
CITY OF FEDERAL WAY

COMPREHENSIVE PLAN

Draft Environmental Impact Statement

CITYSHAPE

From Vision to Plan

November 19, 1993

FACT SHEET

City of Federal Way Comprehensive Plan

- Proposed Action:** Adoption by the City Council of a Comprehensive Plan for the City and its unincorporated planning area, in compliance with the Growth Management Act and Countywide Planning Policies. The Comprehensive Plan will contain goals and objectives, policies and guidelines to manage growth for the next 20 years; it will contain separate elements dealing with land use, housing, the city center, urban design, transportation, capital facilities, annexation, and private utility.
- This Draft EIS evaluates three preliminary concepts for city-wide land use and development of a city center. Following review by interested citizens and agencies, the City will select a preferred alternative for additional environmental review in the Final EIS.
- Location of Proposal:** Federal Way is located in southwestern King County. The Comprehensive Plan will cover a 32-square mile area encompassing the City and adjacent unincorporated areas located within the City's planning area.
- Action Sponsor & Lead Agency:** City of Federal Way
Department of Community Outreach
& Policy Planning
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Required Approvals:

Adoption of an ordinance by the Federal Way City Council. Review and comment by the Washington Department of Community Development and other state agencies, as required by the Growth Management Act.

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Date of Issuance:

November 19, 1993

Comments:

Written comments on the Draft EIS will be accepted until 5 PM on January 3, 1994. Comments should be addressed to:

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Federal Way, WA 98003

Interested parties will have additional opportunities to comment on environmental issues throughout the planning process

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I. SUMMARY

This section provides a brief summary of information contained in the Draft EIS. It provides an overview of the alternatives, the analysis of significant impacts and mitigation measures, and identified unavoidable adverse impacts. It also summarizes Federal Way's strategies for integrating State Environmental Policy Act (SEPA) review with its planning under the Growth Management Act (GMA), and outlines a number of possible approaches for implementing the Comprehensive Plan.

The summary is intended to be brief and selective; the reader should consult individual sections of the Draft EIS for detailed information concerning environmental impacts and mitigation measures.

A. Proposed Action & Project Location

Proposed Action

The Proposed Action is adoption by the Federal Way City Council of a Comprehensive Plan to meet the requirements of the Growth Management Act (GMA). The purpose of the Plan is to provide the City with guidance for future growth, to identify issues of concern, and to articulate a vision for the City. The Comprehensive Plan will include elements on capital facilities, storm water, economic development, land use, housing, park and recreation, natural environment and environmentally sensitive areas, potential annexation areas, transportation, and public and private utilities. Implementation measures will also be developed and adopted subsequent to adoption of the Plan. It will also contain a City Center plan, providing more detailed policies for this portion of the City.

This Draft EIS evaluates initial steps in the development of Federal Way's Comprehensive Plan, including three city-wide land use concepts and three concepts for the City Center. This evaluation of environmental effects will be used by the City and the public to develop more detailed land use concepts, policies, zoning and implementation programs. The City's approach to integrating environmental review with its planning process is described more fully below.

Location of Planning Area

The City of Federal Way is located in south King County. It is approximately 19.9 square miles in area and is generally bounded by Puget Sound on the west; Pacific Highway South and South 272nd Street on the north; I-5 on the east; and the King/Pierce County line on the south.

The geographic area included in the proposed Comprehensive Plan includes the existing corporate limits as well as adjacent unincorporated lands within the City's sphere of influence and which may be annexed in the future. This total planning area, which contains approximately 32 square miles (20,407 acres), is the City's interim Urban Growth Area (UGA) for purposes of comprehensive planning.

B. CityShape Planning Process

State and Regional Planning Framework

While the development of Federal Way's Comprehensive Plan is a local process, it is also occurring within a framework of state laws and regional policies. Some of the factors and decisions influencing the City include the adoption of Countywide Planning Policies (to provide a framework for local planning); the designation of an Interim Urban Growth Area (within which most growth for the next 20-30 years is to occur), the development and allocation of population and employment forecasts, designation of Urban Centers; and decisions on a Regional Transit Project. The City's plan and regulations must be consistent with these policies, as well as with the objectives of the Growth Management Act.

CityShape

The City's process for developing its the Comprehensive Plan -- called "CityShape" -- began in April 1992. It combines technical analysis with citizen participation and environmental review throughout the process. The process is intended to lead to adoption of a Comprehensive Plan (replacing the interim plan adopted when the city incorporated in 1990) that is consistent with the Growth Management Act and reflects a local vision of the community.

The principal steps for development of the plan include:

- Collecting, publishing and evaluating data about the community, much of it published in a *Community Profile* (City of Federal Way, 1993). The Profile also identifies challenges and opportunities and was used to help residents provide input on preferred visions for the community's future.
- Preparing 20-year and 30-year economic growth scenarios. Each of the economic scenarios made different assumptions about the role of the City, the relative amounts of future retail, office, and industrial growth, and the function and shape of the City Center. The scenarios ranged from continuation as a suburban bedroom community, to different visions of an urban city center with varying amounts and types of jobs.
- Incorporating ongoing citizen involvement into the planning process. The community's expressed preferences have been used as the basis of alternative "visions" of Federal Way's future.
- Developing and refining general land use and transportation concepts or "visions" including urban design options. The visions are based on economic development scenarios and public preferences.
- Soliciting public reaction to the concepts with respect to economic performance, transportation efficiency and community values.

- Preparing and circulating a Draft EIS evaluating the environmental effects of the visions. This information will be used to help refine the visions and develop a preferred land use concept.
- Developing a preferred concept (including policies). The preferred concept will be based on preferences expressed in the workshops and open house, and on technical analysis, including the Draft EIS.
- Refining the preferred concept into a comprehensive land use and transportation plan, recommended zoning, guidelines, implementation and procedures using citizen input and environmental analysis.

Plan Objectives and Issues. In addition to compliance with GMA, the general objectives of the Comprehensive Plan -- identified during the early stages of the planning process -- include:

- Providing adequate land to accommodate population and economic growth; and
- Defining necessary community facilities to match planned growth;
- Facilitating development of a high quality city center to meet community needs;
- Developing a land use pattern that reduces traffic congestion and supports mass transit;
- Encouraging development that provides a high quality environment; and
- Identifying neighborhood centers and the range of uses appropriate to these areas;

Identification of Land Use Concepts. Based upon economic forecasts, data gathered for the *Community Profile*, public input, direction from the City's Coordinating Committee, and a public open house, four preliminary land use concepts were identified and described in the 1993 *CityShape* document. The broad concepts are intended to promote public discussion of options, testing of their ability to address major issues and objectives, early evaluation of environmental impacts, and, identification/refinement of a "preferred" land use concept.

Three of the concepts are evaluated in this Draft EIS. A fourth preliminary concept was eliminated from further consideration because of its inability to accommodate forecast population growth, the potential to generate significant adverse environmental impacts on sensitive areas (wetlands and fish-bearing streams), and the likelihood it would divert economic momentum away from the city center.

Identification of broad land use options also paralleled two related efforts: development of three city center design concepts, to change the function, appearance and vitality of the downtown; and development of transportation concepts, aimed at relieving traffic congestion and providing for mass transit.

The City and its team have been using a sophisticated computer model to forecast growth in travel demand over the next 20 to 30 years. This transportation model is also being used to evaluate a range of future street and highway improvements and their potential to improve traffic flow.

Capital Facilities. Each of the plan concepts will require the construction of capital facilities necessary to accommodate future growth. The City also developed a capital facilities program model, designed to help identify the capital facilities, costs and financial strategies (i.e. mixes of taxes, bonding and impact fees) associated with each land use concept and with different levels of service.

C. Integrating SEPA and the CityShape Planning Process

Scope of Action, Phased Environmental Review. The proposed action involves development and legislative adoption of a Comprehensive Plan for the City of Federal Way. No specific physical development is proposed as part of the present action. As defined by the State Environmental Policy Act (SEPA), the action is "non-project" in nature. As discussed in the SEPA Rules, EISs on non-project actions are intended to be flexible tools that promote understanding of environmental trade-offs among alternative courses of action (WAC 197-11-442).

The proposed action will not involve direct physical changes or effects to the environment. The Comprehensive Plan and subsequent implementation actions will, however, establish a framework within which future growth and development will occur.

The proposed action involves phased environmental review pursuant to the provisions of the SEPA Rules (WAC 197-11-060(5)). This EIS is one of a series of environmental documents published during the comprehensive planning process. Future environmental review will include zoning maps and text and other regulatory programs necessary to implement the plan.

Integrating SEPA and the Comprehensive Plan. The EIS on Federal Way's comprehensive plan is intended to help decision makers and the public understand the environmental effects of alternative community visions, including different land use patterns, city center concepts, service standards and similar choices related to future growth. Federal Way has developed a specific strategy for coordinating SEPA with the Comprehensive Plan. The intent of the strategy is to better integrate environmental information with the development of plan concepts and policies, and with public involvement.

The integrated approach to SEPA compliance and planning being followed by Federal Way is intended foster on-going environmental review that begins during the early stages of plan development. Environmental information about different courses of action and possible trade-offs will help interested citizens identify their concerns, which can then be addressed in subsequent environmental documents and in the plan itself.

This Draft EIS evaluates three general concepts or visions for the City's future growth, including three city center alternatives. It focuses on broad land use

patterns, standards/costs for providing capital facilities, and similar issues. The Draft EIS also identifies a range of possible mitigation measures and implementation approaches.

Using the information in the Draft EIS and citizen and agency comment on the document, the City will then define a "preferred" alternative. At the same time, it will develop draft policies for the various elements of the plan (e.g. land use, housing, capital facilities), and a detailed land use map. The preferred alternative will likely be a combination and refinement of several of the broad concepts articulated in the initial plan visions and analyzed in this EIS.

The Final EIS will contain additional environmental analysis, as appropriate, specific to the "preferred" alternative, including proposed policies and more concrete implementation strategies and mitigation measures. It will also respond to comments from agencies and citizens on the Draft EIS.

As currently envisioned, the Final EIS will be published in two stages. A preliminary (pre-publication) Final EIS will accompany the draft plan through the Planning Commission's hearing process and deliberations. New information generated during public hearings, and any recommended changes to the plan or zoning, will be incorporated into the Final EIS; additional analysis will be conducted in response to substantive changes. The Final EIS will then be completed and published before formal action on the plan is taken by the City Council. This staged approach is intended to provide structured opportunities for environmental review of plan refinements and additional citizen comments.

D. Land Use and City Center Concepts

Introduction

Three preliminary land use concepts and three city center concepts were identified and refined during the CityShape process and are evaluated in this Draft EIS. Each land use concept is combined with a city center concept for purposes of description and environmental analysis. The concepts include:

- Concept 1 - Existing Trends and Policies (modified to achieve consistency with the GMA);
- Concept 2 - High intensity City Emphasis; and
- Concept 3 - Strong City Center with Business Park.

Common Objectives and Land Use Patterns

All of the concepts are intended to accommodate forecast population and housing growth. PSRC's preliminary forecasts for the Federal Way Urban Growth Area (October, 1992) were used for planning purposes. These show a total of approximately 57,000 households and 139,700 people residing in the planning area in 2010 (compared to 36,000 households and 98,600 people in 1990).

approximately 57,000 households and 139,700 people residing in the planning area in 2010 (compared to 36,000 households and 98,600 people in 1990).

Under any of concepts, the mix and type/density of land uses would not change in most of the City, particularly in existing single-family residential areas. Residential neighborhoods would experience modest infill at compatible densities where vacant land is available.

Change would primarily occur along and adjacent to the Pacific Highway South corridor and within the city center. Changes would be directed at accommodating population/housing forecasts and achieving economic growth objectives. Among the concepts, land use changes would range from modest office/retail intensification and continued auto orientation, to development of an intense pedestrian-oriented urban core with high-rise mixed-use buildings and high capacity transit. New multi-family residential communities and/or office parks outside of the central core are also part of some of the concepts. Amounts of commercial/industrial uses would vary significantly among the concepts, reflecting increases ranging from 30 percent to 66 percent (in total square feet). All concepts assume protection of natural open spaces and environmentally sensitive areas, as well as provision of public parks.

Land Use Concept 1: Existing Trends -- Land Use and Policies Modified Consistent with the Growth Management Act

Concept 1 represents a continuation of existing trends. It would substantially continue existing land use patterns and reinforce the City's current character as a suburban residential community with a regional retail economic base. Existing comprehensive plan policies, land use designations and implementing regulations would be modified as necessary to accommodate regional population, housing and employment targets and to be consistent with other GMA objectives (e.g. concurrency).

Total housing capacity under this concept would increase by approximately 17,770 dwelling units; almost 60 percent of the increase would be in multi-family units. Most new housing would be developed in a new multi-family village community around 336th Street east of Pacific Highway South, and in and adjacent to the existing city center. Little change would occur in existing neighborhoods; some infilling would occur adjacent to existing neighborhood centers.

Under *City Center Concept 1*, the existing city center would continue to develop primarily as an auto-oriented regional retail center. Low-rise office growth and higher density housing would occur as well, and would make the center more intensively developed than at present. A civic center plaza with offices is envisioned, as are location of community facilities, pedestrian amenities along a route connecting Centennial Park with Steel Lake Park, improved bus facilities and parking structures.

Non-residential uses would increase by approximately 30 percent, with more than one-half the growth occurring in office uses. Most of the growth would occur in and near the city center, in the West Campus area, and in and around the Weyerhaeuser corporate headquarters area located east of I-5.

Parks and open space uses would increase by approximately 61 percent.

Public investment in capital facilities would be focused on road improvements, including widening of some arterials (5 to 7 lanes). Other improvements would include several bus transit facilities distributed throughout core; the widening of South 320th Street and Pacific Highway South; and enlarging and completing the ring road around the city center.

Land Use Concept 2: High intensity City Center.

Concept 2 would retain the City's predominant residential character but would result in some significant changes to the city center and to the City's economic base. The total increase in housing capacity would be comparable to Concept 1, but a somewhat smaller proportion of housing would be multi-family. New housing development would be concentrated in the city center, and in and around residential communities at Pacific Highway South at 272nd Street and 334th Street. Little change would occur in existing neighborhoods.

Total non-residential uses would be one million square feet greater than Concept 1. All of the difference would occur in office uses located in the city center or in the Weyerhaeuser area (east of I-5); manufacturing and retail uses would increase the same as in Concept 1. Overall, the City would achieve a greater balance between housing and jobs.

City Center Concept 2 would involve creation of a higher intensity, more pedestrian-oriented downtown core with a mix of residential, retail, office and civic uses, including a civic center plaza. Office buildings (and some mixed-use residential/office buildings) would be mid-rise to high-rise with structured parking.

Public investment for capital facilities would be focused in and around the city center (from 312th to 320th Streets along Pacific Highway South). Transportation system improvements would include modest upgrades of the arterial road system, and more extensive improvements in the city center, including a feeder bus system, four rail transit stations, and additional pedestrian connections. Major improvements associated with City Center Concept 2 include widening of South 320th Street and Pacific Highway South to accommodate increased traffic; creation of a pedestrian spine linking parks civic plazas, retail and residential uses, together; construction of a grade-separated pedestrian bridge across South 320th Street connecting to Sea Tac Mall; structured parking near the spine of development; connections from new housing and retail areas to Steel Lake Park; and construction of a ring road with landscaped treatment to enclose downtown.

Land Use Concept 3: Strong City Center with Business Park Development and Urban Villages.

Concept 3 would result in the largest and most diverse employment base compared to the other concepts. The City would contain an intensively developed urban core, a major new office park, and new residential communities north and south of the downtown. In general, Concept 3 would involve the greatest degree of change to

Concept 3 would contain somewhat fewer new housing units than Concepts 1 and 2; a slightly higher proportion of total housing would be multi-family. Little change would occur in existing neighborhoods. Most new housing would be located in the city center, and in 3 new residential neighborhoods (generally at medium densities) located north and south of the downtown core -- near 272nd Street and 288th Street (in the corridor between Pacific Highway South and I-5), and between 320th and 334th (along Pacific Highway South).

A high intensity, mixed-use downtown core would be located at Pacific Highway South and 312/320th Streets. Manufacturing, office and retail uses would increase by 6.4 million square feet -- almost two times more than Concept 1 and two-thirds greater than Concept 2. High-rise and mid-rise buildings would contain a mix of retail, office and residential uses. A new business park area would also be located south of the downtown core near the South 336th/348th Street areas.

City Center Concept 3 involves development of a downtown core containing a mix of high-rise and mid-rise office/retail uses, high-rise housing and an "urban village" with a mix of housing types and densities adjacent to a neighborhood retail center. A civic plaza would be located adjacent to an intermodal transit terminal. Some additional low-rise housing would be developed next to Steel Lake Park. A landscaped ring road would encircle downtown and a pedestrian spine would link parks, civic and office and retail uses together.

Public investment for capital facilities would focus on both the city center and the new business park area; capital investments would, as a result, be greater than the other concepts. Transportation improvements would include upgrades of the arterial road system; three rail transit stations, serving the high-intensity housing and office uses in the city center and new business park; a more diffuse bus system (because of multiple employment areas); and some pedestrian facilities.

Transportation improvements associated with the new city center would include a flyover crossing at South 320th Street, to alleviate left turn movements slowing traffic along South 320th Street; an intermodal (rail and bus) transit terminal close to South 320th Street; and pedestrian-oriented improvements on South 320th Street, including street trees, medians, and at-grade pedestrian crossings, to create the feeling of a boulevard.

E. Summary of Significant Impacts, Mitigation Measures and Unavoidable Adverse Impacts.

The following tables contain brief summaries of the major findings of the Draft EIS concerning significant environmental impacts (Table S-1), mitigation measures (Table S-2), and unavoidable adverse impacts (Table S-3). They are presented in matrix format for the sake of brevity. The reader is urged to consult the complete text of the Draft EIS for detailed analysis of environmental issues.

Table S - 1. Summary of Impacts of the Land Use Concepts

| Element | General Impacts | Concept 1 | Concept 2 | Concept 3 |
|---------|---|--|--|--|
| Earth | <ul style="list-style-type: none"> • Increased erosion potential associated with future construction and development activities. • Disturbance of earth and soils during excavation and grading activities. • Regulatory protection for landslide hazards - City's SAO. • Potential for some soil/slope failure during strong seismic event. • Potential for reduced groundwater recharge associated with increased impervious surface area and demand for domestic water. • Potential for contamination of aquifer recharge area due to increased development. | <ul style="list-style-type: none"> • See general impacts. | <ul style="list-style-type: none"> • See general impacts. • Potential risk of contamination of aquifer recharge area due to greater amounts of industrial development in or near recharge area | <ul style="list-style-type: none"> • See general impacts. • Generally comparable to Concept 2. |

Table S-1 (Cont'd). Summary of Impacts of the Land Use Concepts

| Element | General Impacts | Concept 1 | Concept 2 | Concept 3 |
|--|--|---|--|--|
| Air Quality <ul style="list-style-type: none"> • Temporary dust and emission (vehicle/machine) impacts from excavation, grading, and construction activities. • Potential for short-term odor impacts during paving operations. • Increased sources of air pollution as population increases. • Potential for air quality impacts from residential wood burning. • Average automobile carbon monoxide emission rates would decrease in future due to improvements to engine efficiencies and continued emission control requirement. | <ul style="list-style-type: none"> • Same as general impacts. • Total vehicle emissions would be lower than existing conditions. | <ul style="list-style-type: none"> • See general impacts. • Carbon monoxide increase about 1% higher than Concept 1; however, total vehicle emissions about 10% lower than existing conditions. | <ul style="list-style-type: none"> • See general impacts. • Vehicle emissions significantly higher than Concepts 1 and 2; however 5-8% lower than existing conditions. | |
| Water Resources <ul style="list-style-type: none"> • Detention facilities required by City expected to control increased in peak runoff. Peak flows may increase slightly due to new development. • Increased pollutant loading in surface waters resulting from new roads, driveways, parking and other impervious surfaces. • Runoff from vehicular surfaces would be one of the largest nonpoint | <ul style="list-style-type: none"> • Same as general impacts. | <ul style="list-style-type: none"> • Generally comparable to Concept 1. | <ul style="list-style-type: none"> • Generally comparable to Concept 1. | <ul style="list-style-type: none"> • Generally comparable to Concept 1. |

Table S-1 (Cont'd). Summary of Impacts of the Land Use Concepts

| Element | General Impacts | Concept 1 | Concept 2 | Concept 3 |
|--|--|-----------|-----------|-----------|
| <p>Water Resources (cont'd)</p> | <p>sources of pollutant loading from new residential development. Fertilizer and pesticide use in landscaped areas, pet wastes and a wide variety of other residential activities would contribute to pollutant loading.</p> <ul style="list-style-type: none"> • Potential impact to surface water quality during construction resulting from vegetation removal, disturbance of soil, and erosion. • Increased impervious surface coverage would result in decreased ground water recharge. • Increased demand for domestic water would likely result in increased ground water withdrawals. • Significant decreases in ground water recharge of the Redondo-Milton channel. • Increased impervious surfaces and peak flows would also increase the potential for flooding in flood problem locations. Flooding impacts would be comparable among the alternatives. | | | |

Table S-1 (Cont'd). Summary of Impacts of the Land Use Concepts

| Element | General Impacts | Concept 1 | Concept 2 | Concept 3 |
|------------------------------------|---|--|--|---|
| <p>Plants & Animals</p> | <ul style="list-style-type: none"> Federal Way's SAO intended to regulate development near lakes, streams, wetlands, and steep slopes. Development associated with residential areas would result in the loss of some native mixed coniferous-deciduous trees and shrubs. Indirect impacts to plants and animals could result from degradation of riparian plant species and fish habitat in wetlands, lakes and streams from flooding, sedimentation, and reduced base flows. | <ul style="list-style-type: none"> Most impacts focused on Hwy 99 corridor, which is already substantially altered, and parts of I-5. Most valuable habitat protected by City's SAO. | <ul style="list-style-type: none"> Slightly higher impact than Concept 1. | <ul style="list-style-type: none"> Slightly higher impact to habitat than Concept 2. |

Table S-1 (Cont'd). Summary of Impacts of the Land Use Concepts

| Element | General Impacts | Concept 1 | Concept 2 | Concept 3 |
|---|---|--|---|-----------|
| <p>Energy</p> <ul style="list-style-type: none"> • Energy consumption would increase significantly. • All concepts would have similar residential energy demands. • Concepts with more multi-family units could experience slightly higher energy efficiency. • Concepts with more commercial and industrial uses (Concepts 2 and 3) would generally consume more power. | <ul style="list-style-type: none"> • Total energy demand of 229 Megavolt Amperes (MVA); existing system capacity and proposed improvements would result in a potential deficiency of 57 MVA. | <ul style="list-style-type: none"> • Overall energy demand of 237 MVA; a potential deficiency of 131 MVA would exist. • High capacity transit, more multi-family units, and mid-rise scale commercial uses that could result in slightly more efficient use of energy. | <ul style="list-style-type: none"> • Overall energy demands would be greater than Concepts 1 and 2; total demand of 420 MVA with a potential system deficiency of 270 MVA. • Greater commercial uses would require more energy than Concept 1 and Concept 2. • Concept 3 would contain the most multifamily units and high-rise commercial space which could result in the greatest amount of energy efficiency. | |

Table S-1 (Cont'd). Summary of Impacts of the Land Use Concepts

| Element | General Impacts | Concept 1 | Concept 2 | Concept 3 |
|----------------------------|--|--|--|--|
| Environmental Health (EMF) | <ul style="list-style-type: none"> Although new growth would occur in areas located adjacent to the power lines EMF, no known adverse health effects have been identified. | <ul style="list-style-type: none"> Same as general impacts. | <ul style="list-style-type: none"> Same as general impacts. | <ul style="list-style-type: none"> Same as general impacts. |
| Noise | <ul style="list-style-type: none"> Construction activity associated with growth would temporarily increase sound levels. Increases in traffic volumes would increase sound levels between 1.9 - 1.2 dBA. Residential uses would be located within the SeaTac flight path; impacts would be greater under Concepts 2 and 3. Flight path impacts would be reduced by 1996 and significantly reduced by 2020 - due to newer technology. | <ul style="list-style-type: none"> See general impacts. | <ul style="list-style-type: none"> See general impacts. | <ul style="list-style-type: none"> See general impacts. |

Table S-1 (Cont'd). Summary of Impacts of the Land Use Concepts

| Element | General Impacts | Concept 1 | Concept 2 | Concept 3 |
|---|--|---|--|-----------|
| <p>Land Use</p> <ul style="list-style-type: none"> Indirectly, the Comprehensive Plan could have significant effects on the City's mix of land uses and land use patterns. Majority of the planning area would not change significantly some infill in existing neighborhoods at compatible densities. Substantial increase in multi-family housing in all concepts. Non-residential uses (retail, office and manufacturing) would grow substantially with Concept 3 having the greatest increase and Concept 1 the smallest. Displacement of residences and businesses would occur due to redevelopment in Hwy 99 corridor. Conflicts with adjacent areas and jurisdictions could occur at the boundaries between different land uses; impacts would be greatest where differences in intensity or type of use is most extreme. The supply of developable land to accommodate growth could vary over time. | <ul style="list-style-type: none"> Type and nature of recent growth would continue over the next 20 years, reinforcing the City's existing land use character. Existing neighborhoods would become somewhat more densely developed and urbanized. Lowest displacement due to redevelopment. Continuation of the City's suburban land use pattern would include continued strip development along Pacific Highway South, which would compete with the City Center in an economic sense. | <ul style="list-style-type: none"> Overall land use pattern would be similar to Concept 1, but with major changes focused in the City Center and along the Pacific Highway South corridor. Displacement due to redevelopment would be higher than Concept 1. Concentrations of more intensive development around transit center could create pressure for rezoning surrounding areas to capture perceived economic opportunities. City Center more concentrated and intensively developed taller and larger buildings (generally mid-rise). | <ul style="list-style-type: none"> Greatest increase in non-residential development -- more than twice that of Concept 1 and approximately 50 percent greater than Concept 2. Displacement would be similar to Concept 2. The Pacific Highway South corridor would be intensively developed along much of its length; however, land uses would be better planned and more cohesive, including open spaces and transitions between areas of differing use and density. Impacts around high capacity transit stations would be comparable to those identified for Concept 2. | |

Table S-1 (Cont'd). Summary of Impacts of the Land Use Concepts

| Element | General Impacts | Concept 1 | Concept 2 | Concept 3 |
|-------------------|-----------------|--|--|--|
| Land Use (cont'd) | | <ul style="list-style-type: none"> More decentralized land use pattern could create pressure for development of additional neighborhood-scale retail centers, or expansion of existing centers, to provide goods and services to a larger population. | <ul style="list-style-type: none"> Higher levels of economic activity focused into a central core would also contribute to more pedestrian traffic. | <ul style="list-style-type: none"> Most concentrated and most intensively developed City Center with significantly higher levels of office and retail growth. Taller and larger buildings (including high-rise structures). Greater potential for City Center land uses to spill over into or affect adjacent areas (but adjacent areas would also be more intensively developed). The potential for land use conflicts at the fringes of the downtown would be significantly greater than Concepts 1 and 2. |

Table S-1 (Cont'd). Summary of Impacts of the Land Use Concepts

| Element | General Impacts | Concept 1 | Concept 2 | Concept 3 |
|---|---|---|---|--|
| <p>Population, Housing, & Employment</p> | <ul style="list-style-type: none"> Population increases would be approximately 46,000 for all concept and would achieve the population target being used for planning. Rate of population growth is uncertain and will depend upon the local and regional economy, land use policy decisions and market conditions. Housing unit increases comparable among alternatives, 17,763 - 17,700. All three concepts could be approximately 1,500 dwelling units below the PSRC housing target; but deficiency may be due to different assumptions about household size. Over time, a shortage of available land could cause pressure on land and housing costs, as well as pressure for rezoning or redevelopment to achieve higher densities. | <ul style="list-style-type: none"> largest number of housing units; approximately 41 percent would be single family units and 59 percent multi-family. Would maintain the current economic focus of the City and provide the fewest number of jobs. | <ul style="list-style-type: none"> Approximately the same number and ratio of single and multi-family units as Concept 1. Office development one-third more than Concept 1. | <ul style="list-style-type: none"> Smallest percentage of single family units (38.8 percent) and the largest percentage of multi-family units (61.2 percent). Greatest increase in jobs (21 percent greater than Concept 1, and 14 percent more than Concept 2). |

Table S-1 (Cont'd). Summary of Impacts of the Land Use Concepts

| Element | General Impacts | Concept 1 | Concept 2 | Concept 3 |
|---|---|--|---|---|
| <p>Aesthetics, Light & Glare</p> | <ul style="list-style-type: none"> • Potential impacts to visual resources primarily relate to the location, size scale, and intensity of future development. • Majority of multi-family housing would be located in and adjacent to the City Center. • Changes in the visual character of the area are not expected to be significant, assuming that Comprehensive Plan policies and development regulations address design and compatibility. • Views from gateway locations could improve as infill development and redevelopment occurs and design improvements are implemented over time. • Greatest change in light and glare would result from redevelopment of the City Center under Concepts 2 and 3. Use of reflective materials for buildings could generate light and glare impacts. | <ul style="list-style-type: none"> • Least dramatic visual change; land use type, building size and design would be similar to existing conditions. • The area would continue to develop as an auto-oriented regional retail area and would continue to lack visual character and a distinct identity. • Visual character in areas proposed for redevelopment (along S.W. 336th Street between West Campus and I-5) would change from a mix of vacant land and industrial and commercial uses to residential neighborhoods. | <ul style="list-style-type: none"> • Mid- and high-rise buildings would add dimension and scale to the City center and would create more of an identity for the area. • The Comprehensive Plan would contain design elements specific to the City Center – policies, incentives and civic improvements would be focused on achieving a defined vision for appearance and function. • Potential for the City to improve its visual image, enhance primary gateways, and create a cohesive, urban identity. • Significant change in light and glare due to introduction of mid-rise buildings in City Center. | <ul style="list-style-type: none"> • Changes in visual character would be similar to Concept 2. • The downtown core would contain a mix of high-rise and mid-rise office/retail uses and the area would take on a more urban character. • The visual character of the area between S. 336th Street and S. 348th Street would change from that of mixed commercial development to a planned office park. • Most significant change in light and glare due to introduction of high-rise buildings in City Center. |

Table S-1 (Cont'd). Summary of Impacts of the Land Use Concepts

| Element | General Impacts | Concept 1 | Concept 2 | Concept 3 |
|---|---|--|---|-----------|
| <p>Transportation</p> <ul style="list-style-type: none"> • Between 1990 and 2010, total trips would increase by 40 percent as a result of anticipated growth. • Total vehicle miles traveled (VMT) and total vehicle hours traveled (VHT) would increase. • Volume to capacity ratio (v/c ratio) would decrease from 0.67 (LOS A-D) in 1990 to 0.80 (LOS E) in 2010. • Congestion on city streets in 2010 (measured in lane miles) would increase by between 8% (Concept 1) and 32% (Concept 3); average speeds would increase slightly, however. • For home base trips, the proportion of travel by transit would not increase by the year 2010 (expected to remain at 2 percent.). • Carpool mode share is assumed to increase by 3 percent by 2010, as a result of recommended carpool/HOV facility improvements. • Additional pedestrian and bicycle facilities would be constructed to encourage the use of non-motorized modes of transportation. | <ul style="list-style-type: none"> • The increase in total trips would be similar for Concepts 1 and 2 (40 and 41 percent respectively). • Under Concepts 1 and 2, total VMT would increase by approximately 41 percent while total VHT would increase by approximately 46 percent. | <ul style="list-style-type: none"> • Development of City Center would result in new trips focusing in the S. 320th Street corridor in the vicinity of I-5. • Trip increase similar to Concept 1. | <ul style="list-style-type: none"> • Total number of trips generated under Concept 3 would increase by 51 percent compared to 1990 existing conditions. • Total VMT would increase by 44 percent while total VHT would increase by 54 percent. • Development of City Center and redevelopment would result in new trips focusing in the S. 320th and S. 348th Street corridors in the vicinity of I-5. | |

