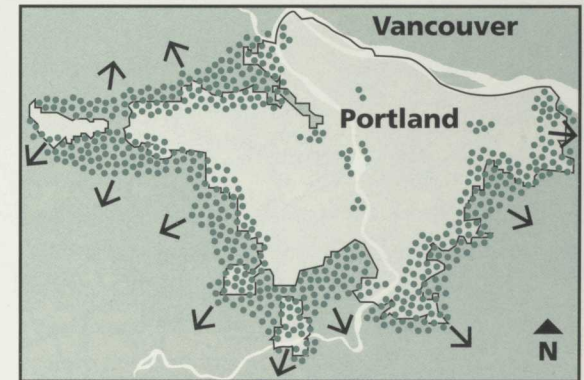
The urban growth boundary expands primarily to the east toward Damascus and Boring in areas mostly designated as exception lands. There also are some boundary expansions in southwestern Washington County on lands currently designated as "exclusive farm use." Concept A calls for expanding the UGB primarily to accommodate houses with moderately sized lots (8,000 to 10,000 square feet) in which there is no high level of transit service nearby. The concept also assumes that 4,500 acres of land inside the current UGB would be preserved as natural areas. Concept A assumes the construction of three new freeways – the Sunrise Corridor, the Westside Bypass and the Mt. Hood Parkway.

Key attributes of Concept A:

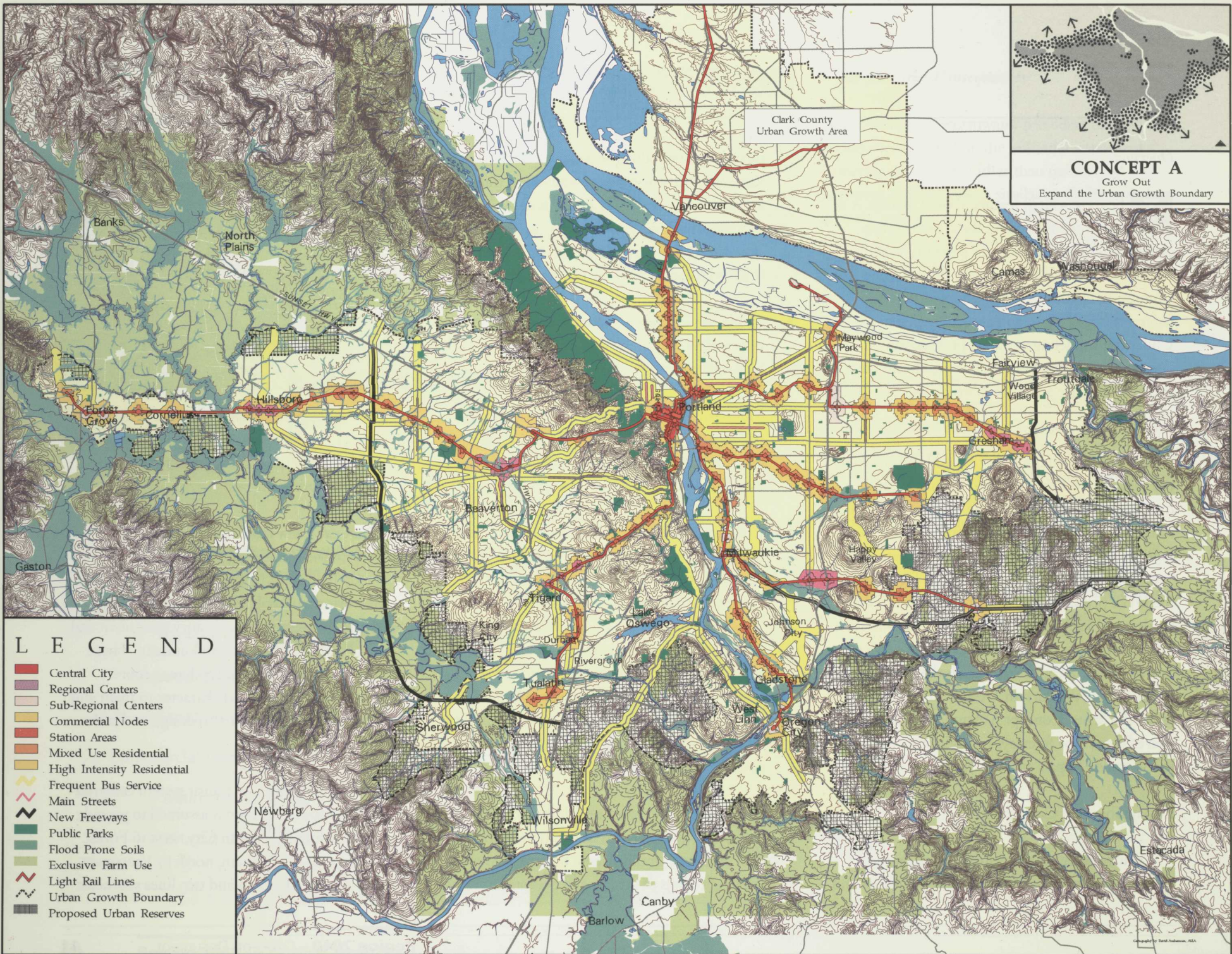
- Widen many of the primary arterials and collector streets, allowing higher densities and

mixtures of uses along some of them. Boulevards that become more prominent as transit corridors include: Sandy Boulevard, Farmington Road, Mollala Avenue, Terwilliger Boulevard, 82nd Avenue, 223rd Avenue, Stafford Road and Pacific Highway (99W).

- Single-family areas remain zoned as they are now, unless they are within one-half mile of a light-rail station.
- Multi-family zones allow densities of 40 units per acre (three-story buildings), and commercial zones allow mixed use at a density of 70 people per acre.
- Commercial zones are assumed to allow mixed use at 70 people per acre. These areas would contain two- and three-story office and apartment buildings with ground-floor retail.
- There are no new land "extensive uses" (requiring a lot of land per use such as warehousing and vehicle sales) except in large industrial centers. Retail uses that are typically built with many parking spaces are accommodated in non-transit areas.
- Along transit corridors, people would have direct and easy access to frequent mass transit. The corridors would also be built to accommodate high levels of bicycle and pedestrian traffic.



- All together the transit corridors can accommodate 115,000 households and 165,000 employees – at about 20 persons per acre or 8 to 10 dwelling units an acre.
- There are a few main streets, including Hawthorne Boulevard, Broadway Avenue, Sandy Boulevard in Portland and sections of Beaverton Hillsdale Highway and Hall Boulevard in Beaverton. Three-story apartment and retail complexes would predominate. These busy streets are intended to have a more localized neighborhood character to them and require greater attention to design and pedestrian orientation.
- A radial high-capacity transit system centered on downtown Portland is assumed to provide service south to Oregon City, west to Forest Grove, east to Gresham, north to Vancouver, southwest to Tualatin and two lines southeast



to Damascus and Foster-Powell. All of the centers (regional, sub-regional and commercial nodes) are located along these radial lines.

Regional Centers and Commercial Nodes

Eleven percent of the vacant land is in mixed-use centers and corridors. The centers represent 1 percent and the commercial nodes 3 percent, yet these two areas are zoned at higher densities and can accommodate about 110,000 households and 430,000 employees.

These regional centers vary from the downtown skyscrapers mixed with four-story retail complexes to low-rise buildings in regional centers such as Beaverton and Gresham. In these regional centers, four-story office buildings are assumed to intermingle with apartment buildings of a comparable size.

These core city centers are located within a quarter-mile of transit stations and provide easy access for commuters. These centers are buffered by moderate density uses of main street environments, parks, and social and cultural offerings.

The development in these centers is a combination of renovating existing buildings, redeveloping low-valued buildings and developing vacant lots and existing parking lots.

Pedestrian amenities include wider sidewalks, trees, benches, bike paths and pocket parks and plazas.

During our in-depth analysis of Concept A, we examined many components of growth management and how they would be affected by Concept A. We looked at how Concept A would affect specific areas in the region, and the effects on transportation, land use, air quality, employment, housing, social stability, parks and open space, and public facilities.

Regional Design Images

As a way of illustrating what these kinds of changes could mean we studied several sites by looking at how Concepts A, B and C could be applied. This was part of the urban design images portion of Region 2040 in which our consultant produced renderings of what eight specific sites around the region could look like if certain growth management policies were put into place. These designs are not intended to outline what will happen under the various concepts, instead, they allow local governments and citizens to visualize what could happen if they decide to make changes in their communities.

Downtown Beaverton and Orenco in Washington County were two of the sites selected. We applied information we had learned about Concept A to those two sites . . . to see visually and specifically the ramifications of Concept A.

Orenco

The 425-acre Orenco site, designated as a commercial node in Concept A, is located along the

westside light-rail corridor and is predominantly vacant today. Currently there are 232 households and 2,448 jobs within the area. Concept A assumes accommodating an additional 1,190 households and 3,330 jobs by the year 2015. Projections are that by the year 2040 there will be an additional 1,700 households and 4,750 jobs.

If we imagine it's the year 2040 and we're flying over the Orenco site, what would we see? First, the historic community of Orenco (on the southeast quadrant of the intersection of Northwest 231st Avenue and the rail line) would be intact, the once scattered vacant lots now would contain single-family homes. Across the street, a Toshiba plant would be built and in use. The historic estate immediately to the north of the site would be preserved, along with plenty of trees and green areas along the creek at the western most end of the site.

To the north of the rail line we would see the most dramatic changes. The transit station at the northwest corner of Northwest 231st Avenue would be adjacent to small shops, such as dry cleaners, a daycare center and coffee shops. A park-and-ride lot also would be available immediately to the west of the station. In the area north of the rail line and south of Cornell Road, there would be a combination of light industrial and research businesses, with adequate parking provided.

The area north of Cornell Road would be a residential neighborhood, with a mix of traditional single-family detached homes at five units per acre (averaging 7,500-square-foot lots), small lot

single-family at eight units per acre (averaging 4,500-square-foot lots), carriage units (with accessory units) at 12.5 units per acre (4,500-square-foot lots with two units per lot), town houses at 17 units per acre (2,300-square-foot lots) and garden apartments/condominiums with surface parking at 20 units per acre. All the residential zoning would be a maximum of two stories high, except garden apartments, which would be a maximum of three stories. (Note that these higher density units are within 1,000 feet of the transit station.)

At the southern part of the intersection of Northwest 231st Avenue and a new street (the traffic circle north of Cornell Road, within the residential neighborhood), we see two-story residences, narrow streets with sidewalks and trees and a substantial pedestrian environment.

Damascus

We analyzed the city of Damascus under Concept A because the concept assumes expansion of the urban growth boundary (UGB), raising the critical issue of how to urbanize what has traditionally been an area of rural development. Known as “exception lands,” these areas are residential lots with areas from 1 1/2 to 5 acres and were “excepted” from protection as farm or forest land. These areas are required by state land-use law to be considered first in line to be urbanized if the UGB is expanded.

The 23-square-mile study area is immediately adjacent to the southeastern portion of the UGB and stretches from about Southeast 152nd Avenue



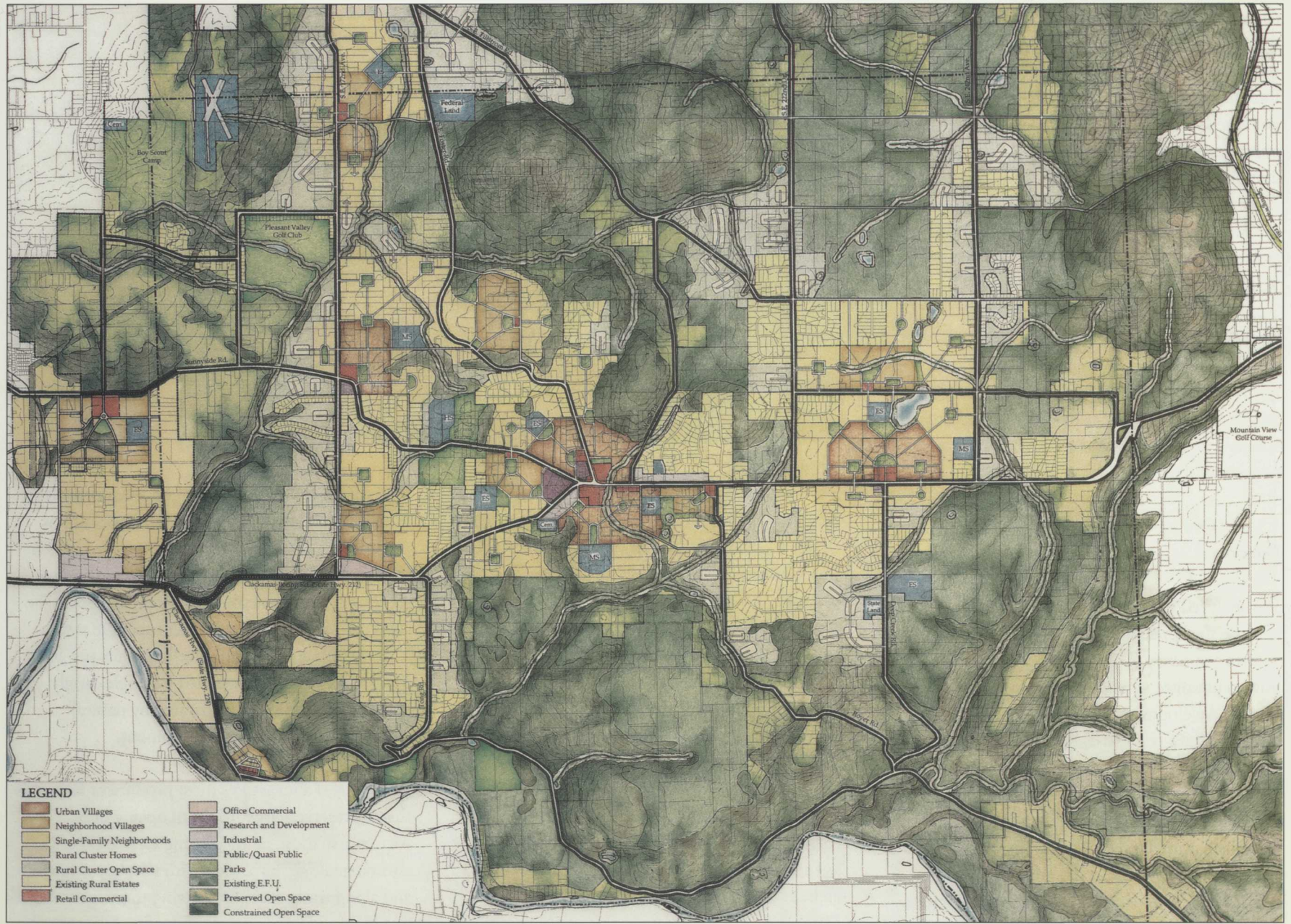
*Orenco aerial view
looking north of
transit station*

east to about Southeast 257th Avenue and from the Clackamas River north to Southeast Borges Road. Under Concept A, an additional 12,000 households and 3,800 jobs were assumed to be accommodated by 2040. We looked at two different alternatives (“low-density alternative” and “village alternative”) for accommodating growth in Damascus.

The low-density alternative assumes that most existing development would remain unchanged. It adds single-family residential (7,500-square-foot lots) around the retail center in Damascus and within the present UGB. The balance of the residential areas is designated as rural estate lots of 3/4 acre and larger. Some industrial uses are included along Highway 212 and adjacent to Damascus. The commercial area of Damascus was enlarged.

The village alternative would concentrate growth into four villages separated by open spaces, thus preserving a sense of community and place. Each village would contain a center for shopping and services at a central crossroad. Areas closest to the center would develop at 12 units per acre with a surrounding area of eight dwelling units per acre. These villages are surrounded by single-family neighborhoods and are separated by natural features or rural density development.

Perhaps this alternative’s most prominent feature is that it preserves large blocks of open spaces, particularly those on the Boring Lava Domes (a natural geologic formation with volcanic origins) and along water areas. Preserving these open spaces would provide two strategic benefits. First, preserving the Domes would provide residents with a



Damascus in 2040

permanent view of green and natural areas, as well as with a green separation between the area and neighboring urban areas. Second, the open spaces along water courses would help protect water quality (the Clackamas River is a source of water for many downstream communities as well as providing fish habitat) by buffering more active uses with natural areas, and could provide corridors of open space for people and wildlife.

Transportation

The transportation system design under Concept A is very similar to that of the base case. Our Concept A assumptions show a nearly 9 percent increase over 1990 in the number of lane miles. Transit service hours in Concept A would be nearly triple that of 1990. The three “freeway” bypass routes (Western Bypass, Mt. Hood Parkway and Sunrise Highway) also are included in Concept A.

Despite these improvements, Concept A would have the worst overall congestion of any growth concept, reflecting a total VMT twice that of 1990 and significantly higher than the other growth concepts. Concept A is the only growth concept to exceed 1990 VMT per-capita levels. Average peak-period travel time in Concept A would increase to 12.5 minutes – the longest of any growth concept and a 30 percent increase over 1990.

While Concept A shows arterial street congestion region-wide, the worst congestion would be along Washington County’s widely spaced suburban streets. The more closely spaced and more fully

integrated network of arterials in east Portland and Multnomah County would have the least congestion.

While much of the freeway system would continue to function well, many freeway bottlenecks would emerge. Some freeway congestion represents more than just a bottleneck and includes the surrounding roads and long sections of freeway. Examples include parts of the Sunset Highway, I-205 in the Clackamas area, Interstate 5 south of downtown Portland and parts of I-84. The three freeway bypass projects primarily would increase access to the urban fringe areas and do little to relieve congestion on existing routes.

We attribute much of the congestion in Concept A to the separation of homes and businesses. Most areas added to the UGB in this concept would be single-family neighborhoods, with few nearby services or jobs. As a result, the arterial streets linking these new neighborhoods to jobs and services would be much more congested than in the other growth concepts. The mostly single-family neighborhoods added along the urban fringe in this concept would be difficult to serve with transit, and the lack of nearby services or jobs discourages bicycle or pedestrian travel.

Concept A would have the lowest daily transit ridership (267,000) of the three growth concepts. Ridership would be highest along transit corridors, main streets, and to regional centers. The lowest would be where limited service is provided to low-density residential areas. Compared to the other concepts, transit coverage is somewhat more limited in Concept A, reflecting the difficulty in

serving new low-density neighborhoods along the urban fringe.

Radial high-capacity transit (light rail or express bus service) linked to downtown Portland would be an important part of the regional transportation network, carrying 21,000 to 47,000 riders daily. Routes to points along the urban edge, such as Forest Grove and Damascus, would be less effective, with only 2,000 to 4,000 riders daily.



Non-auto travel (including transit, bike and pedestrian) accounts for less than 10 percent of all travel in Concept A, although it would increase along transit-oriented streets and in regional centers. Bus service is high in older neighborhoods east of the Willamette River. As a percent of total trips, the bicycle and pedestrian share in Concept A would not change from the 1990 level of about 5 percent.

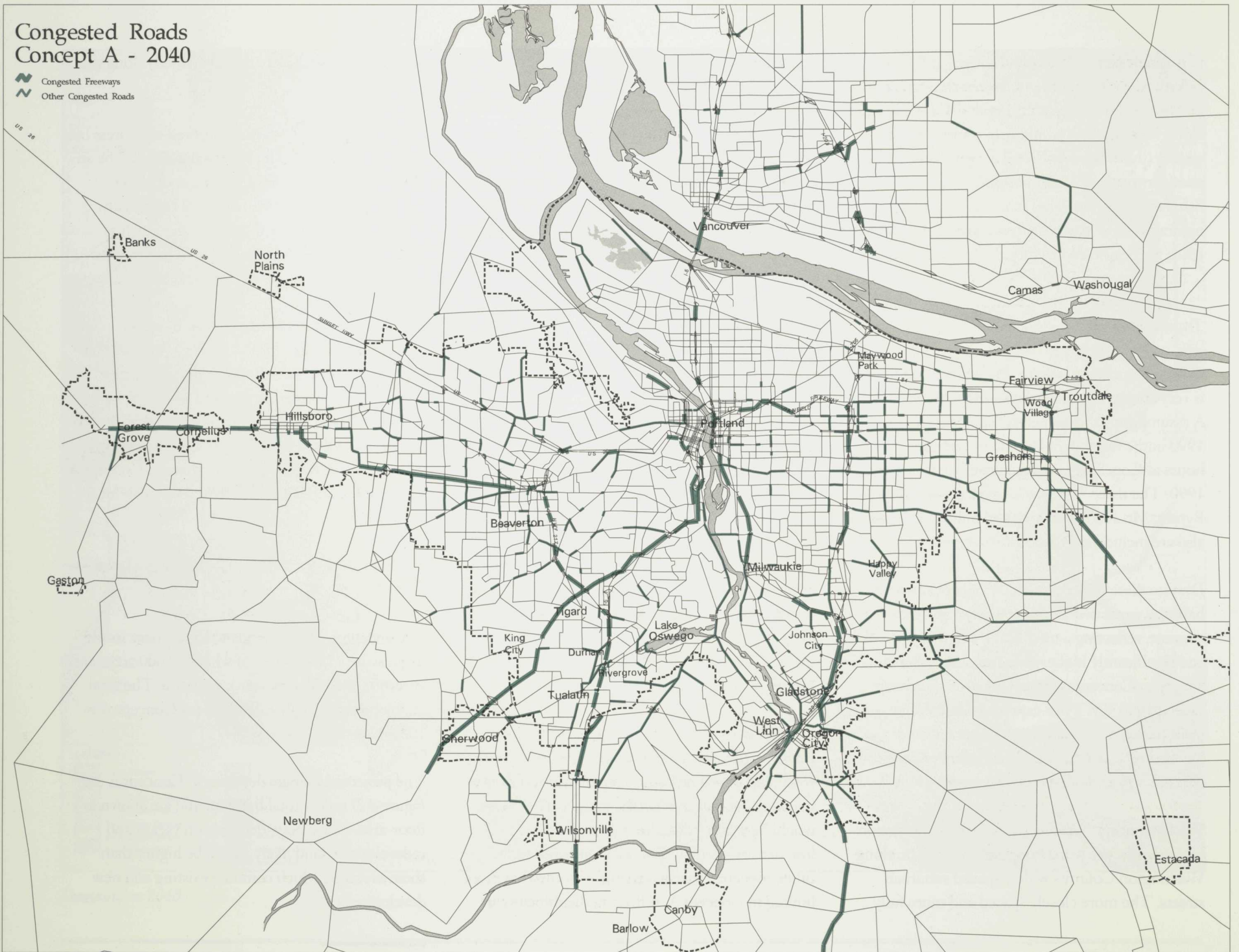
Land Use

In Concept A, the urban growth boundary would increase by 55,000 acres, of which 18,000 acres are currently zoned for exclusive farm use. The total buildable land supply calculated for Concept A is 104,000 acres. (See *Figure 8.1*)

The projected average densities in Concept A (see *Figure 8.2*) reflect total buildout and are shown as floor-area-ratios. New densities on vacant and redevelopable land likely would be higher than these averages, which combine existing and new development.