Table S-1 (Cont'd). Summary of Impacts of the Land Use Concepts

| Element | General Impacts | Concept 1 | Concept 2 | Concept 3 |
|---|---|--|---|-----------|
| <p>Fire and Emergency Medical Services</p> <ul style="list-style-type: none"> Service characteristics affected by future city growth include: traffic congestion reducing response times; needs for water supply and transmission lines to increase fire flows; additional time required to review plans, inspect buildings and perform related activities; and needs for timely data to forecast demands and growth increasing the number of emergency calls. Expansion of existing fire stations and public water supplies may be necessary to ensure adequate fire flows. | <ul style="list-style-type: none"> See general impacts. Concept 1 could generate a total of 3,114 services calls (2,910 residential and 204 commercial). Additional firefighters, management personnel, and equipment could be required beyond planned improvements. Development of the area east of I-5 or near the City Center could require an additional station or station expansion. Additional traffic congestion on local streets could affect response times. | <ul style="list-style-type: none"> See general impacts. Concept 2 would generate approximately 268 more calls annually than Concept 1 due to addition 1 million square feet of office space; District needs would be the same as described under Concept 1. Potentially easier for District to respond to calls due to the concentration of development in a smaller geographic area. Depending on building heights, the city may need to upgrade water transmission and/or storage infrastructure to ensure adequate pressure and water volume. | <ul style="list-style-type: none"> See general impacts. Concept 3 would generate a total annual increase of 3,349 calls by 2010; greater calls associated with office growth. Staffing needs would be slightly greater than Concepts 1 and 2. It may be necessary to locate an additional station near the City Center, given the high density residential and commercial uses. Building heights could require the purchase of an additional aerial truck. | |

Table S-1 (Cont'd). Summary of Impacts of the Land Use Concepts

| Element | General Impacts | Concept 1 | Concept 2 | Concept 3 |
|---------|---|---|---|---|
| Police | <ul style="list-style-type: none"> Future population growth and increased demand for police protection services and other community programs supported by the local police department (e.g., D.A.R.E. and community watch programs.) | <ul style="list-style-type: none"> By 2010, an additional 11,958 service calls could be generated annually, resulting in the need to hire 24 additional officers and purchase 24 patrol cars, equipment and facilities improvements. | <ul style="list-style-type: none"> By 2010 an additional 12,438 service calls could be generated annually, necessitating hiring one more officer than under Concept 1. | <ul style="list-style-type: none"> Concept 3 would create the greatest demand for police services 14,464 annual service calls, necessitating the hiring of 30 officers, purchasing 30 patrol cars, and additional equipment and facility improvements. |
| Schools | <ul style="list-style-type: none"> Total number of students generated does not vary significantly among concepts -- increases between 42 and 43 percent of 1992 FTE. Considering future planned improvements, forecast population would generate the need for 8.6 elementary schools, two junior high schools, and one senior high school. Construction costs would total \$98,642,958 (based on average school costs at 1992 dollars). Mitigation fees (1992 dollars) would generate between \$23,930,891 and \$24,439,667, covering approximately 25 percent of total construction costs. | <ul style="list-style-type: none"> See general impacts. | <ul style="list-style-type: none"> Similar to Concept 1. | <ul style="list-style-type: none"> See general impacts. Approximately 200 fewer students than Concepts 1 and 2. |

Table S-1 (Cont'd). Summary of Impacts of the Land Use Concepts

| Element | General Impacts | Concept 1 | Concept 2 | Concept 3 |
|-------------------------------|--|---|---|---|
| Parks & Recreation | <ul style="list-style-type: none"> All concepts would generate a need for 508 - 785 acres of parks, depending on level of service. Deficit in park acreage would range from 82-380 acres, depending on level of services standards | <ul style="list-style-type: none"> Would add 405 acres of parks and open space. Greatest deficit of park acreage. | <ul style="list-style-type: none"> See general impacts. Would add 426 acres of parks and open space. Slightly smaller deficit in park acreage than Concept 1 (82-359 acres). | <ul style="list-style-type: none"> See general impacts. Would add 426 acres of parks and open space. Slightly smaller deficit in park acreage than Concept 1 (82-359 acres). |
| Water | <ul style="list-style-type: none"> By 2010, projected growth under any of the concepts would generate an estimated water demand of 34 mgd. Approximately 90 percent of the increased water demand would be incurred by the Federal Way Water and Sewer District. Additional sources after 2010 (or 2005 if Pipeline 5 not implemented). | <ul style="list-style-type: none"> Same as general impacts. | <ul style="list-style-type: none"> Same as general impacts. | <ul style="list-style-type: none"> Same as general impacts. |
| Sewer | <ul style="list-style-type: none"> Total new flows would range from 3.66 MGD for Concept 1 to 3.81 MGD for Concept 3. Most of the increased flows would go to the Lakota or Redondo Wastewater Treatment Facilities; flows would increase by about 1.8 MGD at the Lakota facility and .6 MGD at Redondo. | <ul style="list-style-type: none"> See general impacts. | <ul style="list-style-type: none"> See general impacts. | <ul style="list-style-type: none"> See general impacts. |

Table S-1 (Cont'd). Summary of Impacts of the Land Use Concepts

| Element | General Impacts | Concept 1 | Concept 2 | Concept 3 |
|----------------|--|--|--|--|
| Sewer (cont'd) | <ul style="list-style-type: none"> • Second largest increase in flows would go to the Tacoma Wastewater Treatment Facility; this increase may require changes to the agreement between Federal Way Water and Sewer District and the City of Tacoma. • As growth occurs in the southeastern portion of the planning area, sewer service would be extended to the Hylebos and Auburn basin thereby increasing flows to Tacoma and METRO. • Connection of existing unsewered development to the sanitary sewer system may be necessary to protect groundwater quality. | | | |
| Storm Water | <ul style="list-style-type: none"> • Stormwater runoff would increase under all concepts due to increased impervious surfaces. Impacts would not differ significantly among the concepts. • Total flow volumes would increase and could cause sedimentation and erosion. The potential for flooding in some problem areas would also increase. | <ul style="list-style-type: none"> • See general impacts. | <ul style="list-style-type: none"> • See general impacts. | <ul style="list-style-type: none"> • See general impacts. |

Table S-1 (Cont'd). Summary of Impacts of the Land Use Concepts

| Element | General Impacts | Concept 1 | Concept 2 | Concept 3 |
|---|---|---|--|-----------|
| <p>Fiscal</p> <ul style="list-style-type: none"> • Differences between net fiscal impact of land use concepts relatively small. • Major fiscal differences arise from the varying degrees of commercial development between concepts; generally the more intense the commercial development, the better the city's fiscal balance. • Property taxes revenues are estimated to account for over 30 percent of General Fund revenues by 2010. | <ul style="list-style-type: none"> • See general impacts. • Cumulative unfunded capital facility needs \$93.5 million. • Assumes bond issue of \$24.8 million (\$0.26 per \$1,000 assessed value). | <ul style="list-style-type: none"> • See general impacts. • Cumulative unfunded capital facility needs \$96.2 million. • Assumes bond issue of \$24.5 million (\$0.25 per \$1,000 assessed value). | <ul style="list-style-type: none"> • See general impacts. • Cumulative unfunded capital facility needs \$113.5 million. • Assumes bond issue of \$21.3 million (\$0.22 per \$1,000 assessed value). | |

**Table S - 2
Summary of Mitigation Measures**

| Element | Mitigation Measures |
|-----------------------------|--|
| Earth | <ul style="list-style-type: none"> • The City's adopted Sensitive Areas Ordinance (SAO), landscaping requirements, stormwater design/planning regulations and SEPA process would generally identify and limit risks associated with geologic hazards. Proper enforcement of building codes would reduce the potential for slope failure, erosion, and water quality impacts. • Other mitigation could include identification and protection of aquifer recharge areas and implementation of erosion and sedimentation controls during construction to protect water quality. |
| Air Quality | <ul style="list-style-type: none"> • Emissions from construction activities could be reduced by implementing policies and regulations requiring the use of new and/or well-maintained construction equipment; restricting hauling activities during peak commute periods; use of dust suppressants, and wheel washing. • The State's Clean Air Act requires the use of EPA certified wood stoves and regulates residential wood burning. New dwellings are required to have alternative heat sources other than wood. Covenants that ban residential wood burning in planned developments could be established. • Land use Concepts 2 and 3 would promote the use of alternative modes of transportation, helping to reduce emissions from motor vehicles. If identified transportation improvements occur, air quality benefits would occur. |
| Water Resources | <ul style="list-style-type: none"> • Measures to reduce adverse impacts to surface water quality include: source controls directed toward completed developments, permanent stormwater controls, and temporary erosion and sedimentation controls during construction activities. • Other measures could include efforts to educate residents and businesses about maintaining surface water quality and to establish an inspection and maintenance program to inventory and monitor private and public stormwater facilities. • Measures to reduce flooding impacts could include revised detention requirements; regional detention facilities; retain wetlands for stormwater retention; and review regulatory definitions and programs. |
| Plants & Animals | <ul style="list-style-type: none"> • The City's SAO, landscaping provisions, development regulations, and SEPA process would mitigate impacts to plant and animal communities. The SAO could be revised to provide more detailed standards of protection relative to the quality of critical areas; Department of Wildlife management guidelines for priority species should be considered. Field inventory of streams, lakes and wetlands would help to characterize the quality of sensitive areas. • Other mitigation could include incentives for enhancement of critical areas; dedication of Native Growth Protection Easements; design of regional storm water management facilities to enhance wildlife habitat where possible; consideration of habitat in open space planning; and landscaping requirements that employ native plants and/or plant species demonstrated to benefit wildlife. |

**Table S - 2 (Cont'd).
Summary of Mitigation Measures**

| Element | Mitigation Measures |
|-----------------------------------|---|
| Noise | <ul style="list-style-type: none"> • Develop policies requiring noise sensitive construction practices. • Land uses adjacent to high volume roads and freeways should reflect the presence of these noise sources. • The Comprehensive Plan should balance noise issues with other legal mandates. Residential land uses could, for example, be limited in the SeaTac flight path; shifting these uses elsewhere would produce other impacts to the environment. |
| Energy | <ul style="list-style-type: none"> • Mitigation should consider coordination of planning and construction activities with energy purveyors; extension of transit services and use of HOV to reduce dependency on single-occupancy vehicles; and energy saving features in the design and construction of buildings. |
| Environmental Health (EMF) | <ul style="list-style-type: none"> • The City should adopt policies and guidelines that apply to development in or adjacent to the power line corridor. • The City should continue its prudent approach to siting. Future development and/or redevelopment of homes and schools near power lines should be discouraged. • No definitive setback standard has been identified; EMF does decrease substantially 100 feet from the source however. |
| Land Use | <ul style="list-style-type: none"> • Land use and city center policies should reflect the issues and potential impacts identified in the Draft EIS (e.g., overall land use pattern, compatibility between adjacent land uses and districts, etc.). • The land use pattern embodied in the Comprehensive Plan should be consistent with regional land use and transportation decisions. • Appropriate transitions between land use of different type and intensity should be implemented (i.e., use of open space to define land use pattern and provide a visual and physical separation between neighboring uses). • Major development controls, including zoning, SAO, subdivision ordinance, and shoreline master program should be refined or revised to reflect stated policies, achieve consistency between the land use plan and regulations, and ensure fairness for property owners. • Site planning and development standards that address setbacks, design, building orientation, landscaping buffering or screening, and similar factors should be established to promote land use compatibility and achieve design objectives. Procedures for implementing design policies could include a design review process. • The City should continue to update and refine land supply data. "Benchmarks" for the 20-year planning period should be established for factors such as land supply, absorption and cost, density and growth rates. |

**Table S - 2 (Cont'd).
Summary of Mitigation Measures**

| Element | Mitigation Measures |
|---|---|
| Population, Housing & Employment | <ul style="list-style-type: none"> • The City should establish benchmarks, and monitor growth and land supply to determine if assumptions are valid. Corrections to constrained land supply could include increasing residential densities, rezoning, or revising the preliminary population growth forecast to realistically reflect limitations of the City's land supply. • The City's 1991 Comprehensive Housing Affordability Strategy establishes a five-year strategy to address housing needs of low-income and special needs. Significant amounts of multi-family housing contained in the Land Use Concepts, particularly 2 and 3, would help provide affordable housing. • Potential incentives to provide affordable housing could be considered, these could include density bonuses, small lot zoning, zero lot line development, and process incentives. Mandatory requirements for affordable housing units could also be considered. A program to permit accessory units should also be considered. • The level and mix of employment embodied in Concepts 2 and 3 diverge somewhat from the PSRC preliminary forecasts. The City should monitor this process and determine if its economic scenarios continue to be consistent with regional plans. • Growth targets may need to be adjusted if levels of service and capital spending cannot support the preferred land use alternative. • The City's housing strategy should incorporate the objectives of the Washington Housing Policy Act. |
| Aesthetics, Light & Glare | <ul style="list-style-type: none"> • Adoption of design policies, standards, and guidelines in the Comprehensive Plan and development regulations would help achieve design goals. Some form of design review may also be considered. • Design requirements and policies should be efficient and should consider other important city objectives (e.g. affordable housing) along with visual quality. |
| Transportation | <ul style="list-style-type: none"> • Improvements necessary to accommodate forecast growth include widening of existing roadways, construction of new roadways, corridor development, construction of frontage roads and freeway connections between major arterials in Federal Way and I-5, and new HOV facilities on congested arterials. Identified improvements would achieve acceptable levels of service under any of the land use concepts. • Enforcement of the City's Commute Trip Reduction Ordinance would require affected employers to implement programs to reduce the number of employees commuting in single occupant vehicles. |
| Fire and Emergency Medical Services | <ul style="list-style-type: none"> • Future development proposals would need to assess and mitigate impacts on fire services (e.g., providing adequate access for emergency vehicles in new development). • Tax revenues generated by future development would be available to finance additional staffing and equipment requirements. |

**Table S - 2 (Cont'd).
Summary of Mitigation Measures**

| Element | Mitigation Measures |
|-------------------------------|--|
| Police | <ul style="list-style-type: none"> • Measures to reduce the number of police service calls could include providing on-site security for construction sites; encouraging site designs that would reduce opportunities for crimes to occur; adequate street lighting; and promotion of community crime prevention programs. • Tax revenues generated by future development would be available to fund additional police requirements. |
| Schools | <ul style="list-style-type: none"> • It is anticipated that future school needs will be identified in the School District's ongoing planning process and thru project review. The District should use population and housing targets in the Comprehensive Plan and monitor growth (housing and students) to verify planning assumptions. • The City should adopt an ordinance enabling it to collect impact fees on behalf of the school district. |
| Parks & Recreation | <ul style="list-style-type: none"> • Ongoing land use and capital facilities planning should seek to identify additional needs for park and recreation land and facilities. Information in the Capital Facilities section of the Draft EIS should be used to identify a park level of service standard that City residents can support financially and politically. |
| Water | <ul style="list-style-type: none"> • Growth rates and patterns should be monitored to assure that water demand does not outstrip existing resources or new source development. Development of additional regional water supplies should be supported. • The City should reevaluate planned water system facilities to assure that they can support planned land uses. • The Comprehensive Plan should include policies that address water conservation and aquifer protection. • The City should participate in the South King County Coordinated Water System Plan with the objective of assuring adequate, reliable and healthful water supplies to residents. |
| Sewer | <ul style="list-style-type: none"> • Growth rates and patterns should be monitored to assure that sewage flows do not exceed capacities. • The City should reevaluate planned sewer system facilities to assure that they are optimally sized and located to support planned land uses. • The City should consider connecting unsewered development to the sanitary sewer in an effort to protect groundwater resources. |
| Storm Water | <ul style="list-style-type: none"> • As part of its Comprehensive Storm Water Plan, the City will model "worst case" 2010 development; this will form the basis of a future capital improvement program. • The storm water system will preserve and use elements of the natural drainage system, including wetlands. • The City will review its storm water requirements and incorporate updated standards where appropriate. |
| Fiscal Impacts | <p>The City will continue to refine its capital facilities model along with its land use plan. Future input will include refinements to levels of service, additional services, and varying funding sources/levels.</p> |

Table S - 3
Summary of Unavoidable Adverse Impacts

| Element | Unavoidable Adverse Impacts |
|-------------------------------------|--|
| Earth | <ul style="list-style-type: none"> Increased erosion and sedimentation will be produced by construction. Topography would be permanently altered as a result of future development activities |
| Air Quality | <ul style="list-style-type: none"> Air Quality would deteriorate incrementally. |
| Water Resources | <ul style="list-style-type: none"> Increased pollutant loading within receiving waters in the planning area will be increase. Reduced recharge of the aquifer underlying the planning area. |
| Plants & Animals | <ul style="list-style-type: none"> Native vegetation and wildlife would be lost as a result of increased development in the planning area. Reduced and fragmented habitat will cause decrease in local wildlife populations, and some species may become extinct. |
| Noise | <ul style="list-style-type: none"> Noise levels will increase as a result of increased traffic by residents, workers, and for transportation. |
| Energy | <ul style="list-style-type: none"> Increased energy will be consumed. Demands are likely to occur with or without adoption of the Comprehensive Plan. |
| Environmental Health (EMF) | <ul style="list-style-type: none"> Based on available information, it is not clear if exposure to EMF effects are adverse. |
| Land Use | <ul style="list-style-type: none"> Land will be consumed for urban uses. |
| Population, Housing & Employment | <ul style="list-style-type: none"> Assuming continued regional growth, population, housing and employment is likely to increase in the UGA with or without adoption of the Comprehensive Plan. More resources will be consumed and greater demands will be placed on existing infrastructure and resources as a result of increased growth. |
| Aesthetics, Light & Glare | <ul style="list-style-type: none"> The visual character of Federal Way could change from a suburban residential community to a more urbanized City with distinct business/commercial core and image. Overall, changes in design and visual quality are likely to be positive. |
| Transportation | <ul style="list-style-type: none"> Population and employment growth under any land use concept will result in increased vehicle and total person trips. |
| Fire and Emergency Medical Services | <ul style="list-style-type: none"> Future population growth will increase the demand for fire suppression and emergency medical services with or without implementation of any of the land use concepts. |
| Police | <ul style="list-style-type: none"> Future population growth will increase the need for police protection services with or without implementation of any of the land use concepts. |
| Schools | <ul style="list-style-type: none"> As the number of families with school-aged children increases, the demand for school services and facilities would increase. |
| Parks & Recreation | <ul style="list-style-type: none"> Over time, population growth will place increased demands on existing park and recreational facilities and programs and create a need for additional facilities and programs. If additional acquisitions are not made, existing deficiencies would be exacerbated. Additional costs for improvements and operation and maintenance would be incurred. |
| Storm Water | <ul style="list-style-type: none"> Stormwater flows will increase with some effects on erosion, sedimentation and flooding. |

F. Implementation Strategies

The City's growth management planning process will integrate solutions to environmental issues with plans that implement residents' vision for the City's future. This section suggests a range of potential approaches to addressing those issues. These ideas are preliminary and are presented here to promote discussion.

Environmental Protection

Geologic Hazards & Water Resources

- Land use designations (i.e. the location of uses and densities) will reflect the presence of known geologic hazards, including areas with potential for landslides, erosion and aquifer recharge. The City will continue to identify and map these areas over time.
- Alternative approaches for protecting the City's drinking water supplies will be investigated. Ongoing geohydrologic studies should enable the City to identify aquifer recharge areas more clearly and to adjust land uses in response. Some options that would enable the City to further protect its ground water supplies include classifying recharge areas based on geology and hydrology and the potential for contamination; limiting activities that pose a threat of contamination in highly sensitive recharge areas; and requiring master drainage plans, infiltration and Best Management Practices in recharge areas.
- The City's storm water requirements will also be reviewed and modified to help prevent erosion, sedimentation and flooding, preserve water quality, and achieve consistency with state law.
- In cooperation with adjacent jurisdictions and interested agencies, the City will consider preparing basin plans for individual drainage basins. The plans could provide a means for further integrating growth management planning with resource protection (e.g. streams, wetlands, habitat, aquifers) and storm water management.

Habitat and Wetlands

- The City's existing wetland inventory will be updated and supplemented over time. As required by GMA, Federal Way will also review its Environmentally Sensitive Areas regulations to ensure that critical environmental resources are protected and that resource management is coordinated with planned land use. This review will evaluate the pros and cons of classifying wetlands according to functions and values, and establishing buffers that reflect wetland sensitivity and adjacent land use. The review will also consider the potential for non-regulatory techniques for wetland management, including acquisition and incentives.
- Habitat for priority species will be identified and the City will consider whether additional protection of such areas is warranted. The City will review its site planning and landscaping requirements and seek to coordinate them with habitat concerns (as well as with water conservation needs); potential incentives for

concerns (as well as with water conservation needs); potential incentives for preserving locally important habitat will be considered. Habitat will also be used to help identify an open space system to support the preferred land use alternative.

Land Use and Housing

- The basic land use pattern embodied in land use concepts 2 and 3 are consistent with residents' expressed vision for Federal Way, with existing community character, and with the objectives of the GMA and Countywide Planning Policies (CPP). The City's preferred land use alternative will reflect that regional framework; zoning designations and other implementing regulations will be consistent with the plan.
- The City will continue to develop its parcel-based Geographic Information System (GIS). This will provide a tool for collecting and evaluating data about the land base, including environmental features and services and utilities.
- The City will perform additional analysis of land supply in the Final EIS. It will also establish quantifiable measures (or "benchmarks") that can be monitored over time to indicate any changes in market conditions or land supply/demand that would hinder accomplishing the Comprehensive Plan's objectives. The monitoring program will also identify potential corrective actions.
- The City will evaluate the pros and cons of including a "minimum density" requirement in its zoning ordinance. The intent is to ensure that density targets and assumptions underlying the plan are being achieved.
- The City will evaluate information in the Draft EIS and ongoing studies relating to potential constraints to growth associated with water supply, needs for public services and capital facilities, and limitations of public financing. These data will be used to determine if, when and where growth "phasing" may be necessary or appropriate. Potential tools to implement phasing could include designation of priority or sequential growth areas, targeting infrastructure to encourage development, and/or interim controls to prevent premature development.
- In cooperation with King County and affected residents, and based on information in the EIS and other studies, the City will identify the potential sequence and timing of annexation of adjacent unincorporated lands within the Urban Growth Area. It will also work with King County to negotiate interlocal agreements relating to development standards and other issues affecting the transition of unincorporated lands.
- The City will evaluate a broad range of land use and financial incentives and non-regulatory tools that could help accomplish objectives for an Urban Center. These could include public infrastructure investments, density bonuses, process incentives, public-private partnerships and joint development programs.
- A review of existing City ordinances, programs and processes will be undertaken as part of the Comprehensive Plan implementation program. Among other things, this review will seek to identify any regulatory barriers to achieving the

least cost housing possible consistent with public health and safety. This will include identification of standards that are excessive or that add to housing cost without commensurate public benefit.

- ❑ Potential actions that could expand the City's supply of affordable housing might include permitting accessory units, incentives or requirements for a percentage of affordable units in new development proposals, small lot and zero lot line development, and flexible development standards to accommodate new housing forms.

Visual Quality and Design

- ❑ Improving urban design will be an important objective of the Comprehensive Plan. The preferred land use alternative will include clearly stated policies and guidelines that reflect residents' goals and expectations for improving visual quality and achieving an integrated design vision for the Federal Way. Clear design policies and guidelines are one way to mitigate potential land use conflicts. Zoning regulations will embody these policies and apply them to development and redevelopment proposals. The City may also consider alternatives for conducting design review (e.g. administrative or commission). Open space and capital facilities are other plan elements aimed at achieving a high level of quality and consistency in the City's visual appearance.
- ❑ A City Center element of the Comprehensive Plan will include policies and guidelines for desired physical improvements, design and amenities that will occur in the central business district. Implementation is likely to require a combination of public and private actions that focus on a consistent vision of how the City Center is intended to look and function. Techniques could include public-private partnerships and joint development, targeting infrastructure spending, and provision of economic incentives.

Capital Facilities/Transportation

- ❑ The EIS identifies a range of road improvements designed to improve traffic congestion, safety and mobility. The costs of these improvements, and revenues likely to be available to fund them, is identified in the *Fiscal Impacts* section of the Draft EIS. Ongoing traffic and financial planning will evaluate alternatives for levels of service and combined public and private financing of these improvements, consistent with the GMA.
- ❑ Decisions on a regional rail system will likely be made in 1994. The City will continue to make provision for a rail system (e.g. identify right-of-way corridors and station locations, etc.) in its planning. The potential transportation and land use effects of high capacity rail transit service to Federal Way and location of rail transit stations will be evaluated in the Final EIS. Similarly, the Final EIS will evaluate the implications of no rail system (to the City and region).
- ❑ Alternative level of service standards for parks and open space, and the costs of providing necessary facilities, will be further studied. The use of fees, dedications and other forms of private funding, as permitted by state law, and

public financing programs will be evaluated to determine equitable sharing of costs, timing and other issues.

- ❑ The City will continue to work cooperatively with other service providers, including the School District, Sewer and Water District, Fire District and Police Department. Capital improvement programs of each service provider will be coordinated with planned growth, consistent with state law and the mission of these special districts and departments.
- ❑ The Comprehensive Plan's Capital Facilities element will identify cumulative service and facility needs and provide a means for coordinating them with the plan's land use element. Ongoing monitoring and periodic Comprehensive Plan updates will provide a means to achieve concurrent provision of services and facilities with growth. Phasing or adjustments to the City's growth targets and land use plan, could become necessary if acceptable levels of service and funding for capital facilities cannot be achieved.
- ❑ The financial analysis for the Capital facilities element will include review of permitted financing sources, levels and techniques. The City's objective will be to develop a financing program that accommodates growth consistent with GMA requirements, does not place an unacceptable burden on taxpayers, and results in equitable sharing of costs as between existing development and new growth.

Public hearing program will be required to determine appropriate timing of public hearing and other matters.

The City will continue to work cooperatively with other agencies including the School District, Water and Sewer Department, Fire Department and Police Department. Capital improvement programs of self service programs will be consistent with financial growth consistent with state law and the intent of this special district and agreements.

The Comprehensive Plan's Capital Facilities element will identify capital facilities and facilities needs and provide for coordinating them with the plan's land use element. Through the planning and periodic Comprehensive Plan updates will provide a means to achieve consistent provision of services and facilities with growth. Specific adjustments to the City's growth taxes and land use plan could become necessary to adjust the level of service and funding for capital facilities cannot be achieved.

The financial analysis for the Capital Facilities element will include review of potential financing sources, levels and terms. The City's objective will be to develop a financing program that accommodates growth consistent with state law. This program also includes the burden of tax, fees, and levies in adjusting the level of service and funding for capital facilities cannot be achieved.

II. ALTERNATIVES, INCLUDING THE PROPOSED ACTION

A. PROPOSED ACTION AND PROJECT LOCATION

Proposed Action

The Proposed Action is adoption by the Federal Way City Council of a Comprehensive Plan to meet the requirements of the Growth Management Act (GMA). The purpose of the Plan is to articulate a vision for the City to provide guidance for future growth, and to identify issues of concern. The Comprehensive Plan will include elements on capital facilities and services, stormwater, economic development, land use, housing, park and recreation, natural environment and environmentally sensitive areas, potential annexation areas, transportation, and private utilities. Implementation measures will also be developed and adopted subsequent to adoption of the Plan. It will also contain a City Center plan, providing more detailed policies for this portion of the City.

This Draft EIS evaluates initial steps in the development of Federal Way's Comprehensive Plan, including three city-wide land use concept and three concepts for the City Center. This evaluation of environmental effects will be used by the City and the public to develop more detailed land use concepts, policies, zoning and implementation programs. The City's approach to integrating environmental review with its planning process is described more fully below.

Location of Planning Area

The City of Federal Way is located in south King County. It is approximately 19.9 square miles (12,736 acres) in area, configured as a triangle. It is generally bounded by Puget Sound on the west; Pacific Highway South and South 272nd Street on the north; I-5 on the east; and the King/Pierce County line on the south.

The geographic area included in the proposed Comprehensive Plan includes the existing corporate limits as well as adjacent unincorporated lands within the City's sphere of influence and which may be annexed in the future. This area, shown in Figure 1 is the City's interim planning area for purposes of comprehensive planning. It will be referred to in this document as the City's planning area.

The City's planning area covers approximately 32 square miles (20,407 acres); approximately 60 percent is within the present corporate limits and the balance is located in unincorporated King County. See Table 1. The largest portion of the unincorporated area is located east of I-5, extending from the City of Kent on the north to the City of Milton on the south. The Cities of Algona, Pacific and Auburn also abut the planning area on the east.