Congested Roads Concept A - 2040

-  Congested Freeways
-  Other Congested Roads



New single-family lots would average between 7,500 and 9,000 square feet, with a regional density in 2040 of about 10 people per acre. Other than the limited concentrated centers and street corridors, the region would remain mostly low-density development.

The amount of land zoned exclusively multi-family and commercial decreases and is represented by mixed-use zoning. About 74 percent of the housing under Concept A would be single-family with 26 percent developed as multi-family.

Sixty-two percent of the region's development would occur in single-use zoning areas with poor or no transit service, and 38 percent would occur in transit-oriented mixed-use areas. Concept A assumes 6,400 acres of redevelopable land becomes available, based on current lots with low improvement values. We also recognize that redevelopment is likely to occur in areas that have good transportation service and high land costs.

Figure 8.3 shows how and where people would work and live under each of the design types. The central city area would decline in the proportion of total regional employment, and the regional and sub-regional centers would grow slightly. Almost half of the employment growth is in the low-density areas away from transit and city centers. Commercial nodes and main streets would contain a mix of residents and employees, while the transit corridors and other design types would be mostly residential. New land added to the UGB would be 98 percent residential under this concept.

In summary, Concept A would extend land use beyond the current UGB and would not greatly change the way land develops from today. It would urbanize 55,000 acres of rural land and use the vast majority of that land for 9,000-square-foot residential lots. Concept A would zone 40,000 more acres single-family than in Concept B, and zone about half the amount of single-family land allowed in the base case.

Air Quality

Our computer models for transportation-generated air pollution show that under Concept A, levels of certain pollutants (carbon monoxide and volatile organic compounds) would be lower than those today. Only in the category of nitrogen-related oxides would there be an increase from 80,000 kilograms per day to 91,000 kilograms per day. However, when we forecast non-transportation sources of air pollution, the region would be out of compliance for Concept A (and the other concepts) even with the regulatory measures assumed by the state.

Employment

While the overall amount of land available for employment areas (using current rates of employees-to-land ratios) seemed to be sufficient regionally, several areas lacked a balance of projected supply and demand.

In the employment land analysis for Concept A, our projections showed an excess demand (more need

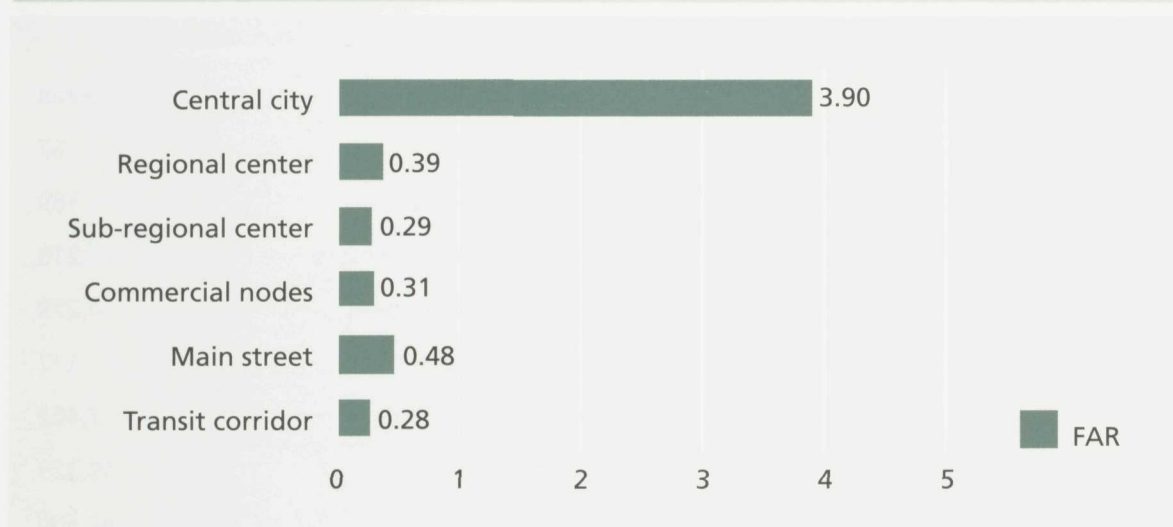
**Figure 8.1 Concept A
Buildable Acres by Design Type**

Design Type	Acres
Central city	67
Regional centers	369
Sub-Regional centers	218
Commercial nodes	4,229
Main streets	127
Transit corridors	7,462
Other	49,353
New UGB	42,500
Total	104,325
Redevelopment Component	6,377

for employment land than the concept provided) in the following areas: the Macadam/Johns Landing area, the outer southeast portion of Portland along Foster Road, and in northeast Portland. In contrast, we predict too much employment land in the following areas: downtown Portland, Columbia southshore, Damascus, Lake Oswego and northern Hillsboro.

A jobs housing imbalance exists in the UGB expansion areas to the southeast in Clackamas County, as well as areas along the periphery of Washington County. These areas are largely residential uses. By contrast, the central commercial areas of Hillsboro, Beaverton, Portland,

Figure 8.2 Floor-area Ratios



Clackamas Town Center area favor jobs over housing in the concept buildout. At a sub-regional level, Washington and Clackamas show an imbalance in favor of households, while the city of Portland (excluding CBD) shows an imbalance in favor of jobs. The most balanced sub-region is the Tigard, Tualatin, Wilsonville, Lake Oswego area and mid-Multnomah County, including Gresham.

Housing

We used our modeling system to predict the imbalance between supply and demand, this time as related to housing. Concept A would not provide sufficient single-family housing in one central area (downtown Portland and inner northeast Portland) and in several areas at the edge of the UGB

(Hillsboro, west of Forest Grove, in the vicinity of Highway 30/Sauvie Island and southeast Wilsonville). In contrast, the model predicts Concept A would provide too much single-family housing in areas such as Damascus, east of Oregon City, west of Wilsonville and in the area north of Forest Grove.

The model also predicts that the amount of multi-family development provided in Concept A is insufficient to meet demand along the edge of the UGB, while a few areas in Damascus, Beaverton and north of Forest Grove are projected to have an excess of multi-family supply.

Social Stability

When we talked with public safety professionals they said they could provide law enforcement, fire safety and emergency medical responses if Concept A were implemented. They specified, however, that it would mean increasing the service area and funding.

In addition, they said law enforcement professionals alone could not provide adequate security under the expanded service areas implied under Concept A. They recommended that growth policies be enacted that would result in community pride – a potent force in the assurance of personal safety. They also recommended that communities integrate building design principles with safety in mind (such as having building storefronts face the street).

Human service providers indicated that Concept A could result in more moderate housing prices, making housing more accessible to low- and moderate-income households. They were concerned, however, that Concept A would not provide much transit service and that dispersed social services would be more expensive. Human service providers strongly recommended for all the growth concepts that there should be incentives for the private sector to develop low- and moderate-income housing throughout the region.

Parks and Open Space

Under Concept A 4,500 acres of presently privately owned lands within the current UGB would be

acquired or protected as natural areas or parks. The assumed expansions of the UGB are shown avoiding sensitive natural areas that include flood prone soils, steep slopes and forests. In addition, Concept A allows larger yards of single-family homes to provide private open space in lieu of additional public open spaces.

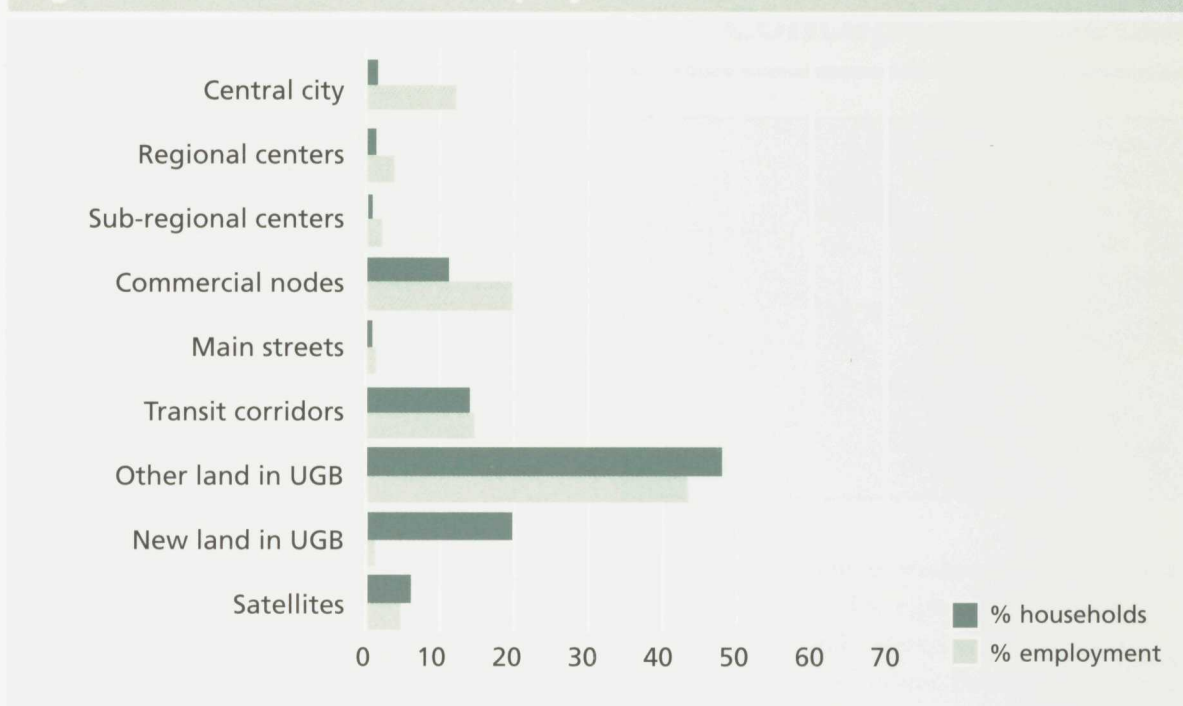
Public Facility Consequences

In examining Concept A in relation to public facility consequences, we looked at factors such as drinking water, wastewater and stormwater facilities. For drinking water, Concept A would include growth in hilly terrain, which would cost more to store and distribute water. Also, large lot sizes likely would mean higher consumption (due to summer lawn watering). A larger service area likely would result in higher costs.

However, Concept A also brings with it some cost-saving considerations. Because water conservation could be achieved more easily (by curtailing summer watering), system reliability costs would be lower. In addition, there would be less watering of public open spaces because there would be fewer public areas. On balance, system providers of the region concluded that Concept A would have water costs higher than Concept B and about the same as Concept C.

For wastewater (sanitary sewer) service, other considerations could come into play. Wastewater systems are generally the most expensive to provide. Concept A would have fairly low wastewater costs

Figure 8.3 Household and Employment Distribution



because, although compact development forms usually are less expensive, the costs of retrofitting in already developed areas can be substantial. Wastewater systems experts therefore concluded that they could not accurately predict which approach is more cost effective. Concepts A and B, however, appear to be the lower cost concepts, according to system providers in the region.

Facilities to manage stormwater runoff also would find major advantages and disadvantages under each growth concept. However, providers in the region found that there were no obvious overall advantages or disadvantages between the growth concepts for stormwater facilities.

Summary

In general, Concept A expanded the transit and highway systems, expanded the urban growth boundary and tried to keep some areas as they are today. It had the highest congestion, highest air pollution, lowest transit ridership, most dispersed population and highest cost for water service. This does not mean that expanding the urban growth boundary is the cause of these problems; instead, it is the way land use and transportation were distributed within the boundary. Concept A has taught us that expanding the urban growth boundary and making only minimal changes to land-use distributions could result in serious problems.

Overview

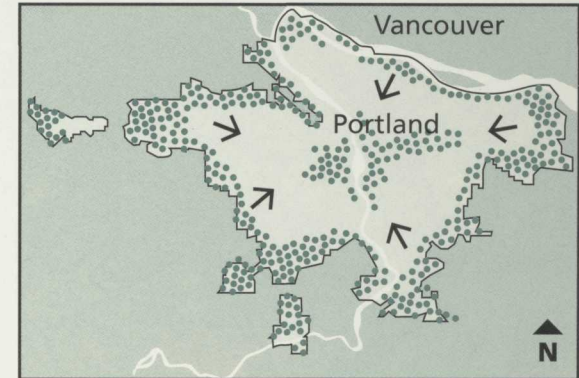
Under Concept B, the region would be very different than under Concept A – it would be much more compact. If we keep today’s urban growth boundary intact (the primary feature of Concept B), 45 percent of new development would be accommodated in centers and corridors with high transit levels. In turn, those centers and corridors would be designed with higher densities (25 persons per acre or greater). Centers such as downtown Gresham and corridors such as Hawthorne Boulevard would become quite common throughout the region.

Some of our analysis of Concept B reveals that:

- Single-family homes would remain the predominant type of housing (60 percent), with higher density (both detached and attached) housing providing the balance.
- New single-family neighborhoods under Concept B would be similar to neighborhoods built before 1950. They would be more compact than those in Concept A and closer to shopping and jobs. New lot sizes would be 20 percent smaller than those in Concepts A or C, averaging 5,800 square feet.
- Considerable redevelopment would occur in existing neighborhoods. Concept B likely

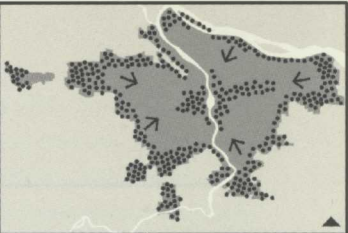
would experience changes in market forces associated with scarcer land, shifting demand to homes on smaller lots. Prices for larger lots and for homes in older urban neighborhoods are likely to increase under any of the scenarios and perhaps more in Concept B.

- Employment would be more concentrated in centers, rather than spread out. Downtown Portland, of course, would be quite employment intensive, with an 9-1 employee-to-resident ratio (nine employees for every one resident) and 50,000 more employees than in Concept A.
- All the centers combined would be expected to accommodate 107,000 more employees in Concept B than in Concept A. Concept B would have 30 percent of employment growth in centers, rather than 13 percent in Concept A. Commercial and mixed-use development would be more intense here. There would be less land devoted to parking spaces.
- Our analysis shows there would be shorter travel distances between destinations, with an increased demand for accessible transit and congestion at peak times that is higher than today.
- Most transportation improvements were for transit in Concept B, since it calls for no new



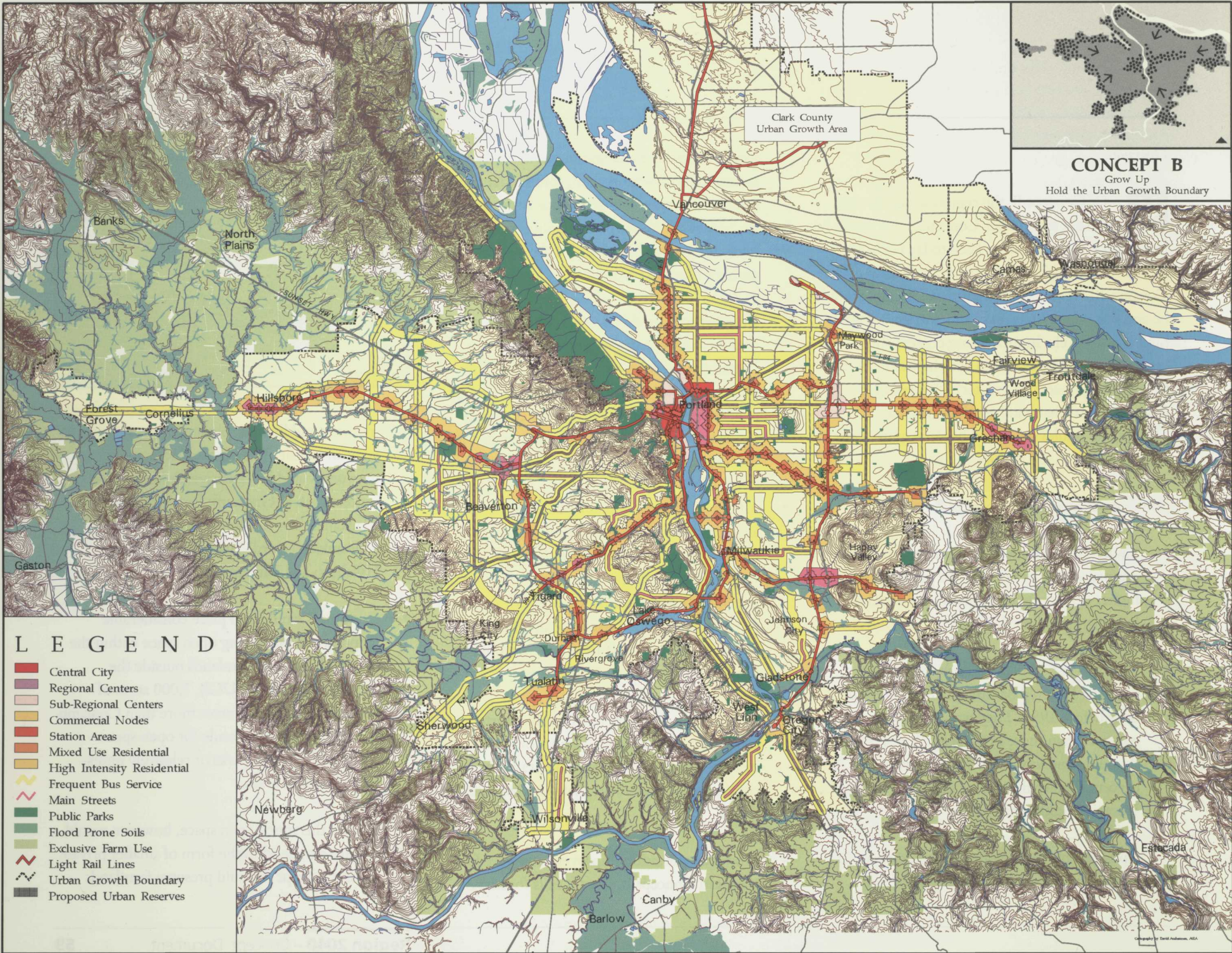
freeways and limited roadway improvements in favor of transit. The high-capacity transit network would be extensive, linking major centers such as Gresham, Powell/Foster Road, Clackamas Town Center, Oregon City, Milwaukie, Tigard, Tualatin, Beaverton, Hillsboro and Vancouver.

- Concept B would also place considerable emphasis on preserving open space within the present UGB and farmlands outside the boundary. Inside the UGB, 7,000 acres of buildable land (2,500 acres more than Concepts A or C) would be set aside for open space – either active urban parks or relatively undisturbed natural areas.
- Having this much open space, however, would require a tradeoff in the form of smaller private yards. Concept B would preserve farmlands



CONCEPT B

Grow Up
Hold the Urban Growth Boundary



LEGEND

- Central City
- Regional Centers
- Sub-Regional Centers
- Commercial Nodes
- Station Areas
- Mixed Use Residential
- High Intensity Residential
- Frequent Bus Service
- Main Streets
- Public Parks
- Flood Prone Soils
- Exclusive Farm Use
- Light Rail Lines
- Urban Growth Boundary
- Proposed Urban Reserves

immediately surrounding the region, saving the rural landscape we know today.

Regional Design Images

As we did for Concept A, we examined several areas around the region to see how they would look if we implemented the growth principles under Concept B. Again, this was part of our Regional Design Images project, in which we hired Calthorpe Associates, a nationally renowned urban design group, to devise renderings and drawings about what those sites would look like under Concept B. The two sites we examined under Concept B were Hillsdale and Orenco in Washington County.

Hillsdale

The urban designs for Hillsdale demonstrate the kind of change that could occur in a predominantly single-family community under Concept B. Hillsdale is currently a residential neighborhood with a commercial strip and frequent bus service. This design illustrates how additional density could be accommodated, mainly by using vacant lands and by redeveloping some properties. The single-family character of the surrounding neighborhood, however, would remain intact. Only the existing commercial and multi-family developments, as well as a small number of single-family areas, would be affected.