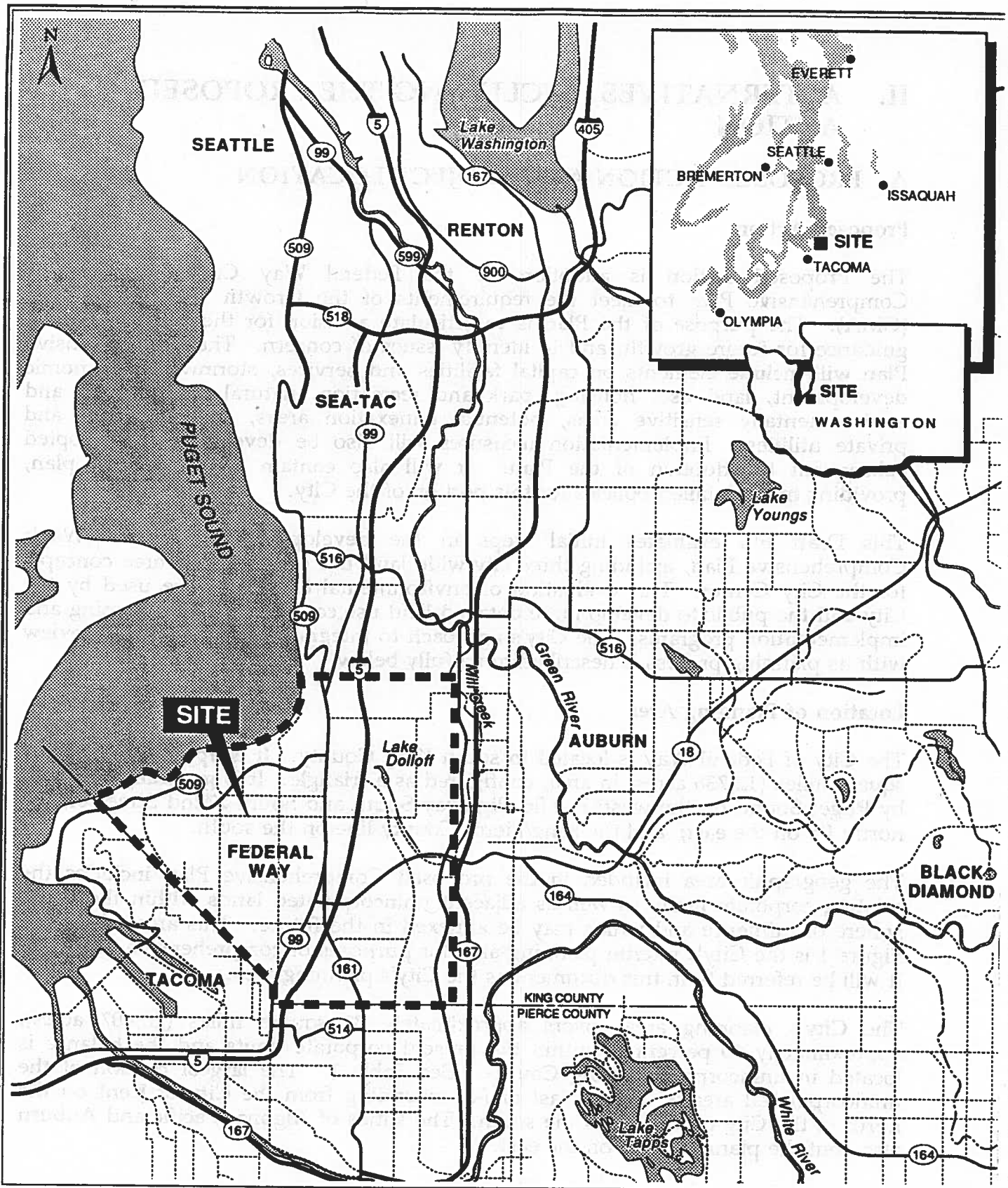


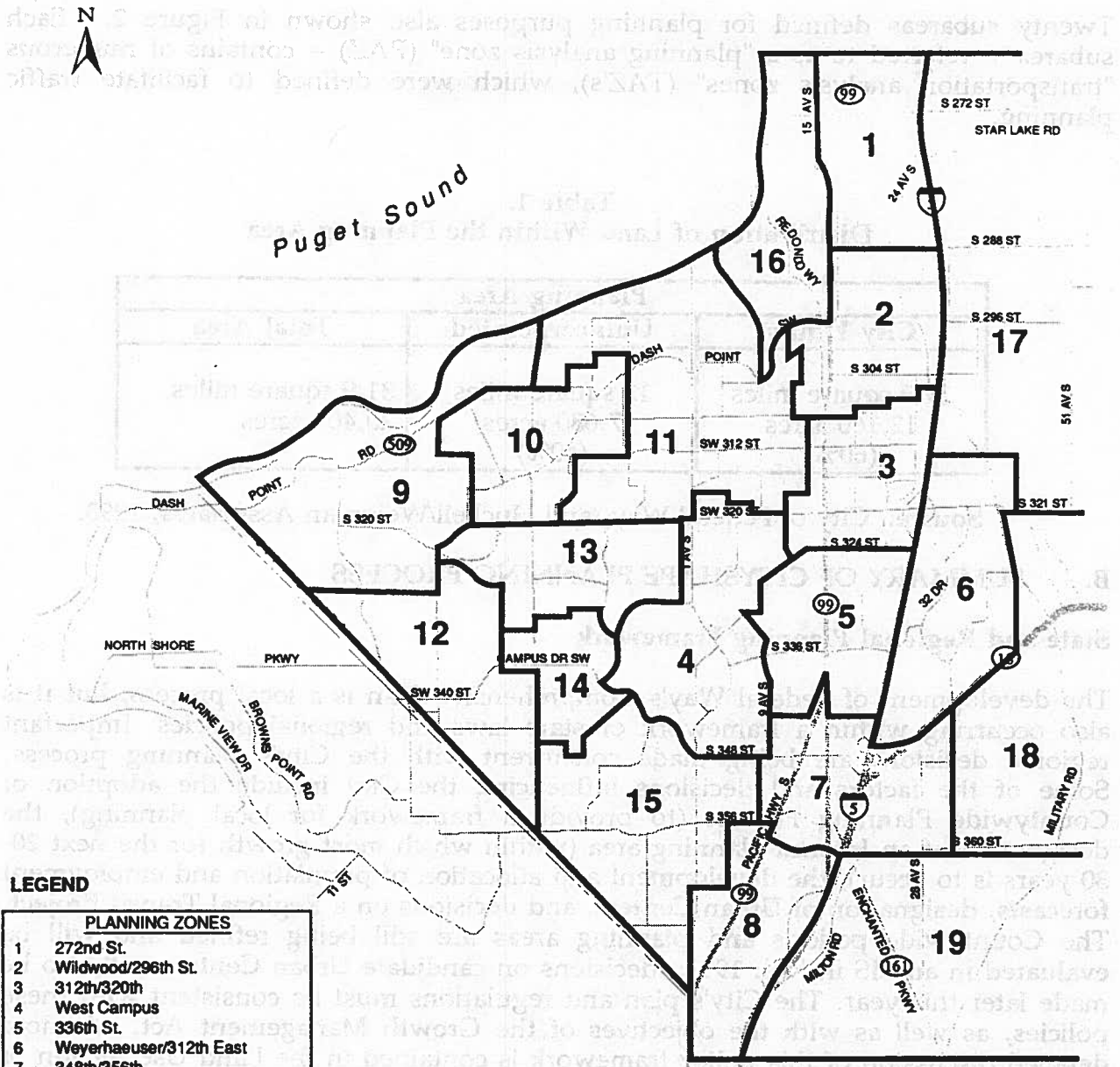
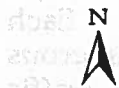
Figure 1

Location of Federal Way
Planning Area

Federal Way
Comprehensive
Plan EIS

CITYSHAPE

From Vision to Plan



LEGEND

| PLANNING ZONES | |
|----------------|--------------------------------|
| 1 | 272nd St. |
| 2 | Wildwood/296th St. |
| 3 | 312th/320th |
| 4 | West Campus |
| 5 | 336th St. |
| 6 | Weyerhaeuser/312th East |
| 7 | 348th/356th |
| 8 | South 99 |
| 9 | Dumas Bay |
| 10 | Lakota |
| 11 | Sacajawea |
| 12 | Olympic View |
| 13 | Twin Lakes |
| 14 | Twin Lakes Neighborhood Center |
| 15 | 356th West |
| 16 | Redondo |
| 17 | East Side North |
| 18 | East Side Central |
| 19 | East Side South |

1 Planning Zone (revised 11/2/93)

Source: City of Federal Way, *Comprehensive Plan*; S. KCGW Management Plan (1989); CityShape, *Land Use Alternatives for the Future*

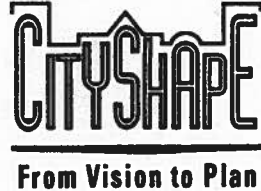


Figure 2
Planning Analysis Zones

Federal Way
Comprehensive
Plan EIS

Twenty subareas defined for planning purposes also shown in Figure 2. Each subarea -- referred to as a "planning analysis zone" (PAZ) -- contains of numerous "transportation analysis zones" (TAZ's), which were defined to facilitate traffic planning.

Table 1.
Distribution of Land Within the Planning Area

| Planning Area | | |
|--|---|-----------------------------------|
| City Limits | Unincorporated | Total Area |
| 19.9 square miles 12,160 acres (60%) | 12 square miles 7,680 acres (40%) | 31.9 square miles 20,407 acres |

Source: City of Federal Way, and Huckell/Weinman Associates, 1993.

B. SUMMARY OF CITYSHAPE PLANNING PROCESS

State and Regional Planning Framework

The development of Federal Way's Comprehensive Plan is a local process, but it is also occurring within a framework of state laws and regional policies. Important regional decisions are being made concurrent with the City's planning process. Some of the factors and decisions influencing the City include the adoption of Countywide Planning Policies (to provide a framework for local planning), the designation of an Interim planning area (within which most growth for the next 20-30 years is to occur), the development and allocation of population and employment forecasts, designation of Urban Centers, and decisions on a Regional Transit Project. The Countywide policies and planning areas are still being refined and will be evaluated in an EIS in Fall, 1993; decisions on candidate Urban Centers will also be made later this year. The City's plan and regulations must be consistent with these policies, as well as with the objectives of the Growth Management Act. A more detailed discussion of this policy framework is contained in the Land Use section of this Draft EIS.

CityShape

The City's process for developing its the Comprehensive Plan -- called "CityShape" -- began in April 1992. It integrates technical analysis with citizen participation and environmental review throughout the process. The process is intended to lead to adoption of a Comprehensive Plan (replacing the interim plan adopted when the city incorporated in 1990) that is consistent with the Growth Management Act and Countywide Policies and reflects a local vision of the community.

The principal steps for development of the plan include:

- Collect, publish and evaluate data about the community. Information collected to aid in planning includes demographics, growth trends and projections, economic scenarios, housing conditions, urban design issues, the location of important environmental features, and capital facility inventories. Collection of baseline data was the first step in the planning process, and was published in a *Community Profile* (City of Federal Way, 1993). The Profile also identifies challenges and opportunities and was used to help residents provide input on preferred visions for the community's future. Technical analysis of this data has generally been a joint effort of the City and its team of private contractors. It has included developing computer models to evaluate transportation systems and capital facilities to aid in planning.
- Incorporate ongoing citizen involvement into the planning process. A variety of opportunities for citizen involvement have been provided throughout the planning process, including appointment of a representative citizen's Coordinating Committee to oversee the project; workshops and open houses; and a public outreach program through the media and community-based organizations. The community's expressed preferences have been used as the basis of alternative "visions" of Federal Way's future.
- Develop and refine general land use and transportation concepts or "visions" including urban design options. The visions are based on economic development scenarios and public preferences.
- Solicit public reaction to the concepts with respect to economic performance, transportation efficiency and community values.
- Prepare and circulate a Draft EIS evaluating the environmental effects of the visions. This information will be used to help refine the visions and develop a preferred land use concept.
- Develop a preferred concept (including policies). The preferred concept will be based on preferences expressed in the workshops and open house, and on technical analysis, including the Draft EIS.
- Refine the preferred concept into a comprehensive land use and transportation plan, recommended zoning, guidelines, implementation and procedures using citizen input and environmental analysis.

Several elements of this process are described in more detail below.

CityShape Kickoff. The City formally launched the CityShape process at an open house at Sacajawea Junior High School, in September 1992. The meeting was designed to inform the public about preliminary findings on existing land use and traffic conditions, and to introduce broad concepts for developing a light rail system and a more intense City Center. This was the first formal event in the planning process, and citizen involvement has occurred continuously as a means to share information and to receive feedback and direction.

Economic Forecasts/Scenarios & City Center Design Concepts. Using public discussion at a workshop in February 1993, and through ongoing discussion with property owners and the Chamber of Commerce, the City's planning team prepared 20-year and 30-year economic growth scenarios. Each of the economic scenarios made different assumptions about the role of the City, the relative amounts of future retail, office, and industrial growth, and the function and shape of the City Center. Puget Sound Regional Council (PSRC) population forecasts were incorporated into the scenarios. The three visions for the future economy included:

1. continuation as a suburban bedroom community, surrounding a regional shopping center;
2. emergence of a City with a more intensively developed urban downtown (including high rise buildings), a mix of retail, residential and office uses, and a better balance between jobs and housing; and
3. an intensively developed, urban City Center (similar to (2)), with additional business park areas and residential communities north and south of the downtown, and a City that functions as a major employment center.

These economic scenarios, in turn, helped shape alternative land use concepts.

Plan Objectives and Issues. In addition to compliance with GMA, the general objectives of the Comprehensive Plan -- identified during the early stages of the planning process -- include:

- Providing adequate land to accommodate population and economic growth;
- Defining necessary community facilities to match planned growth;
- Facilitating development of a high quality city center to meet community needs;
- Developing a land use pattern that reduces traffic congestion and supports mass transit;
- Encouraging development that provides high quality built and natural environments; and
- Identifying neighborhood centers and the range of uses appropriate to these areas;

These objectives will be addressed in the Comprehensive Plan and subsequent implementation programs.:

Identification of Land Use Concepts. Based upon economic forecasts, data gathered for the *Community Profile*, public input, direction from the City's Coordinating Committee, and a public open house meeting on March 10, 1993, four preliminary land use concepts were identified and described in the *CityShape* document (City of Federal Way, 1993). The broad concepts are intended to promote public discussion

of options, testing their ability to address major issues and objectives, early evaluation of environmental impacts, and, identification/refinement of a "preferred" land use concept.

Three of the concepts are evaluated in this Draft EIS. A fourth preliminary concept was eliminated from further consideration because of its inability to accommodate forecast population growth, the potential to generate significant adverse environmental impacts on sensitive areas (wetlands and fish-bearing streams), and the likelihood it would divert economic momentum away from the city center.

Identification of broad land use options also paralleled two related efforts: development of three city center design concepts, to change the function, appearance and vitality of the downtown; and development of transportation concepts, aimed at relieving traffic congestion and providing for mass transit.

Each city center concept contains a preliminary design element which presents a general vision of how portions of the downtown could be redeveloped. The design concepts -- which were reviewed by the public at an open house on May 5, 1993 -- indicate a functional layout of the downtown, including key features (e.g., a civic plaza), transportation facilities, and other land use features supporting a mix of retail and employment uses (e.g., housing, areas of mixed use, transit station areas, job growth, etc.). Two of the City Center (and Land Use) Concepts would achieve densities that support light rail transit, consistent with the Countywide Planning Policies and the Regional Transit Program. The Comprehensive Plan will contain a subarea plan dealing specifically with the city center.

Initial transportation planning efforts were focused on relieving congestion through road improvements and developing opportunities for mass transit. A sophisticated computer model has been used to forecast growth in travel demand over the next 20 to 30 years. This transportation model is also being used to evaluate a range of future street and highway improvements and their potential to improve traffic flow. The preliminary transportation strategies and proposed road improvements were reviewed by the public at an open house on June 2, 1993.

Capital Facilities. Each plan concept require the construction of capital facilities necessary to accommodate future growth. The City developed a capital facilities program model to help identify the capital facilities, costs and financial strategies (i.e. mixes of taxes, bonding and impact fees) associated with each land use concept and different levels of service. A Capital Facilities Plan Forum, held on June 22, 1993, developed consensus on levels of service for parks/open space and transportation facilities, and a general funding strategy. Capital facilities planning will continue to evolve in tandem with the land use element.

C. INTEGRATION OF STATE ENVIRONMENTAL POLICY ACT AND THE CITYSHAPE PLANNING PROCESS

Scope of Action, Phased Environmental Review. The proposed action involves development and legislative adoption of a Comprehensive Plan for the City of Federal Way. No specific physical development is proposed as part of the present action. As defined by the State Environmental Policy Act (SEPA), the action is "non-

project" in nature (WAC 197-11-774); non-project activities include legislative adoption of plans, policies, regulations and similar programs. As discussed in the SEPA Rules, EISs on non-project actions are intended to be flexible tools that promote understanding of environmental trade-offs among alternative courses of action (WAC 197-11-442).

The proposed action will not involve direct physical changes or impacts to the environment. The Comprehensive Plan and subsequent implementation actions will, however, establish a framework within which future growth and development will occur.

The proposed action involves phased environmental review pursuant to the amended provisions of the SEPA Rules (WAC 197-11-060(5)). This Draft EIS is one of a series of environmental documents published during the comprehensive planning process. Future environmental review will encompass zoning maps and text and other regulatory programs necessary to implement the plan.

The intent of phased review is to help agencies and the public identify the broad outline of a proposal (or series of proposals) and evaluate environmental impacts for issues that can reasonably be identified. In this manner, the type and detail of environmental review can be tailored to the specificity of a proposal. This approach can be especially useful for programmatic EISs, where proposals are initially broad, general and conceptual in nature, but will be implemented by more specific actions or proposals in the future. Environmental review for future actions – which can include narrower non-project actions or specific development projects – can then focus on more site-specific and detailed issues. Phased review helps ensure that environmental analysis can identify cumulative impacts in the early stages of a planning program. A phased approach can also help make environmental review reflect the numerous, sequential steps taken in developing a comprehensive land use plan.

Integrating SEPA and the Comprehensive Plan. The EIS on Federal Way's comprehensive plan is intended to help decision makers and the public understand the environmental effects of alternative community visions, including different land use patterns, city center concepts, service standards and similar choices related to future growth. Federal Way has developed a specific strategy for coordinating SEPA with the Comprehensive Plan. The intent of the strategy is to better integrate environmental information with the development of plan concepts and policies, and with public involvement. The strategy is founded on provisions in the SEPA rules relating to the purpose, timing, content and phasing of environmental review (WAC 197-11-055, 197-11-060(3)-(5), and 197-11-442); the Department of Community Development's (DCD) proposed Procedural Criteria for Implementing the Growth Management Act (WAC 365-195-760); recommendations in recent guidebooks published by the Department of Ecology (*The Growth Management Act and State Environmental Policy Act: A Guide to Interrelationships*, 1992) and DCD (*SEPA/GMA Workbook*, 1993); and assistance from experts in SEPA compliance.

In the past, non-project environmental review often did not commence until a land use plan, policies and zoning were substantially completed; environmental input in

development of the plan -- via impact analysis and citizen or agency comment -- was generally limited until a preferred plan was proposed for formal legislative action.

In contrast, Federal Way's integrated approach to SEPA compliance and planning will foster on-going environmental review that begins during the early stages of plan development -- when broad concepts and community visions are being formulated and debated. An integrated SEPA/planning process will also create links between citizen involvement, planning and SEPA. Environmental information about different courses of action and possible trade-offs can help interested citizens identify their concerns, which can then be addressed in subsequent environmental documents and in the plan itself.

This integrated approach will be embodied in environmental documents prepared on the Comprehensive Plan. This Draft EIS evaluates three potential concepts or visions for the City's future growth, including three city center alternatives. It focuses on general goals and objectives (based on the GMA and Countywide Planning Polices); broad land use patterns; standards/costs for providing public services (including potential road system improvements); and similar big picture issues. The Draft EIS also identifies a range of possible mitigation measures and implementation approaches.

Using the information in the Draft EIS and citizen and agency comment on the document, the City will then define a "preferred" alternative. At the same time, it will develop draft policies for the various elements of the plan (e.g. land use, housing, capital facilities), and a detailed land use map. The preferred alternative will likely be a combination and refinement of several of the broad concepts articulated in the initial plan visions and analyzed in this EIS.

The Final EIS will contain additional environmental analysis, as appropriate, specific to the "preferred" alternative, including proposed policies and more concrete implementation strategies and mitigation measures. It will also respond to comments from agencies and citizens on the Draft EIS. Because of these refinements, preparation of the Final EIS will require longer than the 60 days suggested by the SEPA rules. A longer period is, however, consistent with the greater flexibility afforded for non-project EISs (WAC 197-11-442(1)), and with the SEPA/planning integration approaches recommended by DCD and DOE (see the documents referenced above).

As currently envisioned, the Final EIS will be published in two stages. A preliminary (pre-publication) Final EIS will accompany the draft plan through the Planning Commission's hearing process and deliberations. New information generated during public hearings, and any recommended changes to the plan or zoning, will be incorporated into the Final EIS; additional analysis will be conducted in response to substantive changes. The Final EIS will then be completed and published before formal action on the plan is taken by the City Council. This staged approach is intended to provide structured opportunities for environmental review of plan refinements and additional citizen comments.

D. LAND USE AND CITY CENTER CONCEPTS

Background: Existing Conditions and Land Use Patterns

The Federal Way planning area currently supports a wide variety of residential, commercial, industrial activities, as well as parks, open space, and community facilities. The City's 1992 population was approximately 72,350 (King County, 1993) and employment was estimated at almost 22,000. During the 1980's, the population of the City almost doubled; historical population growth is described in the *Land Use* section. As of 1992, Federal Way was the sixth largest city in the state. Total 1990 population for the planning area (incorporated and unincorporated) was estimated at 98,600.

The current mix of land uses in the planning area is shown in Figure 3 and Table 2. Residences are the predominant land use in Federal Way. Currently, there are 37,762 dwelling units, 24,408 of which are single family (64.6 percent of the total) and 13,354 multifamily (35.4 percent of the total) (Federal Way, 1993). Single family residential uses are relatively evenly dispersed throughout the planning area and occupy the majority of the City's land base. Higher density residential development (including apartments, condominiums, and manufactured housing) are primarily located along Pacific Highway South, in the West Campus and Twin Lakes areas, and west of Interstate 5 in the vicinity of South 272nd and 288th Streets.

Table 2.
Existing Land Uses

| Land Use | City Limits | Unincorporated North & West of City | Planning East of City | Total Planning Area |
|-------------------------|--------------|-------------------------------------|-----------------------|---------------------|
| Residential: | | | | |
| Single Family | 14,199 du | 2,467 du | 7,742 du | 24,408 du |
| Multifamily | 9,331 du | 3,252 du | 781 du | 13,354 du |
| Subtotal | 23,530 du | 5,713 du | 8,523 du | 37,762 du |
| Commercial/Ind. | | | | |
| Manufacturing | 2,009,000 sf | 153,000 sf | 475,000 sf | 2,637,000 sf |
| Office | 2,472,000 sf | 60,000 sf | 370,000 sf | 2,902,000 sf |
| Retail | 3,975,000 sf | 234,000 sf | 15,000 sf | 4,224,000 sf |
| Subtotal | 8,456,000 sf | 447,000 sf | 860,000 sf | 9,763,000 sf |
| Government Svcs. | 2,366,000 sf | 241,000 sf | 682,000 sf | 3,289,000 sf |
| Park/Open Space | 659 ac | 5 ac | 34 ac | 698 ac |

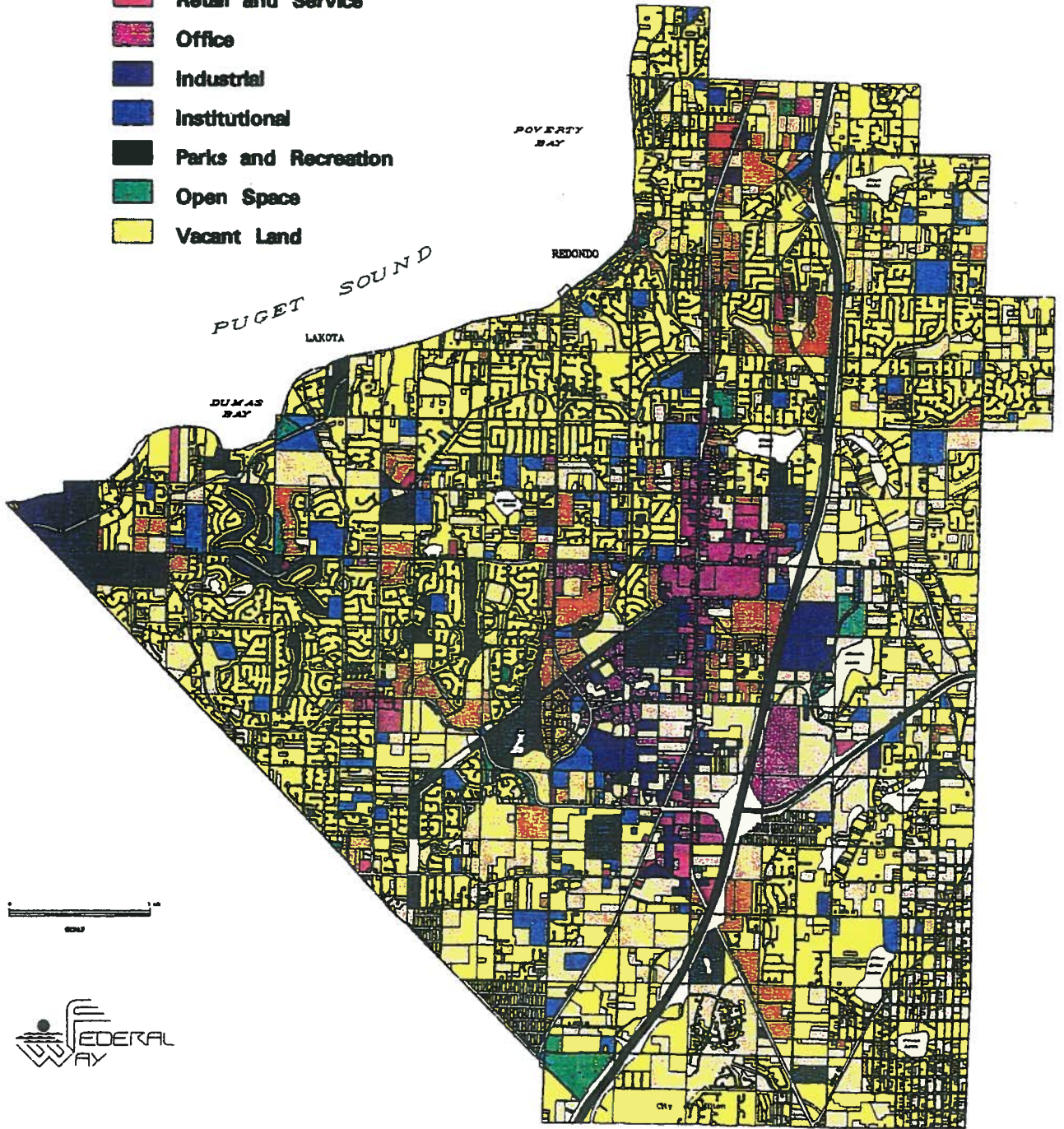
Legend: du = dwelling units, sf = square feet of building area

Source: Makers, Huckell/Weinman Associates, 1993



Land Uses

-  **Single Family**
-  **Multi-Family**
-  **Retail and Service**
-  **Office**
-  **Industrial**
-  **Institutional**
-  **Parks and Recreation**
-  **Open Space**
-  **Vacant Land**



From Vision to Plan

Figure 3

Existing Land Use

Federal Way
Comprehensive
Plan EIS



South 320th Street, from the west side of Pacific Highway South to Interstate 5, is the City's focus of commercial activity. It is predominantly a retail area with some office uses. Major developments include SeaTac Mall, Century City, SeaTac Village, Center Plaza, Evergreen Plaza, and Gateway Center. Federal Shopping Way is located to the north of this area. Additional commercial activity extends in a strip pattern along Pacific Highway South north and south of the SeaTac Mall area. Several neighborhood-scale commercial centers are located within residential areas. Retail uses represent almost one-half of total commercial and industrial floor area within the City.

Concentrations of office uses are located adjacent to the SeaTac Mall area, within West Campus and the Weyerhaeuser headquarters area. Office uses currently represent about 26 percent of total city-wide commercial/industrial floor area.

Industrial and manufacturing activity occurs primarily in the area bounded by Pacific Highway South, 16th Avenue South and South 356th Street on the west side of I-5, and also around the Weyerhaeuser headquarters east of I-5. Industrial uses currently represent about 27 percent of total commercial floor area.

Unincorporated portions of the planning area are predominantly single-family residential in character. Significant concentrations of commercial activity occur at Weyerhaeuser corporate headquarters and along Pacific Highway. Urban activity centers adjacent to the planning area include the cities of Kent, Auburn, Des Moines, Pacific, Algona, Milton, and Tacoma.

The planning area contains 698 acres of parks and open space, most of which are located within the City's boundaries. The largest parks include Dash Point State Park and Dumas Bay Park, (both located along Puget Sound), Steel Lake Park, Hylebos State Park and Celebration Park (undeveloped).

Interim Comprehensive Plan

Federal Way's interim Comprehensive Plan was adopted in 1990, at the time the City was incorporated. The plan contemplated future updates. The interim Plan contains policies and maps addressing the following issues:

- natural environment – groundwater, surface water (including wetlands, streams, lakes, and fish-bearing waters), water quality, wildlife habitat, landslide hazards, and seismic areas);
- population and housing;
- commercial and industrial activities;
- land use classifications;
- open space;
- circulation, including funding sources, functional classifications of streets, and roadway standards; and
- implementation, addressing programmatic needs for the natural environment, housing, land use, open space, and transportation elements.

The interim plan was adopted prior to enactment of the Growth Management Act. As a result, it is not consistent with some GMA objectives and Countywide Planning

Policies. In particular, the interim plan (and implementing zoning) does not provide adequate capacity to accommodate 20-year forecasts of population and housing growth. They would also allow commercial development to continue to sprawl along Pacific Highway South; would not achieve an identifiable pedestrian-oriented central core; and would continue Federal Way's functioning as a suburban bedroom community.

Preliminary Land Use Concepts

Introduction

Three preliminary land use concepts and three city center concepts were identified and refined during the Cityshape process and are evaluated in this Draft EIS. These concepts are described below and shown in Figures 5, 7 and 9. Each land use concept is combined with a city center concept for purposes of description and environmental analysis. The concepts include:

- Concept 1 - existing trends and policies, modified to achieve consistency with GMA (a baseline alternative);
- Concept 2 - High Intensity City Center Emphasis; and
- Concept 3 - Strong City Center with Business Park.

The major differences and similarities are summarized below. A comparison of development capacity among the concepts is contained in Table 3.

The land use and city center concepts provide a range of possible courses of action for the City and describe the environmental and other tradeoffs that would be related to each. They are also intended to be reasonable (albeit preliminary) visions of how the City could develop in the next 20-to-30 years. Each is designed to enable the City to comply with the requirements of the GMA and to fit within the framework established by the Countywide Planning Policies (King County, 1992). The City has not attempted to construct concepts that serve merely as theoretical benchmarks for environmental analysis (for example, a low density residential concept). Taking literally no action at all, for example, would not be consistent with state legal mandates (as discussed above) and is not, therefore, a reasonable alternative under SEPA within the context of the GMA. Concept 1, which incorporates the minimum actions necessary to address GMA requirements, comes closest to representing a traditional "no action" alternative for SEPA analysis. Given the planning and analytic process being used to develop the City's comprehensive plan – involving extensive citizen involvement and integrated environmental analysis – the identified concepts represent a reasonable range of alternatives as required by SEPA (WAC 197-11-440(5)).

Each land use concept also contains a city center design concept, shown in Figures 6, 8 and 10. These design concepts present a general vision of how portions of a central business district – generally extending from South 312th Street to South 324th Street, and focused around Pacific Highway South and SeaTac Mall – could be developed in the next 20-30 years. They show alternatives for functional layout of a

downtown area, noting key civic features, transportation facilities, concentrations of office use and housing, and other focal points. They also provide a sense of the scale and density of future development within the downtown; incorporate different mixes and intensity of uses, varying capital improvements; show different combinations of economic functions; and create different senses of place.

It should be noted that City Center Design Concepts 2 and 3 could be interchanged - that is, City Center Concept 2 could be paired with Land Use Concept 3, and City Center Concept 3 could be paired with Land Use Concept 2. Both land Use Concepts contain adequate capacity (in terms of vacant and redevelopable land) to accommodate either City Center Concept.

Common Objectives and Land Use Patterns

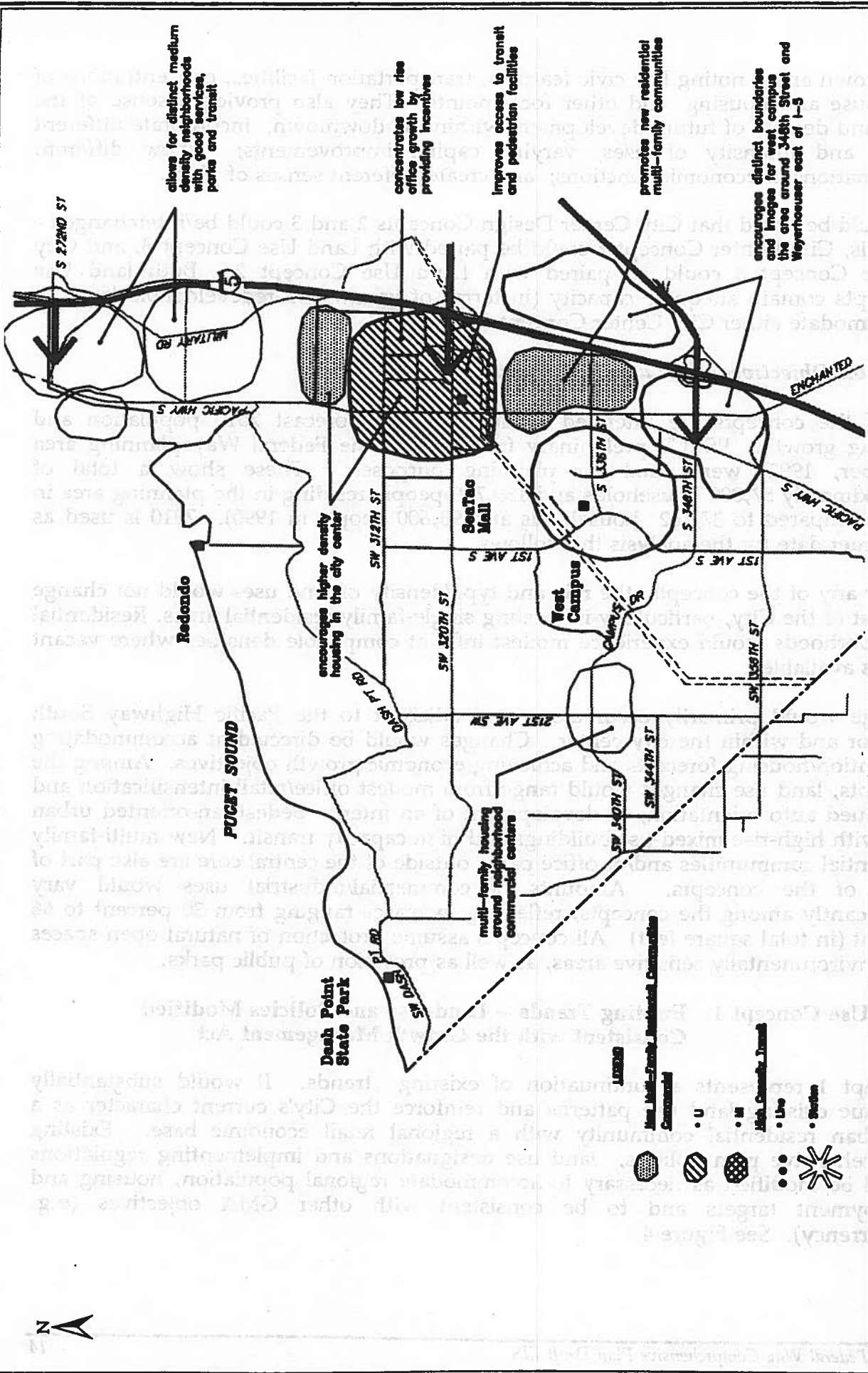
All of the concepts are intended to accommodate forecast 2010 population and housing growth. PSRC's preliminary forecasts for the Federal Way planning area (October, 1992) were used for planning purposes. These show a total of approximately 57,000 households and 139,700 people residing in the planning area in 2010 (compared to 37,762 households and 98,600 people in 1990). 2010 is used as the target date for the analysis that follows.