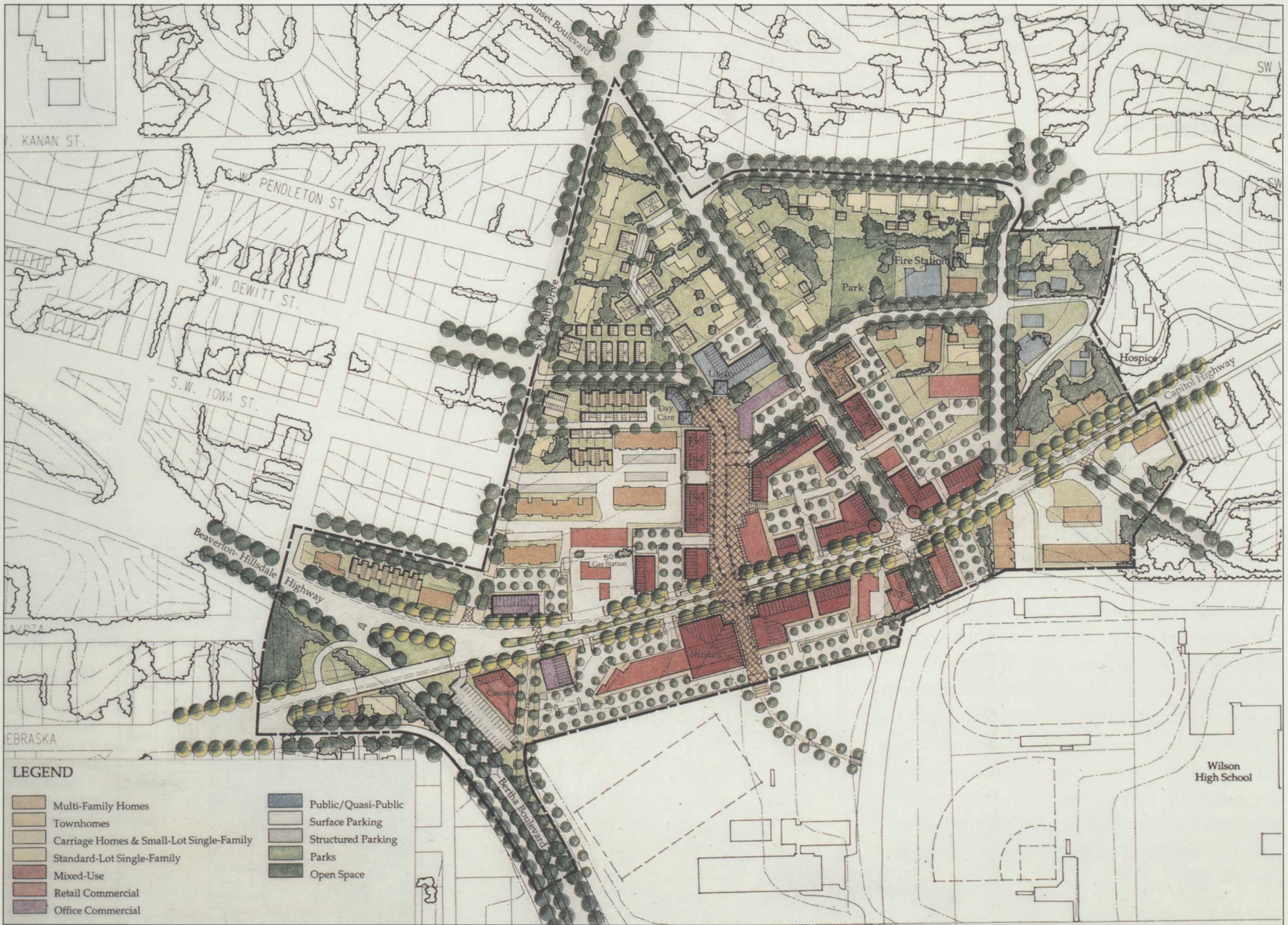
Taking our helicopter tour of the area in the year 2040, we would see that the commercial hub of the



*Hillsdale
aerial view*



*Hillsdale
street scene*



Hillsdale in 2040

area, along Capitol Highway, would have additional commercial uses. Its street width would be narrower because of building additions extended toward the street and because of road improvements that include a median strip and street trees.

An even more dramatic difference is the addition of a street/plaza area stretching south to north from the Nature's store to a new library site. This would provide a much more pedestrian-oriented space, although it would continue to provide auto access. The area would become a place where those who wish to walk or bike to local shopping can do so – or at least walk among shops once they reach the center.

The ground-level view illustrates this mix of pedestrian scale development and cars. Traffic speed through the area would be lower than it is today, and walking across Capitol Highway would be much easier and safer. A mix of ground floor retail and offices, with housing above, would have a maximum of three stories and actually would accommodate more growth than what is called for in Concept B. The additional growth was shown in this design in response to the wishes of Hillsdale neighborhood and business leaders.

Orengo

Our 2040 helicopter tour takes us next to the Orengo site in Washington County, which would have 1,700 additional households and 3,600 new jobs under Concept B. While undergoing some substantial changes, the site would maintain much



*Looking west
along Alder
Street in Orengo*

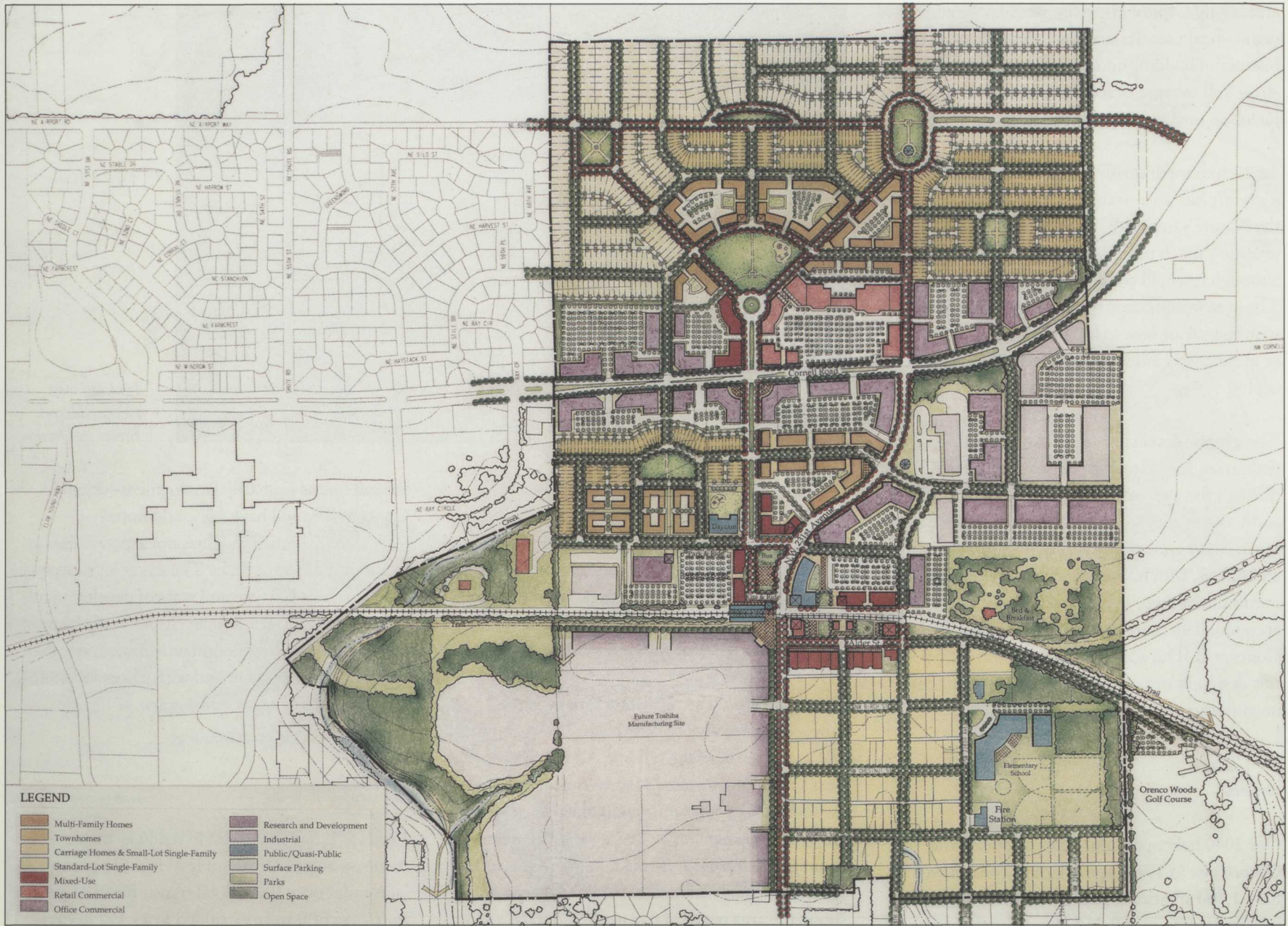
of its historic character. The historic town of Orengo south of the rail line and east of Northwest 231st Avenue would have some development, but there would be no change to existing homes or the single-family character of the area. In addition, the church, historic commercial building, fire station and the historic estate would remain undisturbed.

Concept B would include substantial changes, however, to the west of Northwest 231st Avenue and to the north of the rail line. Vacant land on the west side of Northwest 231st Avenue, today owned by Toshiba Corporation, would likely become a major employment area. There would be a train station, with a park-and-ride lot and several retail and commercial businesses. While Concept A shows the area north of Cornell Road to be all residential and the area between Cornell Road and

the rail line as primarily employment-oriented, Concept B would have some additional multi-family homes and does not separate uses as much into different areas. The street level perspective illustrates the type and scale of development that could occur along Alder Street in the historic part of Orengo – development with no more than two-story development and with places for transit, walking and biking, as well as cars.

Transportation

Concept B had the fewest in roadway improvements, with an increase of less than five percent in lane-miles over 1990. Total transit hours of service for Concept B were expanded to 13,192 hours –



Orenco in 2040

almost triple the 1990 level – but only 7 percent more than Concept A.

The result of combining improved transit service and increased development density is a significant increase in non-auto transportation, with Concept B having the highest level transit, bicycle and pedestrian travel of any growth concept. Total non-auto travel would vary by destination, accounting for 55 percent of all trips to downtown Portland, 12 percent to regional centers and 15 percent along main streets.

Despite the increase in non-auto travel, Concept B would have significant congestion along many major routes, with approximately 14 percent of all urban roadways having high levels of congestion. While total vehicle miles traveled (VMT) would increase by 62 percent over 1990 levels, Concept B still would have the lowest regional VMT of any concept, and the lowest VMT per capita, improving on 1990 levels by 12 percent. Average peak-hour travel time in Concept B would slow to 11 minutes, an 18 percent increase over 1990. We attribute much of the congestion in Concept B to the relatively modest road improvements in this concept and the intense land use along major routes.

The three proposed new freeways (Western Bypass, Sunrise Corridor and Mt. Hood Parkway) are not included in Concept B. Some planned capacity improvements were deleted from highways and streets throughout the region. In addition, existing capacity was removed from some main streets to

make room for bikes and pedestrian improvements. We found that would create widespread congestion around the region. Some examples include Highway 217, the Sunset Highway, 99W and I-5 south. Congestion also would be widespread along radial arterials in east Multnomah County. However, the eastern portion of I-84, the western portion of U.S. 26 in Washington County, the northern segment of I-5 and I-205 in the Stafford area all would have low congestion.

Freeway congestion in this concept would not be limited to isolated bottlenecks. Most of the congested freeways are flanked by equally congested arterials, suggesting that freeway backups affect many adjacent routes as well.

While Concept B would have about the same percentage of households and businesses having access to transit as today, it would have the greatest increase in transit ridership of any concept, rising from 125,000 today to 487,000 in 2040. It also would increase the transit share of commute travel to 13 percent, compared to 5 percent in 1990. This illustrates how complementary land use and improved transit service lead to increased ridership.

Increased bus service would draw more riders in Concept B than in the other growth concepts, especially along main streets and transit corridors. As in Concept A, bus ridership in Concept B would be highest east of the Willamette River. However, with the exception of a few transit corridors and main streets, bus service west of the Willamette River would be more difficult to provide because of

topography and lower housing and employment densities.

Radial high-capacity transit corridors into downtown Portland would have significantly greater daily ridership than circumferential routes or extensions to points along the urban edge. The major radial corridors, such as the Banfield and Westside lines, would range from 25,600 to 81,300 daily boardings. Circumferential routes, such as along Highway 217, would range from 6,400 to 23,100 daily boardings.



The bicycle and pedestrian share of total trips in Concept B would grow to 6 percent, a slight increase from 1990. Of the three growth concepts, Concept B would have the largest share of bicycle and pedestrian trips as a percentage of total person trips. The significant growth in non-auto travel, along with predicted widespread congestion in Concept B, underscores the importance of having land uses that are easily served by transit and a transportation system balanced in road and transit improvements.

Land Use

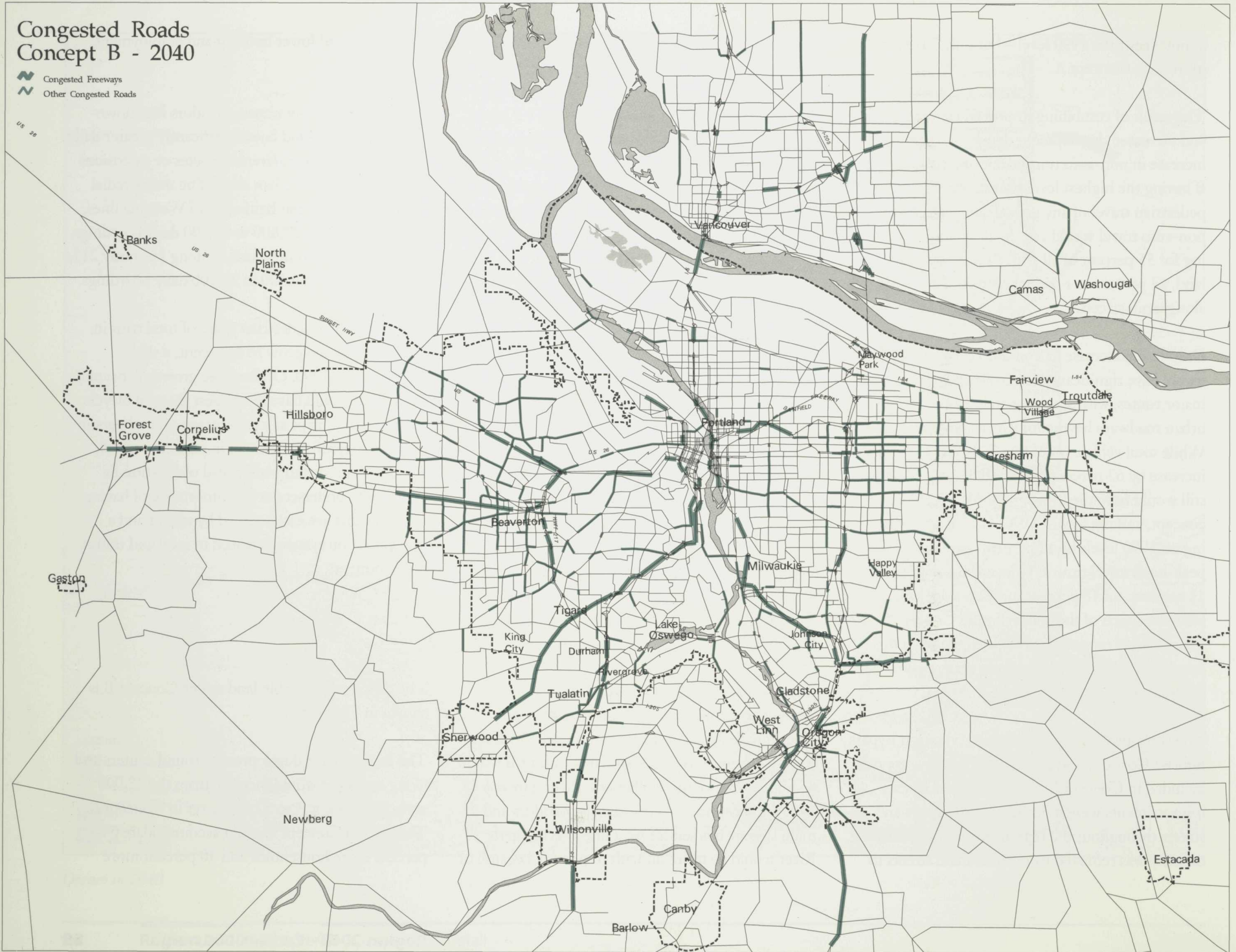
The supply of buildable land under Concept B is shown in Figure 9.1.

The land area for development around centers and along corridors would increase from the 42,000 acres in Concept A to 52,000 acres in Concept B. This means Concept B could accommodate 64 percent more households and 30 percent more

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employees than Concept A in these mixed-use transit areas. Under Concept B 56 percent of the developed area would have access to high quality transit.

Redevelopment of existing areas would double in Concept B compared to Concept A. This means 11,300 acres would be redeveloped in Concept B, compared to 6,000 acres in Concepts A and C.

Concept B's density figures by design types are seen in Figure 9.2. The floor area ratios represent averages of both existing and new development (for new growth densities see Appendix). Buildings in central city areas would be between five and 10 stories, one to four stories in regional and sub-regional centers, and one to three stories in nodes, corridors and main streets. New residential lots would average 5,800 square feet, compared to 7,300 square feet in Concept A. The regional density in Concept B would be 12 people per acre.

Zoning under Concept B would include 31 percent mixed-use land (12 percent attached single-family with light commercial, 17 percent medium- to high-density multi-family with commercial, and 2 percent light industrial/lofts). In total, 60 percent of residential zoning would be single-family, and 40 percent would be multi-family.

In looking at the mix of residences and employment by design types, Concept B shows that the central city, regional centers and sub-regional centers would emphasize employment. The commercial nodes, and main streets and corridors show an even

mix. The "other" category slightly emphasizes residential development. (See Figure 9.3)

Concept B is distinctive for creating the most intensive centers and corridors. Downtown Portland would have the same proportion of regional employment that it has today – about 18 percent. The regional and sub-regional centers would be stronger than today, employing 10 percent of the region. There would be a substantial increase in density along main streets and transit corridors, where the zoning allows floor-area ratios to reach 1:1, or about two-story buildings.

Air Quality

Similar to Concept A's air quality impacts, Concept B would have a lower level of carbon monoxide and volatile organic compounds being emitted from cars than in 1990 because of vehicle emission improvements and a gradual phasing out of older (dirtier) vehicles. However, nitrogen-oxide pollutants likely would increase from their 1990 level of 80,000 kilograms per day to 84,000 kilograms per day in 2040 – about a 5 percent increase. We should bear in mind, though, that this kind of increase would occur in all the concepts. Concept B would provide the largest net reduction (about 8 percent) over the base case.

Employment

Our analysis shows that there would be a high employment demand in inner eastside Portland and

**Figure 9.1 Concept B
Buildable Acres by Design Type**

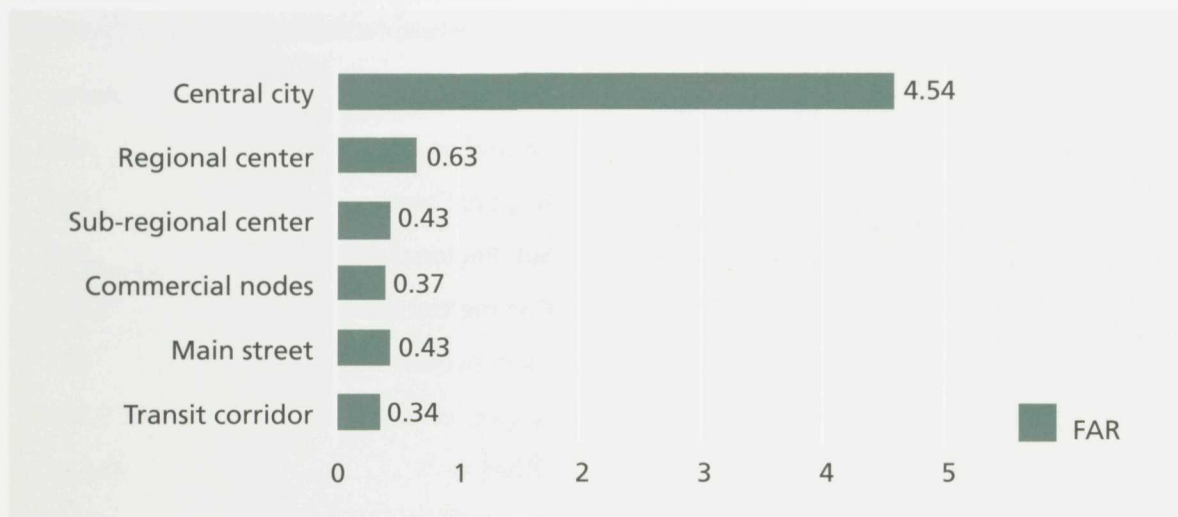
Design Type	Acres
Central city	100
Regional centers	507
Sub-Regional centers	323
Commercial nodes	5,322
Main streets	791
Transit corridors	9,370
Other	48,653
New UGB	0
Total	65,066
Redevelopment component	11,330

in Gresham under Concept B. Our projections show an excess supply of employment land in Hillsboro, the Blue Lake area along the south shore of the Columbia River, and in the Sunnyside area if development occurred at the densities projected.

Currently the Hillsboro and Columbia south shore areas have substantial proportions of the region's total inventory of vacant industrial land. This did not change significantly in Concept B.

The Sunnyside and Foster/Powell areas in Concept B would include substantial employment areas near transit stations. Our model shows, however, that there may be a higher supply than demand for land allocated for employment.

Figure 9.2 Floor-area Ratios



Concept B does the most for achieving a jobs/housing balance in the region. It minimizes the imbalances by not adding residential land at the periphery and by adding more mixed uses throughout the region. Nevertheless, Portland remains a jobs dominated area while such areas as mid-Washington County, Lake Oswego and West Linn remain largely residential. At a sub-regional level, Washington, Clackamas, and Eastern Multnomah counties show an imbalance in favor of households. The most balanced sub-regions are the Tigard, Tualatin, Wilsonville, Lake Oswego area and the city of Portland (excluding the CBD).

Housing

As noted earlier, we looked to the base case as being a reasonable expression of recent housing market expectations. Bearing that in mind, we analyzed

Concept B for how well it would meet this predicted demand for two basic product types – single-family and multi-family housing. As we expected, the analysis showed that Concept B would have the highest unmet demand and lowest supply for single-family housing.

That projected demand tended to be in areas near or beyond the edges of the present UGB. Locations forecast to have single-family demand greater than supply include areas in or near: Damascus and Boring, Redlands, the Stafford Basin, south of Wilsonville, Parrett Mountain, the Tualatin River plain, north of Forest Grove and Cornelius, west of Forest Grove, North Plains and Sauvie Island. The model also predicted that each concept would have a higher demand than supply for single-family housing in downtown Portland.

In looking at multi-family housing, the model predicted that Concept B would have the highest supply of multi-family housing among all the concepts. The areas of excess supply tended to be in the center of the region in areas that included the Columbia south shore, immediately east of downtown Portland, and Hillsboro. Outlying areas showed up as having a high demand for multi-family housing, including areas in and around: Boring, Redlands, south of Oregon City, the Stafford Basin, south of Wilsonville, the Tualatin River plain, north of Forest Grove, North Plains and west of Forest Grove.