Under any of the concepts, the mix and type/density of land uses would not change in most of the City, particularly in existing single-family residential areas. Residential neighborhoods would experience modest infill at compatible densities where vacant land is available.

Change would primarily occur along and adjacent to the Pacific Highway South corridor and within the city center. Changes would be directed at accommodating population/housing forecasts and achieving economic growth objectives. Among the concepts, land use changes would range from modest office/retail intensification and continued auto orientation, to development of an intense pedestrian-oriented urban core with high-rise mixed-use buildings and high capacity transit. New multi-family residential communities and/or office parks outside of the central core are also part of some of the concepts. Amounts of commercial/industrial uses would vary significantly among the concepts, reflecting increases ranging from 30 percent to 66 percent (in total square feet). All concepts assume protection of natural open spaces and environmentally sensitive areas, as well as provision of public parks.

Land Use Concept 1: Existing Trends -- Land Use and Policies Modified Consistent with the Growth Management Act

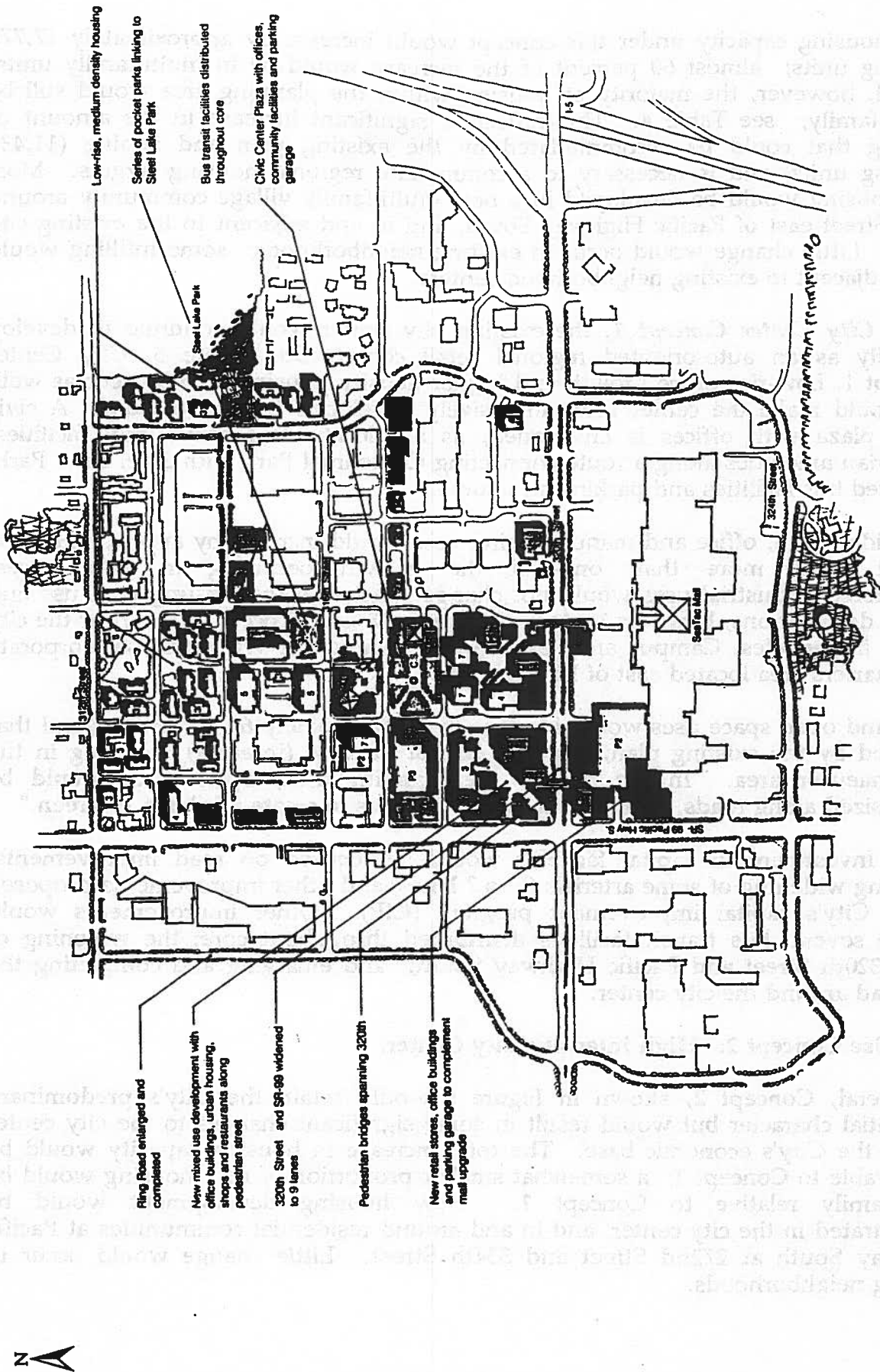
Concept 1 represents a continuation of existing trends. It would substantially continue existing land use patterns and reinforce the City's current character as a suburban residential community with a regional retail economic base. Existing comprehensive plan policies, land use designations and implementing regulations would be modified as necessary to accommodate regional population, housing and employment targets and to be consistent with other GMA objectives (e.g. concurrency). See Figure 4.



CITYSHAPE

From Vision to Plan

Figure 4
Land Use Concept 1



Low-rise, medium density housing

Series of pocket parks linking to Steel Lake Park

Bus transit facilities distributed throughout core

Civic Center Plaza with offices, community facilities and parking garage

Ring Road enlarged and completed

New mixed use development with office buildings, urban housing, shops and restaurants along pedestrian street

320th Street and SR-89 widened to 9 lanes

Pedestrian bridges spanning 320th

New retail stores, office buildings and parking garage to complement mall upgrade

Figure 5
City Center Concept 1

Total housing capacity under this concept would increase by approximately 17,770 dwelling units; almost 60 percent of the increase would be in multi-family units. Overall, however, the majority of housing within the planning area would still be single family; see Table 4. This reflects a significant increase in the amount of housing that could be accommodated by the existing plan and zoning (11,432 dwelling units) and is necessary to accommodate regional housing targets. Most new housing would be developed in a new multi-family village community around 336th Street east of Pacific Highway South, and in and adjacent to the existing city center. Little change would occur in existing neighborhoods; some infilling would occur adjacent to existing neighborhood centers.

Under *City Center Concept 1*, the existing city center would continue to develop primarily as an auto-oriented regional retail center. See Figure 5, City Center Concept 1. Low-rise office growth and higher density housing would occur as well, and would make the center more intensively developed than at present. A civic center plaza with offices is envisioned, as are location of community facilities, pedestrian amenities along a route connecting Centennial Park with Steel Lake Park, improved bus facilities and parking structures.

City-wide, retail, office and manufacturing uses would increase by approximately 30 percent, with more than one-half the growth occurring in office uses. (Commercial/industrial uses would not change relative to the existing land use and zoning designations, however.) Most of the growth would occur in and near the city center, in the West Campus area, and in and around the Weyerhaeuser corporate headquarters area located east of I-5.

Parks and open space uses would increase by approximately 61 percent beyond that provided by the existing plan, with the largest increase (in acres) occurring in the Weyerhaeuser area. In the rest of the planning area, open space would be emphasized along roads, ravines and similar features to create a "ribbon of green."

Public Investment in capital facilities would be focused on road improvements, including widening of some arterials (5 to 7 lanes) and other improvements proposed in the City's capital improvement program (CIP). Other improvements would include several bus transit facilities distributed throughout core; the widening of South 320th Street and Pacific Highway South; and enlarging and completing the ring road around the city center.

Land Use Concept 2: High intensity City Center.

In general, Concept 2, shown in Figure 6 would retain the City's predominant residential character but would result in some significant changes to the city center and to the City's economic base. The total increase in housing capacity would be comparable to Concept 1; a somewhat smaller proportion of new housing would be multi-family relative to Concept 1. New housing development would be concentrated in the city center, and in and around residential communities at Pacific Highway South at 272nd Street and 334th Street. Little change would occur in existing neighborhoods.

**Table 3.
Comparison of Land Use Concepts for
Federal Way Planning Area**

| Land Use | Existing Development | -----New Concept 1 | Development Concept 2 | Capacity ----- Concept 3 |
|---------------------|---------------------------------|-------------------------------|----------------------------------|-------------------------------------|
| Residential: | | | | |
| Single-fam | 24,408 DU's | 7,363 DU's | 7,402 DU's | 6,886 DU's |
| Multi-fam | 13,354 DU's | 10,407 DU's | 10,361 DU's | 10,877 DU's |
| Subtotal | 37,762 DU's | 17,770 DU's | 17,763 DU's | 17,763 DU's |
| Comm/Indust. | | | | |
| Manufact. | 2,637,000 SF | 600,000 SF | 600,000 SF | 1,100,000 SF |
| Office | 2,535,000 SF | 1,600,000 SF | 2,600,000 SF | 4,000,000 SF |
| Retail | 4,591,000 SF | 720,000 SF | 720,000 SF | 1,300,000 SF |
| Subtotal | 9,764,000 SF | 2,920,000 SF | 3,920,000 SF | 6,400,000 SF |
| Park/OS | 698 AC | 405 AC | 426 AC | 426 AC |
| Schools | 8 | 14 | 14 | 14 |
| Commun. Svcs | 3,289,000 SF | 1,005,000 SF | 1,005,000 SF | 965,000 SF |
| Govt. Svcs. | 435,000 SF | 715,000 SF | 775,000 SF | 775,000 SF |

Notes:

1. Acreage figures rounded to nearest five acres; differences in totals due to rounding.
2. The Manufacturing category includes business parks (which include office uses), and SIC categories encompassing wholesale trade, transportation, communication and utilities.
3. The Community Services category include such uses as churches, meeting halls, lodges, day care facilities, etc.
4. Government Services includes fire stations, libraries, city hall, utility facilities, hospitals, and similar uses.

Sources: City of Federal Way, Huckell/Weinman Associates, Inc.

**Table 4.
Mix of Housing Units in Planning Area**

| | ----- Total Units ----- | |
|-----------------------------|--------------------------------|---------------------|
| | Single Family | Multi-family |
| Existing Development | 24,408 (65%) | 23,761 (35%) |
| Concept 1 | 31,770 (57%) | 23,761 (43%) |
| Concept 2 | 31,810 (57%) | 23,715 (43%) |
| Concept 3 | 31,092 (56%) | 24,231 (44%) |

Source: City of Federal Way, Huckell/Weinman Associates, Inc.

Total non-residential uses would be significantly (one million square feet) greater than in Concept 1. All of the difference would occur in office uses located in the city center or in the Weyerhaeuser area (east of I-5); manufacturing and retail uses would increase the same as in Concept 1. Overall, the City would achieve a greater

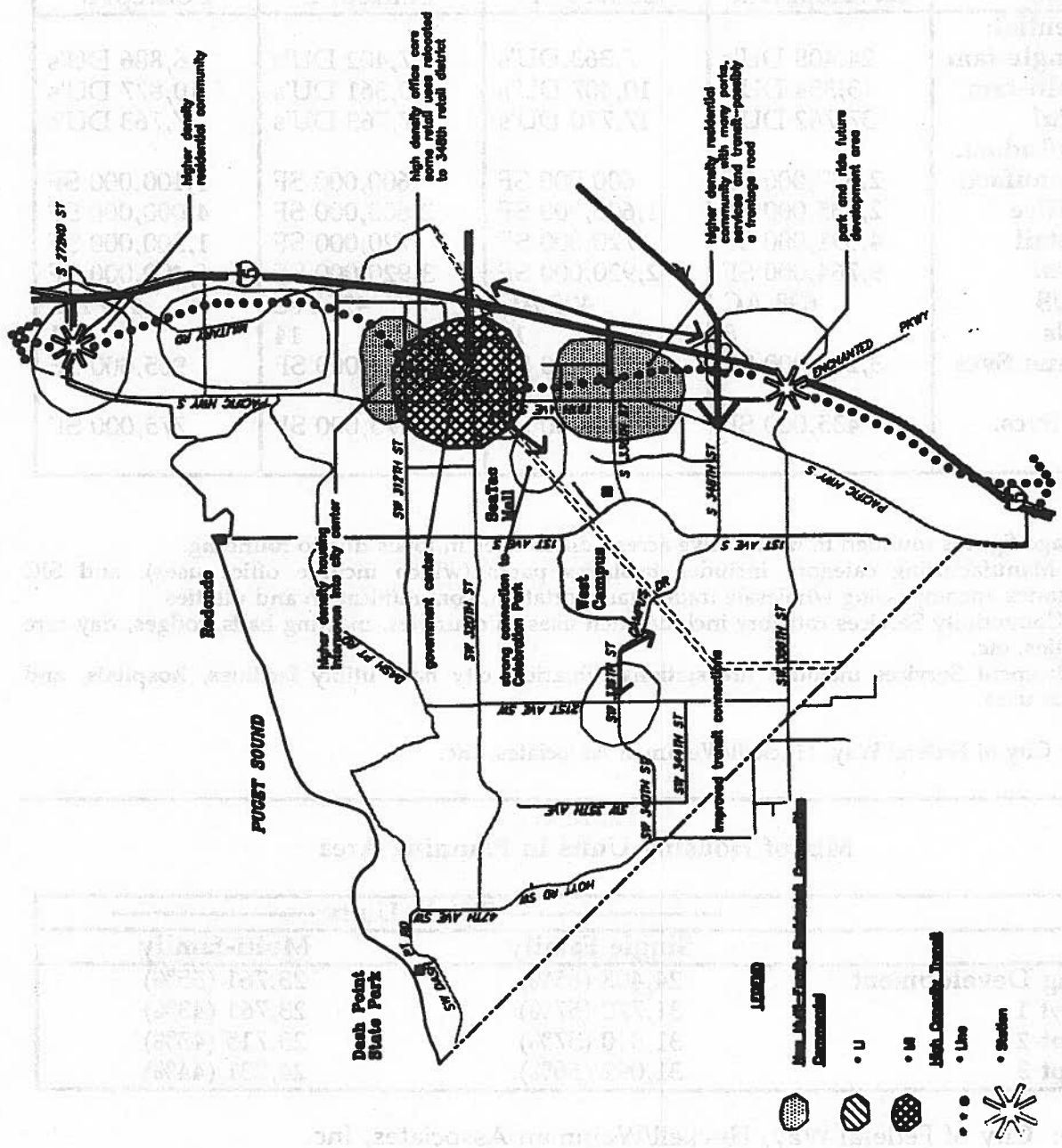


Figure 6
Land Use Concept 2

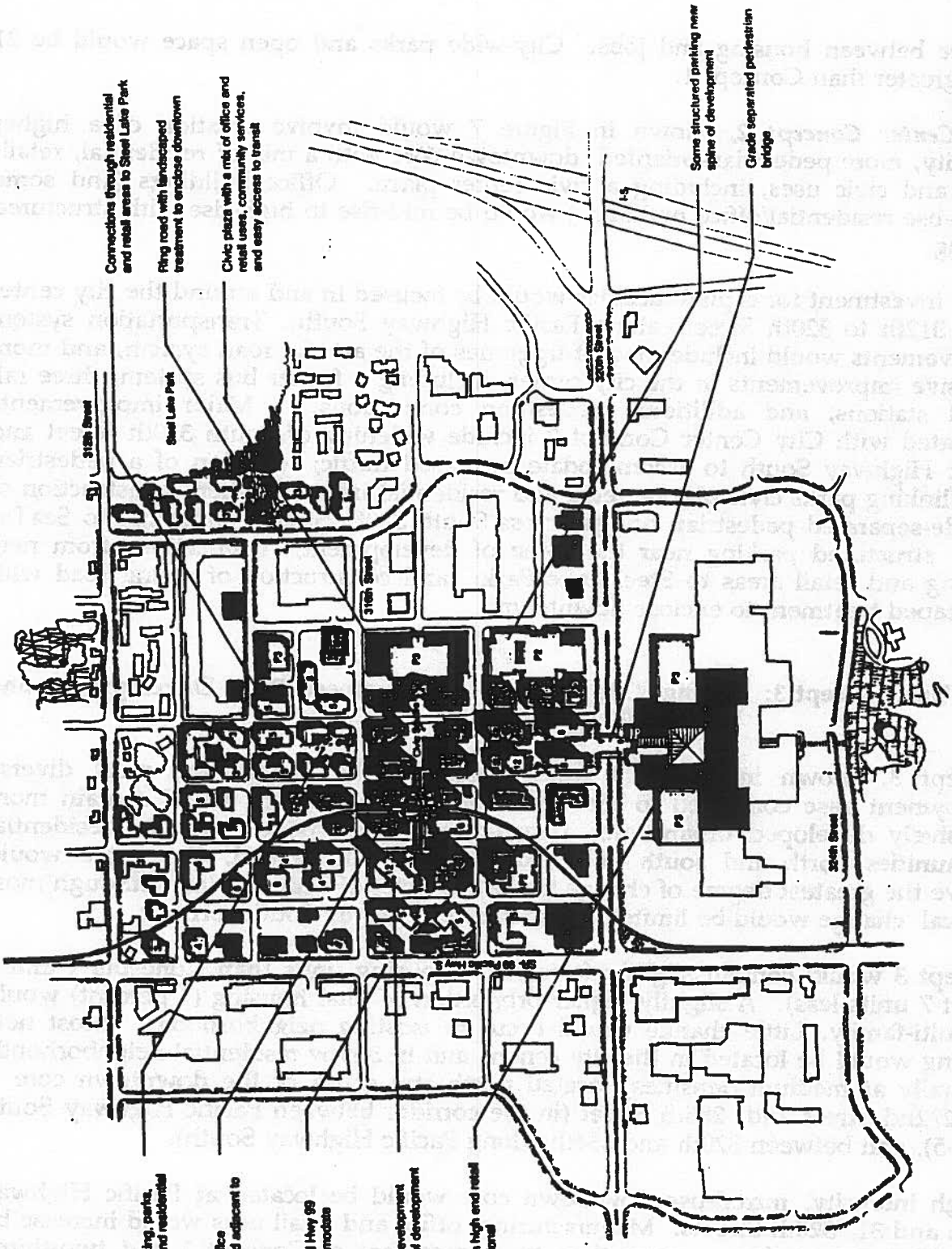


Figure 7

City Center Concept 2

balance between housing and jobs. City-wide parks and open space would be 21 acres greater than Concept 1.

City Center Concept 2, shown in Figure 7 would involve creation of a higher intensity, more pedestrian-oriented downtown core with a mix of residential, retail, office and civic uses, including a civic center plaza. Office buildings (and some mixed-use residential/office buildings) would be mid-rise to high-rise with structured parking.

Public investment for capital facilities would be focused in and around the city center (from 312th to 320th Streets along Pacific Highway South). Transportation system improvements would include modest upgrades of the arterial road system, and more extensive improvements in the city center, including a feeder bus system, three rail transit stations, and additional pedestrian connections. Major improvements associated with City Center Concept 2 include widening of South 320th Street and Pacific Highway South to accommodate increased traffic; creation of a pedestrian spine linking parks civic plazas, retail and residential uses, together; construction of a grade-separated pedestrian bridge across South 320th Street connecting to SeaTac Mall; structured parking near the spine of development; connections from new housing and retail areas to Steel Lake Park; and construction of a ring road with landscaped treatment to enclose downtown.

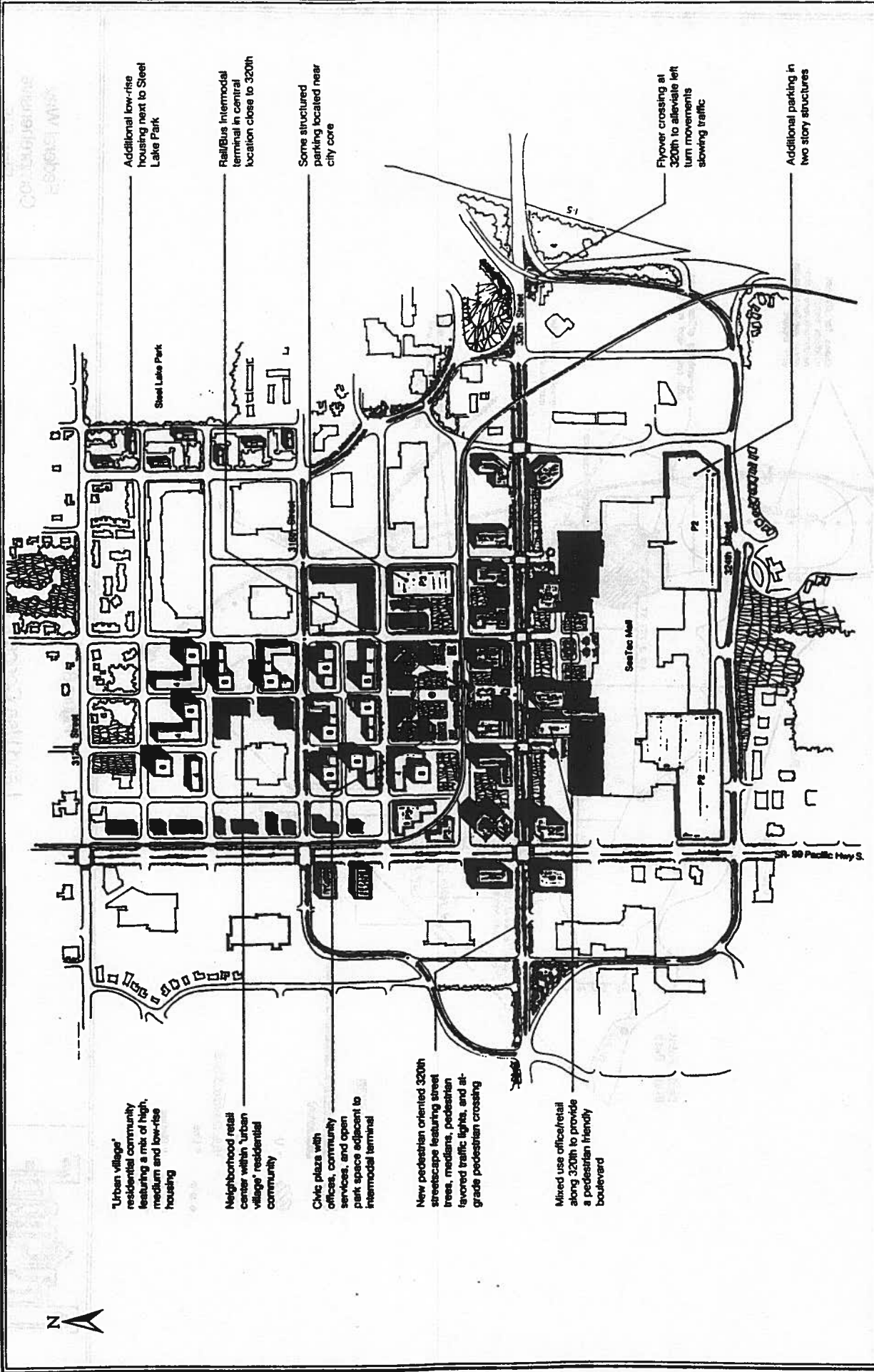
Land Use Concept 3: Strong City Center with Business Park Development and Urban Villages.

Concept 3, shown in Figure 8 would result in the largest and most diverse employment base compared to the other concepts. The City would contain more intensively developed urban core, a major new office park, and new residential communities north and south of the downtown. In general, Concept 3 would involve the greatest degree of change to the character of Federal Way, although most physical change would be limited to the Pacific Highway South corridor.

Concept 3 would contain slightly fewer new housing units than Concepts 1 and 2 (about 7 units less). A slightly higher proportion of total housing (1 percent) would be multi-family. Little change would occur in existing neighborhoods. Most new housing would be located in the city center, and in 3 new residential neighborhoods (generally at medium densities) located north and south of the downtown core — near 272nd Street and 288th Street (in the corridor between Pacific Highway South and I-5), and between 320th and 334th (along Pacific Highway South).

A high intensity, mixed-use downtown core would be located at Pacific Highway South and 312/320th Streets. Manufacturing, office and retail uses would increase by 6.4 million square feet — more than two times that of Concept 1 and two-thirds greater than Concept 2. High-rise and mid-rise buildings would contain a mix of retail, office and residential uses. A new business park area would also be located south of the downtown core near the South 336th/348th Street areas.

City Center Concept 3 is shown in Figure 9. Development in the downtown core would contain a mix of high-rise and mid-rise office/retail uses, high-rise housing



Additional low-rise housing next to Steel Lake Park

Rail/Bus Intermodal terminal in central location close to 320th

Some structured parking located near city core

Flyover crossing at 320th to alleviate left turn movements slowing traffic

Additional parking in two story structures

'Urban village' residential community featuring a mix of high, medium and low-rise housing

Neighborhood retail center within 'urban village' residential community

Civic plaza with offices, community services, and open park space adjacent to intermodal terminal

New pedestrian oriented 320th streetscape featuring street trees, medians, pedestrian ignored traffic lights, and at-grade pedestrian crossing

Mixed use office/retail along 320th to provide a pedestrian friendly boulevard

Figure 9

City Center Concept 3

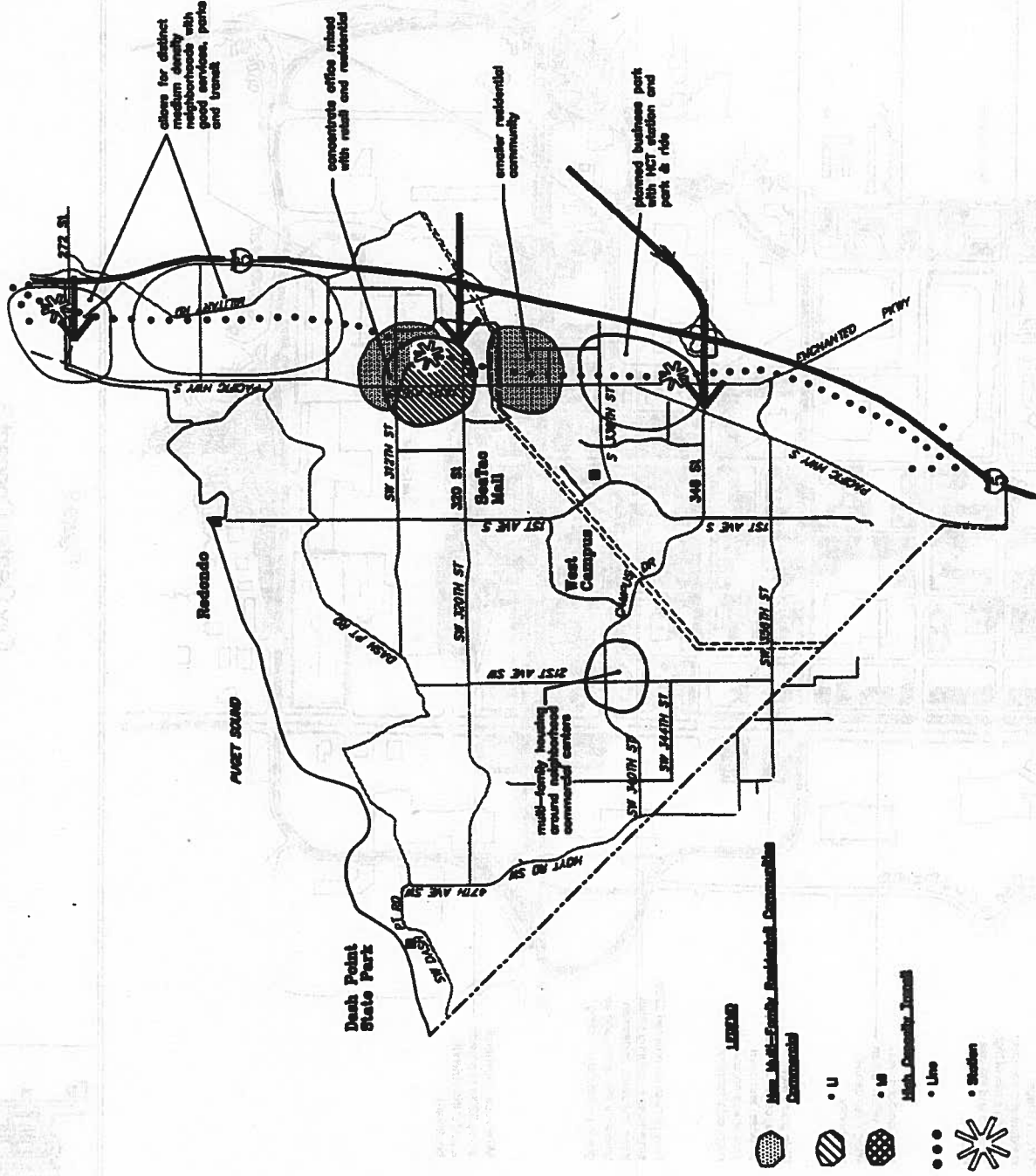


Figure 8
Land Use Concept 3

and an "urban village" with a mix of housing types and densities adjacent to a neighborhood retail center. A civic plaza -- with offices, community services, and open space or a park -- would be located adjacent to an intermodal transit terminal. Some additional low-rise housing would be developed next to Steel Lake Park. A landscaped ring road would encircle downtown and a pedestrian spine would link parks, civic and office and retail uses together. Structured parking would be located near the city core and a pedestrian bridge would link SeaTac mall with the new development north of 320th.

Public investment for capital facilities would focus on both the city center and the new business park area; capital investments would, as a result, be greater than the other concepts. Transportation improvements would include upgrades of the arterial road system; three rail transit stations, serving the high-intensity housing and office uses in the city center and new business park; a more diffuse bus system (because of multiple employment areas); and some pedestrian facilities.

Transportation improvements associated with the new city center would include a flyover crossing at South 320th Street, to alleviate left turn movements slowing traffic along South 320th Street; an intermodal (rail and bus) transit terminal close to South 320th Street; and pedestrian-oriented improvements on South 320th Street, including street trees, medians, and at-grade pedestrian crossings, to create the feeling of a boulevard.

and an "Urban Village" with a mix of housing types and densities adjacent to a
neighborhood retail center. A third phase - with higher density, services, and
open space or a park - would be located adjacent to an intermodal transit terminal.
A dense additional 10-15% housing would be located near the Lake Park. A
intercepted and road would connect the downtown and a pedestrian spine would link
park, street and other and retail area together. Additional parking would be located
near the city center and a pedestrian bridge would link the downtown with the new
development south of 230th.

Public investment for capital facilities would focus on both the city center and the
new business park area; capital investments would, as a result, be greater than the
other category. Transportation improvements would include upgrades of the arterial
road spacing from transit stations, serving the high-density housing and office
uses in the city center and new business park, a more efficient bus system (because of
larger employment base) and some pedestrian facilities.

Transportation improvements associated with the new city center would include a
busway crossing at South 230th Street, to allow for bus movements showing
pedestrian along South 230th Street, an intermodal (rail and bus) transit terminal close to
South 230th Street and pedestrian-oriented improvements on South 230th Street,
including street trees, medians and grade pedestrian crossings, to create the
feeling of a boulevard.

III. ENVIRONMENTAL ANALYSIS: AFFECTED ENVIRONMENT, SIGNIFICANT IMPACTS, MITIGATION MEASURES, UNAVOIDABLE ADVERSE IMPACTS

EARTH

AFFECTED ENVIRONMENT

Topography

The Federal Way planning area is located on a plateau between Puget Sound and the Green River Valley. Ravines and hillsides are present along the Puget Sound coastline; slopes range from 25 to 45 percent in this area. Most of the land within the city is on a plateau which consists of low rolling hills, varying from 300 to 400 feet above sea level with a series of hills up to 500 feet in elevation paralleling I-5 on the west; slopes in this area are generally less than 15 percent.