Social Stability

Public safety professionals pointed out advantages and disadvantages to Concept B. They agreed that density and crime were not linked and that Concept B would not necessarily mean more crime. They said the major link to crime was income, not density.

The public safety professionals expressed more concern about dispersed land-use patterns that could spread public safety personnel over a much larger territory. They predicted that emergency response times would be shorter in Concept B than in the other concepts because of a more compact urban form. Also, some aspects of Concept B could be considered safer than the other concepts. They said, for example, that transit becomes safer as more people use it since potential criminals would have more witnesses to criminal behavior. In addition, Concept B could result in a greater sense of

community pride and more effective neighborhood watch systems . . . that community policing would be quite successful.

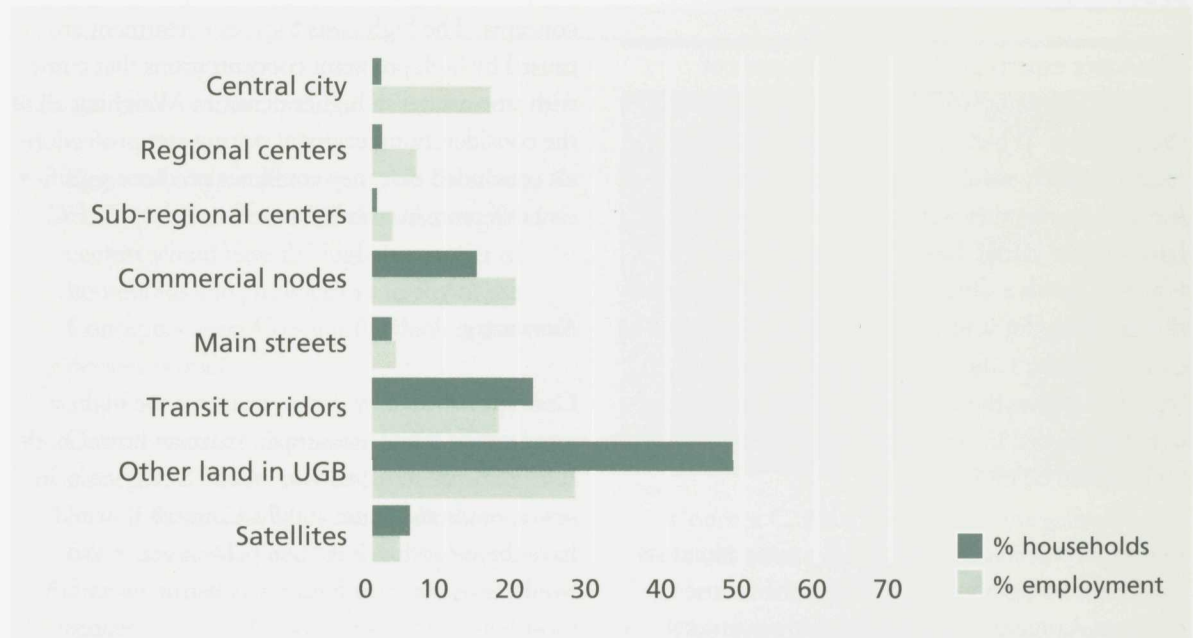
Human service representatives said they were concerned about housing affordability under Concept B. With nearly all development being accommodated on existing lands, land prices may be higher and affordable housing could be more difficult to provide. But they also indicated that centers and corridors would allow for more cost-effective and accessible centralized services. Their recommendation for Concept B was the same as for Concepts A and C; namely, that there should be incentives for private developers to provide affordable housing under any of the growth concepts.

Parks and Open Space

Because there is no expansion of the UGB in Concept B, private yards in new developments would be smaller and new developments would have more people per acre than in Concepts A and C. To maintain an adequate supply of open space, we therefore would need to withhold more public open space within the current UGB.

Under Concept B, about 7,000 acres of buildable land would be preserved as public open spaces – active public parks as well as undeveloped natural areas. These acres were drawn from the inventory of buildable lands and were in addition to environmentally sensitive lands (wetlands, flood prone areas and steep slopes) within the current UGB.

Figure 9.3 Households and Employment Distribution



Within this 7,000 acres, most of the land would be currently vacant lands while a small proportion would be already developed lands. These developed lands would be assumed to be converted to open spaces. When there is no vacant land to acquire for public park uses, underdeveloped or unused (but developed) sites could be purchased and converted. This would be more costly than acquiring undeveloped lands. In addition, vacant lands acquired in Concept B for open spaces likely would be more expensive than lands acquired in Concepts A or C.

Public Facility Consequences

Concept B had lower costs than Concepts A or C when we considered drinking water supply and treatment, according to regional water provider professionals. First, they cited the cost savings that accrue from higher densities since the length of water pipe is likely to be much shorter and serve more people in higher density developments than in lower density developments. Then too, the average yard size and therefore summer water demand is less (although watering demands for additional public open spaces may mitigate such savings). Costs also may be less where redevelopment

involves replacing old, worn out water lines that needed replacement anyway.

The water experts predicted that the costs of transmitting water would be about the same for all the concepts. When needed, water conservation measures likely would center more around home use than on summer watering (since people would have smaller yards). Home use conservation, however, yields a smaller water savings. This means that planning for water shortages would be more complex under Concept B. Storage costs likely would be higher in Concept B because land prices could be higher, meaning sites for water storage tanks would be more costly.

Our experts predicted Concept B wastewater costs would not be significantly different than those in Concept A, mainly because they said wastewater treatment requirements would become more stringent throughout the region. The result would be elimination of current differences in the water quality treatment standards of receiving streams and the effluent treatment costs to maintain or enhance the receiving stream. Concept B did benefit from its more compact urban form, but redevelopment could incur costs that offset these savings.

For stormwater, Concept B would have the lowest costs for quality, moderate costs for collection, transportation and institutionalizing, and the highest costs for treatment. Water quality professionals predicted Concept B would be better than the other concepts because today's untouched water bodies would remain so. Stormwater collection systems are required for many existing urban areas

in the region, which kept the collection, transportation, and institutional costs about equal to the other concepts. The high costs for water treatment are caused by high pollutant concentrations that come with stormwater in higher densities. Weighing all of the considerations, regional stormwater professionals concluded that they could not predict a significant difference in costs between Concepts A, B or C.

Summary

Concept B would by design conserve the highest number of natural areas, open space and rural land. It is predicted to have lower public facility costs in sewer, roads and water supply. Concept B would have the most transit ridership, however, it also would have the most light rail constructed and the most hours of transit service. While the concept would contain an economically healthy downtown Portland, it also would densify corridors and centers the most. Concept B would require a shift in housing demand for more multi-family units and smaller single family lots than today.

Overview

Concept C's chief distinguishing characteristic is that it would send a substantial number of jobs and houses to existing satellite cities just outside the current Metro UGB. Called "satellite cities," these areas would become relatively self-sufficient communities with an even mix of jobs and housing. We expect that two-thirds of the people who live in the satellite cities will work there.

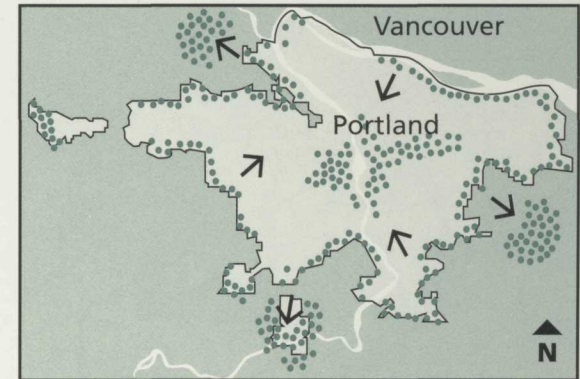
Concept C also increased household and employment in regional centers. In the satellite communities (such as Newberg, Sandy and Canby) people have said they want to keep a sense of identity in their community and that they dislike the thought of becoming part of the metropolitan area. To prevent that, Concept C calls for separating satellite cities from the metropolitan core by greenbelts of farmland, commercial forests, very low-density rural residential, and open spaces, that would be located in broad bands around the highways which connect the satellites to the Metro area.

Just how much growth can these satellite cities expect under Concept C? Figure 10.1 shows our population projections in 2040 for those areas.

For those who think these growth rates are unrealistically high, a look at the growth of similar cities provides perspective. (See Figure 10.2)

Key attributes of Concept C:

- Regional centers are more dense. Gresham, Hillsboro, Beaverton and the other regional centers would have the highest number of households and employment in any of the Concepts – even Concept B, which is the densest overall.
- Corridors are similar in area and density to Concept A. Streets such as Sandy Boulevard, Powell Boulevard, McLoughlin Boulevard, Farmington Road and Mollala Highway all become mixed-use and more accessible by transit.
- It adds 23,000 acres to the UGB, less than half of what would be added in Concept A. The expansion would occur primarily to the southeast in Clackamas County, the Damascus/Boring area and in minor additions within Washington County.
- Concept C's greater allocation of households in centers means less land is needed for residential uses at the edge than under Concept A. We assumed only about 20,000 new households in the new areas added to the UGB, compared to 160,000 households in Concept A.
- The traditionally urban area of the region would have fewer growth pressures under



Concept C, since one-third of the growth would go to the satellite cities.

- The region's small downtown centers would grow from 15,000 new households in Concept B to 37,000 new households in Concept C.
- Downtown Portland in Concept C would have 7,000 more households than Concept B, but 50,000 fewer employees. The result would be a much closer balance between jobs and housing than under the other concepts. Transit, walking and biking all increase as people have relatively easy access to jobs and services near their households.
- Housing in these regional centers would see more change than under the other concepts. Our analysis shows that 25-30 percent of the developed land in these downtown centers (Gresham, Tigard, Beaverton, Hillsboro,

Milwaukie and Oregon City) would be redeveloped at higher mixed-use densities to achieve a balance of jobs and housing.

In short, Concept C's combination of satellite cities, strong regional centers and UGB expansion would create quite a diverse region. Concept C is a mixed regional form consisting of transit, freeway improvements, UGB expansion, greenbelts and satellite cities. It also would require considerable coordination among local and regional governments.

Regional Design Images

We analyzed Sandy and Clackamas Town Center as part of the Regional Design Images project to learn what those communities or cities could look like under Concept C. (For a full account of all of the sites, see the Regional Design Image report prepared by Calthorpe Associates.) These designs are not intended to outline what will happen under the various concepts; instead, they allow local governments to visualize what could happen if they decide to make changes in their communities.

Sandy

Located in Clackamas County on Highway 26, the city of Sandy in 1990 had 5,006 people (1,992 households) and 1,575 jobs. It has its own urban growth boundary and urban reserves designed today to hold 20,000 people.

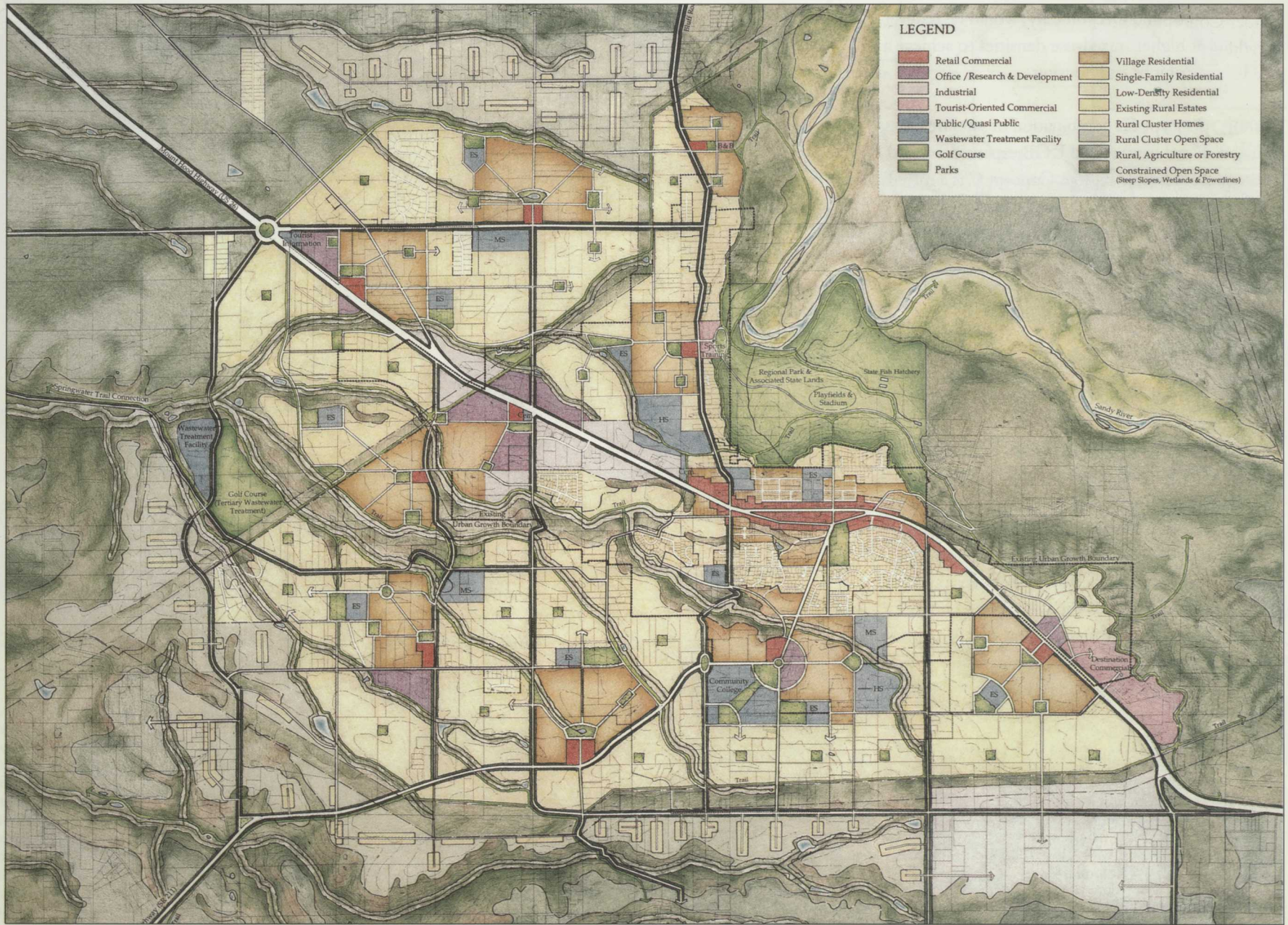
Figure 10.1 Assumed Growth in Satellite Cities – Concept C

Satellite City	Existing 1990 Pop/Employ	New Growth 2040 Base Case Pop/Employ	New Growth 2040 Concept C Pop/Employ
Canby	10,595 / 3,691	22,859 / 8,801	58,678 / 29,695
Estacada	4,468 / 895	5,562 / 2,738	46,004 / 26,428
Newberg	14,146 / 6,182	19,936 / 13,313	51,062 / 31,716
North Plain	1,510 / 399	2,294 / 530	45,354 / 24,716
Sandy	5,006 / 1,575	7,841 / 3,777	45,596 / 23,906
Scappoose	5,787 / 1,781	9,148 / 4,259	48,426 / 27,062
Totals	41,512 / 14,523	67,639 / 33,418	295,120 / 163,523

(Note: Existing 1990 data based on transportation zones which do not exactly fit city boundaries. And, new growth would be added to existing 1990 number to get a year 2040 total.)

Figure 10.2 Historic 50-Year Growth of Cities of the Region

City	1940 Population	1990 Population
Beaverton	1,052	53,310
Forest Grove	2,449	13,559
Gresham	1,951	68,235
Lake Oswego	1,726	30,576
Oregon City	6,124	14,698



Sandy in 2040

Under Concept C, however, Sandy would grow by an additional 45,000 people for a total of about 50,000 people by the year 2040. Concept C also would bring an additional 24,000 jobs to Sandy, for a total of 26,000 jobs.

Taking our helicopter trip over Sandy 50 years from now, we would see that Concept C includes open space as its primary feature. Maintaining the city's physical setting with views of Mt. Hood, the Sandy River gorge is paramount and would remain undisturbed under Concept C. The design would include a distinct separation between the city and adjacent rural areas. Rather than having development decreasing gradually away from the city center, Concept C would accommodate growth more compactly within the city.

Our designs also recognized, though, that there are existing undeveloped, but zoned areas for rural uses around Sandy's area of urbanization. Our design shows clustered residential development, leaving substantial areas in open space. This would achieve two goals. First, it would conserve much of the open space in presently undeveloped areas. Second, if additional land were needed in the distant future, it could be accommodated in these open areas, without disturbing the residential development.

Another important feature to the open space in and near Sandy is the Tickle Creek tributary, which would be used as the backbone of a greenspace system for the city. This would provide residents with visual and actual connections with the natural environment, as well as serve as the basis for east-west trails through the city.



Aerial view of village pattern of development in Sandy

Designs used to illustrate Concept C assumed that the downtown commercial core would remain intact, perhaps building on downtown's role as the gateway to Mt. Hood. Neighborhoods would be centered along small-scale businesses and schools, surrounded by a mix of housing densities. The result would be a heightened sense of individual neighborhoods within the city.

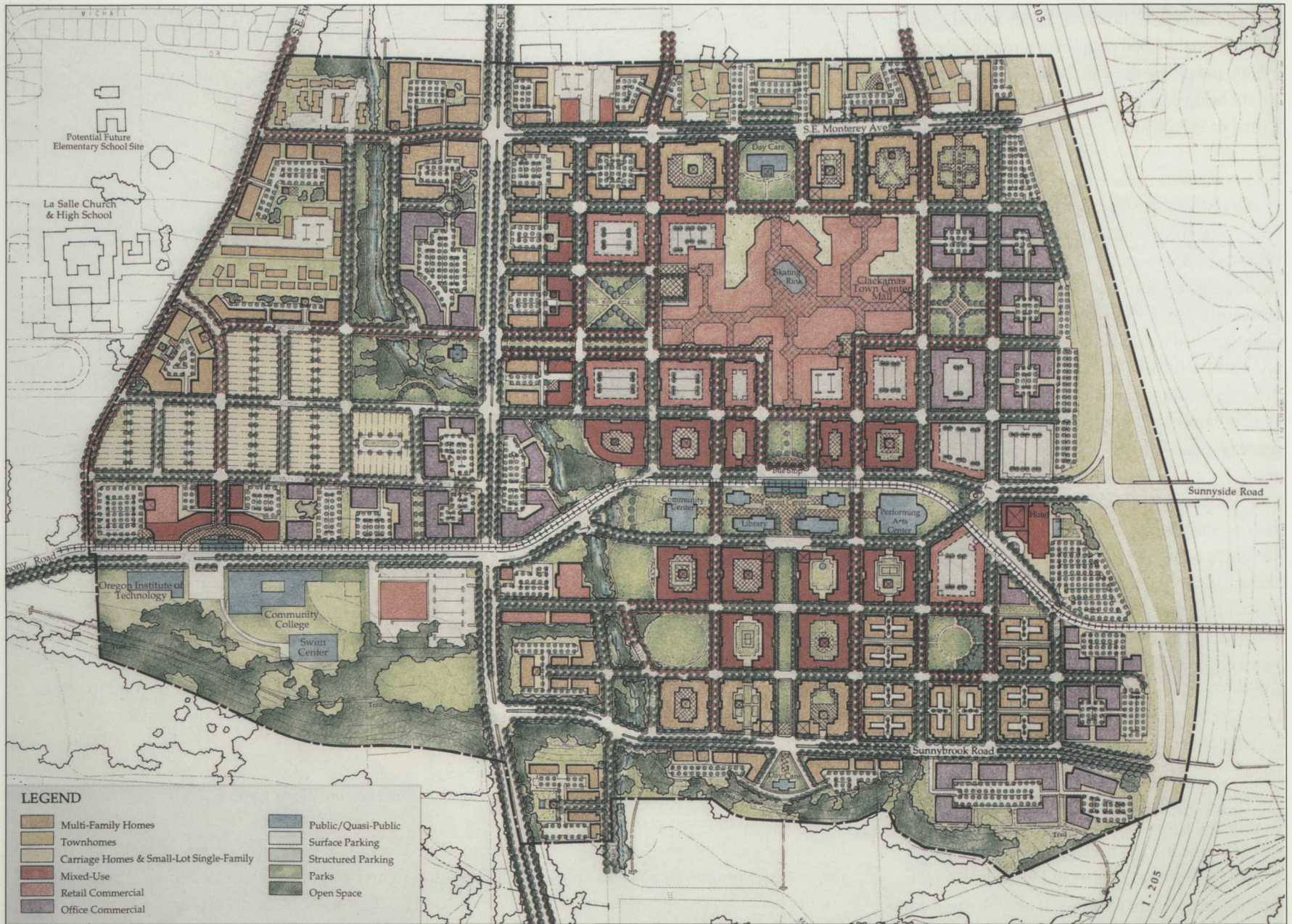
Along Highway 26, there would be a substantial amount of employment land, with industrial and research and development uses, with a substantial industrial area in the southeast corner of the city. In addition, two aspects of the design were intended to help promote the city's economic health through diversification. First, the design included a community college complex south of the historic commercial district. This facility would augment current educational facilities, but perhaps more important, it would provide training and educational support to

employers in the area. This could help in attracting new businesses.

The design also calls for a sports training facility to help diversify the city's economy. Given Sandy's proximity to Mt. Hood and the surrounding natural beauty, such a facility could attract tourists and recreationalists. Finally, a destination commercial center is shown in the eastern portion of the city, building on Sandy's growing attraction to artists . . . again helping to diversify the economy.

Clackamas Town Center

Under the Concept C designs, Clackamas Town Center would need to accommodate an additional 2,900 households and 4,600 jobs. Concept C proposes that Clackamas Town Center become one of the largest compact centers, undergoing some



Clackamas Town Center in 2040

significant changes. In the year 2040, it would house 9,000 jobs and 4,000 households.

Looking at the area from the air, two of the currently predominant features of the area – the Clackamas Town Center mall and the Clackamas Promenade – are quite different from today. The Clackamas Promenade would be completely removed, and Sunnyside Road would become a series of one-way streets. Within the space created between the couplet streets, there would be a civic area that includes a light-rail transit stop, performing arts center and other public uses. North and south of the civic area, a linear plaza (see ground level illustration) connects the transit station to the creek and to the mall. The Clackamas Promenade would be replaced with mixed-use developments, parking structures and multi-family homes.