Geology and Soils

The Alderwood and the Oridia-Seattle-Woodinville association are the predominant soil types found within the Federal Way planning area (U.S. Department of Agriculture, 1973). The Alderwood association is found in the majority of the planning area, covering all but portions of the eastern and northeastern portion. It is comprised of 85 percent Alderwood soil, 8 percent Everett soils, and 7 percent various other soils. Soils in the Alderwood series are moderately well drained gravelly sandy loams that are 20 to 40 inches deep, situated over consolidated glacial till with relatively low permeability. The Alderwood association is found in upland terraces on slopes ranging primarily between 0 and 30 percent, but can extend into slopes up to 70 percent. Soils in this association are well suited to pasture and timber production but are poorly suited for cultivated crops. These soils have slight to moderate limitations for urban development. The primary limitation of this soil is the seasonal high water table which can make excavation for basements and utility lines difficult.

The Oridia-Seattle-Woodinville Association is found in the central portion of the planning area, southwest of Mirror Lake. It is comprised of 17 percent Oridia soils, 13 percent Seattle soils, 10 percent Woodinville soil, and 60 percent mix of soil types. Soils in this association are poorly drained and occur in nearly level areas or in major stream valleys. Most soils in this association are well suited to row crops and are desirable for farming. Site preparation for urban development is more costly on this association. SCS characterizes these soils as having moderate to severe limitations for residential and commercial development (SCS, 1973). The primary limitation is the seasonal high water table which can make excavation for basements and utility lines difficult.

Geologic Limitations

In general, soil type and degree of slope affect the suitability of a site for building locations, recreational facilities and landscaping. According to data in the King County Sensitive Areas Map Folio (King County, 1990), the City of Federal Way planning area contains some geologic hazards including landslide hazards, erosion hazards, and seismic hazards. Based on available data, these hazards are not extensive within the planning area. See Figure 10. The primary location of identified hazard areas is along the bluffs adjacent to Puget Sound in the vicinity of Dash Point State Park and Redondo; these areas are susceptible to erosion and landslide effects. Other areas identified as having erosion and landslide potential are located northeast of the S.W. 320th/I-5 interchange and northeast of Enchanted Parkway; and east of I-5 adjacent to the Green River Valley. A seismic hazard area is located in the northeast portion of the planning area, along the Green River.

Ground Water

Federal way is dependent on ground water for all its domestic water supply. There are three main aquifers that provide water within the study area. The Redondo-Milton Channel is the aquifer closest to the surface and is also the most prolific. The majority of the Federal Way Water and Sewer District's wells are located in this aquifer. The Intermediate aquifer ranges from 150 to 500 feet below ground; this aquifer feeds eight wells. The deep aquifer is 700-900 feet below ground. Recharging of the aquifers comes primarily from ground water infiltration beginning at the soil surface.




Based on available information, recharge to the Redondo-Milton Channel aquifer occurs in two identified recharge areas within Federal Way; see the discussion in the *Water Resources* section of the Draft EIS. These are generally located along S. 320th (in the eastern portion of Planning Analysis Zone (PAZ) 13 and the northeastern portion of PAZ 4); and east of I-5 (in the western portions of PAZs 1 and 18, the eastern portion of PAZ 6, and the central portion of PAZ 19). Potential for contamination of ground water from surface activities is greatest in these areas.

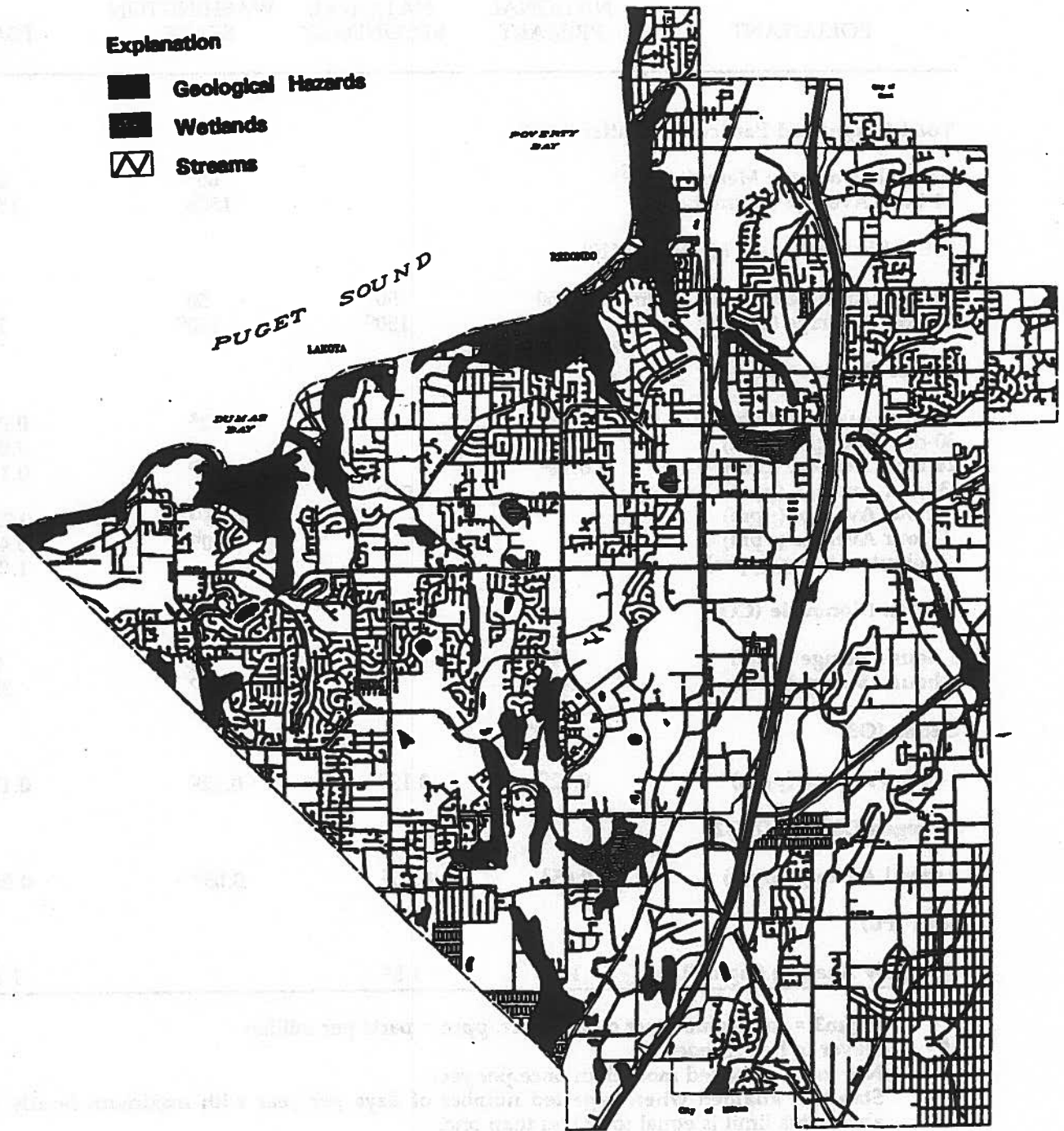
SIGNIFICANT IMPACTS

Assuming that geologic hazard areas are protected pursuant to existing City regulations, significant earth-related impacts are not anticipated for any of the land use concepts. Erosion is the primary impact that could result from future development/redevelopment in the Federal Way planning area. Earth-related impacts would be common to development occurring under any of the land use concepts. Construction would involve excavation and disturbance of soils, removal of vegetation, covering of soils with impervious surfaces, exposure of soils to erosion. Soil excavations and site grading would result in small changes in local topography.



Explanation

-  Geological Hazards
-  Wetlands
-  Streams



CITYSHAPE

From Vision to Plan

Figure 10

Sensitive Areas

Federal Way
Comprehensive
Plan EIS

**Table 5.
Ambient Air Quality Standards**

| POLLUTANT | NATIONAL PRIMARY | NATIONAL SECONDARY | WASHINGTON STATE | PSAPCA |
|---|-----------------------------|-------------------------------|-----------------------------|-------------------|
| Total Suspended Particulate Matter (TSP) | | | | |
| Annual Geometric Mean (mg/m^3) | | | 60 ^a | 60 ^a |
| 24-hour Average (mg/m^3) | | | 150 ^b | 150 ^b |
| Inhalable Particulate Matter (PM10) | | | | |
| Annual Arithmetic Mean (mg/m^3) | 50 | 50 | 50 | 50 |
| 24-hour Average (mg/m^3) | 150 ^c | 150 ^c | 150 ^c | 150 ^c |
| Sulfur Dioxide (SO₂) | | | | |
| Annual Average (ppm) | 0.03 ^a | | 0.02 ^a | 0.02 ^a |
| 30-day Average (ppm) | | | | 0.04 ^a |
| 24-hour Average (ppm) | 0.14 ^b | | 0.10 ^b | 0.10 ^a |
| 3-hour Average (ppm) | | 0.50 ^b | | |
| 1-hour Average (ppm) | | | 0.25 ^d | 0.25 ^d |
| 1-hour Average (ppm) | | | 0.40 ^b | 0.40 ^a |
| 5-minute Average (ppm) | | | | 1.0 ^e |
| Carbon Monoxide (CO) | | | | |
| 8-hour Average (ppm) | 9 ^b | | 9 ^b | 9 ^b |
| 1-hour Average (ppm) | 35 ^b | | 35 ^b | 35 ^b |
| Ozone (O₃) | | | | |
| 1-hour Average (ppm) | 0.12 ^c | 0.12 ^c | 0.12 ^c | 0.12 ^c |
| Nitrogen Dioxide (NO₂) | | | | |
| Annual Average (ppm) | 0.05 ^a | 0.05 ^a | 0.05 ^a | 0.05 ^a |
| Lead (Pb) | | | | |
| Quarterly Average (mg/m^3) | 1.5 ^a | 1.5 ^a | | 1.5 ^a |

mg/m^3 = micrograms per cubic meter; ppm = parts per million

- a** Never to be exceeded
- b** Not to be exceeded more than once per year
- c** Standard attained when expected number of days per year with maximum hourly average above this limit is equal to or less than one.
- d** Not to be exceeded more than twice in seven days
- e** Not to be exceeded more than once in eight hours

Ozone

Ozone is a highly reactive form of oxygen created by sunlight-activated chemical transformations of nitrogen oxides and volatile organic compounds (hydrocarbons) in the ambient air. Unlike carbon monoxide concentrations which tend to occur very close to the source(s) of emissions, ozone problems tend to be regional in nature because the atmospheric chemical reactions which produce ozone occur over a period of time. During the lag time between emission and ozone formation, ozone precursors can be transported far from their sources. Transportation sources are one of a number of sources which produce the precursors to ozone.

Until 1987, the Seattle-Everett-Tacoma region was designated "nonattainment" for ozone because pollution levels exceeded the limit set by the ambient standard. Because monitoring data from the several years prior to 1987 indicated that ozone levels had not exceeded ambient standards, in 1987 the EPA designated the area as attaining the ozone standard.

During the summer of 1990, ozone concentrations exceeded the 0.12 ppm ambient standard several times at monitoring stations in both Enumclaw and Lake Sammamish State Park. As a result of these violations, EPA redesignated most of Snohomish, King, and Pierce Counties as nonattainment for ozone; the nonattainment area includes all of Federal Way and the Comprehensive Plan planning area.

No violations of the ozone concentration limit were recorded at PSAPCA monitoring stations in 1991, 1992 or 1993. Thus, one of the key criteria for redesignating the area "attainment" for ozone has been met. PSAPCA can petition EPA for redesignation by modifying the State Implementation Plan (SIP) to include a plan that ensures the ozone standard will be met for the next ten years. Until the SIP is revised and EPA approves it, the City's planning area will remain nonattainment for ozone.

Particulate Matter

Total suspended particulate (TSP) is the "total" amount of particulate matter in the ambient air including particles up to about 75 micrometers in diameter. Until 1987 there were federal, state, and local regulations limiting TSP. In 1987 the federal TSP standards were replaced with standards based on the fraction of the total particulate less than or equal to about 10 micrometers in diameter (PM10). This is the important size fraction of particulate matter in terms of potential human health impacts, because particles this size can be inhaled deeply into the human lung.

PM10 is generated by industrial activities and operations, fuel combustion sources like residential wood burning, motor vehicle engines and tires, and other sources. Such sources occasionally cause high PM10 levels in the Puget Sound region, and several areas in Seattle and Tacoma have been declared nonattainment areas because PM10 concentrations sometimes exceed health standards.

There are no direct monitoring data for PM10 in the City's planning area, but given the lack of major sources it is likely that PM10 concentrations are below the limits set by the health standards most of the year. During prolonged periods of stagnant meteorological conditions, however, it is possible that PM10 emissions from vehicles, residential solid-fuel space heating, and other sources in the planning area could elevate PM10 concentrations beyond the established health standards. The planning area is not included in an existing PM10 nonattainment area.

Carbon Monoxide

Carbon monoxide is the product of incomplete combustion, and it is generated by transportation sources and other fuel-burning activities like residential space heating, especially heating with solid fuels like coal or wood. Carbon monoxide (CO) is usually the pollutant of greatest concern related to transportation sources because it is the pollutant emitted in the greatest quantity for which short-term health standards exist. Short-term standards (as opposed to annual average standards) are often the controlling, or most restrictive air pollution standards. There are two air quality standards for carbon monoxide: a 1-hour average standard of 35 parts per million (ppm) and an 8-hour average standard of 9 ppm. These levels may be exceeded once per year without violating the standard.

Unlike ozone, carbon monoxide is a pollutant whose impact is usually very localized. The highest ambient concentrations of carbon monoxide usually occur near congested roadways and intersections during periods of low temperatures, light winds, and stable atmospheric conditions. Because the impact occurs so close to the source, it is not possible to extrapolate carbon monoxide concentrations from regional data or distant monitors.

There is no direct CO monitoring data for the planning area, so there are no definitive indications of existing CO concentrations. Nonetheless, violations of the CO standard in previous years led to the nonattainment designation of the urbanized portions of King, Snohomish and Pierce counties. Even though there are no local monitoring stations that indicate CO violations, Federal Way is included in the nonattainment area because motor vehicles originating in Federal Way contribute to CO problems elsewhere.

PSAPCA monitoring stations at other Puget Sound locations show that carbon monoxide levels achieved the standards in 1992 and 1993. With two consecutive years without a violation, PSAPCA may also revise the SIP for CO to include a plan to ensure continued compliance with the ambient standards and petition EPA for redesignation.

In order to provide a basis for comparison with future alternatives, existing hydrocarbon, carbon monoxide, and nitrogen dioxide emissions were calculated based on existing traffic conditions, using the same procedures applied to future alternatives (described below). As discussed more fully in the following section, the air pollution emissions for existing conditions are higher than future emissions.

SIGNIFICANT IMPACTS

Adoption of the Comprehensive Plan would not, in itself, have direct effects on air quality. The Comprehensive Plan will, however, provide a framework that will guide future growth and development. Indirectly, the plan could affect the air quality in three ways. During construction of infrastructure or private development projects, dust associated with construction could be significant, even if impacts are temporary. The City's planning area would also affect the environment through pollutants released during residential wood burning or industrial sources. Finally, increased traffic due to growth would generate vehicle emissions. These impacts would result from any of the land use concepts and are addressed in further detail below.

Construction Impacts

During construction, dust from excavation and grading would contribute to ambient concentrations of suspended particulate matter. The construction contractor(s) would have to comply with the Puget Sound Air Pollution Control Agency's Regulation I, Section 9.15 requiring reasonable precautions to avoid dust emissions. This effort may include applying water or dust-binding chemicals during dry weather.

Construction would require the use of heavy trucks and smaller equipment such as generators and compressors. These engines would emit air pollutants that would slightly degrade local air quality, in general, these emissions and resulting concentrations would be far outweighed by emissions from traffic in the City's planning area.

Some phases of construction would cause odors detectable to some people away from a construction site. This would be particularly true during paving operations using tar and asphalt. Such odors are usually short-term.

Construction equipment and material hauling can affect traffic flow. If construction delays traffic enough to significantly reduce travel speeds in the City's planning area, general traffic-related emissions would temporarily increase.

Residential Wood Burning

Because residential development may include the installation of fireplaces or wood stoves, there is a potential for air quality impacts from wood burning. Air quality impacts from residential wood burning have been documented by numerous studies. These studies have found that wood-burning appliances have the potential to cause elevated concentrations of air pollutants during periods of poor dispersion. Consequently, if the residential development were to include the installation of large numbers of wood-burning appliances (e.g., wood stoves, fireplaces, or fireplace inserts) it would represent a potentially significant source of carbon monoxide, respirable particulate matter, and a range of toxic air contaminants.

Transportation Impacts

Transportation impacts from indirect measures associated with the City's Comprehensive Plan were evaluated city-wide based on vehicle-miles-traveled (VMT), average speeds, and emission factors. With this information peak-hour emissions were calculated for 1990 Existing Conditions, and Concept 1, Concept 2, and Concept 3 in 2010.

The City tabulated VMT over the entire city limits for four road types: neighborhood collectors, collector arterials, minor arterials, and principle arterials. In addition to VMT, the City identified vehicle-hours-traveled and average speed for each of these road types.

The emission factors used in conjunction with functional classification were generated by the EPA Mobile5.0A, Mobile Source Emissions Model (EPA 1993). The emission factors were used to calculate the amount of hydrocarbons, carbon monoxide, and nitrogen oxides (in grams per mile of travel) which traffic in the planning area emits now and would emit in the future. Mobile5.0A is the fifth in a series of models for predicting vehicle emissions based on a specific traffic description for an area of interest. EPA recommends this model be used in these types of analysis.

The percentages assumed in the federal testing procedure were used to represent the percentages of vehicles in cold-start and hot-start modes. To simulate conditions when carbon monoxide violations have been found most likely to occur in the Puget Sound Region, outdoor minimum and maximum daily temperatures of 25° and 45° Fahrenheit were used, and a peak-hour temperature of 40°F was assumed (Pade 1992). In lieu of specific data describing the age and vehicle mix of traffic in the area, data representing the 1990 Washington state vehicle registration pattern were used to represent the distribution of vehicles by type and age in the future year evaluated (2010).

To quantify existing conditions, emissions were calculated based on 1990 peak-hour traffic volumes. To evaluate the land use Concepts, projected 2010 peak-hour traffic conditions (traffic volumes, levels of service, and peak-hour travel speeds) were estimated by the City of Federal Way.

In some areas of Washington, vehicles are tested to determine if their tailpipe exhaust meets specific emission limits. Vehicles that fail the test must be serviced by a mechanic and reinspected. The City of Federal Way is included in the current vehicle Inspection and Maintenance (I&M) program boundaries, so credit for an I&M program was considered in emissions calculations.

Land Use/City Center Concept 1

To meet anticipated population growth, a number of transportation infrastructure improvements are scheduled (see the *Transportation* section of the EIS). These improvements would be designed to increase intersection efficiency, thereby improving air quality. For instance, an intersection which operates at a level of service F, is very inefficient and delayed vehicles are quite noticeable. When

vehicles are delayed and idling in a queue, the maximum amount of pollutants are emitted. If this intersection is improved to a LOS "C", congestion and air pollution emissions are considerably decreased.

Average automobile carbon monoxide emission rates are expected to decrease in the future due to improvements in engine efficiencies and from continuation of federal and state vehicle emission control requirements. Even with growth in VMT, therefore, total emissions in the planning area would be lower compared to existing conditions. Table 6 indicates the emissions would be lowest with Concept 1. More detailed data are contained in Appendix A.

Table 6
Calculated 1-Hour Pollutant Emissions in pounds

| Land Use Concept ^a | Peak-Hour Emissions ^b (pounds) | | |
|-------------------------------|--|-------|-----------------|
| | HC | CO | NO _x |
| 1990 Existing Conditions | 860 | 9,602 | 923 |
| Concept 1 | 766 | 8,602 | 829 |
| Concept 2 | 773 | 8,713 | 828 |
| Concept 3 | 808 | 9,170 | 848 |

Source: City of Federal Way, KJS Associates, Inc., and McCulley, Frick, and Gilman, Inc.

- The scenario includes roads in the City's planning area, with Level of Service A through F.
- Emissions are determined from VMT provided by the City of Federal Way and Emission Factors computed from Mobile5.0A.

Land Use/City Center Concept 2

The overall land use pattern encouraged by Concept 2 would be similar to Concept 1, but major changes would be focused on the City Center and along the Pacific Highway South corridor. Transportation improvements are the same as Concept 1. A high capacity transit system would also be developed.

Vehicle-hours-traveled calculations show an increase (most likely due to the City Center); the effect of rail transit also has not been modeled at this time. As a result, speeds generally decrease and emission factors increase. For this reason, emissions of carbon monoxide increase by about 1% compared with Concept 1. Total emissions of hydrocarbons and carbon monoxide would be about 10% lower than Existing Conditions.

Land Use/City Center Concept 3

Vehicle-miles-traveled would be significantly higher than existing conditions and Concepts 1 and 2. Traffic emissions would also be higher. Nonetheless, emissions are 5-8% lower than existing conditions because future decreases in the emission rates (per vehicle) would continue to offset the increase in VMT.

MITIGATION MEASURES

Construction Mitigation Measures

Emissions from construction activities could be reduced by the adoption of policies and regulations requiring the use of new and/or well-maintained construction equipment; restricting the hauling of materials during peak commute periods; requiring the use of water or dust suppressant on exposed surfaces at construction sites; requiring truck wheels to be washed before entering City streets from dusty construction sites.

Residential Wood Burning Mitigation Measures

The King County Department of Health has determined that woodstoves and other solid fuel burning devices are significant contributors to neighborhood air pollution in King County. As a result, the Department of Health has established woodstove regulations that govern wood stove sales, installation and operation. These regulations ban the sale or installation of woodstoves not certified by the US Environmental Protection Agency. The regulations also require new dwellings to have an alternate source of heat other than wood. Any residential development that would occur in the City's planning area would be subject to these regulations.

Although federal, state and County regulations governing residential wood-burning provide a significant reduction in air pollution, wood smoke could still cause a significant air quality impact if a substantial fraction of residences that could be constructed in the City's planning area elect to burn wood. The most effective means of mitigating wood smoke impacts would be to establish a community covenant that bans residential wood burning in planned developments.

Transportation Air Quality Mitigation Measures

If identified improvements improve intersection levels-of-service, air quality benefits would occur. Detailed analysis of specific intersections would be needed to quantify existing and future air quality associated with proposed improvements.

UNAVOIDABLE ADVERSE IMPACTS

Emissions of some pollutants would cause an incremental deterioration of air quality. Air quality effects associated with transportation would improve relative to existing conditions.

WATER RESOURCES

AFFECTED ENVIRONMENT

Surface Water

The Federal Way planning area is divided into four major drainage basins:

- Hylebos Creek basin
- Lower Puget Sound basin
- Green River basin
- White River basin.

Figure 11 shows these drainage basins as well as major lakes and wetlands in the planning area. Table W-1 in Appendix B lists sub basins and their areas.

No data are available for existing impervious surface coverage within the planning area. Appendix B (Table W-2) presents rough estimates of existing impervious surface coverage by drainage basin under two separate assumptions regarding the average impervious surface coverage in developed areas. All subsequent table references can be found in Appendix B.

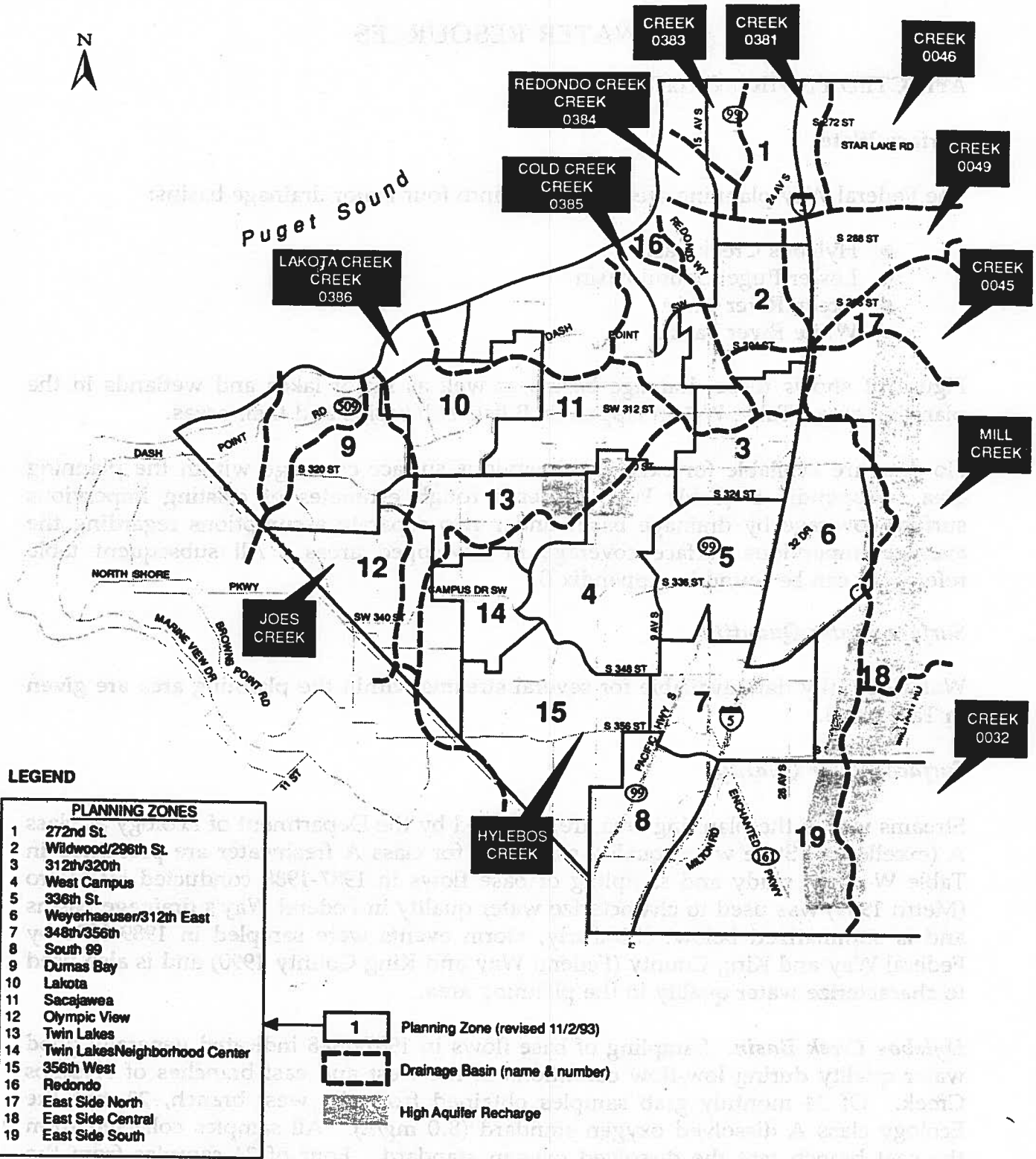
Surface Water Quantity

Water quantity data available for several streams within the planning area are given in Table W-3.

Surface Water Quality




Streams within the planning area are classified by the Department of Ecology as class A (excellent). State water quality standards for class A freshwater are presented in Table W-4. A study and sampling of base flows in 1987-1988 conducted by Metro (Metro 1989) was used to characterize water quality in Federal Way's drainage basins and is summarized below. Similarly, storm events were sampled in 1989-1990 by Federal Way and King County (Federal Way and King County 1990) and is also used to characterize water quality in the planning area.

Hylebos Creek Basin. Sampling of base flows in 1987-1988 indicated generally good water quality during low-flow conditions in the west and east branches of Hylebos Creek. Of 24 monthly grab samples obtained from the west branch, 23 met the Ecology class A dissolved oxygen standard (8.0 mg/L). All samples collected from the east branch met the dissolved oxygen standard. Four of 24 samples from the west branch and one of 12 samples from the east branch exceeded the Ecology class A standard for fecal coliform bacteria. All base flow samples obtained from Hylebos Creek met the class A temperature and pH standards.



LEGEND

| PLANNING ZONES | |
|----------------|--------------------------------|
| 1 | 272nd St. |
| 2 | Wildwood/296th St. |
| 3 | 312th/320th |
| 4 | West Campus |
| 5 | 336th St. |
| 6 | Weyerhaeuser/312th East |
| 7 | 348th/356th |
| 8 | South 99 |
| 9 | Dumas Bay |
| 10 | Lakota |
| 11 | Sacajawea |
| 12 | Olympic View |
| 13 | Twin Lakes |
| 14 | Twin Lakes/Neighborhood Center |
| 15 | 356th West |
| 16 | Redondo |
| 17 | East Side North |
| 18 | East Side Central |
| 19 | East Side South |

-  Planning Zone (revised 11/2/93)
-  Drainage Basin (name & number)
-  High Aquifer Recharge

Source: City of Federal Way, *Comprehensive Plan*; S. KCGW Management Plan (1989); CityShape, *Land Use Alternatives for the Future*



From Vision to Plan

Figure 11

Drainage Sub-Basins and Aquifer Recharge Areas

Federal Way
Comprehensive
Plan EIS

Storm event sampling in 1989-1990 (Federal Way and King County 1990) revealed significant increases in contaminants in the Hylebos Creek west and east branches during storm conditions compared to base flow. Thirty-five of 39 samples exceeded the class A fecal coliform standard, and 15 of 45 samples exceeded the 50 mg/L threshold value for total suspended solids established for the Hylebos Creek and Lower Puget Sound Basin Plan (King County 1991). Nutrient concentrations also increased during storm events, with 20 of 39 samples exceeding the U.S. EPA guideline of 0.10 mg/L of total phosphorus. Thirty-one of 33 samples exceeded the U.S. EPA acute 1-hour criterion for copper of 0.0039 mg/L assuming a hardness value of 20 mg/L calcium carbonate, and six of 37 samples exceeded the U.S. EPA acute 1-hour criterion for zinc of 0.084 mg/L assuming a hardness value of 20 mg/L calcium carbonate.

Additional findings of the Federal Way and King County (1990) study include significant erosion in upper tributary reaches of the Hylebos Creek basin, with consequent sedimentation in the west Hylebos wetland located in the northeastern corner of PAZ 15, as well as flooding problems on the tributary draining Panther Lake and in the east branch tributary that runs along Interstate 5.

Lower Puget Sound Basin. Base flow sampling indicated generally good water quality during low-flow conditions in three streams within the planning area – Joe's Creek, Lakota Creek, and Cold Creek. All monthly base flow samples obtained during the Metro study met class A standards for dissolved oxygen, temperature, and pH. Two of 12 samples obtained from Cold Creek and Lakota Creek exceeded the class A standard for fecal coliform bacteria. All 12 base flow samples from Joe's Creek met the class A standard for fecal coliform bacteria.

Storm event sampling revealed significant increases in contaminants during storm conditions compared to base flow. Fourteen of 15 samples exceeded the class A fecal coliform standard, and four of 15 samples exceeded the 50 mg/L threshold value for total suspended solids established for the Hylebos Creek and lower Puget Sound basin plan. Nutrient concentrations also increased during storm events, with seven of 15 samples exceeding the U.S. EPA guideline of 0.10 mg/L of total phosphorus. All 10 samples exceeded the U.S. EPA acute 1-hour criterion for copper, and two of 15 samples exceeded the U.S. EPA acute 1-hour criterion for zinc.

Additional findings of the Federal Way and King County (1990) study include substantial erosion in Redondo and Lakota creeks as well as other drainages in the basin, and flooding problems in the Twin Lakes area on Joe's Creek.

Green River Basin. During 1990 and 1991, King County collected stormwater samples during storm and non storm conditions from the Mill Creek tributary that drains Lake Geneva and from the creek main stem about one mile downstream of Lake Dolloff. All nine samples obtained from the Lake Geneva outlet stream met the class A standard for dissolved oxygen, whereas three of 10 samples on the main stem did not meet the class A standard for dissolved oxygen. One of 10 samples

from the Lake Geneva outlet stream exceeded the class A temperature standard, whereas all 11 samples from the main stem station met the temperature standard. Nine of 12 samples obtained from the Lake Geneva outlet stream and six of 12 samples obtained from the main stem station exceeded the class A standard for fecal coliform bacteria. The frequent exceedance of the fecal coliform standard could be due to runoff from hobby farms as well as failing septic tanks. The latter cause is particularly likely in the Lake Geneva outlet stream, which drains a watershed with a history of failing septic tanks (King County 1992). Ten of 23 samples exceeded the U.S. EPA guideline of 0.10 mg/L for total phosphorus, whereas none of the 20 samples exceeded the U.S. EPA acute toxicity criterion for zinc.

Erosion in Peasley Canyon is a significant problem and is the subject of a current King County project. Erosion is partly due to increased runoff from the portion of the Mill Creek subbasin.

White River Basin. During preparation of this report, no water quality information was found for the portion of the White River basin that lies within the planning area. However, land use in the White River portion of the planning area is similar to that found in the Mill Creek portion of the planning area. Therefore, surface water quality in the White River basin is probably similar to that described above for the Mill Creek subbasin.

Flooding

Although there is no federally designated floodway or floodplain with the planning area, Federal Way and King County (1990) have identified existing flooding problems in the Hylebos, lower Puget Sound, and Mill Creek drainage basins. Problems within the planning area include the following:

In the Joes Creek subbasin, flooding around Lorene and Jeane lakes and SW 325th Street west of 32nd Avenue SW

- In the West Hylebos subbasin, flooding:
 - near the outlet of Panther Lake
 - near the intersection of SW 353rd Street and 1st Avenue S.
 - near the intersection of 336th Street and 18th Avenue S.
 - near S. 356th and S. 359th streets East of Highway 99
 - near S. 373rd Street east of Highway 99
- In the East Hylebos subbasin, flooding near 20th Place S. east of State Route 161

Other, smaller flooding problems have also been observed within the planning area and at downstream locations in the Hylebos and Mill Creek basins. In the Hylebos basin, flooding has occurred at Swindell Road S. near Highway 99, where the East Branch crosses under 5th Avenue in Milton, and on the mainstem in the Fife area

near 70th Avenue E. between Highway 99 and Interstate 5. In the Mill Creek basin, flooding has been identified in the lower end of Peasley Canyon.

The City's Sensitive Areas Ordinance generally defines "flood hazard areas: as areas adjacent to stream courses that are subject to flooding in 100-year storms.

Many of the identified flooding problems relate to inadequate capacity of roadway culverts coupled with increased runoff volumes due to past development. Some of the problems can be alleviated by removing debris clogging culverts, but other flooding events appear to be indicative of more widespread systemic problems (Federal Way and King County 1990).

Ground Water

The main aquifer zone (referred to as the Milton-Redondo channel) underlying the planning area occurs within sands and gravels of the Vashon advance outwash as well as within an older sand and gravel unit. The advance outwash, which is located primarily in the western portion of the planning area, may be connected hydrologically with the older sand and gravel unit, located primarily in the eastern portion of the planning area. Relatively impermeable Vashon till overlies this aquifer zone throughout much of the planning area, providing some protection from contaminated surface water. The aquifer zone intersects the ground surface in places along the Puget Sound bluff, as well as in some creek valleys. The Milton-Redondo channel provides domestic water to a number of users including the Federal Way Water and Sewer District, which is the primary water purveyor in the planning area.

Recharge of the Milton-Redondo channel aquifer is not totally understood. In addition to various creek bottoms, two general areas of significant recharge have been identified in previous studies and are shown in Figure 11, one located in the vicinity of South 320th Street approximately 1 to 2 miles west of Interstate 5, and the other located east of Interstate 5 along the ground water divide running from the vicinity of Lake Dolloff to the vicinity of Fivemile Lake (Federal Way and King County 1990). The recharge area along South 320th Street is located in the eastern portion of PAZ 13 and the northwestern portion of PAZ 4. The recharge area east of Interstate 5 is located in the western portions of PAZ 17 and PAZ 18, the eastern portion of PAZ 6, and the central portion of PAZ 19.

The volume of average recharge over the lower Puget Sound and Hylebos Creek basins has been estimated at about 15 to 17 inches per year (Federal Way and King County 1990). Ground water withdrawal has increased from about 15 percent of that recharge in 1977 to about 50 percent in 1990 (Federal Way and King County 1990). The increase in withdrawal has coincided with a decline of 10 to 12 feet in water table elevations within the Milton-Redondo channel and a decline in summer base flows in Hylebos Creek (Federal Way and King County 1990). The increase in ground water withdrawal and increased impervious surface coverage, largely the

results of past development within the planning area, may be major causes of declining water table elevations during the past decade.

SIGNIFICANT IMPACTS

Surface Water Resources

Calculations of the gross land area subject to development over the next twenty years within each drainage basin for the three land use concepts is presented in Table W-5. Estimates of the amounts of additional impervious surface area created within each drainage basin as a result of forecast growth are shown in Table W-6 and discussed below.

Surface Water Quantity Impacts

Creation of additional impervious surface area would result in additional runoff volumes. The expected volume of runoff resulting from a 2-year, 24-hour design storm under each of the alternatives is presented in Table W-7. The estimates presented in the table are based on an average precipitation value for Federal Way of 2.1 inches for the 2-year, 24-hour design storm and the predominant soil types within each basin.

Detention facilities required by the city in most developments would control increases in peak rates of runoff. Peak rates would nonetheless probably increase somewhat, because some new development (individual single-family dwellings, for example), would not provide detention; in addition, some detention facilities may not operate as designed. Future peak flow rate increases cannot be estimated accurately at this time.

Surface Water Quality Impacts

Long-term Impacts. Increased development would result in increased pollutant loading in surface waters due to increased runoff from new roadways, driveways, parking areas, and other impervious surfaces. Table W-8 presents projected areas of new impervious surface subject to vehicular use under each alternative. These estimated areas are based in part on requirements for parking areas as specified in city zoning regulations, with the assumption that properties would be developed to the maximum extent allowed by regulation.

As an indication of stormwater pollutant loading from new development under each of the three alternatives, Table W-9 presents projected loadings in stormwater runoff from new impervious surfaces subject to vehicular traffic for one metal, one nutrient, and total suspended solids, assuming there is no treatment of stormwater running off these surfaces. Table W-10 presents loadings projected for the same three contaminants assuming that runoff is treated consistent with Ecology (1992) guidelines. Assumptions regarding pollutant concentrations in untreated runoff are

based on Brown and Caldwell (1989) and Pitt and Bissonnette (1984), and removal efficiencies of treatment facilities are based on King County (1993). The estimates do not take into account all sources of contaminants in stormwater runoff but are indicative of the magnitude of additional pollutant loading, because runoff from vehicular surfaces would be one of the largest nonpoint sources of pollutant loading from new development in the planning area. Fertilizer and pesticide use in residential and landscaped areas, pet wastes, and a wide variety of other residential activities would contribute additional pollutant loading.

Construction Impacts. An additional cause of adverse impacts on water quality would be construction activities associated with the new development projected under each of the three alternatives. Construction results in removal of existing vegetation, disturbance of soil, and erosion of the exposed soil, potentially leading to sedimentation in receiving waters. City regulations would require most construction activity to provide erosion and sedimentation controls. However, these controls cannot entirely eliminate potential construction-related water quality impacts. The severity of construction-related impacts would depend on several factors, including the effectiveness of city review and enforcement of erosion and sedimentation control plans, on-site maintenance of erosion and sedimentation control facilities, and the overall pace of development.

Table W-5 lists the total land area within each basin subject to potential development (or redevelopment) under the three land use concepts. These figures generally compare the level of impact among alternatives and among drainage basins. The area actually disturbed for construction would be less than that shown in the table because the entire gross land area of parcels are not cleared or disturbed during construction. Overall, the area disturbed by construction over the planning period, and therefore the level of impact on water quality from construction activity, would be similar among land use concepts. The west branch of Hylebos Creek, however, would experience a greater degree of disturbance under concept 3 than under the other alternatives over the planning period. Comparisons of area subject to development with projected runoff volumes (Table W-5 and Table W-7) indicate that construction activity would cause relatively greater adverse effects to the west branch of Hylebos Creek. For example, the estimated 2-year design storm runoff volume in the west branch is about 3 times the estimated runoff volume in Mill Creek, whereas the area to be developed (and the projected sediment load from construction activities) in the west branch subbasin would be about 4 times that in the Mill Creek subbasin.

Hylebos Creek Basin Impacts. Impervious surface area would increase by 50 to 100 percent over the portion of the Hylebos Creek basin within the planning area under any land use concept (Table W-2 and W-6). The increase in impervious surface area would be slightly greater under concept 3 than under the other alternatives and would be greater (by about 50 acres) in the west branch subbasin. Expected increases in runoff volumes directly mirror these changes in impervious surface areas, with an approximately 35- to 40-acre-foot increase in 2-year design storm

runoff volume in the west branch and an approximately 15- to 17-acre-foot increase in 2-year design storm runoff volume in the east branch. These volume increases are about 10 percent and 8 percent, respectively, of estimated existing volumes during the 2-year design storm. Even if required detention facilities effectively limit increases in peak rates of runoff, the extended period of peak runoff may nonetheless result in additional channel erosion (Booth 1989).

Increases in loadings of some contaminants in stormwater runoff would be significant for both the west and east branch subbasins under any of the land use concepts (see Appendix __, Tables W-9 and W-10). The greatest increase would occur under Concept 3. Because of the increased loadings, the frequency of exceedances of state and federal water quality standards and criteria would increase, resulting in further degradation of stream habitat within the Hylebos creek drainage basin.

Lower Puget Sound Basin Impacts. Impervious surface area would increase by 15 to 20 percent over the portion of the lower Puget Sound basin within the planning area under any land use concept (Appendix __, Tables W-2 and W-6); differences among the concepts are not significant. The projected increase in runoff volume during the 2-year design storm would be in the range of 2 to 3 percent of estimated existing volumes.

Receiving waters in this basin would experience increased pollutant loading during storm events, although the increase in loading would not be as significant as the loading increases in the Hylebos Creek basin (Appendix __, Tables W-9 and W-10). In general, no significant difference in loading would occur among the land use concepts except in the Lakota Creek subbasin, where impacts associated with concept 3 would be greater. As in the Hylebos Creek basin, the frequency of exceedances of state and federal water quality standards and criteria would increase, resulting in incremental degradation of stream habitat within the lower Puget Sound basin.

Impacts Green River Basin Surface Water Resources. Impervious surface area would increase by 35 to 55 percent over the portion of the Green River basin within the planning area under any of the land use concepts. The increase in impervious surface area would be generally comparable (within 7-8 acres) under all concepts. Increases in runoff volume during the 2-year design storm would be about 7 percent of existing volumes in the Mill Creek subbasin and an average of 4 percent over the remainder of that portion of the Green River basin that lies within the planning area.

The drainages in this basin would experience a substantial increase in pollutant loading due to stormwater runoff from new development despite implementation of standard treatment requirements. As in the Hylebos Creek basin, the frequency of exceedances of state and federal water quality standards and criteria would increase, resulting in further degradation of stream habitat within the lower Mill Creek subbasin. The pollutant loading, projections do not indicate any significant difference in impacts among the three alternatives.

Impacts on White River Basin Surface Water Resources. Impervious surface area would increase by 60 to 90 percent over the portion of the White River basin within the planning area under any of the concepts. Differences among the land use concepts (4 acres) is not significant.

Drainages within the portion of the White River basin that lies within the planning area would experience increased pollutant loading due to stormwater runoff. Projected increases in loading relative to total runoff volume are significant in this basin and are almost of the same magnitude as the relative increases projected in the Hylebos Creek basin. The projections do not indicate a significant difference in impacts among the three concepts.

Flooding

As a result of increased development under any of the land use concepts, the volume of runoff would increase (see Table W-6). Peak rates of runoff leaving the sites of most new development would be controlled by required stormwater detention facilities. These facilities would be designed in accordance with Ecology standards and would control peak rates of runoff to pre-development rates. The change in peak rates of runoff will be determined after the effects of new impervious surface area within each drainage basin is modeled by the City. It is likely that there would be little difference in flooding impacts between the three concepts, with one exception. Concept 3 would result in significantly greater impervious surface area and thus greater potential flooding impacts in the Hylebos basin (see Table W-6). These impacts will be reassessed in the Final EIS.

Despite the City's stormwater detention requirements, the peak rates of runoff in drainages within and downstream of the planning area are nonetheless likely to increase with new development, with consequent increased rates and severity of flooding under any of the three concepts. Runoff from some new development (e.g., single family houses on older, existing lots) would not be detained and it is unlikely that individual detention facilities would operate in all cases as intended because of inadequate design, installation, or maintenance. In addition, detention facilities that would be required of new developments may extend the length of time over which peak flows occur, because of the greater volumes of runoff. These extended runoff peaks could result in increased flooding even if existing peak runoff rates do not increase. Existing culverts and other stormwater conveyance structures that do not have adequate capacity to handle existing peak rates of runoff would be further surcharged by extended runoff peak flows potentially resulting in greater flooding upstream of those conveyance structures.

Ground Water Impacts

Future growth and development within Federal Way would result in two primary impacts on ground water. First, development would lead to increased impervious

surface coverage, resulting in decreased ground water recharge. Second, development would lead to increased demand for domestic water and probably to increased ground water withdrawals. In addition, where both shallow ground water and porous soils exist, pollutants in stormwater runoff could enter and degrade the quality of ground water. The location and nature of these potential ground water impacts cannot be identified with certainty without additional detailed hydrogeologic studies. However, important recharge areas have been identified, and development within these recharge areas could result in significant decreases in ground water recharge of the Redondo-Milton channel.

The three land use concepts involve significant increases in growth in PAZ 4 (West Campus) and PAZ 6 (Weyerhaeuser/312th); both PAZs contain portions of identified aquifer recharge areas. Concepts 2 and 3, in particular, would locate industrial uses within these PAZs. At this time, however, the specific geographic location of future uses relative to identified aquifer recharge areas cannot be identified. Depending on the types of businesses locating within these areas, and approaches to drainage control, these concepts could present a greater potential threat to ground water pollution.

Please refer to the Water Service section of the Draft EIS for a discussion of impacts to ground water quantity.

MITIGATION MEASURES

Surface Water

Mitigation measures to reduce adverse impacts on surface water quality resulting from future development in the planning area fall into three categories: source controls directed toward completed developments, permanent stormwater controls, and temporary erosion and sedimentation controls for construction activity. The city currently requires permanent stormwater controls and temporary erosion and sedimentation controls during construction and would continue to do so over the planning period. Additional measures the city could consider to further reduce potential impacts on surface water quality are described below:

- Continue and expand present efforts to educate residents, businesses, and others within the planning area regarding the importance of maintaining the quality of surface waters. The Hylebos Creek and lower Puget Sound basin plan (King County 1991) and Mill Creek water quality management plan (King County 1992) describe specific actions to provide source controls, some of which the city has begun to implement.
- Complete current efforts to inventory existing stormwater facilities, and consider a program of retrofitting inadequate or nonexistent stormwater systems.

- Preserve wetlands in flood prone areas to provide storage for floral waters.
 - The City should review its existing definition, study requirements and regulations relating to flood hazard areas. The Countywide Planning Policies should be consulted for potential direction for revising the existing program. Any such revision should occur in conjunction with preparation of implementation programs.
 - Infiltration of stormwater could be required where space is available and soils are suitable.
 - A program of periodic inspection and maintenance for detention facilities will be implemented.
 - Regional detention facilities could be considered where existing downstream capacity problems are severe. Specific solutions at individual problem locations may not adequately alleviate flooding problems.
 - The City could consider basing detention requirements for redeveloping areas on the pre-existing undeveloped condition rather than the current developed condition. The stormwater model will provide a "worst case" analysis and determine appropriate standards.
 - The City's current effort to inventory stormwater culverts and other conveyance structures would identify capacity problems, and propose solutions.
- The following measures would reduce the extent of potential problems:

Flooding

- Develop a program to assure adequate inspection and maintenance of all public and private stormwater facilities.
- Continue and improve city review, inspection, and enforcement of the design and implementation of temporary erosion and sedimentation control measures at construction sites.
- Integrate new stormwater treatment technologies into stormwater requirements as new technologies become available and practical. Improvements to present technologies and standard requirements for stormwater treatment would reduce the increase in pollutant loading in receiving waters that accompanies development.

Ground Water

To partially mitigate the reduction of ground water recharge due to increased impervious surface coverage, in areas where appropriate soil types exist, infiltration should be used in preference to releasing stormwater to surface waters, consistent with Department of Ecology (1992) guidelines. While infiltration would be particularly useful as mitigation in defined ground water recharge areas, stormwater facilities should be designed to provide adequate protection for ground water quality.

Other potential measures could involve identification and classification of aquifer recharge areas

UNAVOIDABLE ADVERSE IMPACTS

An increase in pollutant loadings within receiving waters in the planning area is an unavoidable consequence of further development in the planning area. New development would result in reduced recharge of the aquifer underlying the planning area.

PLANTS & ANIMALS

AFFECTED ENVIRONMENT

Plants

The Federal Way planning area occupies an approximate 30-square mile area between Puget Sound and the Green River valley. Most of the land within the city is on a plateau which consists of low rolling hills, varying from 300 to 400 feet above sea level with a series of hills up to 500 feet in elevation paralleling I-5 on the west.

Western Washington is part of the Pacific North Coast conifer forest which extends from the Gulf of Alaska to the Mendocino County coast of California (Barbour, et. al. 1987). On a regional scale, the natural landscape has been described in terms of broad vegetational patterns called vegetation zones by Franklin and Dyrness (1988). In western Washington and Oregon, these zones tend to be related to altitude. Federal Way is located in the western hemlock (*Tsuga heterophylla*) zone which includes the majority of the Puget Lowlands and is the most extensive zone west of the Cascades. The most common coniferous tree species in undisturbed areas are Douglas fir (*Pseudotsuga menziesii*), western red cedar (*Thuja plicata*), and western hemlock. Areas disturbed by logging, urban/suburban development, utility rights-of-way and stream corridors typically support deciduous tree species common to the western hemlock zone including red alder (*Alnus rubra*), big leaf maple (*Acer macrophyllum*), black cottonwood (*Populus trichocarpa*), and Oregon ash (*Fraxinus latifolia*). Isolated stands of lodgepole pine (*Pinus contorta*) and white pine (*Pinus monticola*) also probably occur in limited numbers.

A vegetation cover type map developed for all of King County using Landsat imagery (King County 1987) was also used to further distinguish vegetation types with a greater level of detail. Lowland forested areas, for example, can be divided into old-growth lowland forests, second growth lowland coniferous forests, second growth lowland deciduous forests, and second growth lowland deciduous/coniferous mix.

The Landsat cover type map shows that much of the Federal Way planning area is characterized by urban cover types which are either poorly or moderately vegetated. However, according to the Landsat imagery, major portions of the planning area — including much of the area east of I-5 to the edge of the Green River Valley, a large portion of the southern central part of the City, and much of the steep bluffs along Puget Sound — are either second growth lowland coniferous forest, second growth lowland deciduous forest, or second growth lowland deciduous/coniferous mixed forest.

Direct observation and aerial photographs indicate that a corridor of Douglas fir and western red cedar is found along the I-5 corridor including its freeway interchanges. Other vegetated corridors exist along portions of Highways 161, 99, and 18, Military Road, SW 320th St., 1st Way S., and Campus Dr. The steep slopes along the entire Puget Sound shoreline are vegetated in mixed second growth coniferous/deciduous forests. The Lower Puget Sound drainages, Joe's Creek, Lakota Creek, Cold Creek,

and Redondo Creek, have carved through the upland plateau creating steep ravines. These ravines are largely forested with second growth native coniferous and deciduous forest (King County 1991). There are also riparian forests and shrub/forb communities associated with these ravines. The area surrounding West Hylebos State Park and Panther Lake is also similarly forested. Native riparian vegetation has been eliminated along many segments of the Hylebos and Lower Puget Sound stream systems. There has been wholesale replacement of conifers by smaller deciduous trees and shrubs in many areas (King County 1991).

Wetlands

Inventoried wetlands in the Federal Way planning area are summarized in Table 7. Wetland information is based on King County's Wetland Inventory (1983, 1990); information on species composition is derived from data collected during that inventory. Additional wetlands are likely to be located in the area, typically along drainages and streams, and in isolated topographic depressions within areas which have soils having a compact glacial till layer near the surface.

Forested wetlands in the area are typically comprised of one or more of the following tree species: red alder, big leaf maple, black cottonwood, western hemlock, western red cedar, Oregon ash, quaking aspen (*Populus tremuloides*), Douglas fir, and Sitka spruce (*Picea sitchensis*).

Understory species in forested wetlands may include such shrubs as salmonberry (*Rubus spectabilis*), red elderberry (*Sambucus racemosa*), indian plum (*Oemleria cerasiformis*), thimbleberry (*Rubus parviflorus*), salal (*Gaultheria shallon*), wild crabapple (*Pyrus fusca*), red huckleberry (*Vaccinium parvifolium*), red-osier dogwood (*Cornus stolonifera*), vine maple (*Acer circinatum*), cascara (*Rhamnus purshiana*), wild rose (*Rosa* spp.), cherry (*Prunus* spp.), and twinberry (*Lonicera involucrata*).

Scrub-shrub wetlands are typically dominated by one or more of the following species; vine maple (*Acer circinatum*), red-osier dogwood (*Cornus stolonifera*), twinberry (*Lonicera involucrata*), wild crabapple (*Pyrus fusca*), wild rose (*Rosa* spp.), willow (*Salix* spp.) and hardhack (*Spiraea douglasii*).

Most of the wetlands support various herbaceous plants including lady fern (*Athyrium felix-femina*) and bracken fern (*Pteridium aquilinum*), horsetails (*Equisetum* spp.), skunk cabbage (*Lysichitum americanum*), cattail (*Typha latifolia*), American brooklime (*Veronica americanum*), yellow iris (*Iris pseudocorus*), creeping buttercup (*Ranunculus repens*), dock (*Rumex* spp.), marsh pepper (*Polygonum hydropiper*), water parsnip (*Sium suave*), potentilla (*Potentilla palustris*), large-leaved yellow avens (*Geum macrophyllum*), water parsley (*Oenanthe sarmentosa*), bittersweet nightshade (*Solanum dulcamara*), and aquatic buttercup (*Ranunculus orthorhynchus*).

**Table 7. Federal Way Planning Area Wetlands
(King County Wetland Inventory)**

| Wetland Number | USFWS Classification | Estimated Size (Acres) | King County Rating |
|---------------------------|----------------------|------------------------|--------------------|
| Lower Puget Sound: | | | |
| 4 | PEM | 5.5 | 2 |
| 5 | PUB, PEM, PAB | 1.3 | 1 |
| 6 | PUB | 12.2 | 2 |
| 7 | PUB | 20 | 2 |
| 8 | PSS, PAB | 1.8 | 2 |
| 9 | PSS | 19 | 2 |
| 10 | PFO | 4.6 | 2 |
| 11 | PFO | 4.6 | 2 |
| 12 | PUB | 1.3 | 2 |
| 13 | PSS | 6 | 2 |
| 14 | PEM | 3 | 2 |
| 15 | PUB, PAB | 9.6 | 2 |
| 16 | PAB, PUB | 10 | 2 |
| 17 | PUB | 2.3 | 2 |
| 18 | PUB | 1.8 | 2 |
| 19 | PAB, PSS, PFO | 2.6 | 2 |
| 22 | PSS | 3.4 | 2 |
| 23 | PSS, PFO | 1.9 | 1 |
| 24 | PSS, PEM | 2.8 | 2 |
| 25 | PUB, PSS, PAB | 10 | 1 |
| 28 | PSS | 3.7 | 2 |
| 29 | PEM, PSS, PAB | 8.5 | 1 |
| 31 | PFO, PSS | 3 | 2 |
| 32 | PSS | 8 | 2 |
| 33 | PSS | 6 | 2 |
| 34 | PFO | 8 | 2 |
| 50 | PFO | 4.3 | 2 |
| Hylebos Creek: | | | |
| 1 | PEM, POW | 1.8 | 2 |
| 2 | PEM, POW | 12.0 | 1 |
| 4 | PSS, PEM | 4.6 | 2 |
| 7 | PSS, PAB | 10.3 | 2 |
| 9 | PSS | 5.5 | 2 |
| 10 | PSS, PEM | 2.8 | 2 |
| 11 | POW, PEM | 2.4 | 2 |
| 12 | PAB, PSS, PEM | 11.5 | 1 |
| 13 | POW, PSS | 3.5 | 2 |
| 14 | PFO | 4 | 2 |
| 15 | LAB, LEM, LUB | 37.7 | 2 |
| 16 | PAB, PEM | 2.75 | 2 |
| 17 | PSS | 5.1 | 2 |
| 18 | PFO, PSS, POW | 93 | 1 |
| 20 | PEM, PSS | 6.9 | 1 |
| 21 | PSS | 3.5 | 2 |
| 22 | PEM, POW | 1.8 | 2 |
| 23 | PEM | 1.8 | 3 |
| 24 | POW, PEM | .5 | 2 |
| 25 | POW, PEM | 4.8 | 2 |
| 26 | PAB, POW | 2.1 | 2 |
| 28 | PEM, POW | 1.2 | 2 |
| 29 | PEM, POW | 8 | 2 |
| 32 | PFL | .2 | 3 |
| 33 | PEM, POW | 3.1 | 2 |
| 34 | PSS | 1.4 | 1 |
| 35 | PEM | 2.3 | 2 |
| 36 | POW | 1.2 | 2 |
| 37 | POW, PEM | 2.3 | 2 |
| 39 | PSS | 2.1 | 2 |
| 41 | PSS | 2.8 | 2 |
| 42 | PSS | 7 | 2 |
| 43 | PEM | 9.3 | 2 |

| | | | | |
|---------|-----|-------------------------|-----|-----------------------------------|
| Legend: | PEM | Palustrine | PUB | Palustrine, Unconsolidated |
| | PSS | Palustrine, Scrub/Shrub | PFL | Palustrine, Flat |
| | PFO | Palustrine, Forested | LAB | Lacustrine, Aquatic Bed |
| | POW | Palustrine, Open Water | LEM | Lacustrine, Emergent |
| | PAB | Palustrine, Aquatic Bed | LUB | Lacustrine, Unconsolidated Bottom |

Source: King County, 1983

The occurrence of species of sedges, rushes, and grasses varies with the wetland but the following species are known to occur; water sedge (*Carex aquatilis*), slough sedge (*Carex obnupta*), river bulrush (*Scirpus fluviatilis*), small-fruit bulrush (*Scirpus microcarpus*), softstem bulrush (*Scirpus validus*), *Dulichium arundinaceum*, spike rush (*Eleocharis* spp.), soft rush (*Juncus effusus*), dagger-leaf rush (*Juncus ensifolius*), slender rush (*Juncus tenuis*); reed canary grass (*Phalaris arundinacea*), foxtail grass (*Alopecurus* spp.), and Manna grass (*Glyceria* spp).

The open water portions of wetlands also may include white pond lily (*Nymphaea odorata*), Yellow pond lily (*Nuphar polysepalum*), pond weed (*Potamogeton natans*), water shield (*Brassenia schruberi*), water milfoil (*Myriophyllum* sp.), bogbean (*Menyanthes trifoliata*), duckweed (*Lemna minor*), and bladderwort (*Utricularia minor*).

There are several peat moss (*Sphagnum* sp.) bogs with special plant communities which include Labrador tea (*Ledum groenlandicum*), bog laurel (*Kalmia occidentalis*), and cranberry (*Vaccinium oxycoccus*), species not typically found in other wetland communities. These wetlands are Lower Puget Sound 23 and Hylebos 7,17,18,20, and 34 (Table 7).

Riparian and wetland vegetation are important wildlife habitats which provide food and cover for wildlife. Typically, riparian areas and wetlands provide more valuable wildlife habitat per acre than do forested upland areas. Undeveloped riparian zones, which frequently include wetlands associated with streams, are also important corridors for wildlife moving within developed areas. Along streams, riparian vegetation enhances fish habitat by providing shade to moderate temperatures, stabilizing banks to minimize sedimentation, providing breeding habitat for insects to enhance food available to fish, and supporting the aquatic food chain by providing a source of organic material.

Animals

Wildlife habitat in the Federal Way planning area has been reduced over time as a result of urban and suburban development. This habitat decline has accelerated in the past two decades because of the recent high pace of development. However, important wildlife habitat remains where relatively undeveloped tracts of land remain in native vegetation. These remaining habitat areas are typically associated with steep slopes, streams, lakes, ponds and wetlands. Depending upon their size, configuration and degree of disturbance, these areas provide wildlife habitat ranging in quality over time from good to very poor. Historically the Hylebos Creek system supported a rich fauna including three species of salmon and two species of trout. There has, however, been substantial reduction in both species diversity and number of individuals as a result of direct and indirect impacts from development and urbanization.

A number of animal species inhabit the planning area. Small forested tracts, particularly those associated with wetlands, are known to support populations of red fox, black-tailed deer, river otter and possibly beaver. Mountain beavers, cottontail rabbits, raccoons, pacific jumping mice, muskrats and frogs are known to occur in and around scrub-shrub and palustrine emergent wetlands. A variety of other

mammals including coyote, opossum, skunks, weasels, bats, moles, shrews, and several species of native and exotic rodents can be expected to occur in the planning area as well based on the presence of suitable habitat.

Numerous bird species also occur. Open water and marshy areas attract waterfowl and shorebirds including Canada geese, ruddy ducks, mallards, wood ducks, common coot, pied-billed grebes, great blue herons, green-backed herons, egrets, killdeer, spotted sandpipers, American bitterns, Virginia rails and many other species. A great blue heron rookery with over fifty active nests is located at the western boundary of Dumas Bay County Park.

Both the green-backed and the great blue herons are considered "priority species" by the Washington Department of Wildlife (WDW). In general, this designation indicates species of concern due to their population status and their sensitivity to habitat alteration. Threatened and endangered species, and several other classifications of wildlife (e.g. sensitive, candidate, and monitor species) are included within the priority designation. WDW has prepared management recommendations for priority species; the recommendations provide guidance for planning and mitigation actions. Several additional priority species are identified in the discussion below.

Other bird species observed or expected in upland forested, scrub-shrub and suburban areas include pileated woodpeckers (also a priority species), barn, violet-green and tree swallows, red-winged blackbirds, rufous-sided towhees, band-tailed pigeons, Swainson's thrushes, American robins, song sparrows, marsh and winter wrens, rufous hummingbirds, chestnut-backed chickadees, American goldfinches, house finches, yellow warblers, yellowthroats, Steller's jays, common crows and belted kingfishers. Gallinaceous species, found in forested and scrub-shrub areas, include pheasant, California quail and ruffed grouse. Raptors are represented by the red-tailed hawk, Cooper's hawk, sharp-shinned hawk and potentially the northern harrier, all of which inhabit scrub-shrub, marshy or other open areas. The northern bald eagle and the peregrine falcon – both identified as priority species by WDW – either have been observed or potentially feed and breed along the coastal portions of the planning area from the King County line at Dash Point north to Redondo Beach. Two active bald eagle nests are located along Poverty Bay in the vicinity of Redondo. Both the bald eagle and the peregrine falcon are on the State and Federal lists of threatened and endangered species.

Although greatly reduced from historic levels, remnant populations of salmonids are present in the lower reaches of the Hylebos Creek system as well as Lakota and Joe's Creeks in the Puget Sound Basin. The Spring Valley wetland, tributaries 0013 and 0014 of West Branch Hylebos Creek and Lower Joe's Creek are used by one or more species of salmonids for feeding and/or spawning and are considered to be locally significant resource areas. The lower portion of East Branch Hylebos Creek is a steep-sided ravine with a good riparian corridor and provides excellent fish habitat. Lower Hylebos Creek has been significantly degraded by human activity and now serves only as a fish migration route. Lakota Creek supports limited salmonid spawning and rearing due to stocking by the Federal Way Sewer and Water District. Species that may be present include coho, chum and chinook salmon, steelhead and cutthroat trout.

Although not within the planning area, a small population of freshwater mussels exists in the West Branch Hylebos near the confluence of the East and West branches; the presence of this indicator species reflects the relatively unpolluted water in the upstream reaches of the West Branch.

SIGNIFICANT IMPACTS

Future growth and development can affect plants directly and indirectly. Development directly results in the removal of plants and can also indirectly eliminate their habitat. Clearcutting, for example, removes canopy species, but understory species are affected by the removal of the canopy. The extent of the impacts depends on the location and density of future land uses in the planning area. As a result of impacts to natural plant communities, wildlife habitat is lost as well. When habitat is lost, animals must relocate to different areas. Some of these areas provide suboptimum habitat for wildlife and individuals moving there perish. Other individuals move to areas which provide adequate habitat, but such areas typically are already at their capacity to support particular wildlife species. In this situation, individuals perish or reproductive success is limited. In either scenario, the result of reduced habitat is lower wildlife populations.