The mall area north of Sunnyside Road would have substantial redevelopment that includes multi-family housing, office commercial, mixed use and structured parking areas. These kinds of changes, along with those in the Clackamas Promenade, assume that some of the existing commercial developments would become functionally obsolete during the next 50 years. That is, with the rapid changes that occur in retail marketing, some existing structures may not be competitive with newer designs that provide consumers with features that promote higher customer volume.

Other possible design changes in the Clackamas Town Center include transition of the area north of Harmony Road, west of 82nd Avenue and east of Fuller Road from its current single-family residen-



Looking north from the Clackamas Promenade area

tial to small lot single-family homes, multi-family, mixed use and office commercial uses. In addition, 82nd Avenue would change from its current commercial use to a combination of office commercial and multi-family homes.



Transportation

In addition to a balance between jobs and households within the satellite cities, Concept C assumes a series of “green corridors” – transportation links across the greenbelts that would separate satellite towns from the main urban area. The green corridors feature high performance, limited access highway, transit, bicycle and pedestrian facilities that give easy access to satellites while minimizing urban impacts on greenbelts through a strict control of access.

The Concept C road network would be extensive, with an increase in lane-miles of 11 percent over 1990 – more than any concept, and exceeded only by the base case. We included three “freeway” bypass projects in this network, and transit in Concept C would be expanded to 12,553 hours of service – the second most of any concept.

Our analysis shows that Concept C would be the least congested of the growth alternatives and the base case. While total VMT in the urban area would increase by 56 percent over 1990 levels as compared with a 62 percent increase Concept B. VMT per capita would drop by nearly 4 percent over the same period as compared to 12 percent decrease in Concept B. Concept C would have a large increase in VMT outside the urban areas a result of traffic between the Metro area and the

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satellites and within the satellites. The projected decrease reflects the mix of jobs, housing and services that would occur throughout the region in Concept C.

In general, non-auto travel in Concept C would be higher than Concept A, but less than Concept B. The bicycle and pedestrian share of regional travel was higher than in 1990, accounting for more than five percent of all trips. More than 370,000 daily transit riders are projected in Concept C, exceeding Concept A, but significantly less than the nearly 490,000 rider projected for Concept B. Bus ridership patterns in Concept C would be similar to the other growth concepts, with the heaviest use on routes in the traditional neighborhood blocks of east Portland.

Radial high-capacity transit corridors within the main urban area of Concept C would have higher ridership than in Concept A, but less than Concept B, with daily boardings ranging from 27,000 to 59,000 riders. Circumferential light rail routes on Highway 217 and I-205 would have lower ridership, with about 12,000 daily boardings.

Ridership on radial transit routes to the satellite towns would be uneven. Express bus routes to the satellite cities of Estacada, Scappoose and Sandy would each attract several hundred riders daily. Commuter rail links to Canby, McMinnville and Ridgefield would have daily boardings of 6,400 to 9,900 riders. Light-rail extensions in Concept C to Tualatin, Wilsonville and Damascus attracted few riders.

The combination of transit and highway improvements, growth in the satellite town and increased housing and employment in the suburban centers contributed to a comparatively congestion-free highway system in Concept C. Allocation of growth to the satellite towns, and ensuring a balance of jobs and housing in these communities are key factors in limiting congestion within the existing urban area.

Internal work trips in the satellite towns would range from 60 to 99 percent of all work trips, and in general, the satellites farthest from the main urban area would have the highest percentage of internal work trips. Non-work trips in the satellite towns show a similar pattern, with 85-95 percent of all non-work trips occurring internally. While these figures reflect a strong relationship between housing and employment, they also suggest that greater distance between the satellites and the main urban area encourages internal travel.

The job and housing growth assumed in the satellite towns would be largely dependent on the quality of access provided by the “green corridors.” Some satellites have poor connections to the main urban area and would require major investments to provide a level of access that could accommodate growth. Other towns, like Sandy, Canby and North Plains, have major highway connections that have already promoted suburban development.

Concept C raises key policy issues about the mix of urban travel routes and rural land uses. The “green corridors” approach is an attempt to bridge the greenbelts that separate satellite towns from the

main urban area without creating economic pressure for urban development in these areas.

Land Use

Concept C assumes that the Metro urban growth boundary would increase by 23,500 acres, with 12,000 acres taken from land zoned exclusively for farm use and 11,500 acres from lands that are not preserved for farm and forest use – exception lands. (See *Figure 10.3*)

Concept C would include 6,700 acres of redevelopment. Six thousand would occur due to low value of buildings in 1990, 700 acres in the centers would redevelop through some greater inducement – higher land prices, locational advantages of the centers and public policy that encourages redevelopment in these areas. The average new residential lot size in the Metro UGB would be 8,300 square feet. . . the largest of the concepts and most like current trends.

Concept C’s floor-area- ratios can be seen in *Figure 10.4*. The central city in C would have a comparable density to Concept B, but with less total development. The regional and sub-regional centers would be 50 percent more dense than Concept B and nearly 100 percent more dense than in Concept A. These centers likely would contain two- to six-story buildings, while the other mixed-use commercial nodes, main streets and corridors would have one- to two-story buildings. Concept C’s resulting density was nine people per acre – slightly lower than concept A for the area inside the UGB.

**Figure 10.3 Concept C
Buildable Acres by Design Type**

Design Type	Acres
Central city	67
Regional centers	403
Sub-Regional centers	151
Commercial nodes	4,338
Main streets	342
Transit corridors	5,955
Other	49,580
New UGB	17,738
Total	78,574
Redevelopment Component	5,993

The shift in zoning is similar to concepts A and B, with more mixed use. As in Concepts A and B, the multi-family and commercial categories would decrease from 1990 levels, since they are replaced in central areas and corridors by mixed-use designations. Twenty-seven percent of the land is zoned mixed-use. This breaks down into: 13 percent planned unit development and attached single-family housing with light commercial; 12 percent medium to higher density multi-family with commercial office/retail; and 2 percent lofts with small business or light industrial uses. Under Concept C, about 69 percent of the housing would be single-family, and 31 percent would be multi family.

Figure 10.4 Floor-area Ratios



Figure 10.5 shows the assumed relationship between residences and employment in Concept C. Of note is the higher residential component in the centers, which is a marked difference from the other concepts. Concept C would have the closest balance of jobs and housing that support the transportation and land-use design.

Concept C's diverse form includes strong centers and low-density development land along the urban growth boundary. One-third of the region's growth would occur in these satellite cities, relieving much of the development pressure on the metropolitan area as compared to Concepts A and B. Regional centers, the central city and sub-regional centers would play a greater role, making Concept C distinct in its close jobs-to-housing balance. The remaining design types would be similar to Concept A with moderate mixed-use densities.

Air Quality

Our projections show that Concept C's air quality would be quite similar to that found in Concept A. For transportation generated air pollutants we found that Concept C likely would increase NOx (oxides of nitrogen) to 87,000 kilograms per day. That compares to Concept A, which forecast 91,000 kilograms per day, and Concept B that predicted 84,000 kilograms per day. For carbon monoxide and volatile organic compounds Concept C, as with the other concepts, is expected to result in fewer pollutants than in 1990.

Employment

Our economic analysis indicates that in the center of the region, particularly the inner to middle

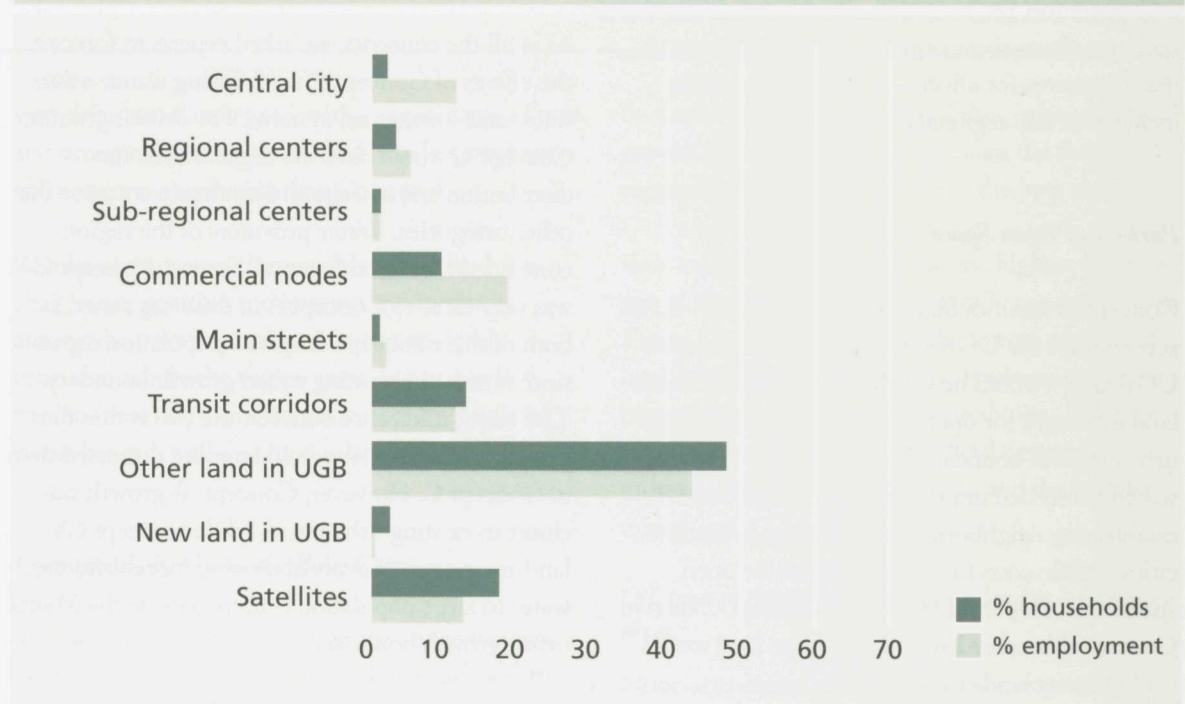
eastside, there would be a higher demand for employment land than supply. In addition, an area of northwest Portland, Johns Landing and Milwaukie all are predicted to have a demand for employment land that exceeds supply under Concept C. The Columbia south shore area, Hillsboro and the Sunnyside area are forecast to have more employment land than needed by the year 2040 at the density we assumed.

The jobs/housing balance in Concept C is evident in the regional centers, and in some areas where minor UGB expansions are minimized: Gresham, Milwaukie, Oregon City, Tualatin and Hillsboro. Portland, Beaverton and Tigard still have more than the average share of jobs. Just as less central or less transit accessible area remain residential – Lake Oswego, mid-Washington county and Forest Grove. At a sub-regional level, Washington and Clackamas show an imbalance in favor of households, as does the city of Portland (excluding the CBD). The Tigard, Tualatin, Wilsonville, Lake Oswego area shows a job imbalance.

Housing

Although our housing analysis of Concept C did not include the satellite cities per se, it did predict more demand than supply of single-family land outside the current UGB. There were only two areas (Boring in Clackamas County and north of Forest Grove in Washington County) under Concept C predicted to have more supply of single-family land than needed for demand.

Figure 10.5 Households and Employment Distribution



The model predicted that in Concept C there would not be enough multi-family land supplied outside the current urban growth boundary. This suggests that demand for higher density and more moderate housing at the edge of the boundary would not be met without substantial changes.

We found four areas likely to have too much supply of multi-family housing: near the Portland International Airport, in inner northeast Portland area along Broadway, in parts of Beaverton and on the west side of Wilsonville.

Social Stability

Concept C received support from many of the public safety and security professionals. They indicated that the sense of community found in that concept would help reduce crime and bolster law enforcement efforts.

Similar to comments about Concept B, human service professionals said the centers in Concept C would make providing social services more cost effective. However, they indicated that Concept C could result in wide geographic separation of income classes, as could Concept A. This feature

could isolate lower income households from jobs, transportation and shopping opportunities. Representatives from these organizations again stressed that incentives for affordable housing should be included in any regional growth strategy.

Parks and Open Space

Concept C assumes that 4,500 acres of land – 3,500 acres within the UGB and 1,000 acres in the new UGB area – would be withheld from the buildable land inventory for open spaces within the current urban growth boundary. In addition, open spaces would be needed in expanding the UGB and for establishing neighboring communities as satellite cities. Public costs for acquiring land for open spaces probably would be less in Concept C than in Concept B because lower demand for land would lead to lower land costs.

Part of our open space analysis of Concept C included assessing the impact on agricultural lands. Of the 23,000 acres needed to expand the UGB in this concept, about 12,000 acres are currently zoned for exclusive farm use. To consider the total impact on farm and forest resource lands, however, we would need to know how dense the satellite cities are likely to become. If they had densities similar to Concept B, little additional land would be used. If they develop at lower densities, greater amounts of rural land would be urbanized.

Water Facility Consequences

As in all the concepts, we asked experts to forecast the effects of Concept C on drinking water, wastewater and stormwater systems. For drinking water, Concept C would have the highest costs for distribution and storage and moderate costs for the other categories. Water providers of the region concluded that considering all factors, Concept C was very close to Concept A in drinking water, as both of these concepts involved population expansion outside the existing urban growth boundary. The major difference between the two is that the growth in Concept A would be more dispersed than in Concept C. However, Concept A's growth was closer to existing urban land, while Concept C's land-use patterns involved moving more drinking water to large population centers outside the Metro urban growth boundary.

Concept C would have the highest costs for all wastewater categories, except collection, where it tied with the other two concepts. In this instance, our experts predicted the satellite cities would exceed the capacity of existing systems and would need entirely new infrastructure.

Stormwater costs of Concept C were tied with Concept A, both of which would be moderate. Stormwater providers could not discern distinct cost differences among the three growth concepts for stormwater management. The benefits of greenspaces, density and dwelling types likely would be offset by their associated costs.

Summary

Concept C presents some appealing results. It would achieve the lowest congestion of the concepts and would have the second best transit use. It has today's densities but has strong, vital centers.

It appears, however, that Concept C would be expensive to develop and difficult to implement. The projected growth may not occur in the satellite cities, at least not all six of them. In addition, there is no guarantee that the projected balance of jobs and housing would occur and that it would match housing costs with employment income.

Our analysis of Concept C can lead to some intriguing conclusions. First, it is important to have a balance between jobs and housing, both in centers and in outlying cities. Second, the greenbelts between the satellite cities were quite effective, not only in maintaining a sense of community and a closeness to nature, but also as a means of modifying travel demand regionally.

It's impossible to describe everything we've learned during the Region 2040 process in the space of a summary report. Much of our new-found knowledge is the result of in-depth technical analysis involving issues such as land consumption, travel times and distances, the effects increased density would have on air quality, and different types of urban forms. Just as important are the things we've learned based on public input and on people's values. These are not as tangible as the technical information – it's impossible to place a number or statistic on what people cherish about their communities – but certainly just as important. This chapter is a summary of the major lessons we've learned about Region 2040.

Creating and Analyzing the Concepts

Below are some of the major lessons we learned in analyzing the concepts. The “lessons” are in *italic*, followed by explanations.

The land-use pattern inside the urban growth boundary is more important than the size or shape of the urban area.

We concluded that the land-use pattern within the urban form was more important than the overall form itself. For example, Concepts A and C were modeled at about the same density and had the same population within the current urban growth boundary. However, the transportation results were

very different. Concept C, with a greater mix of uses and strong regional centers, would have less congestion and more transit ridership than Concept A.

Results of transportation modeling and land-use analysis suggest that the important differences among the growth concepts are not as closely related to where the region grew, but rather how the land was used. The solution to many regional issues lies in a well designed urban area.

Concepts A, B, C and the Base Case

The land-use patterns found in the concepts were intended to be different, although they all used the same design types for the sake of comparison. Figure 11.1 illustrates the differences in land supply and consumption among the growth concepts. The base case has the largest supply and maintains a 20-year land supply in the year 2040. Although Concept A seems to have substantially more land than Concept C, a closer examination shows that the two are more similar than at first glance.

The similarities in land supply in Concepts A and C become evident when we considered the neighboring cities. There is no formal accounting of how much land those neighboring cities might use to accommodate growth. If they accommodated growth at densities similar to those found in the metropolitan area, the total land area likely would

be similar to Concept A. But if they accommodated growth in a pattern similar to today, the total land supply likely would be similar to the base case.

Base case and Concept A have the highest percentage of land devoted to single-family residential (See Figure 11.2). Concept B has the lowest amount of land set aside for single-family development while providing the most land for mixed uses. The base case has the largest percent of land devoted to industrial uses, the least for parks and the least for mixed uses.

Off street parking is a major user of land in commercial areas.

Floor-area-ratios provide a way of comparing intensity of use in a piece of property. Figure 11.3 lists average floor-area-ratio assumptions. A traditional style (pre-1930s) commercial development along a main street area such as Hawthorne Boulevard has limited offstreet parking and one-story buildings built nearly to property lines. That style can have the same floor-area ratio as suburban office developments such as Kruse Woods, which has three- to five-story buildings, extensive landscaping and offstreet parking. It appears that shared, public parking is a key factor in areas developing with less parking and higher floor-area ratios. However, larger commercial developers may balk at not being able to provide as much parking. Peak parking days around Christmas are critical to some merchants.

Figure 11.1 Buildable Acres by Concept and Design Type*

	Base Case	Concept A	Concept B	Concept C
Central city	48	67	100	67
Regional center	273	369	507	403
Sub-regional center	41	218	323	151
Commercial nodes	2,284	4,229	5,322	4,338
Main streets	8	127	791	342
Transit corridors	4,924	7,462	9,370	5,955
Other	49,181	49,353	48,653	49,580
New UGB	98,214	42,500	0	17,738
Total	154,973	104,325	65,066	78,574*
(Redevelopment component)	0	6,377	11,330	5,993

* Includes vacant and redevelopable acres. In the case of Concept C, it does not include satellite city acreages.

Single-family homes and lots consume the most land. Small changes in new lot sizes can have substantial effects on the amount of land needed to accommodate growth.

Single-family residential development is by far the most common land-use designation. Small changes in the average size of new single-family lots can have a significant effect on the ability to accommodate growth within the urban growth boundary. The average new lot size in Concept B (5,800 square feet) is closer to historic trends for urban areas than are the other concepts (7,300 square feet in Concept A and 8,300 square feet in Concept C).

If smaller lots become the norm, some people will seek housing at lower densities and will find them either outside the metropolitan area or in another city or region altogether. In either case, premium prices are likely to occur on larger lots anywhere within reasonable commuting distance, meaning the availability of lower cost low-density housing likely would decrease. As shown in the Regional Design Images portion of Region 2040, row houses, small-lot single-family homes, and accessory units can add enough density to support transit without relying exclusively on apartments as the only high-density housing choice.

We could accommodate 50 years of growth in the urban growth boundary if the housing and employment market would shift to a higher density development style, and if the public would support it.

Accommodating growth within the existing boundary would require about a 25 percent increase in average density. If the density of current development is not changed, the boundary would need to be expanded within the next five to 10 years. There are three key elements that determine density: single-family lot sizes, the amount of off-street parking in commercial developments, and land that is redeveloped into new uses as the existing uses and buildings become obsolete.

Transportation

We examined the three growth concepts and the base case using a wide variety of transportation and land-use assumptions. Road networks were expanded by 5 to 11 percent over the 1990 system, and transit service for the three concepts became about triple 1990 levels, although service configurations and type of service (bus, light rail, etc.) differed among the concepts. Additions to the regional system would be modest, given the Region 2040 assumption of about 1 million new residents – a 77 percent population increase over 1990.

Overall vehicle miles traveled would increase in all the growth concepts.

Our analysis shows that, in each of the growth concepts and the base case, it's inevitable that vehicle miles traveled will increase as the population grows. The level, of course, varies among the

Figure 11.2 Land-use Zoning by Percent of Total Land

	Base Case	Concept A	Concept B	Concept C
Single family	61%	57%	46.5%	51.5%
Multi-family	11%	1%	5%	1.5%
Commercial	8.5%	1%	1%	1%
Industrial	16%	12%	10%	14%
Mixed use	0%	24%	30.5%	27%
Parks/open space	1%	3%	5%	3%
Public facilities	2.5%	2%	2%	2%

(Mixed Use includes: Planned Unit Development, Commercial Neighborhood, and mixed use centers/corridors - multi-family with commercial office and retail with small percentage of industrial/loft space.)

Figure 11.3 Average Floor-Area Ratio by Design Type

	Base Case	Concept A	Concept B	Concept C
Central city	3.17	3.90	4.50	4.53
Regional center	0.26	0.39	0.62	0.92
Subregional center	0.25	0.29	0.46	0.66
Commercial node	0.28	0.31	0.34	0.30
Main street	0.50	0.44	0.43	0.42
Transit corridors	0.30	0.28	0.34	0.26

concepts. Total VMT in the urban area would increase from 1990 levels by 56 percent in Concept C, 62 percent in Concept B and nearly 90 percent in Concept A and in the base case. However, Concept C has a disproportionate increase in VMT outside the primary urban area and is slightly lower than the Concept A's projected regionwide vehicle miles traveled. The auto would continue to be the dominant mode of transportation in all of the growth concepts, accounting for roughly 90 percent of all travel. Lack of improvements to the road system likely would result in substantial congestion.