In general, destruction or degradation of riparian vegetation, wetlands and undeveloped or less densely populated areas can cause the loss or displacement of mammal, bird, amphibian, and reptile species, resulting in lower overall numbers and variety of wildlife. Alteration of riparian areas and associated wetlands can lead to direct loss of habitat and interfere with movement of wildlife through riparian corridors. Because of their productivity, impacts to wetland and riparian habitats may be more significant than effects on other habitats. Wetlands also provide natural drainage functions and stormwater retention. Preservation and appropriate use of wetlands for these functions can result in cost savings compared to constructing man-made facilities.

Impacts on the quality and quantity of an area's water can also adversely affect fish and other aquatic species' populations. Increasing impervious surfaces within a basin can increase peak runoff and siltation to streams while reducing base stream flows during the summer. Fish breeding and rearing areas within streams are especially sensitive to siltation. Temporary construction activities that increase siltation within streams can have long-term impacts on fish populations by killing fish fry and degrading spawning habitat. The growth of fish populations from hatching to migration depends on the health of the aquatic ecosystem. Loss of riparian vegetation and degradation of wetlands associated with streams can result in fewer numbers of salmonids which survive to reproductive maturity.

In general, Federal Way's Sensitive Area Ordinance, tree retention and landscaping requirements, and SEPA process would regulate development near lakes, streams, wetlands and geologic hazard. Development undertaken pursuant to adopted plans and regulations will, nevertheless, affect the city's remaining plant and animal communities.

- The Department of Wildlife's management guidelines for priority species should be considered when the City reviews its Sensitive Areas Ordinance.

UNAVOIDABLE ADVERSE IMPACTS

Native vegetation and wildlife habitat will be lost as a result of population growth and increased development in the planning area. Reduced and fragmented habitat will cause a decrease in local wildlife populations, and some species may become extinct within the planning area.

The Department of Health, Education and Welfare is pleased to announce the availability of the following information for public release.

UNIVERSITY OF CALIFORNIA

The University of California is pleased to announce the availability of the following information for public release. This information is being made available to the public in order to ensure that all interested parties are fully informed of the current status of the project. The information is being made available to the public in order to ensure that all interested parties are fully informed of the current status of the project.

The majority of growth in any of the land use concepts will concentrate in the city center area between I-5 and Pacific Highway South where there is little remaining forest or wetland. Under all of the concepts, the city's established residential areas would generally experience small and gradual changes. Since most of the natural vegetation and animal habitat in the city is associated with residential areas and drainages, the impacts of the three alternatives to plants and animals would generally be similar. However, substantial development would also occur east of I-5; this would result in alteration of existing habitat and reduction of some species.

The direct impacts of the three land use concepts would be focused on the most urbanized portion of Federal Way, near the Highway 99 "spine". In particular, Concepts 2 and 3 concentrate high intensity development in those areas which are currently most developed, such as the City Center; significant habitat alterations have already occurred in this area. Focusing growth in a limited area that is already disturbed would also tend to reduce development pressure from currently undeveloped lands; relatively greater amounts of habitat would be retained. Based on projected vacant land remaining in the planning area in 2010, Concept 1 would have the lowest impacts to existing habitat, followed by Concepts 2 and 3.

An area of high density housing is also planned along S. 304th Street between I-5 and Pacific Highway South, an area containing Steel Lake and associated wetlands. While the City's Sensitive Areas Ordinance would limit habitat alteration somewhat, permitted development would result in loss of some native mixed coniferous/deciduous and shrubs, particularly in the western portion of the site. Unless adequately mitigated, the loss of vegetative cover and greater amounts of impervious surfaces could increase peak runoff and siltation into Steel Lake and wetlands. The south-east corner of the Twin Lakes Neighborhood Center site is a mixed coniferous/deciduous forest containing a wetland. Multi-family housing in this area would have impacts similar to those identified for Steel Lake. The area around the intersection of S. 336th Street and 1st Avenue S. is forested and involves Hylebos Creek, Panther Lake, and several wetlands; future development in this location could result in loss of trees as well as increased runoff and siltation.

Indirect impacts to plants and animals under all three land use concepts could result from degraded water quality, increased peak flows and decreased base flows in aquatic environments associated with increased urbanization. Changes to wetland and riparian plant species composition can result from sedimentation, increased flooding and reduced base flows. This, in turn, can have a negative impact on amphibian, mammal and bird populations. Increased flooding and sedimentation caused by increased development in a watershed can degrade or destroy fish habitat in wetlands, lakes and streams. Since the greatest degree of development will occur within the upper reaches of the West Branch Hylebos sub-basin, the greatest threat from indirect impacts is to the wetlands and streams within that sub-basin. See the additional discussion in the *Water Resources* section of the Draft EIS.

MITIGATION MEASURES

The City's existing Sensitive Areas Ordinance, landscaping provisions, and development regulations, and implementation of its SEPA responsibilities, would mitigate impacts to plant and animal communities. These policies would be applied

on a project-by-project basis and provide protection to the City's streams, wetlands, lakes and steep slopes.

The following additional mitigation measures should be considered to supplement existing plans and programs.

- The City should review its Sensitive Areas Ordinance, pursuant to the Growth Management Act, and incorporate modifications based on policies in the Comprehensive Plan and the analysis in the Draft and Final EISs. The objective of the review should be to better coordinate resource protection with growth management planning. Non-regulatory approaches (such as incentives and acquisition programs) should be considered along with regulations.
- A field inventory of streams, lakes, and wetlands, should be conducted over time to better characterize the quality of these sensitive areas.
- Using more detailed inventory information, the City's sensitive areas regulations could be revised to provide more detailed standards of protection related to the relative quality of the critical areas. Wetland setbacks, for example, are currently the same regardless of the type or quality of the wetland. Greater setbacks for higher quality wetlands, and reduced setbacks for lower quality wetlands, might be appropriate.
- Enhancement of critical areas should be considered. Enhancement could include activities which will further protect and/or rehabilitate sensitive areas such as streams and wetlands. Possibilities include mitigation banks, various incentives for protection of sensitive areas and public purchase of sensitive areas.
- Retention and dedication of Native Growth Protection Easements (NGPE) could be incorporated into sensitive area regulations. In many cases, setbacks from streams, wetlands and lakes and undeveloped portions of geologically hazardous areas could be permanently protected from removal of vegetation. By placing a NGPE upon a deed, the potential for inadvertent disturbance of vegetation is minimized.
- Design of regional storm water management facilities should incorporate features which enhance wildlife habitat where possible such as created wetlands or wet ponds with wetland edges. Such facilities should not be sited in undisturbed habitats but should be placed only in very degraded habitats. Such a policy of multiple use will create some habitat and add to passive recreational opportunities for the public while protecting aquatic habitat downstream.
- Habitat considerations should be incorporated into planning for the City's open space system. The system could, for example, include wetlands, steep slopes, streams and wetlands, which also correspond to valuable habitat areas.
- Landscaping requirements for projects could be required to employ native plants and/or plant species which have a demonstrated benefit to wildlife.

ENERGY

AFFECTED ENVIRONMENT

Petroleum

Vehicle travel is the predominate use of petroleum-based energy resources in the Puget Sound region. Fuel for travel accounts for three-fourths of all petroleum consumed, with the remaining fuel used for space heating. Travel-related fuel consumption is influenced by several factors, including: the number of trips made by vehicles, the amount of congestion on roadways, and the mix of vehicles using the system. The most important factor affecting fuel consumption is the number of trips made by vehicles, which is significantly influenced by the pattern of development and the spatial relationships among residences, work sites, and shopping areas. The availability of alternatives to the single-occupant vehicle, such as transit, car pools and walking, also affects the number of vehicle trips in an area. Federal Way currently has limited transit opportunities and is relatively auto-dependent -- two factors contributing to fuel consumption. The total number of daily vehicle trips in 1992 in Federal Way was estimated to be 350,000 (see the *Transportation* section of this Draft EIS).

Natural Gas

The Washington Natural Gas Company supplies natural gas to the entire City of Federal Way, with a system of stations, mains, and distribution lines running throughout the South King County/Tacoma region. All natural gas is supplied to Washington Natural Gas customers from the Northwest Pipeline, a north-south pipeline running east of Interstate 5. This pipeline is closest to Federal Way at a point southeast of Auburn (City of Federal Way, 1992a).

The majority of the city has natural gas lines in place, with the exception of a few multi-family neighborhoods in the southern portion of the city. According to Washington Natural Gas, the City of Federal Way currently has 14,700 (4 percent) of the total 390,000 customer connections in the Puget Sound Region. The number of customers has grown approximately 61 percent over the past decade. Existing natural gas distribution infrastructure is sufficient to handle current peak demands generated by the Federal Way area (City of Federal Way, 1992a).

Washington Natural Gas intends to construct and improve a number of mains and develop new gas sources to serve the Federal Way area. Planned improvements include construction of new gas mains along Hoyt Road and 1st Way S., raising pressure of existing mains, and providing a separate source of gas at the north end of the primary main that serves Federal Way (City of Federal Way, 1992a).

Electricity

The City of Federal Way receives electrical service from Puget Sound Power & Light Company (Puget Power), who receives power from the Bonneville Power Administration's (BPA's) power distribution system. Two BPA distribution lines

bisect the Federal Way area: the Tacoma-Covington line (500 kV) and the Tacoma-Raver line (500 kV). Both lines travel in a southwest-northeast direction and pass through the city center, just south of SeaTac Mall. BPA does not plan to expand facilities in the Federal Way area for the foreseeable future (Starky, 1993).

Power obtained from BPA is transferred into Puget Power's system via four substations and two switching stations in the south King County area. All Puget Power transmission lines supplying Federal Way are 115 kV lines and help to link King County, Pierce County, and Tacoma City Light. In Federal Way, electricity is distributed throughout the city via seven substations. These stations are all rated at 25 MVA (Megavolt Amperes) and experience winter loads ranging between 18 MVA (Belmore II substation) and almost 33 MVA (Kitts Corner substation). Each substation is estimated to have a rated capacity to serve approximately 6,700 households. Therefore, the existing seven substations have enough capacity to supply almost 47,000 customers (7 x 6,700) with electricity (customer capacity is measured as residential hookups, given the various energy consumption rates among commercial uses). The system served approximately 33,800 residential and 2,900 commercial and industrial customers in 1990. Assuming a rate of customer growth that parallels population growth, the system will likely serve 41,000 customers in 1993. Thus, the system likely has current remaining capacity to serve approximately 6,000 additional customers (47,000 - 41,000) in Federal Way. In addition to the existing substations, other substations outside the greater Federal Way area can also be utilized to supply electricity to the city (City of Federal Way, 1992a).

Based upon Puget Sound Regional Council (PSRC) population and employment forecasts, Puget Power has estimated that the load for the greater Federal Way area is expected to grow by 104 MVA between 1990 and 2020. A number of efforts are being undertaken by Puget Power in the Federal Way area to plan for this increased demand, including:

- Installing four new transmissions lines;
- Constructing six new substations;
- Implementing an Automated Distribution System (no manual rerouting of electricity);
- Changing radial neighborhood distribution systems to loop distribution systems; and
- Continuing Puget Power's electricity conservation program for customers (City of Federal Way, 1992a).

SIGNIFICANT IMPACTS

All of the land use concepts would result in major energy consumption increases within the city. In general, the three land use concepts contain roughly an equal number of residential units, resulting in similar residential energy demands. Land uses concepts with relatively more multifamily uses could experience slightly higher energy efficiency, given features such as common walls. As the mix of commercial uses changes under the different land use concepts, commercial energy uses would also change. Concepts with more commercial and industrial uses (Concepts 2 and 3)

would generally be expected to consume more power than those with fewer of these uses (Concept 1). However, Concepts 2 and 3 could also possess a greater potential energy efficiency (e.g., common walls, less building surface area to outside).

Although energy conservation efforts such as Puget Power's program help to curb energy demands, certain uses inherently consume more energy than others. Table 8 shows a variety of uses and their energy consumption. To the extent that a particular land use concept contains varying amount of these uses, it will use more or less energy. On this basis, the three land use concepts are evaluated below.

Table 8. Energy Demands by Land Use

| Use | Energy Use (kWh/gal/year) |
|-------------------------|---------------------------|
| Single-Family Residence | 5.7 |
| Multifamily Residence | 3.6 |
| Retail | 19 |
| Office | 23 |
| Manufacturing | Varies with type of use |

Source: Bonneville Power Administration, 1993.

Land Use/City Center Concept 1

This land use concept would continue the current automobile-dependent suburban city core, with associated levels of traffic and congestion. Furthermore, this concept would have the least dense development and would not include high capacity transit linkages. As a result, the use of gasoline and other petroleum products would likely increase the most under this concept. The trend toward more energy efficient automobiles and carpooling may offset this impact to a certain extent.

Natural gas and electricity use under this concept can be divided into residential and commercial components. If every 6,700 households generate the need for approximately 25 MVA (rated capacity) in energy, then the additional 17,800 housing units developed under this land use concept would generate the need for 66 MVA (three substations).

For commercial uses, Table 9 shows calculations for anticipated energy use under Concept 1. Combining commercial energy consumption with the consumption estimated above for residential uses results in a total energy demand of 229 MVA for Concept 1 (excluding manufacturing uses). Subtracting the current remaining capacity in the system (22 MVA – enough to serve 6,000 customers), the additional demand would be approximately 207 MVA. For comparison purposes, if all 207 MVA were provided in natural gas form, approximately 6,010 therms of natural gas would be required.

Table 9. Commercial Energy Consumption for Concept 1

| Use | Space | Energy Use Calculation |
|---------------|--------------|--|
| Office | 1,600,000 SF | $1,600,000 \text{ SF} \times 23 \text{ kWh/year} = 36.8 \text{ mWh}^* + 310250^{**} = 119 \text{ MVA}$ |
| Retail | 720,000 SF | $720,000 \text{ SF} \times 19 \text{ kWh/year} = 13.7 \text{ mWh}^* + 310250^{**} = 44 \text{ MVA}$ |
| Manufacturing | 600,000 SF | Variable, depends extensively on particular use. |

Source: Richardson, 1993; BPA, 1993; and similar studies.

* Million kilowatt hours

** Assumes a peak load factor of .5 and a power factor of .85.

The six substations planned for the area would provide an additional 150 MVA of energy from Puget Power. Thus, a deficiency of at least 57 MVA (207 MVA - 150 MVA = 57 MVA = 2 to 3 substations) would still exist. This deficiency would need to be supplied by Puget Power and/or Washington Natural Gas. Demand for electricity and/or natural gas use would likely depend on relative energy prices, availability of nearby infrastructure, and similar factors. Regardless of which utility ultimately provides the demanded energy, discussions would need to be held between the two utilities and Federal Way to assure that adequate energy infrastructure and energy sources are provided to meet anticipated city growth.

A variety of infrastructure would need to be provided to supply the energy needs generated under Concept 1. Additional electricity substations and distribution lines would need to be constructed. Transmission lines connecting BPA electricity sources to the Puget Power network would also likely need to be constructed. For natural gas use, additional natural gas lines would need to be installed, and the pressure in the existing lines likely increased to adequately handle the additional demand. As described in the adopted *Utilities Element of the Comprehensive Plan*, these infrastructure needs and energy sources are currently being planned and will be available when demanded.

Land Use/City Center Concept 2

The overall energy usage associated with this land use concept would be similar to the energy use described for Concept 1. Concept 2 would contain a number of features resulting in less consumption of petroleum products, including more dense development and high capacity transit linkages. Offsetting some of these advantages would be the additional commuters (and vehicle trips) associated with an additional 1 million square feet of office space. Overall, the use of gasoline and other petroleum products would likely increase at a slower rate for Concept 2 than for Concept 1, because of the aforementioned density and transit effects.

If energy use is divided into residential and commercial components, then this concept would generate roughly the same residential energy need as Concept 1 (66 MVA, or three substations) and would require 237 MVA of energy for commercial

uses (not including manufacturing). Combining these energy uses results in a total demand of 281 MVA for Concept 2 (including the subtraction of current remaining capacity) – approximately 131 MVA (5 to 6 additional substations) more energy than is planned to be supplied by Puget Power. The 281 MVA of electricity is equivalent to approximately 8,150 therms of natural gas. As under Concept 1, this 131 MVA deficiency would need to be supplied by Puget Power and/or Washington Natural Gas and discussions would need to be held between these entities and utility planners from Federal Way.

This concept would have slightly fewer single-family homes and slightly more multifamily units than Concept 1. This could result in slightly more efficient use of energy for Concept 2 than for Concept 1. A similar effect could result for the commercial portion of Concept 2. Commercial uses under Concept 2 would be more likely to be mid-rise scale than the commercial uses under Concept 1. As a result, Concept 2 commercial uses could gain some energy efficiencies because more common walls and features such as smaller outside building area.

As under Concept 1, a variety of infrastructure (e.g., substations, electrical lines, natural gas lines) would need to be provided to supply the energy needs generated under Concept 2. The pressure in the existing natural gas lines would also need to be increased to adequately handle the additional demand.

Land Use/City Center Concept 3

Land Use Concept 3 would create energy demands greater than either Concept 1 or 2. Concept 3 would contain a number of features resulting in less consumption of petroleum products (e.g., very dense development, high capacity transit linkages) as well as features resulting in significantly more consumption of petroleum products (e.g., 2.5 million square feet more of office space and associated commuting trips). Given the magnitude of these offsetting impacts, it is unknown whether petroleum consumption will increase at a faster or slower rate than under the other two land use concepts.

This concept would generate essentially the same residential energy need (66 MVA) as Concepts 1 and 2. Commercial uses associated with this land use concept (not including manufacturing) would be significantly greater than under the other two concepts and, as a result, would require 380 MVA of energy – 217 MVA more than the commercial portion of Concept 1, and 143 MVA more than the commercial portion of Concept 2. Combining residential and commercial energy uses results in a total demand of 420 MVA for Concept 3 (including the subtraction of current remaining capacity), or 12,200 therms of natural gas. This is a far greater demand than will be met via the currently planned six substations. This energy demand would be 270 MVA (10 to 11 substations) more than planned by Puget Power. It would be critical that this deficiency be addressed by Puget Power, Washington Natural Gas, and the City of Federal Way.

Some scale economies may exist in providing large amounts of energy to a relatively densely developed area, as embodied in Concept 3. To the extent that these scale economies may exist, the per-unit cost of providing energy may be reduced more for this land use concept than for the other concepts. Similarly, this concept would

have the most multifamily units of the three alternatives. This feature could result in the highest residential energy efficiency of the three alternatives. With the largest amount of commercial space and a high-rise configuration planned for this concept, the most efficient use of commercial energy could also potentially be achieved under Concept 3.

Infrastructure needs under Concept 3 would be similar to the other two concepts; however, more infrastructure would be required, given the greater energy demands. In addition to the total 9 to 11 substations required for Concepts 1 and 2 (assuming 100 percent electricity use), development under this concept would require 6 to 8 additional substations and could necessitate new BPA transmission line connections for Puget Power.

MITIGATION MEASURES

The following mitigation measures should be considered in selection of a preferred land use concept and should be addressed in the Comprehensive Plan:

- **Coordinate planning and construction activities with energy purveyors (i.e., Puget Power, BPA);**
- **Encourage extension of transit services, including increased use of HOV, and other policies designed to reduce dependency on single-occupancy vehicles; and,**
- **Include energy saving features in the design and construction of projects. These energy saving measures might include insulation, double glazed windows, reflective exterior surfaces, energy saving lighting, or other measures designed to decrease energy usage.**

UNAVOIDABLE ADVERSE IMPACTS

Energy consumption will increase in response to population growth, the amount of commercial development, and the number of vehicles on the city's road system. These demands are likely to occur with or without adoption of the Comprehensive Plan.

ENVIRONMENTAL HEALTH

A. ELECTROMAGNETIC FIELDS (EMF)

Affected Environment

Bonneville Power Administration (BPA) powerline corridor crosses the City of Federal Way Urban Growth Area from northeast to southwest. Two 500 kV distribution lines are located in this corridor -- Tacoma-Raven and Tacoma Covington. The powerline easement crosses the I-5 corridor from northeast to southwest at the interchange with S.W. 320th then turns west and runs along S. 324th Street before turning southwest at 11th Place S. Along S. 324th Street, the power lines abut parking areas along the south side of SeaTac Mall and other retail development, and pass a mobile home park, apartments and single family residences. The power lines also cross the West Campus area and residential development in the southern portion of the City.

Powerlines, electrical wiring, and electrical devices and appliances all produce electric and magnetic fields of various strengths. In simple terms, an electric field is invisible lines of force that repel or attract electrical charges. An electromagnetic field (EMF) is a field with two components -- one electrical, the other magnetic. Electric fields are measured in units of kilovolts per meter (kV/m), and magnetic fields in gauss (G). Measurement of magnetic fields is commonly expressed in milligauss (mG).

Sources of EMF operate along a wide range of frequencies within the electromagnetic spectrum. Fields occurring at different frequencies along this spectrum differ in the way they interact with objects, including living organisms. The point along this spectrum at which electric power systems operate in North America is 60 cycles per second (60 Hz). This is an extremely low frequency on a spectrum which ranges from less than 1 Hz (the earth's geomagnetic field) to 100 trillion Hz (visible light). Consequently, 60 Hz fields are often referred to extremely low frequency (ELF) fields.

Electromagnetic fields are found anywhere one finds electricity. EMFs are generated by high-voltage transmission lines, low-voltage distribution lines, and substations as well as electrical devices and appliances found in homes and businesses such as computers, television sets, hair dryers, and microwave ovens. The strength of an EMF depends on the amount of current flow - not on the voltage -- and the current is a function of energy consumption. Therefore, the magnetic field from a power line of a given voltage will vary with the season and time of day. Highest fields usually occur during the periods of maximum electricity use, typically the early evening, when people are using household appliances. For the same amount of power delivery, a lower voltage line will carry more current -- and have a larger magnetic field -- than an equivalent high-voltage line.

While electric fields are relatively easy to shield, magnetic fields are much more difficult to shield. Electric fields can be partially shielded by trees, shrubbery, and building walls. Magnetic fields, on the other hand, pass through most common

objects without being significantly affected (certain special metal alloys can reduce magnetic fields if the source is enclosed). Containment is not practical for many sources of EMF, including power lines. Burying transmission and distribution lines does not provide a ready solution as soil is not an effective shield against EMFs. In addition, buried power lines are generally closer to people on the surface than are overhead lines. The magnetic field intensity of power lines can be reduced to some degree by pole design and wire location; however, for other safety and reliability reasons, power lines have minimum required spacing for poles and wires.

EMFs diminish rapidly with distance with the rate of decay depending on the source. Appliances produce high-intensity EMFs up close, but the fields decrease rapidly and reach background levels a few feet from the source. For example, typical magnetic field strengths at 1-2 inches from a microwave oven are 750 - 2000 mG. This decreases to 3 - 8 mG at a distance of a meter (approximately 39 inches). Fields from power lines also decrease rapidly with distance. Typical average magnetic field strength under a 500 kV transmission line measures 87 mG; at 100 feet, this decreases to 13 mG, and at 200 feet decreases to 3 mG. At peak loads, the magnetic field strength at 100 feet measures approximately 27 mG and at 200 feet, 7 mG. Table 10, which is based on data compiled by the Bonneville Power Administration (BPA), illustrates this point.

Table 10.
Typical EMF Measurements

| EMF Source | Measured Distance | Electric Field | Magnetic Field in mG | |
|---------------------------|-------------------|----------------|----------------------------|---------|
| | | | Peak | Average |
| Transmission Lines | | | | |
| - 500 kV | On ROW | 7000 V/m | 183 mG | 87 mG |
| | Edge of ROW | 3000 V/m | 62 mG | 30 mG |
| | 100 Feet | 1000 V/m | 27 mG | 13 mG |
| | 200 Feet | 300 V/m | 7 mG | 3 mG |
| - 230 kV | On ROW | 2000 V/m | 118 mG | 58 mG |
| | Edge of ROW | 1500 V/m | 40 mG | 20 mG |
| | 100 Feet | 300 V/m | 15 mG | 7 mG |
| | 200 Feet | 50 V/m | 4 mG | 2 mG |
| - 115 kV | On ROW | 1000 V/m | 63 mG | 30 mG |
| | Edge of ROW | 150 V/m | 14 mG | 7 mG |
| | 100 Feet | 70 V/m | 4 mG | 2 mG |
| | 200 Feet | 10 V/m | 1 mG | 1 mG |
| Electric Blanket | As used | 2000 V/m | up to 100 mG (non-uniform) | |
| Electric Hairdryer | 1 foot | 40 V/m | 1-70 mG | |
| Coffee Maker | 1 foot | 30 V/m | 10 mG | |
| Electric Shaver | 1-2 inches | | 150-15,000 mG | |
| Television | 1 foot | | 0.4-20 mG | |

Note: 1. Total right-of-way (ROW) width is 100 feet; distance from edge of ROW is 50 feet.
2. At a distance of 1.5 meters (5 feet), most appliance fields are less than 1 mG

Source: BPA, 1993.

Scientific studies of biological response to exposure to EMF fields have been undertaken for a number of years, and continue to be conducted. The studies initially focused on potential risks from exposure to electric fields, but more recently have focused on effects associated with low-level constant exposure to magnetic fields. Studies on the effects of electric and magnetic fields have been conducted in the U.S. as well as in a number of other countries including Sweden, Denmark, Finland, Germany, Spain, Italy, Great Britain, and Russia. Basically three kinds of studies have been done: 1) laboratory studies that expose single cells, groups of cells, or organs to EMFs under a variety of conditions; 2) laboratory studies that expose animals or humans to EMFs; and 3) epidemiological studies that look for an association between exposure to 60 Hz fields and various diseases.

The issue of a potential connection between EMFs and cancer has resulted primarily from epidemiological studies. Epidemiological research establishes statistical associations that may or may not indicate cause-and-effect relationships. Two types of studies have explored the possibility that long term exposure to EMFs is a factor in cancer. The first type looks at death rates from different diseases for people employed in occupations that require working with various types of electrical equipment. The second type of study compares the magnetic field exposure received by people with specific cancers, particularly leukemia, with the exposures received by other similar people. The most widely discussed studies that showed a positive correlation between EMF exposure and childhood leukemia were conducted by Wertheimer and Leeper in 1979 and involved children who lived close to power lines and substations in Denver, Colorado. These studies were repeated by Savitz in 1986 with similar results. The Savitz study confirmed that there was some correlation between powerline configurations and the measured magnetic field strength in nearby homes. Savitz et al characterized the combined results of their and other powerline/cancer studies as suggestive but inconclusive (BPA 1989). A number of studies similar to the Wertheimer/Leeper and the Savitz research, including those by Tomenius (Stockholm, 1982) and London and Peters (USC, 1991), reached similar conclusions. Studies recently released in Sweden (Feychting and Ahlbom, Stockholm, 1992) also suggest a correlation between the degree of exposure to high levels of electromagnetic fields over extended periods of time and incidence of childhood leukemia (TIME magazine, October 26, 1992; Seattle Times, November 9, 1992). None of the studies have concluded that there is a direct causal link between EMF and cancer.

Despite indications from the epidemiological studies, there is as yet no precise accepted threshold for EMF effects. More complex characteristics of EMFs – such as high-frequency transients, harmonics (multiples of 60 Hz fields), and on- and -off field exposures, as well as factors that may interact with powerline fields, such as the Earth's magnetic fields, ground currents, and toxic chemicals – may be involved (Slesin, 1991a). A Scientific Advisory Board (SAB), appointed by the U.S. Environmental Protection Agency (USEPA) to review a report prepared by the USEPA on the relationship between EMF and health risks, recently concluded "There is insufficient evidence from the human epidemiology data and from animal/cell experiments to establish cause-and-effect relationships between low frequency electric and magnetic field exposure and human health effects and cancer." (SAB, 1991) In January, 1992, the Board concluded in part that "Currently available

information is insufficient to conclude that ...electric and magnetic fields are carcinogenic." (Slesin, 1991b)

The USEPA has not determined a scientific basis for regulating magnetic field exposure and no U.S. federal agency has yet set EMF standards. The Washington State Legislature has affirmatively declined to regulate EMFs for lack of a scientific basis to do so (Washington Laws of 1989, Ch. 143).

In a 1989 report to the Congressional Office of Technology Assessment, (OTA), a team from Carnegie Mellon University proposed a policy of "prudent avoidance"; decision makers would look for strategies to limit exposure to 60 Hz from all sources, but would adopt only those strategies that are "prudent" investments considering costs and the current level of scientific understanding about possible risks. Because magnetic fields diminish rapidly over distance, right-of-way widths and setbacks are generally considered to be reasonable forms of mitigation.

Significant Impacts

All of the land use concepts would locate some development (both commercial and residential) near the powerline corridor. Concepts 1 and 2 would locate new multi-family development adjacent to this corridor in the area between the City Center and West Campus. Concept 3 would locate a small residential community to the south of S. 324th Street. Intensification of land use in areas located adjacent to the power lines could result in a higher number of people being exposed to EMF. Residents and workers could be at risk of long-term EMF exposure. To date, no definite link has been established between such exposure and adverse health impacts.

At this time, there are no accepted thresholds for EMF effects. In addition, there is insufficient evidence from human epidemiology data or animal/cell experiments to establish cause-effect relationships between low frequency electric and magnetic field exposure and human health effects (SAB, 1991).

Mitigation Measures

Due to the increasing concern over potential health effects of EMF, it is important to consider the siting of future development adjacent to power line rights-of-way. In general, the City has been following a policy of prudence in regard to siting of land uses. The Comprehensive Plan should include policies that regulate future development in the power line corridor. Future development/redevelopment of homes and schools near power lines should be discouraged.

Unavoidable Adverse Impacts

Intensification of land use in areas adjacent to the power line corridor would expose more people to the effects of EMF. Based on available information, it is not clear if such effects are adverse.

B. ENVIRONMENTAL NOISE

Affected Environment

The human ear responds to a very wide range of sound intensities. The decibel (db) scale used to describe sound is a logarithmic rating system that accounts for the large differences in audible sound intensities. This scale accounts for the human perception of a doubling of loudness as an increase of 10 dB. Therefore, a 70-dB sound level will sound twice as loud as a 60-dBA sound level. People generally can not detect differences of 1 dB; under ideal laboratory situations, differences of 2 or 3 dB can be detected. A 5-decibel change would be expected to be perceived under normal listening conditions.

When addressing the effects of noise on people, it is necessary to consider the frequency response of the human ear. Sound level measurement instruments are therefore designed to respond to or ignore certain frequencies. The frequency-weighting most often used is A-weighting, and measurements from instruments using this system are reported in "A-weighted decibels" or dBA. All sound levels in this evaluation are reported in A-weighted decibels unless otherwise noted. Typical sound levels of familiar noise sources and activities are presented in Table 11.

For a given noise source, factors affecting the noise impact include distance from a source, frequency of the sound, ground effects like absorption or reflection, obstructions, and duration. The degree of impact also depends on who is listening at the time of the noise event and on existing sound levels.

Applicable Standards & Criteria

Federal regulatory agencies use the equivalent sound level (Leq) to evaluate noise impacts. The equivalent sound level is the level of a constant sound that has the same sound energy as the actual fluctuating sound. Because Leq is similar to an average sound level, it is important to identify the time period being considered.

In residential areas, environmental sound levels are often described on a 24-hour basis. One measure of the 24-hour sound level is the 24-hour equivalent sound level, Leq(24); this can be considered an average sound level over the entire day. Another measure is the day-night sound level Ldn, which is similar to the Leq(24) except it adds 10 dBA to sound levels occurring between 10 pm and 7 am to account for the extra sensitivity of residents to noise during sleep hours.

Section 22-956 of the City of Federal Way's zoning code adopts the maximum environmental noise limits established by the State of Washington (WAC 173-60). The state regulation establishes limits on the levels and durations of noise crossing property boundaries. Allowable maximum sound levels depend on the land use of the noise source and the land use of the receiving property. As shown in Table 11, the levels allowed for residential receiving property are reduced by 10 dBA at night (between 10 pm and 7 am on weekdays and between 10 pm and 9 am on weekends).