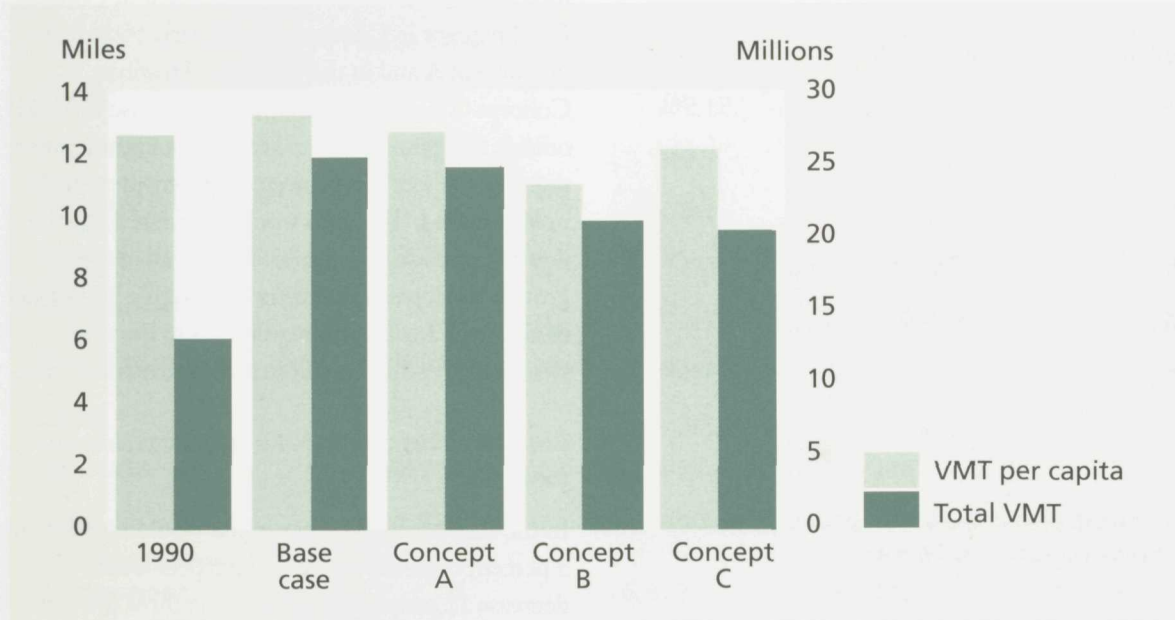
Land-use policies are essential to reducing vehicle miles traveled.

In the base case, VMT per capita would increase by 5 percent over 1990 levels. Concept B would decrease 12 percent, the best of the three growth concepts, but still falling short of the state-required 20 percent reduction from 1990 levels (See Figure 11.4). Concept A would result in a 1 percent increase in vehicle miles traveled per capita, while Concept C would achieve a reduction of four percent from 1990.

It is a matter of debate about how close the concepts may come to meeting the VMT per capita requirements. This arises in part from the difficulty of modeling short, especially pedestrian, trips that are likely to occur in dense, mixed-use developments.

One of the most effective ways to reduce per capita VMT is by changing land-use development patterns. Since there is a large amount of existing

Figure 11.4 VMT Per Capita and Total VMT (inside UGB)



residential land not conducive to non-auto travel, however, efforts should be focused on new development. As a result, change will be local, rather than uniform throughout the region.

The compact urban form found in Concept B and parts of Concept C is more responsive than lower density uses to parking restrictions, pedestrian amenities and land-use considerations as a way to reduce VMT and increase transit ridership. We can see in Concept A the effects of land use in achieving VMT goals with a low-density development pattern and the separation of housing and employment. Concept A would produce the only increase in VMT per capita among the three concepts.

None of the concepts has forecast a reduction of VMT per capita sufficient to meet the state required goal of a 20 percent reduction. However, Concepts B and C showed significant movement in the right direction.

Dense, well-connected street networks accommodate growth with less congestion.

The number of congested roadways in the region would increase in each growth concept. Concepts A and B would see the worst congestion, each with more than 14 percent of their roadways congested – four times the amount in 1990. With its dispersed “satellite” population, Concept C would have congestion on about 9 percent of its street system.

Though lower than the other concepts, it still is nearly three times the 1990 level.

A dense network of well-connected arterial streets is the most efficient transportation design for accommodating growth. Arterials in dense networks (such as mid-Multnomah County) with relatively modest capacity improvements remain well below their projected capacity. More dispersed arterials (such as those in eastern Washington County) with greater capacity fail to match the performance of denser networks.

A dense, well-connected network of streets also benefits transit, bicycle and pedestrian travel. Bus service in the traditional neighborhoods east of the Willamette River is the easiest to provide and would have the highest ridership in each of the growth concepts. Bicyclists and pedestrians benefit from the obvious accessibility that a well-connected street network provides.

Where possible, a frequent network of connecting streets should be pursued. When this is not possible, arterial streets will have much greater traffic flow and greater congestion as the region grows (See Figure 11.5).

New regional highways should be evaluated on their ability to support planned regional centers.

The three new regional highways (including the Mt. Hood Parkway, Western Bypass and Sunrise Corridor) in general would attract more jobs and housing growth along their routes. New regional highways that are bypasses mainly serve the urban fringe. However, when a new regional highway

directly connects a regional center to the rest of the region, as in the Mt. Hood Parkway, it would significantly enhance housing and job growth adjacent to the Gresham regional center. Subsequently, new regional highways should be evaluated according to their ability to serve or complement planned urban centers.

Land-use policies are important in encouraging non-auto transportation.

Total non-auto travel would account for 9 to 11 percent of all personal travel in the three growth concepts. Non-auto travel includes walking, bicycling and using transit. Although auto travel would continue to dominate the transportation system, non-auto modes provide an important alternative to major destinations as well as to neighborhood trips. In Concept B, for example, the peak period of transit trips to the central business district would nearly double from the 1990 level to more than 50 percent of all trips.

Compared to 1990 levels, transit ridership would more than double in Concept A, triple in Concept C and nearly quadruple in Concept B. The Concept B ridership reflects a system that is modeled with complementary pedestrian amenities, parking limitations and a supporting development pattern of housing, employment and services. Adding transit service alone, however, does not necessarily increase ridership. The relatively poor transit use in Concept A, with transit hours of service similar to Concept B, shows the importance of land use and other considerations (See Figure 11.6).

Figure 11.5 Connected and Disconnected Streets

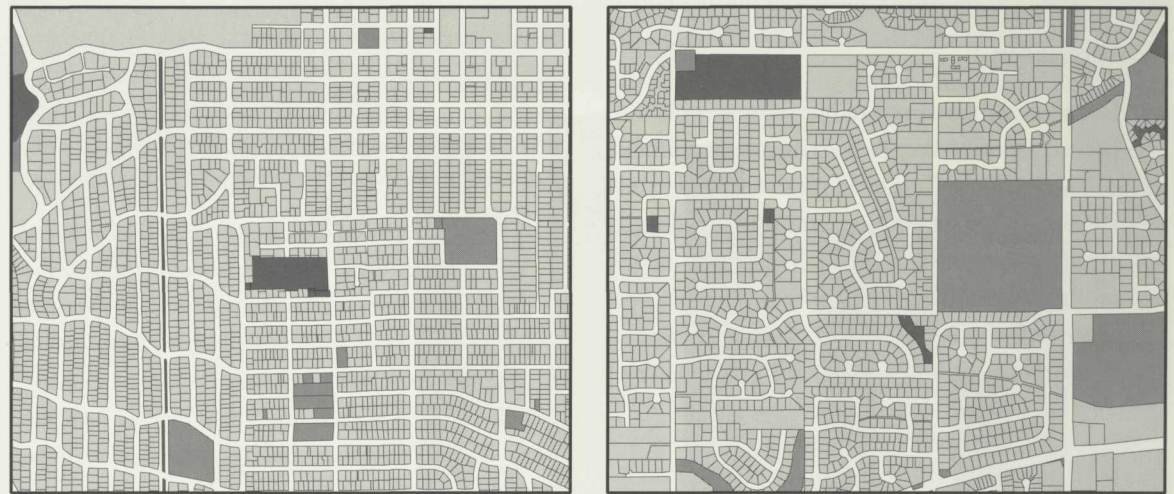


Figure 11.6 Daily Transit Service and Ridership

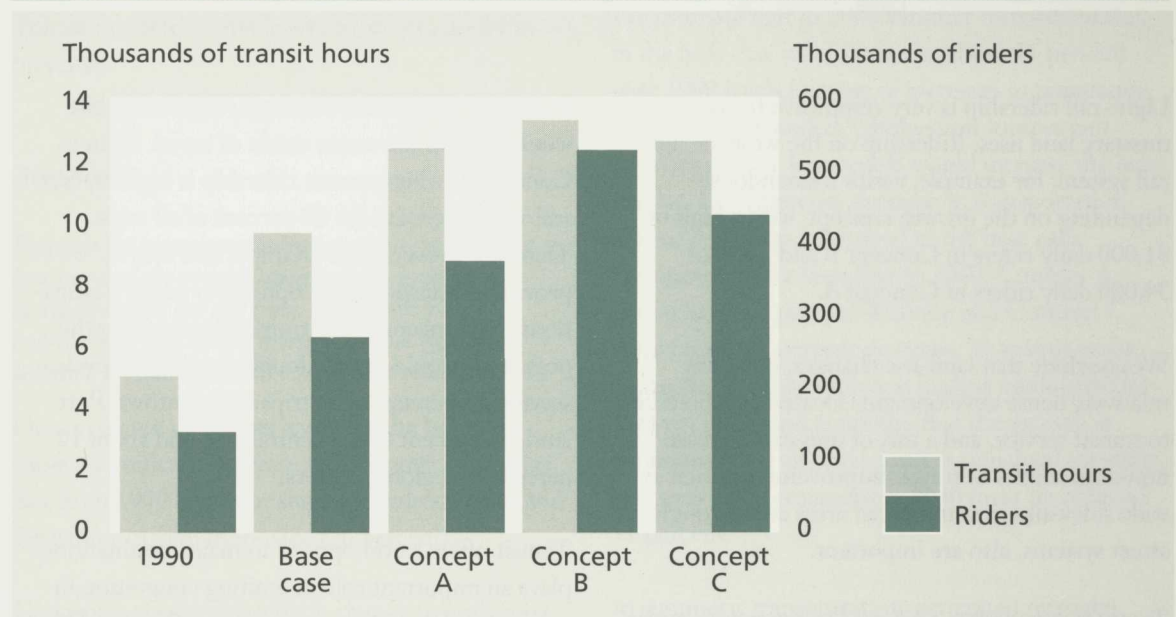
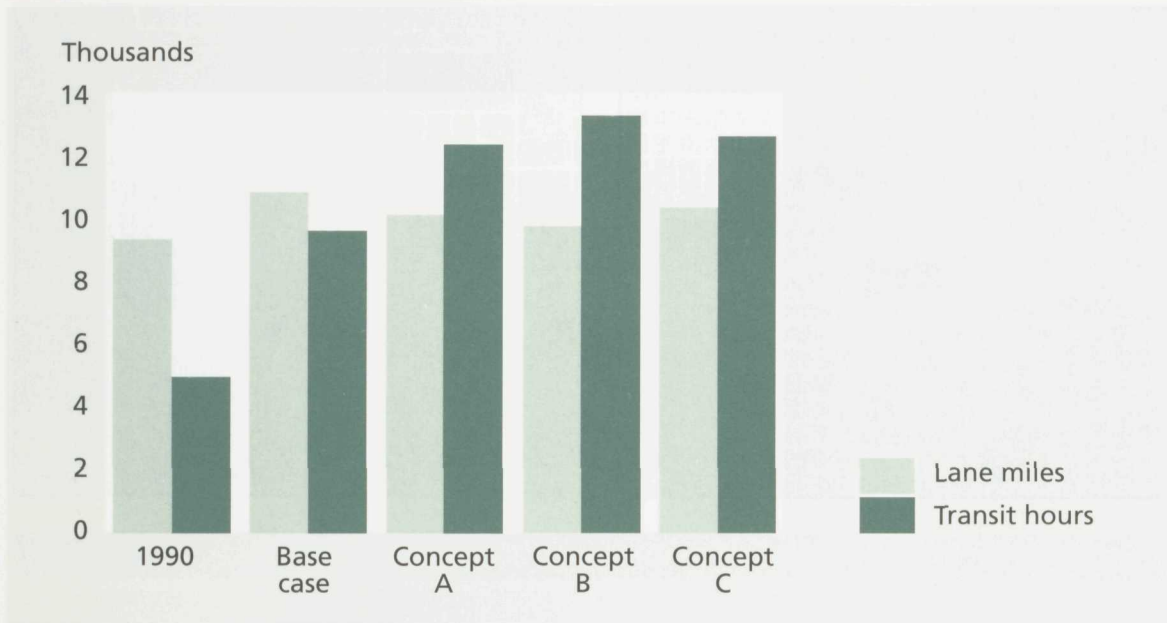


Figure 11.7 Highway and Transit System Improvements



A radial light-rail transit system functions as the backbone for regional transit and shapes the region's land-use form.

An effective regional transit system would include high-capacity transit, local bus service and special door-to-door transit. While light-rail transit service would be the backbone of the transit system, buses still would carry more than 50 percent of the passengers projected in each of the growth concepts.

The currently planned radial light-rail corridors to downtown Portland, including the Banfield and Westside MAX lines and the South/North corridor, would have promising ridership in all the concepts. Other radial corridors such as Powell, Barbur Boulevard and the central eastside area, also are promising and warrant further study.

Circumferential transit corridors (those that circle around the center rather than radiate out from it) would have a lower ridership level than radial corridors in each of the concepts but may need further study. High-capacity extensions to the urban fringe, including Forest Grove, Damascus, Mt. Hood Community College and Wilsonville, would have significantly less ridership. For these routes, other transit options such as improved bus service should be considered.

The basic north-south and east-west light-rail lines will form the foundation for land uses that will shape the region. The light-rail systems are efficient, and their ability to move thousands of people an hour without autos makes them powerful forces in building pedestrian oriented parts of the region.

Light-rail ridership is very responsive to complementary land uses. Ridership on the westside light-rail system, for example, varies tremendously depending on the growth concept, with a high of 81,000 daily riders in Concept B and a low of 39,000 daily riders in Concept A.

We conclude that land-use changes, including relatively dense developments located conveniently to transit service, and a mix of uses can increase non-auto modes of travel. Improvements, such as wide sidewalks in commercial areas and through street systems, also are important.

Transit is important to a balanced transportation system.

In each of the growth concepts, the automobile would remain the major mode of travel. Even in Concept B, where transit ridership is highest, cars still would account for 88 percent of all trips. Transit, however, plays an important role in providing transportation options to major destinations. In Concept B, the transit share during the peak hour would nearly double from 1990 levels, serving 55 percent of all trips to downtown Portland, 48 percent to the central city, and about 12 percent to regional centers.

Transit offers travel options to major destinations, plays an important role in limiting congestion in major travel corridors and at destinations, and limits the need for additional roadway expansion. (See Figure 11.7)

Public investment in these facilities make private investment possible and feasible.

Transit success is linked to the ease of pedestrian travel, and pedestrian travel is made more practical by transit.

As a percentage of all trips, the bicycle and pedestrian share generally keeps pace with, or slightly exceeds, regional population growth in the three concepts. Most transit trips begin or end with a pedestrian trip, underscoring the need to provide pedestrian links to transit facilities. Since many trips include more than one destination, making transit accessible to pedestrians greatly increases the likelihood of non-auto travel.

Without strong pedestrian systems, we cannot improve transit use nearly as much as with them. Pedestrian systems can work independently of transit as well, especially in small, self-contained cities and neighborhoods. Pedestrian systems should be substantially improved if they are to reach their full potential to support the transit system.

Pedestrian trips should be considered a basic element in virtually all urban designs.

Pedestrian trips are a part of most transit trips, with pedestrian trips equaling or exceeding transit trips in all the growth concepts. In addition to supporting transit, pedestrian trips provide for substantial non-auto trips within neighborhoods, centers, main streets and other development types.

While pedestrian travel is influenced by the availability of sidewalks, providing destinations within walking distance is the critical element. Pedestrian trips, like most auto trips are for a

purpose – to reach a destination. Providing mixed uses is critical to the success of a pedestrian-friendly environment. Safe, interesting and attractive places to walk are critical.

Trips made by bicycles are important and should be treated quite differently than trips made by pedestrians.

Because they are both muscle-powered, bikes and pedestrians often are grouped together. But obviously bicycles are vehicles – they travel at higher speeds, travel longer distances and are more appropriate in the street than on a sidewalk. In Oregon, cities with the best bicycle facilities (such as Eugene and Corvallis) have many times the bicycle use found in our region. Sidewalks are not intended for bicycles ridden by adults. Streets, if properly designed, can be made safe and accessible for bikes. Transit needs to be made accessible and useful to bicyclists.

Air Quality

Forecasts for transportation-generated air pollution in the base case and the growth concepts show significant decreases in tons per day from 1990 levels for hydrocarbons and carbon monoxide. That type of air pollution is relatively small compared to total emissions.

Our projected emissions levels for the base case show a significant decrease (60 percent) in tons per day from 1990 levels for summer hydrocarbons and for winter carbon monoxide (26 percent).

Concept A shows virtually no change in emissions compared to the base case. Concepts B and C have similar emission levels in the urban area, with a 6 to

7 percent decrease in summer hydrocarbons and winter carbon monoxide emissions compared to the base case.

The downward trend in winter carbon monoxide is significant enough that we probably can preclude the pollutant as a problem in 2040. But because it is a localized problem, some “hot spot” analysis should be done to ensure continued compliance. It is obvious that air quality regulations for cars are working and that this kind of pollution becomes a smaller part of the total air quality problem.

Air pollution forecasts for the base case and the concepts all show increased nitrogen oxides compared to 1990, although Concept B provides a significant reduction from the base case.

We estimate that in 2040 summer nitrogen oxides in the base case would increase about 17 percent over 1990 levels because of increases in population, vehicle miles traveled, combustion sources and network speeds. Concept B would increase the least and has an 11 percent decrease in transportation-related emissions compared to the base case. Compared to the base case in 2040, Concept A would have a 3 percent decrease and Concept C would have a 7 percent decrease. To maintain the air quality on-road emission budget established for the year 2006, and assuming that the growth in emissions from all other sources remained constant, nitrogen oxide emissions in 2040 must be reduced 31 percent.

In summary, transportation-generated nitrogen oxides must be limited to meet air quality standards and can be reduced by urban form and land-use

patterns, more compact development, and increased opportunities for transit, bicycling and walking.

In future years, because of vehicle emission improvements, non-transportation sources of hydrocarbons will tend to increase as the population also increases.

Because of cleaner burning vehicles and tighter regulations on vehicle emissions, emissions levels from transportation sources of hydrocarbons will be lower in 2040 than they were in 1990. Other generators of hydrocarbon pollution such as point and area sources are projected to increase as the population increases, however, and create additional smog. This will result in non-compliance with federal air pollution standards, requiring additional air pollution control strategies.

Social Stability

Strong communities with a sense of place tend to be safer places for residents.

Law enforcement professionals from around the region made it clear that having a strong identity within the local community would be very important for community safety. Residents who take pride in their community are more likely to participate in community policing – an effective way of providing security. If we want safer places, we need to design and build them with a strong sense of identity and place.

Compact areas can have faster emergency response times.

When law enforcement, fire protection and emergency medical response representatives

discussed the concepts, they agreed that Concepts B and C provide more compact urban patterns that are more cost effective to serve. They expressed concern about the base case because of its dispersed land-use pattern and the associated higher costs and longer response times. If we want safer communities, we should build compactly.

Effective affordable housing programs should be a component of urban growth.

Human service professionals recommended that there be programs to provide affordable housing throughout the region. The human service providers recognized that a portion of the growing population would have need for help with housing and other social services and that there was a need for creative solutions that involved all local jurisdictions and the private sector. Local communities can impact the cost of housing.

Employment

Estimates of supply and demand for employment land suggest that some areas are out of balance.

Our analysis suggests that there are some areas of the region with surplus concentrations of currently vacant land designated for employment. The Columbia south shore and Hillsboro areas likely will have a substantially greater supply of employment land than demand. Other areas such as mid Multnomah County or some of Portland's eastside have greater demand than supply.

We need to think about how areas currently zoned "industrial" will actually develop. We forecast that most employment will be non-manufacturing in these areas. Current (1990) patterns of employment show that 57 percent of employment is on land zoned commercial, 32 percent on industrial land and 11 percent is on residential land. Most vacant land for employment is zoned industrial.

We expect suburban employment to increase.

We predict that employment will increase in suburban locations. National data has shown this trend beginning as early as 1950. However, nationally and locally, for the period 1980 to 1990, there have been somewhat more compact development patterns than those of the earlier period. This suggests that although the suburban areas will continue to experience employment growth, it will be denser than in the past. Access to new jobs will be important to suburban and central city residents, alike.

A balance of jobs and population for many sub-areas of the region does not exist today. Each of the growth concepts has differing results in the final jobs/housing balance.

When the majority of vacant land is commercial-industrial, over time development tips the balance in favor of jobs. And if the majority of land is residential, households predominate over time. If we contain expansion, as in Concept B, and change the zoning toward mixed uses, jobs will be closer to residential areas and there will be more balanced areas. However, existing areas with extensive amounts of land zoned commercial and industrial – such as Portland's eastside or the Sunset corridor –

will remain primarily job-oriented. Overall, what we found the region's peripheral areas mostly residential and the central districts mostly oriented toward jobs in all the concepts.

The base case has the greatest imbalance in jobs and housing, especially in the Hillsboro and Sunnyside areas. Sunnyside has 2.8 jobs per household in 1990, and would be 2.3 in the base case. Hillsboro, which is 1.8 jobs per household today, would rise to 2.5 in 2040 base case. Concept B and Concept C do the most for achieving a jobs housing balance in the 20 sub-areas. In the examples above, Sunnyside and Hillsboro would be about the regional average of 1.4 in Concept B, and slightly higher at 1.5 to 1.6 in Concept C.

Housing

The current Metro housing rule requires that one-half of land zoned residential must be for multi-family housing. This is more than would be built in any of the concepts, except for Concept B. (See Figure 11.8 Average Single Family/Multi-Family Unit Ratio in 2040.)

There are areas within the region with too little or too much land for single-family or multi-family housing.

There are some areas in the region where predicted demand exceeds supply or vice versa. With better access at the edges of the region, demand for housing is stronger. Without that additional access, demand for land in the more central areas of the region is strong and demand at the edge is much weaker.

In addition, Concept B probably projects more higher density residential than today's market would demand given today's preferences. Some of that gap could be addressed by creating innovative single-family housing (e.g., small lot single-family, row homes) with relatively high densities (10 to 15 units per acre), while also providing homes on individual lots.

While the expected demand for housing will not match the 50-50 mix of zoning capacity required by the Metro housing rule, we may want to continue to "overzone" for multi-family consistent with the Metro housing rule, realizing that all of it may not be built.

Water, Sewer and Stormwater

Concept B has the lowest costs for water and sanitary sewer service. Stormwater costs are indistinguishable among the concepts.

The water, sewer and stormwater providers of the region made a substantial effort to understand the consequences of each concept. Water costs would be much lower than sanitary sewer and stormwater costs. The providers were unable to identify substantial differences among the growth concepts for stormwater. They indicated, however, that Concept B would be the least costly for water and sanitary sewer. Generally, the larger the area and lower the density the higher the infrastructure costs.

Concentration of development includes limitations.

The service providers recognize that concentration of development would have some limitations. There

were many areas where existing infrastructure could accommodate more density. In other areas, existing infrastructure that was nearing replacement could be increased to accommodate higher densities. If neither of those solutions are feasible, costs could increase substantially. The age and capacity of existing systems may be a key to increasing density in existing developed areas.

Values

People realize this region is unspoiled compared to most other metropolitan areas. Because of this, they are apprehensive about change.

In surveys and discussions with the public and formal advisory committees, we found that people consistently mentioned similar values. People from all parts of the region hold their community in high esteem – they find it a beautiful place to live. They have lived in or know of other parts of the country that do not have the physical beauty, accessibility, friendly people and the green landscape of this region.

Looking out 50 years forces people to think about change. Human nature is such that change and the unknown can be frightening. We avoid and dislike what we don't know, and people's primary fear about the region is that growth will create negative changes. Any changes will have to be well justified, respond to quality of life issues and provide ample opportunity for public involvement.

People love the accessibility of the car but think that transit, biking and walking should be made easier and more convenient.

People want accessibility to jobs, shopping and other destinations. Most trips in the region today are made by car, mainly because of the speed, accessibility, low marginal costs, and convenience. Many people, however, said they valued transit the same as or greater than auto-oriented improvements. Development patterns geared solely toward the car are risky if energy availability changes or if their ability to drive is curtailed by age or disability. We should strive to create a balanced transportation system but not forget that roads and cars are a major part of the solution.

People don't want any more density than is necessary in their neighborhoods.

Residents like their neighborhoods and communities. They take pride in the unique features of their neighborhoods or communities and want them protected from inappropriate change. They are concerned about too much or poorly designed density in their neighborhood. Therefore, new residential development must be designed to fit the characteristics of the neighborhood. In most areas buildings should be no higher than two to three stories, and several smaller developments may be better than a few large developments. In addition residents should be assured that most existing residential areas will not need to change under any scenario.

The Nature of Growth

Much of the growth will come from in-migration.

Our projections show that two-thirds of the region's population growth will come from people moving here from somewhere else, many of them returning after an absence. However, changing birthrates, increased longevity levels, and shifts in the ethnic or income characteristics of our population could change this projection. Because of this, today's residents will make decisions about growth that will affect people migrating here. Changes in population characteristics due to migration could affect our regional growth policy. We will attract different types of immigrants depending on how the region grows.

The average age of the population will increase substantially and its ethnic diversity will increase.

The demographics of our future population will be different than today. If present trends continue the average age will increase. We estimate that by the year 2040 the percentage of people age 65 and older will increase from 13 percent to 24 percent, a rate comparable to Florida's population.

Also, the region's ethnic mix will diversify, with Asian, Hispanic and African-American populations growing at a faster rate than the non-Hispanic white population. Projections show the ethnic mix will change from today's 89 percent white, non-Hispanic to 73 percent white, non-Hispanic.

An aging population could have substantial impacts on transportation, housing, schools, and many other

community services and characteristics. One result could be that more of the population (seniors) would be unable to rely on a car for mobility. Another is that since peoples from many different cultural backgrounds will be populating the region, preferences for housing and neighborhood design may change to meet their expectations and needs.

Slowing Growth

Slow-growth policies based on building limits have been unsuccessful elsewhere and appear to be counterproductive.

The experience of other areas that have attempted to deal with growth problems by limiting development have created other, equally difficult problems. Most policies have attempted to limit residential development while continuing to allow economic development, resulting in imbalances of jobs and housing. Often, the result has been a slow-growth area of high cost housing surrounded by rapidly growing areas of affordable housing. This development style results in sprawl, increased traffic, housing shortages, and other problems. It also results in a greater separation of people by economic class.

Current state law prohibits regulations that would stop or slow growth.

According to our legal assessments, state law requires that we anticipate growth and plan to accommodate it. It does not prohibit, but strictly limits building limits or moratoriums. Unless state law is changed, no- or slow-growth is not an option.

A good strategy is to respond to specific problems resulting from growth.

As long as we have a good environment and healthy economy, our region will be attractive to people from other areas. Growth pressures most likely are inevitable. Since the law says we must plan for growth, we must focus on managing growth in the best way possible. Responding to specific problems seems more direct and proactive – but it won't necessarily slow growth.

General Conclusions

It would be difficult to make substantial expansions to the urban growth boundary

Potential UGB expansions would call for urbanizing large lot rural (exception) lands or agricultural lands. There is likely to be local as well as regional opposition to developing either of these two types of land. We also have determined that fewer than 2,500 acres could be added with existing infrastructure. About 16,000 acres could be added by expanding existing infrastructure. Any expansions beyond that would require entirely new and costly urban infrastructure – roads, sewage and water systems.

This infrastructure limitation may result in increasing costs for the expansion that can occur. Because of this, existing vacant land in the UGB, along with new additions and redevelopable land, should be treated as a scarce resources. The remaining land that is easily served should be used as efficiently as possible. Additions to that land base will be much more expensive than using today's land.

We should seek a jobs and housing balance.

As we learned from the failure of Concept A, any expansions to the urban growth boundary should incorporate several kinds of uses, in particular those that provide job opportunities. These areas should strive toward a balance of jobs and housing. The ratio of jobs to households can vary from community to community, but it is obvious that as more people work near their home, there will be less job-related auto travel.

We must conserve connections with the natural landscape.

People place a high value on having open space. It is what makes this region livable and also provides a continuing boost to the economy. Open space, especially river and riparian corridors, should be thought of as part of the essential urban infrastructure and is at least as important as sewer and water lines.

Equitable financing of public facilities should be a prerequisite for development.

Public infrastructure and service costs (including schools, parks, streets, sewer, water, stormwater, police and fire) should be determined and financing arranged so that costs are substantially borne by beneficiaries of the development. It is recognized that in some cases the beneficiaries may be whole communities or the entire region.

Figure 11.8 Region 2040 Indicators

Category	Measures	1990	BC	A	B	C
Buildable Acres (No estimate of satellite acres)	Central City	39	48	67	100	67
	Regional Centers	134	273	369	507	403
	Sub Regional Centers	36	41	218	323	151
	Commercial Nodes	998	2,285	4,229	5,322	4,338
	Main Streets	7	8	127	791	342
	Transit Corridors	460	4,925	7,462	9,370	5,955
	Other	52,063	49,181	49,353	48,653	49,580
	New UGB	0	98,214	42,500	0	17,738
	Total	53,736	154,974	104,325	65,066	78,574
Distribution of Development	Central City	7%	5%	5%	7%	6%
	Regional Centers	1%	1%	2%	4%	4%
	Sub Regional Centers	1%	1%	1%	2%	1%
	Commercial Nodes	7%	9%	15%	17%	13%
	Main Streets	1%	1%	1%	3%	2%
	Transit Corridors	9%	18%	14%	21%	12%
	Other	71%	52%	46%	42%	44%
	New UGB	0%	8%	13%	0%	2%
	Satellites	3%	5%	5%	5%	16%
Location of Growth	% of growth in existing Metro UGB	–	83%	71%	100%	63%
	% of growth accom. by redevelopment	–	0%	6%	18%	8%
	EFU Conversion (Acres)	–	63,900	17,200	0	11,400
	% of Employment on Industrial land	32%	43%	53%	33%	53%
Zoning	Single Family	59.0%	61.0%	57.0%	46.5%	51.5%
	Multi-Family	11.0%	11.0%	1.0%	5.0%	1.5%
	Commercial	7.0%	8.5%	1.0%	1.0%	1.0%
	Industrial	19.5%	16.0%	12.0%	10.0%	14.0%
	Mixed Use (commercial and residential)	0.0%	0.0%	24.0%	30.5%	27.0%
	Parks/Open Space	1.5%	1.0%	3.0%	5.0%	3.0%
	Public Facilities	2.0%	2.5%	2.0%	2.0%	2.0%
Density	People per Acre	8.9	7.9	9.8	12.4	9.2
	% High Density (centers) + 50 persons/acre	8.9%	7.4%	7.9%	11.2%	13.6%
	% Medium Density (corridors) 20-50 persons/ac.	17.6%	29.1%	30.1%	43.0%	32.3%
	% Low Density (other) less than 20 persons/ac.	73.7%	63.5%	61.9%	44.0%	54.2%
Housing	Single Family / Multi Family (percent)	70/30	70/30	74/26	60/40	69/31
Transportation (all measures inside Metro UGB)	Average VMT per Capita	12.4	13.04	12.48	10.86	11.92
	Mode Split: Auto/Transit/Walk-Bike (percent)	92/3/5	92/3/5	91/4/5	88/6/6	89/5/6
	Lane Miles	5,304	6,777	6,377	5,557	6,116
	Transit Service Hours	4,965	9,575	12,322	13,192	12,553
	Congested Roadway Miles (PM peak hour)	150.5	505.6	682.0	642.6	403.9
Air Quality	CO Winter (Kg/day)	835,115	614,451	613,537	579,579	569,091
	CO Summer	574,708	528,601	525,133	496,017	487,188
	HC Summer	177,857	70,700	69,810	66,375	65,745
	NOx Summer	80,452	94,024	90,987	83,817	86,988
Water	Drinking Water Costs			Moderate	Low	Moderate
	Wastewater Costs			Moderate	Moderate	High
	Stormwater Costs			Moderate	Moderate	Moderate

Building the Preferred Alternative

Our study of the Region 2040 growth concepts, the base case and existing conditions has provided a wealth of information. Like engineers testing various prototypes, we have devised test cases that stressed certain ideas to their limits. The failures found within each concept are just as important as the successes, because they tell us the how far we can go with certain ideas.

To put it another way, the growth concepts, including the base case, are useful only as sources of information and insight. They are like prototype cars that have been tested for strengths and deficiencies. We may spend a lot of time pouring over the data and examining the results, but the prototypes are not intended to be cars that are driven and put to use.

We have learned, for example, that a continuation of our current land-use practices and policies would result in a huge consumption of land, at least by Oregon standards. We have learned that simply increasing density and providing transit does not solve growth problems.

Most important, we have learned that we have a fairly broad range of workable alternatives. We should have both the knowledge and courage to choose policies that will keep intact what people most cherish about the region, and deal intelligently and thoughtfully with the changes ahead.

With the guidance of citizens and other input, we will develop those workable choices into the “preferred alternative” (based on technical information and public input) for managing regional growth for the next 50 years. The Metro Council will consider that preferred alternative, consider public reaction and then adopt a growth management policy by this fall. In conjunction with the Future Vision, that policy then will be used to develop a Regional Framework Plan by 1997. This plan may require changes in local governments’ comprehensive plans and zoning.

Whatever the preferred alternative, it will be guided by some specific state and federal standards. Specifically, it will have to reduce VMT per capita by 20 percent. It will have to justify any urban reserves and urban growth boundary expansions according to state law. Within these limits, there are many alternatives that can be considered.

Elements of the Preferred Alternative

There are several urban design elements necessary for creating a preferred alternative and ultimately a regional growth management policy. These are evolutionary steps in themes that have long been a part of Oregon planning; they also will serve as fitting guideposts for our region’s future. We’ve identified these elements as the most successful and workable features found in each of the growth

concepts and the base case. Combined, they create a richer palette of elements than those found in the Concept A, B and C “prototypes.”

We do not intend the accompanying map to serve as the preferred alternative; instead, it is used to illustrate some of the features that can be used to create the preferred alternative. These are the land-uses elements that include neighbor cities, greenbelts, greenspaces, urban reserves, centers, corridors and main streets. It also includes the transportation system that links them together, such as highways, multi-modal streets, local streets and light rail.

Urban Design Elements

Neighbor cities

The satellite city concept has evolved from creating new cities to adding growth into existing small cities at the edge of the urban growth boundary. Our regional future is closely linked with these neighbors, regardless of how much or how little growth is directed their way. We must work with our neighbors because we affect one another.

Based on what we’ve heard from these neighbor cities, we’ve concluded that the base case projection for these cities probably was too low and that the Concept C projection was too high. In addition, not



Farmland is a valuable resource and part of our regional identity.

all of the neighbor cities selected will grow equally. We suspect that Sandy, Canby and Newberg will grow the most, with each having 25,000 to 40,000 total residents by the year 2040. We also recognize that the cities of Woodburn, Scappoose and North Plains already have good transportation systems to the metropolitan area and will experience growth pressure as a result. Estacada has a poor transportation system to the region and probably will experience less growth pressure.

The performance of the neighbor cities in Concept C was quite good. Sixty-five percent of the work traffic and 90 percent of the non-work traffic would remain inside the cities.

Our evaluation shows that the neighbor cities approach in Concept C requires three key elements:

- There would be a separation of rural land between each neighboring city and the metropolitan area. If the region grows together, the

transportation system would suffer and the cities would lose their sense of community identity.

- There would be a strong balance between jobs and housing. The more a city retains a balance of jobs and households, the more trips are likely to remain local.
- There needs to be a “green corridor,” or a highway through a greenbelt that serves as a link to the metropolitan area without access to the farms and forests within the greenbelt. This would keep accessibility high, which encourages employment growth but limits the adverse affect on the surrounding rural areas.

We should recognize some of the difficulties in achieving the three basics of a neighboring city. The greatest concern is that the housing will be available there, but the jobs will not. Some of the existing cities have primarily residential growth, while others, notably Newberg, have a closer balance of jobs and housing.

Greenbelts

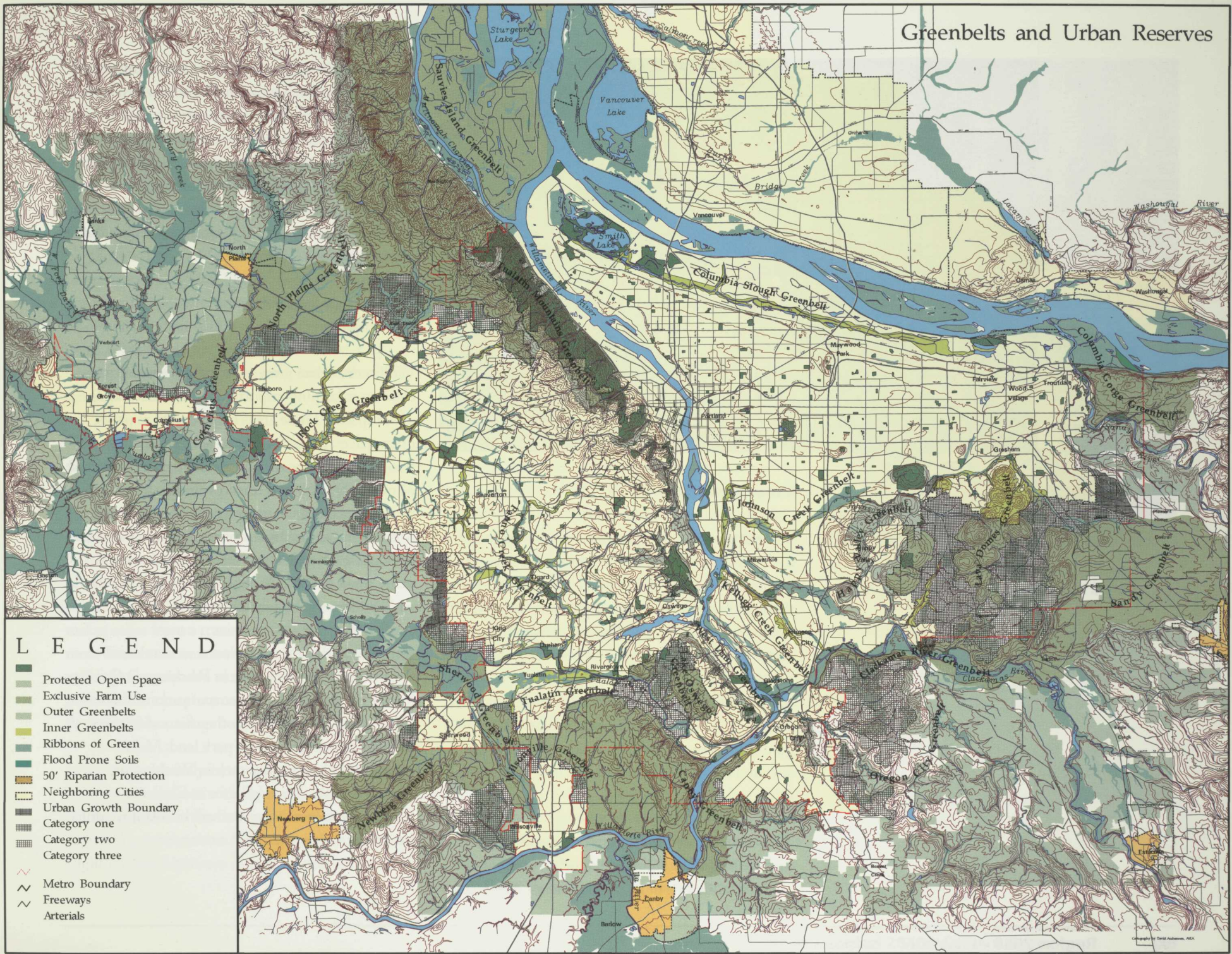
Issues raised by the neighbor cities have led to the development of a new regional land-use idea: that of permanent greenbelts. These would be rural areas that keep adjacent urban areas separate. These rural lands are not needed or planned for development but are more likely to experience development pressures than areas farther away.

These areas already are designated for farms, forestry, natural areas or rural-residential use. The purpose is to designate these areas as greenbelts or separators for a 50-year time frame and beyond. Creating greenbelts would require cooperation and agreements among various city, county, state and regional agencies.

Greenbelts would include land used for farms, forestry, natural preserves and very low-density rural residential development. It also would restrict new commercial or industrial development and might receive priority status as potential areas for new park and open space acquisitions. Road improvements specifically would exclude interchanges or other highway access to the rural road system, as would any nearby extensions of urban services.

Greenbelts also might be used to separate cities within the metropolitan area’s political boundaries. The cities of Cornelius and Hillsboro, and Tualatin, Sherwood and Wilsonville all are separated by existing rural land that provides a break in urban patterns. New areas of urban reserves, if they are designated, also could be separated by greenbelts. The region does not have to be a contiguous urban mass. One of the key values we heard from the public is the closeness to nature, and *permanent* greenbelts would help achieve that objective.

Greenbelts and Urban Reserves



LEGEND

- Protected Open Space
- Exclusive Farm Use
- Outer Greenbelts
- Inner Greenbelts
- Ribbons of Green
- Flood Prone Soils
- 50' Riparian Protection
- Neighboring Cities
- Urban Growth Boundary
- Category one
- Category two
- Category three
- Metro Boundary
- Freeways
- Arterials

Providing ribbons of greenspaces inside the UGB is one component of the preferred alternative.



Urban Reserves

The purpose in developing urban reserves is to designate land not yet needed for the 20-year supply but needed for 50 years of urban growth. As seen in the map, we have included 40,000 acres of potential urban reserves. If no net regional density changes occur within the urban growth boundary, this is 80 percent of the 50,000 acres of land that would need to be added if there are no density changes within the UGB. The 40,000 acres was selected using guidelines for rural reserves set by state land-use laws and by the Regional Urban Growth Goals and Objectives.

These urban reserves fall into three categories. The first are simple additions to the urban area. These are small additions of up to 2,300 acres. The second

are large-scale additions that add new communities to the metropolitan area but can be serviced with existing infrastructure, such as existing water treatment plants and sewage treatment plants. There are only 16,000 acres in this category. The third category requires entirely new infrastructure. This is the largest category, with 22,000 acres, and is projected to have the highest costs for providing urban services.

Green Spaces

Within the urban growth boundary, another key element is keeping important natural features as green spaces. These areas may be used as parks, open spaces, protected areas such as wetlands and floodplains, or low density residential development. Many of these natural features already have significant land set aside as open space. The Tualatin Mountains, for example, contain major parks such as Forest Park and Tryon Creek State Park and many small parks such as Gabriel Park in Portland and Wilderness Park in West Linn.

Other areas are oriented toward wetlands and streams, with Fanno Creek in Washington County having one of the best systems of parks and open space in the region. Many other natural features have no protection and no park land. Major corridors such as Rock Creek in Washington County and the Boring Buttes in Clackamas County are valued areas that will be lost if we don't take steps to preserve them.

Designating these areas as official green spaces would have several effects. First, it would remove these lands from the inventory of urban land available for development. The capacity of the urban growth boundary, as well as the ability to accommodate housing and employment, would have to be calculated without these areas. Second, these natural areas would receive a high priority for purchase as parks and open space, such as in Metro's Greenspaces program. Finally, regulations could be developed to protect these critical natural areas that would not conflict with housing and economic goals. That would help result in the transfer of development rights to other lands better suited for development.

Centers

We found that creating higher density centers of employment and housing would be advantageous for several reasons. These centers would provide access to a variety of goods and services in a relatively small geographic area. Having centers also makes sense from a transportation perspective, since most centers are conducive to transit, bicycling and walking. Centers also would act as social gathering places and community centers where people would find the "urban village" atmosphere many cherish.

In our concept analysis, we placed hypothetical centers only in areas with light-rail access. We now believe that this is too limiting. Centers exist not as supporting mechanisms for light rail, but vice versa. Light rail and highways should support centers. We

propose that a center be designated for each significant sub-region and major city.

There are three types of centers, determined mainly by size and accessibility. The "central city" is downtown Portland and has a market area of millions of people. "Regional centers" have market areas of hundreds of thousands of people, and "town centers" have market areas of tens of thousands. Several areas that today are not populated enough to support a center will grow to support one in the future, and a few communities that are town centers today could evolve into regional centers. The number of these that can be successfully maintained is limited by the population, economy and infrastructure necessary for their support.

The major advantages of centers in the marketplace are accessibility and the ability to concentrate goods and services in a relatively small area. A significant problem in creating centers, however, is that most of the existing centers are already developed and any increase in the density must be made through redeveloping existing land and buildings. Emphasizing redevelopment in centers over development of new areas would require a partnership of regional, local and state government to increase the attractiveness of these centers and to remove barriers for redevelopment.

The Central City

Downtown Portland serves as our major regional center and functions well as an employment and cultural hub for the metropolitan area. It provides accessibility to the many businesses that require



Portland's central city serves the entire region.



Regional centers such as downtown Gresham became increasingly important as major mixed-use locations.



Town centers such as Oregon City offer opportunities to blend old and new development.



Hawthorne Boulevard in Southeast Portland is an example of a neighborhood main street.

access to a large market area and also serves as the location for cultural and social functions that draw the region together. It is the center for local, regional, state, and federal governments, financial institutions, commerce, the center for arts and culture, and for visitors to the region.

In addition, downtown Portland would have a high percentage of travel other than by car – three times higher than the next most successful area, which are main streets such as Hawthorne Boulevard. Jobs and housing would be readily available there, without the need for a car. Maintaining and improving upon the strengths of our downtown should remain a high priority. The central city would have the highest transit access in the region, with light-rail or high-frequency bus access (within 1/4 mile) with a corresponding high number of pedestrians. Zoning would be mixed-use with a density that allowed around 400 persons per acre.

Regional Centers

Regional centers are accessible to hundreds of thousands of people. There would be only a few, traditional centers such as Milwaukie, Gresham and Beaverton, and new centers such as Washington Square and Clackamas Town Center. They should have good access to their market area – by highway and by transit. They should be connected with the central city with high-capacity transit and highways. They need good internal circulation for pedestrians, transit and autos. They should be distributed to cover the region, with at least one

center in the west, the southwest, southeast and eastern part of the region.

They would contain lower densities than the central city. The floor-area ratios in these centers would be between 1.5:1 and 2:1, with buildings two to four stories high. These regional centers would be served directly by light rail and a dense highway and arterial system, with high intensity employment and housing nearby. The pedestrian amenities also would be high. Zoning here would be changed to mixed use, with permitted densities of 100 to 150 people per acre.

Town Centers

These are accessible to tens of thousands of people and are important in forming and defining communities. Small city centers such as Lake Oswego, Forest Grove and Tualatin and large neighborhood centers such as St. Johns are examples of town centers. They are smaller scale regional centers, with similar characteristics. They have good internal transportation systems, are connected to the closest regional centers by arterials and transit, and are well served by arterials, collectors and local transit.

The floor-area-ratio for town centers would be about 0.5:1 to 1:1. The new development here would be one to four stories high. The pedestrian amenities would be high, with zoning that allows mixed use at 70 people per acre.

Corridors and Nodes

We also examined how development could occur along major arterials called corridors and around light rail stations called nodes. These should emphasize residential development along with locally supporting retail and service. A regional growth management plan should recognize all the viable corridors and nodes, as well as potential new areas such as Baseline Road and parts of McLoughlin Boulevard.

Areas within one-half mile of a light-rail station automatically would be included as nodes, and other transit centers also may form nodes. These corridors and nodes would be geared toward service and retail uses and would be most successful when located at the edges of neighborhoods with pedestrian-oriented streets. They include both traditional shops and modern stores but are built with the pedestrian in mind.

The floor-area ratio would be about 0.5:1, with less intensive employment and a predominance of neighborhood retail businesses. Zoning here would allow 40 to 70 people per acre with mixed use.

Main Streets

Main streets are unique in that they can be along a corridor, or along two or more streets that meet at a crossroads. Main streets typically will serve neighborhoods and may develop a regional specialization – such as antiques, fine dining, entertainment, or specialty clothing – that draw people from other



Traditional neighborhoods within walking distance of a store, school or park are highly valued.

parts of the region. When several main streets occur within a few blocks of one another, they serve as a dispersed center, such as the main street areas of Belmont, Hawthorne and Division that serve inner southeast Portland.

Main street development typically would be about one-half or one block deep. We expect main streets to emerge through redevelopment of existing uses in older areas or through new planned development. The floor-area-ratio would be 0.75:1, with one- to three-story buildings. Main street development typically would be about 10 blocks long, although there may be parallel or intersecting main streets (downtown Sherwood is a good example). There would be a high level of pedestrian and bike amenities. Zoning would allow a combination of multi-family, attached single-family, local services and retail, some light industrial and 20 to 70 people per acre.

Employment Areas

One of the flaws in our concept analysis was that major employment centers were combined in the “other” category. Major areas of employment such as the Sunset corridor, the Tualatin-Wilsonville area, the Sunnyside corridor, the Columbia corridor and the Rivergate area provide much of the basic employment that drives the local economy. These areas, however, will undergo transformations because of the changing economy and because nine out of 10 jobs created in the last 20 years have been non-manufacturing.

Many of the fastest growing areas in our economy do not require, and are not supported by, the traditional concept of industrial parks. Older industrial areas tend to have a much greater diversity of uses than new areas, usually because they developed under little or no zoning. Employment areas need priority access to freight movement and the flexibility of industrial-related mixed uses, including services for the employees who work, shop and live in or near these areas.

Providing access to households is a challenge, and these areas will develop in a much lower density, from five to 20 employees per acre. Those that are needed exclusively for industry, shipping and warehousing should be protected as such. Some areas currently designated for industrial development would be better developed as mixed use employment and residential areas, especially where they are close to transit and neighborhoods.

Neighborhoods

The most basic of land-use categories, and the one with which most people feel an emotional connection, is the neighborhood. This includes a wide range of configurations, from nearly rural to very urban. Perhaps more than any other land-use type, neighborhoods and the way they are designed can affect a region’s livability.

A well-designed neighborhood will lessen traffic region-wide by making trips within the neighborhood feasible and accessible. Creating such a neighborhood involves both design and land use. The successful neighborhood will provide for residents’ basic needs for frequent trips, such as basic shopping and services, recreation, school and social interaction. Each neighborhood will not meet all these needs but should meet many of them if the following elements are included:

- **Boundaries and centers** – Neighborhoods often are defined by their boundaries and centers. Boundaries include arterial streets, and centers include a park, school or natural feature such as a creek.
- **A pedestrian environment** – To create social interaction and reduce auto traffic, neighborhoods should have a pleasant and safe environment for walking. Pedestrian traffic is safest when it is within sight of homes and businesses.
- **Mixed housing and uses** – While it is not necessary to have uses mixed within a single site or street, one of the requisites for a pedestrian

trip is to have somewhere to go. Most local trips are for shopping, service, school and recreational purposes, as well as work trips for some residents. These trips can be made by foot or bike if they are within a half-mile of the residence. Including commercial activity near neighborhoods is an important element in a successful mixed-use regional design, making them more of a full-service community.

In addition, having a variety of housing types encourages a mixture of ages and incomes in neighborhoods. Protecting and enhancing neighborhoods can be accomplished by using multi-family between local commercial and single-family areas.

Through streets – One of the most significant problems in many recently developed areas is the lack of through streets, a phenomenon that has occurred in the last 25 years. It is one of the primary causes of increased congestion in new suburbs. Traditional neighborhoods contained a grid pattern with up to 20 through streets per mile. But in new areas, one to two through streets per mile is the norm. Combined with large-scale single-use zoning and low densities, it is the major cause of increasing auto dependency and congestion. While existing neighborhoods probably will not change, new developments should begin including at least eight through local streets per mile, which would allow for better access and still allow occasional cul-de-sacs.

Parks, schools, and natural features – One of the defining characteristics of neighborhoods are community facilities. Each neighborhood should have at least one that can provide recreational opportunities and activities for children in the neighborhood.

Although specific neighborhood plans are a local concern, their existence, design and function have regional effects. Minimum standards for the regional aspects of neighborhood design should be included in the preferred concept.

Transportation Elements

The transportation elements needed to create a successful growth management policy will reinforce a particular land-use pattern. Today, streets are defined by their traffic characteristics. We propose to create a new definition, one that defines streets and highways by their urban form and multi-modal characteristics. This is a designation that combines land use and transportation planning.

Arterial systems are built to develop a complete and flexible network that allows people to make choices about how they can move about in the region. Any shift in travel to alternative modes reduces the burden on the network, and in many cases improves the environment in neighborhoods, corridors and centers.

Major Arterials and Highways

These are the major streets that move traffic and goods around the region. They include freeways, limited access highways and heavily traveled arterials. They are important not only because of the movement of people, but because they are the region's major freight routes. Since much of our regional economy depends on moving goods and services, it is essential to keep congestion on these roads to manageable levels.

These major road system elements frequently are used as transit routes but are not conducive to bicycles or pedestrians because of traffic speed and volume. However, some should include bike lanes for work or shopping trips and pedestrian facilities near transit.

Major arterials and highways tend to attract businesses. While they are a proper location for auto-oriented businesses, they are poor locations for businesses designed to serve neighborhoods or sub-regions. Businesses oriented to neighborhoods are better located on multi-modal arterials (see below). Major arterials need the highest levels of access. But it is important that they not become barriers to movements across them, whether by autos, pedestrians, transit or bicycles. They should focus on providing access to and among centers, rather to the lands that front them.

Multi-modal Arterials

These represent most of the region's arterials. They contain a variety of improvement styles and speeds. If the region decides to emphasize neighborhoods and corridors, the arterial system would become the backbone for multi-modal travel. Streets in older sections of the region are better designed for multi-modal travel because they often carry a great deal of traffic – up to 30,000 vehicles a day – but still have significant pedestrian activity.

A street that today offers a multi-modal approach is southeast Milwaukie Avenue in Westmoreland, with on-street parking and two lanes of relatively slow traffic. Other streets with much larger volumes also have some strong pedestrian characteristics and use, such as southeast Hawthorne Boulevard and northeast Broadway Avenue. Some examples of streets with newer development that are becoming multi-modal include State Street in Lake Oswego and Macadam Avenue in southwest Portland.

Many streets, however, accommodate vehicle traffic at the expense of other modes of traveling. Wide lanes, multiple turning lanes, narrow sidewalks next to high-speed traffic, and intersections spaced far apart have created an environment that is difficult and dangerous to use without a car. The Regional Transportation Plan therefore should identify multi-modal streets and establish standards for improvements.



Light rail offers access between centers and opportunities to cluster new uses at station sites along the transit line.



A bus system adapts easily to new regional form and can provide high levels of service along transit corridors.

The prototypical multi-modal arterial would have on-street parking, have a 60-foot-wide travel width (curb to curb), accommodate bicyclists and have fewer than 30,000 vehicles per day. In addition, they should have frequent signalized crossings for pedestrians. Sidewalks would be eight to 12 feet wide. Where these streets are between activity centers, they can allow higher speeds, provide bikepaths, and eliminate on street parking.

Multi-modal streets are important because they are more than corridors for cars; instead, they are the edges of neighborhoods and serve as important commercial centers. Aesthetics are especially important because if the environment is not inviting for walking, biking, or transit, these destinations lose their attraction.

Collectors and Local Streets

These streets become a regional priority when a lack of adequate connections forces neighborhood traffic onto arterials. Establishing a standard of at least eight through streets per mile would do much to allow neighborhood trips on smaller local neighborhood streets. This would create a 600-foot grid and the possibility of some short in-between cul-de-sacs.

Light Rail

The existing and planned light-rail lines – eastside, westside and south/north – performed well in the concepts and responded well to possible land-use

changes that could increase ridership. Their usefulness occurs mostly in bringing high numbers of people to and from higher density centers. Downtown Portland is the prime example, although other regional centers warrant similar access over time. In general, increasing densities around light-rail stations and in light-rail corridors would have a significant impact on ridership, validating efforts underway now to create unique communities around each station area.

Building the Preferred Alternative

Using the land-use and transportation building blocks described above, we can establish a preferred growth management concept that will guide the region through the next 50 years.

Here are four basic ideas that can be used to design the preferred alternative:

- Retain key open spaces, both inside the urban area and in rural areas between the region and neighbor cities.
- Develop and enhance neighborhoods so that they are accessible by walking and bicycling; include enough nearby commercial activity so that many services are available to residents.
- Enhance and reinforce existing centers of employment.
- Focus development on transit corridors, improve streets to multi-modal arterial stan-

dards, and create a reasonable mix of uses along these corridors.

What follows is an example of what might become the preferred alternative. This builds on what we have learned in Region 2040 and outlines a possible regional form. We will construct the actual preferred alternative this summer, once the final round of public involvement is completed. That alternative then will be presented to the Metro Council.

This example contains several building blocks necessary for creating a livable region for the long-term future. The general scenario begins with the 1990 conditions and rearranges land use and transportation with the following elements:

- A supportive transportation network that connects centers via transit corridors and an arterial system.
- Centers of different sizes with varying mixes of jobs and housing.
- Varying densities such as downtown Portland (350 people and 135 dwelling units per acre), and town centers such as Forest Grove (25 people and 10 units per acre).
- Neighborhoods bordered by mixed-use corridors within walking and biking distance.
- Corridors and nodes with 20 to 40 people per acre and 6 to 16 dwelling units an acre.

- Single-family lot sizes that average 8,500 square feet.
- An enhanced parks and open space component, with rural reserves in select locations beyond the urban growth boundary.
- Neighbor cities that keep their distinct identities and are developed along with the metropolitan area in a coordinated fashion.

Once the conceptual design is in place, the second step is to estimate the capacity for accommodating population and employment. We can do this by looking at the potential vacant and redevelopable land for all the neighborhoods, centers and corridors and applying zoning densities and other development assumptions. We used the same method for developing projections and analyzing effects for the three growth concepts and the base case.

Estimating Capacity and Land Consumption

The key to estimating both capacity and its consequences is to predict densities and the resulting land consumption.

Assuming 1.1 million additional people are living in the region in 50 years, we estimate that about 40,000 net acres of land would be added to the urban growth boundary. We arrive at this figure by assuming that although the building blocks discussed above are in place, the overall densities are about the same as today. This assumption is based on many factors, such as having more green space

and lower densities where there is no transit. That leaves about 221,000 households and 90,000 jobs to be placed within the UGB expansion areas. At 14 people per acre (six units an acre and 7,200-square-foot lots, a floor-area ratio of .25, and 15 employees per acre), this equals about 40,000 net acres or 50,000 gross acres of needed urban reserves or UGB expansion lands.

Representing a variety of possible policy choices, here are five ways to reduce the amount of that 50,000-acre expansion:

- Decrease the average new lot size for single-family homes from 8,500 square feet to 7,000 square feet, and create more compact neighborhoods. **Land savings: 15,000 acres.**
- Increase the number of households and jobs in the regional, urban, and town centers by increasing the average density from the current 93 persons per acre to an average of 235 persons an acre (50 dwelling units an acre and 120 employees an acre, or about 2- to 4-story buildings). **Land savings: 6,000 acres.**
- Increase the density in the corridors and nodes from the existing 26 persons an acre to 46 persons an acre (15 households and 12 employees per acre). This would be a mix of multi-family, single-family and neighborhood commercial buildings. Redevelop 15 percent of land in these corridors and nodes at the new density. **Land savings: 14,000 acres.**

- Reduce parking spaces and increase employment densities in otherwise less dense areas (for general commercial and industrial uses). This means floor-area ratios would be about .35 on average. **Land savings: 5,000 acres.**
- Assume that at least three of the neighbor cities would grow by 30,000 additional households and jobs, diverting some growth from the metropolitan region. **Land savings: 10,000 acres. (This acreage would not be a net saving since it would occur elsewhere in the region, around neighbor cities.)**

The first four land conservation measure match the potential UGB expansion of 40,000 net acres or 50,000 gross acres. These policy approaches provide a range of savings. It illustrates the importance of these decisions in designing the alternative. In addition to the building blocks, a discussion of densities and land conservation measures is a relevant element in estimating the regional form.

These measures could be adjusted to accommodate people's interest in preserving rural land and in making lifestyle changes to create a more compact region. These changes would include how and where people live, where they work and even how they get to work.

While we do not expect people interested in living in outlying areas to move to centers, it is possible they could adapt to living comfortably on smaller lots. Similarly, some people may find convenient and affordable housing in mixed-use corridors,

while others prefer the immediacy of living in a town or city center.

This is just one example of a preferred alternative and the thought process behind it. Such an alternative would go a long way toward creating a region that contains a complementary urban design system and that encourages easier access, good neighborhoods, and natural areas and parks. Second, it is a specific example of how densities can affect urban form above and beyond the principle design and functional elements. The preferred alternative not only applies sound principles for regional policy, but also sets development guidelines to accommodate growth realistically.

Creating a Growth Policy

The choice is now up to the region. By using basic regional building blocks, connecting them with the transportation elements and applying the desired amount of land conservation elements, we can recommend an urban form to be forwarded to the Metro Council and to the public for their ideas, concerns, changes and adoption.

There are many important factors to remember when making choices about our region's future. But none is more important than realizing that all of us can and will control our future. This region already began that action years ago. Now, the next step is to trust our values and act on them to create the best possible 50-year growth policy for the region.

The Need for a Decision Now

It is important that the decision on a preferred growth concept be made soon. Those that want an answer about the future location of the UGB include farmers, citizens, developers and public agencies. Some of the reasons are:

- Farmers in the vicinity of the UGB want to make investments in orchards, crops or equipment that take many years to recoup capital at risk. If the UGB is likely to be changed soon, they may not make these investments. If the boundary is not changed in their area, they are more likely to make agricultural investments.
- Citizens in the vicinity of the present UGB want to know what kind of land use changes are likely to occur. They are concerned with changes that could affect their investment concerns (their home).
- Developers looking to meet housing, commercial or industrial market needs want to know if they can plan on additional land being available or whether they will need to look elsewhere to meet market demand.
- Public agencies planning sewer, water and other facilities that have useful lifetimes of 50 years or more would benefit from knowing

where they will be expected to provide these services. Finding out later that capacity is needed in an area not planned for public services is usually much more costly than if facilities are planned over a period of years.

Also, there are local, state and federal mandates to address specific concerns with transportation, land use and air quality. For example, Metro's Charter adopted by voters in 1992, mandates a Regional Framework Plan due December 1997, although several elements of the plan are due in the summer of 1995 because of other state or federal requirements. These include identification of urban reserves and completion of a Transportation System Plan (TSP) – both due in spring of 1995. All of these requirements should be driven by an overall growth management policy that Region 2040 is intended to provide.

Regardless of the above issues, some people believe that unless critical issues are addressed very soon, there won't be a livable region left. They want policies changed now, while there's still time to protect the quality of life.

The Decision Process

We are not seeking to adopt the base case, or Concept A, B or C. Each has faults. We have learned much from the analysis of these concepts.

Now we want to apply what we have learned and shape a preferred management strategy. We propose to do this by working with three primary groups – citizens, technical staffs and policymakers from throughout the region.

Citizens will be provided a tabloid (more than 500,000 in the region – one for every household) that briefly describes the issues and asks for preferences concerning trade-offs between more compact development or UGB expansions. In addition, this report and 15 minute video are available as more detailed sources of information. Responses will be received in a number of ways. The survey questions can be faxed or mailed in, or citizens can call the Region 2040 hotline with their comments. In addition, eight open houses will be held to answer questions and take public comments, as will workshops with a number of host organizations – local governments, business groups, citizen groups and others. An outreach program to children is also included in this work effort. "Citizens" include business, environmental and other interest groups as well as neighborhood and citizen planning organizations.

At the technical level, staff from throughout the region will continue to be consulted as Metro staff and the management committee work on shaping a management strategy based on citizen comment and what we've learned from technical analysis of the growth concepts. The management strategy

will be tested with our models and revised as necessary.

On the policy level, the technical recommendations, along with all of the public comments, will be presented to the Metro Planning Committee and Metro Council, as well as the Metro Policy Advisory Committee, the Joint Policy Advisory Committee on Transportation and the Future Vision Commission.

The executive officer will present a recommended alternative to the Metro Council this fall. Then the final round of advisory hearings will begin.

Finally, the Metro Council will hold hearings so that all interested persons can have an additional and final opportunity to respond to recommendations.

The Decision Components

The decision that Metro Council will make will be a substantial one. It will set a course for how Metro will proceed with other related projects and policies. It will set a general management strategy, while being flexible enough to respond to changing conditions. The decision will include:

- A description of the preferred configuration of Metro's urban form to the year 2040 including a map of approximate locations of the conceptual urban growth boundary (UGB), urban reserves and phasing strategies to the extent possible.

- A work plan to achieve a site-specific UGB, urban reserves and regional Transportation Systems Plan.
- Preliminary 2015 population and employment growth forecast derived from 2040 reports as the basis for discussion of the 1995 UGB and TSP.
- A range of preliminary 50 year population and employment growth forecasts for refinement in the regional framework plan.
- A regional framework plan implementation strategy based on the urban form concept describing an approach to preparation and adoption of framework plan components required in the 1992 Metro Charter including the UGB, urban reserves, TSP, housing density, urban design, Greenspaces, water supply, coordination with Clark County, and elements such as transit corridor and urban centers and water quality.
- A referral to MPAC of any draft functional plan provisions and referral to JPACT of any draft transportation functional plan provisions needed to preserve opportunities to implement the preferred urban form for review and recommendation as specified by the Regional Urban Growth Goals and Objective Objective 5.

After the decision about the preferred alternative is made by the Metro Council, additional related actions will also be initiated. These will include

drafting an ordinance containing amendments to the RUGGO based on the preferred alternative after MPAC review; a description of applicable state, regional and local government implementation responsibilities for the adopted preferred alternative configuration, regional framework plan strategy, and any proposed functional plan provisions; and a commitment to attempt to integrate local plans while still achieving regional goals.

The Decision Challenge

We learned much people in the region care about this place. We have shown that because our region is so attractive, growth pressure and impacts are likely. Our best technical plans will likely fail without having substantial participation from all perspectives. In order to succeed, we need to know what choices people of the region are willing to make. There are ways to accommodate the hopes and concerns of many different interests. We need your help to chart the future of the region.

Acknowledgements

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
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