Table 11. Typical Sound Levels (dBA)

| | | |
|--|-----|---|
| | 140 | Threshold of Pain |
| | 130 | |
| Continuous exposure can cause hearing loss | 120 | Jet takeoff at 200 feet, Auto horn at 3 feet |
| | 110 | Chain saw, noisy snowmobile |
| | 90 | Heavy truck at 50 feet |
| | 80 | Quiet snowmobile at 50 feet Busy urban street (daytime) Quiet motorcycle at 50 feet |
| Speech interference | 70 | Normal auto, commercial area |
| | 60 | Conversation at 3 feet |
| Sleep interference | 50 | Quiet residential area |
| | 40 | Quiet home, Library |
| | 30 | Bedroom at night, Concert hall (background) |
| | 20 | |
| | 10 | Broadcasting studio |
| | 0 | Threshold of hearing |

Table 12. Federal Way Environmental Noise Standards
(From WAC 173-60)

| Land Use at Noise Source | Land Use at Receiving Property | | |
|--------------------------|--------------------------------|------------|------------|
| | Residential (day/night) | Commercial | Industrial |
| Residential | 55/45 | 57 | 60 |
| Commercial | 57/47 | 60 | 65 |
| Industrial | 60/50 | 65 | 70 |

These sound levels are maximum levels that can only be exceeded for certain periods of time: 5 dBA for no more than 15 minutes in any hour, 10 dBA for no more than 5 minutes of any hour, or 15 dBA for no more than 1.5 minutes of any hour. Sometimes these exceptions are described in terms of the percentage of time a certain level is exceeded. For example, L25 would represent a sound level exceeded 25 percent of the time, or 15 minutes in any one hour. Similarly, L8.33 and L2.5 are the sound levels exceeded 5 and 1.5 minutes in an hour, respectively.

Noise from commercial sources affecting a residential property is limited to 57 dBA during the day and 47 dBA at night. With the allowed exceedances, however, the

day limits are 62 dBA for 15 minutes per hour, or 67 dBA for 5 minutes per hour, or 72 dBA for 1.5 minutes per hour. In practice, a location is considered in compliance with the ordinance if the measured L25 is less than 62 dBA, the L8 is less than 67 dBA, and the L2 is less than 72 dBA. Night limits (10 pm to 7 am) are 10 dBA more stringent.

When the allowed exceedances are considered, these sound level limits correspond to an Leq that is approximately 2 dBA higher than the criteria in Table 12. For a commercial source affecting a residential receiver, the daytime noise limit expressed as an Leq (a sound energy average) is about 59 dBA. Although the regulations are not specified in terms of Leq, it is useful to approximate the standards this way for planning purposes and for comparison with federal standards and guidelines.

It is important to note that the dominant noise sources in Federal Way – traffic on public roads and aircraft – are exempt from the State noise limits. Therefore, efforts to determine whether a particular source complies with the ordinance must somehow eliminate noise contributions from exempt sources, or argue that the exempt sources do not contribute significantly to observed/measured sound levels.

Table 13. FHWA Roadway Noise Abatement Criteria (dBA)

| Land Use Category | Hourly Leq (dBA) |
|---|------------------|
| Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. | 57 (exterior) |
| Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, schools, churches, libraries and hospitals. | 67 (exterior) |
| Developed lands, properties or activities not included in the above categories. | 72 (exterior) |
| Undeveloped lands. | --- |
| Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals and auditoriums. | 52 (interior) |

Federal Way Ordinance 90-37 establishes regulations to control public disturbance from noise, including horns, sirens, vehicle repair and testing, shouting, and loud music. Ordinance 90-65 added tire screeching, night-time construction, and night-time residential maintenance and repair to the list of public disturbances. Federal Way also adopted the State's noise limits for watercraft.

The U.S. Federal Highway Administration (FHWA) identified noise criteria and established procedures for evaluating road improvement projects in its Federal-Aid Highway Manual (U.S. Department of Transportation, 1982). The FHWA defines a traffic noise impact to have occurred when the predicted traffic noise levels approach or exceed the noise abatement criteria in Table 13, or when the predicted traffic noise levels substantially exceed the existing noise levels. The impact analysis summarized in the following section has been conducted in accordance with the procedures identified in the FHWA publication.

The Department of Housing and Urban Development recommends a maximum outdoor Ldn sound level of 65 dBA in residential areas. Federal funding for housing projects in areas that exceed 65 dBA is normally withheld unless there is special approval. Similarly, residential areas affected by aircraft are considered noise-impacted by the Federal Aviation Administration if the Ldn exceeds 65 dBA.

The U.S. Environmental Protection Agency (EPA) has no regulations governing environmental noise. It has, however, conducted extensive studies to identify the effects of certain sound levels on public health and welfare. The EPA "Levels Document" identifies sound levels "requisite to protect the public health and welfare with an adequate margin of safety" (U.S. EPA, 1974). Partly because neither the cost nor feasibility of achieving these sound levels were taken into consideration, these levels are guidelines, not regulations or standards. EPA specifies an outdoor Ldn of 55 dBA where quiet is important. In subjective terms, this limit is half as loud as an area with an Ldn of 65 dBA.

EPA evaluates noise impact based on the relative change in sound due to a project. It classifies an increase of 0 to 5 dBA as a slight impact, an increase of 5 to 10 dBA as a significant impact, and an increase of more than 10 dBA as a very serious impact.

Existing Sound Levels

In areas where traffic dominates ambient sound levels, daytime equivalent sound levels (Leq) are likely to range from 50-70 dBA (depending on distance to roads). The higher range of noise levels would be experienced on and near roads with high volumes of traffic and higher average speeds. These would include Pacific Highway South, 1st Avenue South and I-5. Night sound levels are likely to be 10 dBA lower. In quieter residential areas removed from Interstate 5, heavily travelled arterials, and Sea-Tac flight paths hourly Leqs are likely to range from 40-50 dBA during the day and somewhat lower at night. Sound levels were not measured in Federal Way as part of this evaluation.

Because Federal Way is in line with the flight path to and from Seattle-Tacoma International Airport (Sea-Tac Airport), aircraft noise is a significant contributor to the local sound environment. Noise exposure maps have been prepared for Sea-Tac Airport (Port of Seattle, 1993) that display annual average Ldns for 1991 and 1996 airport operations, see Appendix C. The 1991 noise contours indicate that airport traffic generates an annual average Ldn of about 69 dBA at S. 272nd Street and SR-99; airport noise decreases to about 65 dBA at Steel Lake. Although the noise contours are not provided for Ldns lower than 65, it is likely that airport noise

remains above an Ldn 60 dBA in most of the City. The areas where the Ldn exceeds 65 dBA are considered incompatible with residential land uses based on FAA and HUD noise criteria.

The City of Federal Way, in cooperation with the Regional Commission on Airport Affairs, an association of cities concerned about additional expansion of airport activity, commissioned a measurement program to evaluate Sea-Tac Airport noise predictions (Optimum, 1993). Sound level measurements were taken for a 24-hour period at several locations south of the airport, including one 100 feet west of the intersection of S 308th Street and 23rd Avenue S in Federal Way. Ninety-nine percent of the 271 take-offs during this 24-hour period were to the south, which results in higher aircraft noise impacts than would northbound take-offs. This measurement revealed an Ldn of 68 dBA, which is 3 dBA higher than the 65 dBA identified for this location on the Port of Seattle's noise contours for 1991. The Port's contours represent annual average Ldns, and a single day of noise measurements with southerly take-offs is bound to produce higher noise levels than annual average noise levels.

Significant Impacts

The Comprehensive Plan would not, in itself, have direct effects on environmental noise. It would, however, indirectly affect environmental sound levels during construction of infrastructure projects or private development; during operations of new sources of noise; and as a result of increased traffic in the City's planning area. The Comprehensive Plan could also affect noise impacts from aircraft by regulating land uses in flight paths. These impacts are addressed in further detail below.

General Noise Issues

Construction Noise

Construction of new projects is usually accompanied by temporary increases in noise due to the use of heavy equipment and the hauling of construction materials. Noise impacts depend on the background sound levels, the type of construction equipment being used, and the amount of time it is in use. Excavation, grading, and building erection usually generate noise audible on surrounding properties.

Typical noise levels from construction are displayed in Table 14. As indicated, sound levels 50 feet from construction equipment typically exceed environmental noise limits. Sounds from construction equipment (usually a point source) decrease about 6 dBA for each doubling in distance from the source. Construction noise may still have an adverse impact on nearby residents and businesses, although construction noise is exempt from environmental noise regulations during the day.

Table 14. Typical Construction Equipment Noise (dBA)

| Activity | Estimated Leq | | Types of Equipment | Range of Noise Levels at 50 feet |
|----------|---------------|-------------|--------------------------|----------------------------------|
| | At 50 feet | At 200 feet | | |
| Clearing | 83 | 71 | Bulldozer Dump truck | 77-96 82-94 |
| Grading | 75-88 | 63-76 | Scraper Bulldozer | 80-93 77-96 |
| Paving | 72-88 | 60-76 | Paver Dump truck | 86-88 82-94 |
| Erection | 72-84 | 60-72 | Crane, Concrete mixer | 75-85 75-85 |

Source: U.S. Environmental Protection Agency, 1971.

Operational Noise

As discussed above, sources of environmental noise in Federal Way are subject to limits based on land uses of the source and the receivers. The least restrictive situation occurs where industrial land uses affect industrial receivers; this is appropriate, since industrial land uses tend to be loudest but relatively insensitive to noise. Conversely, residential sources affecting residential receivers are subject to the most restrictive noise limits. This is appropriate because loud sources in residential areas can affect noise-sensitive receivers.

Traffic Noise

Anticipated increases in traffic volumes, discussed in the *Transportation* section of the Draft EIS, would tend to increase traffic noise at a rate of 3 dBA for each doubling of the traffic volumes. If, for example, traffic were to double on a road with an existing hourly traffic volume of 10,000 vehicles, the hourly traffic noise would increase 3 dBA. This would be barely perceptible to most people, although they may notice the increase in the number of particularly loud vehicles (such as some motorcycles, hot-rods, and trucks). Decreases in average vehicle speeds would tend to partially offset increases in traffic volumes.

In addition to changes in traffic volumes and speeds, the types of vehicles on the road affects traffic noise. If an area that is currently residential is rezoned to accommodate commercial or light-industrial land uses, there may be an increase in the percentage of truck traffic. This would normally increase traffic noise even if the total traffic volume does not increase appreciably.

Aircraft Noise

The Port of Seattle's calculated noise contours for 1996 operations indicate aircraft noise would decrease compared with the 1991 noise levels. This noise reduction is attributed to the gradual replacement of older technology aircraft with newer and quieter "Stage 3" aircraft. Annual average Ldns near S. 272nd Street and SR-99 are expected to be approximately 64 dBA, or 5 dBA lower than the Port's 1991 noise contours. The calculated 65-dBA contour line is approximately 2/3 mile farther north than in 1991 (near S 284th Street).

The Puget Sound Regional Council (PSRC) and the Port of Seattle released a Draft Environmental Impact Statement in January 1992 that evaluated a number of alternatives for increasing airport capacity in the Puget Sound area (PSRC, 1992). The preferred alternative included the construction and operation of a third north-south runway at Sea-Tac airport. Noise contours prepared for the EIS identify annual average Ldns for the year 2020 for the various alternatives. Even with the development of a third runway, calculated sound levels are 5-10 dBA lower than those calculated for 1991. The 65 dBA contour extends as far south as Highline Community College, well-north of the Federal Way City limits and about 2 miles farther north than today. Although the 60-dBA contour is not drawn, interpolation between the 55 and 65 dBA lines suggests that most of the City would lie between the 60 and 55 dBA contour lines in 2020. The dominant flight path is approximately centered on SR-99 through Federal Way. Based on FAA criteria for land use compatibility, the PSRC study indicates aircraft noise should not preclude future residential development anywhere in the City over the long term.

Land Use Concept 1

Table 15 identifies the VMT anticipated in 2010 with the adoption of Concept 1. It indicates that traffic noise would increase by 1-2 dBA on neighborhood collectors and collector arterials, and less on busier roads. This change in traffic noise is not likely to be noticeable to most people but would contribute incrementally to higher ambient sound levels.

To meet anticipated population growth, a number of transportation infrastructure improvements are scheduled (see the Transportation Analysis section of the EIS). Although widening of existing roads generally has a small impact (0-3 dBA) on traffic noise levels at adjacent locations, the construction of new roads often substantially increases environmental sound levels (5-15 dBA) temporarily.

With its emphasis on additional multi-family housing near the City Center where commercial development might have occurred, Concept 1 increases housing in the north-south corridor most affected by aircraft activity. Noise impacts could be mitigated, however, with special building codes oriented toward noise attenuation (e.g., King County Ordinance 8184).

Table 15. Changes in Traffic Volumes & Traffic Noise Levels

| Comparison to Existing Conditions | Neighborhood Collectors | Collector Arterials | Minor Arterials | Principle Arterials | Total |
|-----------------------------------|-------------------------|---------------------|-----------------|---------------------|-------|
| Concept 1 | | | | | |
| % Increase in VMT | 0.41 | 0.39 | 0.17 | 0.16 | 0.31 |
| Noise Increase (dBA) | 1.5 | 1.4 | 0.7 | 0.6 | 1.2 |
| Concept 2 | | | | | |
| % Increase in VMT | 0.42 | 0.40 | 0.20 | 0.04 | 0.28 |
| Noise Increase (dBA) | 1.5 | 1.5 | 0.8 | 0.2 | 1.1 |
| Concept 3 | | | | | |
| % Increase in VMT | 0.40 | 0.41 | 0.14 | 0.06 | 0.27 |
| Noise Increase (dBA) | 1.4 | 1.5 | 0.6 | 0.3 | 1.0 |

The environmental noise implications of Concept 2 are very similar to those of Concept 1, except that there is less emphasis on multi-family development in the urban areas. The focus on office and retail uses in the City Center is more appropriate from a noise perspective.

Land Use Concept 3

The environmental noise implications of Concept 3 are very similar to those with Concept 1, except for the greater emphasis on non-residential development in the urban areas. The focus on office and retail uses in the City Center is more appropriate from a noise perspective. However, the location of additional (and more intensive) residential development north of the City Center would conflict with efforts to minimize noise impacts related to aircraft. Additional residential development proposed for the area near and south of S. 272nd Street would place it in the area most-affected by Sea-Tac Airport aircraft noise. Noise impacts could be mitigated, however, with special building codes oriented toward noise attenuation (e.g., King County Ordinance 8184).

Mitigation Measures

Construction Impacts

Construction noise in the City of Federal Way could be minimized by developing policies requiring noise-sensitive construction efforts. Such efforts could include properly sized and maintained mufflers, engine intake silencers, engine enclosures, and turning off equipment when not in use. Stationary construction equipment should be located away from sensitive receiving properties where possible. Where this is infeasible, or where noise impacts are still significant, portable noise barriers should be placed around the equipment with the opening directed away from the sensitive receiving property. These measures are especially effective for engines used in pumps, compressors, welding machines, etc., that operate continuously and contribute to high, steady background noise levels. In addition to providing about a

10 dBA reduction in equivalent sound levels, the portable barriers demonstrate to the public the contractor's commitment to minimizing noise impacts during construction.

Although back-up alarms are exempt from the State's noise regulations, they are among the most annoying sounds from a construction site. Where feasible, equipment operators should drive forward rather than backward to minimize this noise. Noise from material handling can also be minimized by requiring operators to lift rather than drag materials wherever feasible.

Substituting hydraulic or electric models for impact tools such as jack hammers, rock drills and pavement breakers will also reduce construction noise. Electric pumps could be specified if pumps are required to remove groundwater from pipeline trenches or from areas excavated for new facilities.

The most important element in reducing construction noise is a restriction of work to daytime (7 a.m. to 10 p.m. or earlier) hours. This restriction is desirable in that background urban noise is more likely to mask construction noise during the day. A construction contract could specify that necessary night-time work would be subject to prior approval by the project manager.

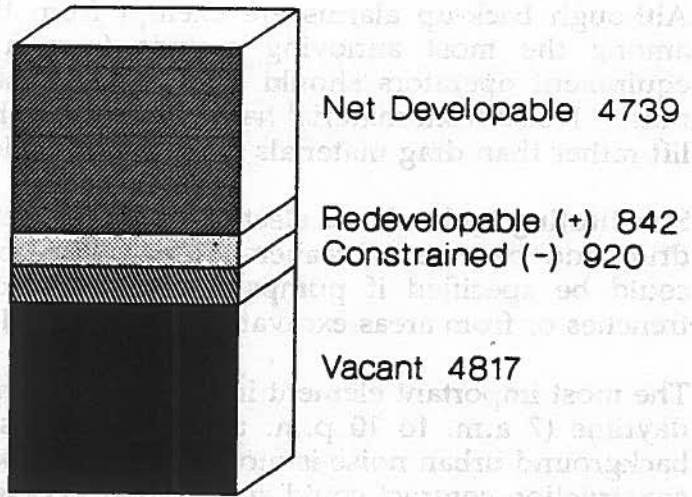
Long Term Noise Impacts

Land use planning, and preparation of a Comprehensive Plan, can be an effective means of avoiding or minimizing noise impacts created by conflicting land uses. Land use designations that guide noisier land uses away from residential areas can reduce future noise impacts.

Given the numerous elements the Comprehensive Plan is attempting to balance -- land use, transportation, resource protection, and population, housing, and employment growth -- and the City's existing land use pattern, it is probably not practical to completely avoid locating residential uses under the Sea-Tac approach and take-off corridor (Highway 99). Although aircraft noise forecasts suggest the noise impact related to Sea-Tac operations will decrease in the future, many residents will still consider LdNs below FAA's criterion of 65 dBA to be too loud. Building codes such as the one established by King County's Ordinance 8184 will help reduce interior sound levels in such areas.

Further mitigation of noise impacts -- either for aircraft approaches and take-offs or for vehicle traffic -- would require modification of land uses for any of the land use concepts. Adjustments could include limiting location of residential land uses adjacent to high volume roadways (i.e., Pacific Highway South and I-5) and within the noise-impacted portion of the flight path (i.e., the northern portion of the Pacific Highway South corridor). Locating these land uses elsewhere in the community would, however, generate other environmental impacts, such as increased housing/density in existing neighborhoods. Alternatively, the City could reduce its growth target based on these potential impacts.

**Figure 13.
Planning Area Land Supply (Acres)**



Total Acres = 20,407

Table 17. Planning Area Land Supply (Acres)

| Vacant Land | Constrained Land | Net Vacant** | High Redevelop. Potential | Net Developable |
|-------------|------------------|--------------|---------------------------|-----------------|
| 4,817 | 920 | 4,734 | 842 | 4,739 |
| 23.6% | 4.5% | 23 % | 4.1% | 23% |

Notes:

Total Area = 20,407 acres

* The category of constrained land includes environmentally sensitive lands (699 acres) and lands in public ownership (221 acres). Percentage figures for constrained lands refers to the percentage of vacant/redevelopable land.

** Assumes that all land is available for development; this assumption is tested in the *Impacts* subsection.

Source: City of Federal Way, Huckell Weinman Associates, Inc.

A discrete portion of the City's land supply is considered to have a high potential to be redeveloped more intensively or for a different use in the next 20 to 30 years. This category includes parcels where the value of the land is high relative to the value of existing buildings and improvements. Using King County Assessor's data, a ratio of 25 percent (value of the structure to value of the land) was applied to residential property and 50 percent for non-residential properties. Parcels below

these improvement-to-land thresholds were assumed to have high redevelopment potential.

As shown in Table 17, there are approximately 842 gross acres of redevelopable land (approximately 4 percent of total supply) within the planning area, based on the above assumptions. Three-quarters of this land (528 acres) is located within the existing city limits, with the balance in the unincorporated area east of I-5.

How much of this land will redevelop in the future will depend on a variety of factors, including land use plans and zoning designations, economic conditions, availability of services, applicable regulations and incentives, and property owners goals. The land capacity analysis in the *Impacts* subsection applies different development assumptions (to both vacant and highly redevelopable land) to test the ability of the land use concepts to accommodate forecast growth.

As shown in Table 17, approximately 920 acres are considered to be "constrained" for development. This includes environmentally critical areas, such as wetlands, streams and steep slopes (699 acres), and lands in public ownership (221 acres). On a relative basis, most constrained lands are located in the western and southern portions of the planning area, generally in the PAZs comprising Dumas Bay, Lakota, Sacajawea, Redondo, 356th West, and South 99. Assuming that constrained lands will not be developed because of public policy and environmental regulations, the net land supply (vacant and redevelopable) theoretically available to accommodate future growth is 4,739 acres. Approximately 18 percent of this total is land considered to have a high potential to redevelop. Additional constrained lands could be identified as a result of future inventories and data analysis.

Significant Impacts

The Proposed Action would not, in itself, have direct effects on land use or the environment. The Comprehensive Plan will, however, provide a basic framework that will guide growth and development in the City over the next 20 to 30 years. It will also result in subsequent actions by the City – such as implementing new development regulations and infrastructure investments – and private parties to implement the Comprehensive Plan. Indirectly, therefore, the Comprehensive Plan could have significant effects on the City's mix of land uses and land use patterns.

Direct impacts of future development would include development of vacant land and redevelopment along the Pacific Highway South corridor, particularly in the City Center. Some existing land uses in redeveloping areas would be displaced. Indirect land use impacts could include pressure for rezoning to higher densities or more intensive land uses in areas adjacent to the City Center. In some situations, this can take the form of pressure for more retail development to serve a larger population or denser market area. Concepts 2 and 3, however, include significant increases in retail uses; this would tend to reduce or eliminate the potential for some spin-off uses. Pressure for neighborhood-scale retail uses, to serve residential areas, could occur. These potential effects are described below in the context of changes in land use and land use patterns.

Land Uses

Figure 14 and Tables 18 and 19 show changes in major land use categories for the preliminary land use concepts; Appendix C shows changes by PAZ. In general, the City would remain predominantly residential in character but would, over the course of 20 years or longer, become incrementally more densely developed and more urban in character. Much of the City's supply of vacant land would be developed for urban uses. This is not necessarily an adverse impact. It would, for example, be consistent with the mandates of state and regional land use policy (see the *Plans and Policies* subsection). Traffic, noise and other effects associated with a larger population would also occur and are analyzed throughout this Draft EIS. Some residents could perceive a change in the quality of their neighborhoods as a result of continuing growth and may view this change as adverse.

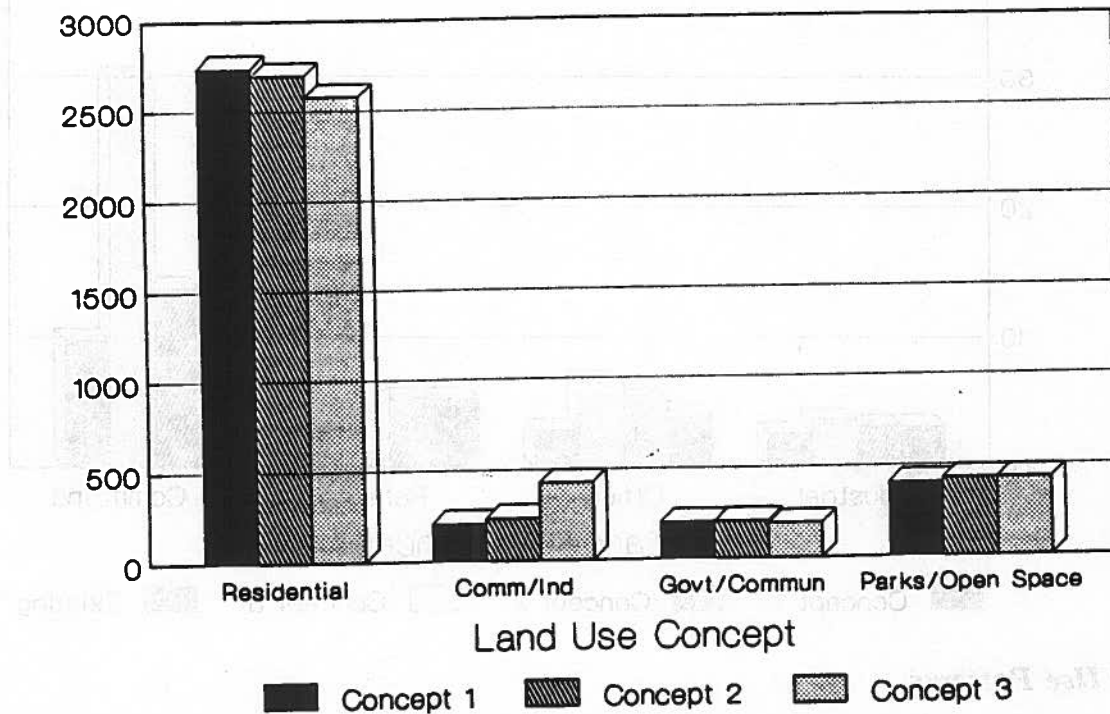
Under all of the concepts, the majority of the planning area would not change significantly in terms of types of land use. Change would generally be focused in relatively few PAZs, with the greatest impact occurring in and adjacent to the City Center (PAZs 3, 5 and 7) and some unincorporated areas (PAZ 6 east of the City limits and PAZ 1 to the north). The amount and type of development in the City Center and the Pacific Highway South corridor would, however, influence the mix of activities in the City and its overall land use character.

On a percentage basis, the difference between the land use concepts is relatively small. In terms of land area, and varying with land use concept, the planning area would be between 83.6 percent and 84.4 percent residential (compared to 85.7 percent currently); commercial and industrial uses would increase to between 12.8 percent and 13.9 percent of land area (compared to 14.3 percent presently). In general, Concept 1 is characterized by the highest ratio of residential uses and the lowest ratio of commercial/industrial uses. Conversely, Concept 3 contains the greatest proportion of commercial/industrial uses and the lowest percentage of residential uses. Concept 2 is in the middle between Concepts 1 and 3.

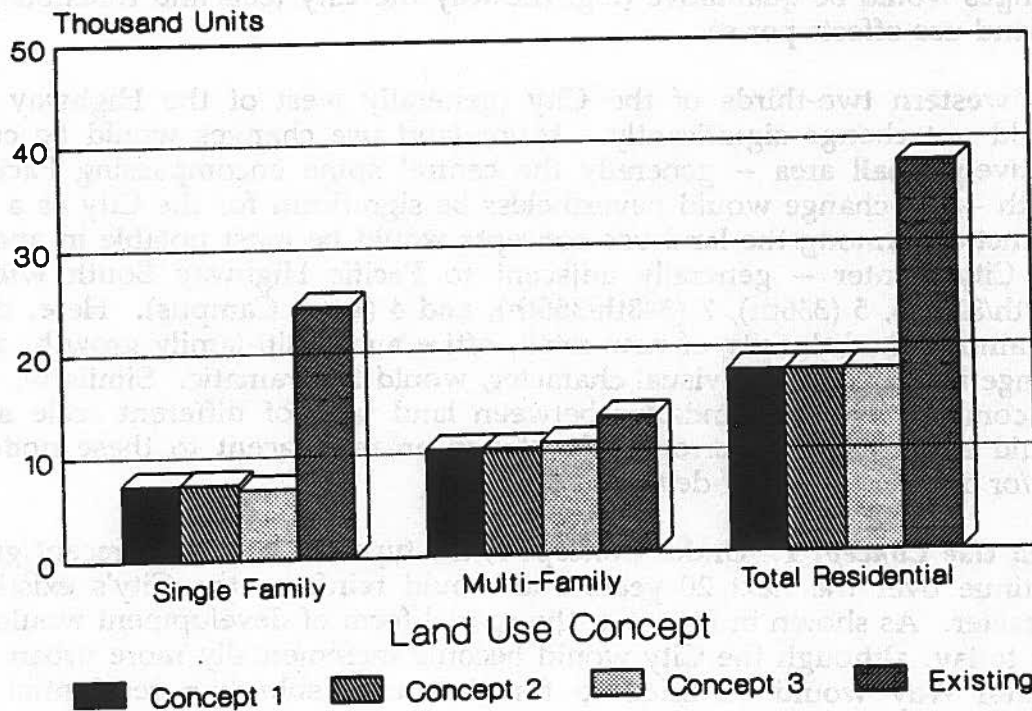
As shown on Figure 15, growth of residential uses would be approximately equal among the concepts, ranging from 17,763 units (Concepts 2 and 3) to 17,770 (Concept 1). Each concept could potentially accommodate the PSRC 2010 growth forecast (depending on land market conditions). As shown in Table 4 on page 18, the resulting ratio of single-family to multi-family housing units in the planning area as a whole would be 57 percent single-family to 43 percent multi-family (compared to the present ratio of 65 percent single family and 35 percent multi-family). For the planning area as a whole, multi-family units as a percentage of total new housing would range from about 58 percent (Concepts 1 and 2) to 62 percent (Concept 3).

Over the 20 year planning period, the number of single-family units in the planning area would increase by approximately 30 percent for any of the land use concepts. PAZs experiencing the greatest increases in single-family units would include 356th West (PAZ 15), and the East Side PAZs (17, 18 and 19).

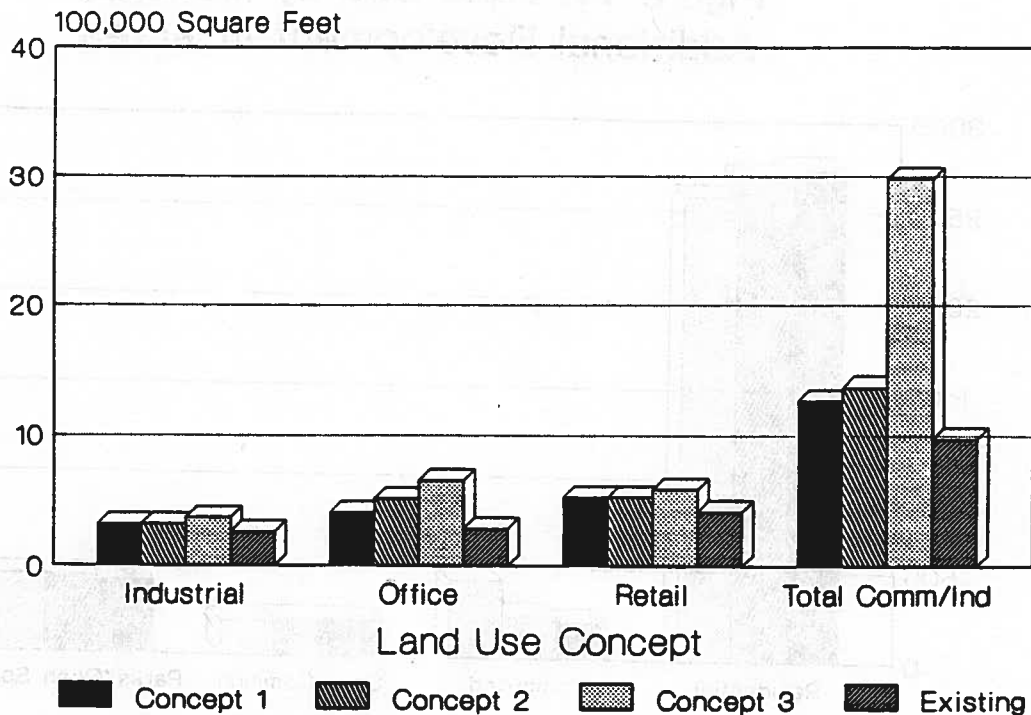
**Figure 14. Land Use by Concept
Additional Development in Acres**



**Figure 15. Planned Land Use -
Residential Units**



**Figure 16. Planned Land Use -
Commercial/Industrial**



Land Use Patterns

The land use changes implied by the 3 concepts are ones of both degree and kind. While percentage differences among the concepts may be marginal, they would achieve different levels of economic activity, different mixes of uses, and different balances between future residential population and employment. Many of these changes would be qualitative (e.g. the way the City feels and functions) or may not be land use effects per se.

The western two-thirds of the City (generally west of the Highway 99 corridor) would not change significantly. Major land use changes would be confined to a relatively small area – generally the central spine encompassing Pacific Highway South – but change would nevertheless be significant for the City as a whole. The distinctions among the land use concepts would be most notable in and adjacent to the City Center – generally adjacent to Pacific Highway South within PAZs 3 (312th/320th), 5 (336th), 7 (348th/356th), and 4 (West Campus). Here, differences in the amount and density of new retail, office and multi-family growth, and resulting change in land use and visual character, would be dramatic. Similarly, the potential for conflicts at the boundaries between land uses of different scale and intensity would be greatest in currently developed areas adjacent to these nodes of denser and/or different types of development.

Land Use Concept 1. Under Concept 1, the type and nature of recent growth would continue over the next 20 years and would reinforce the City's existing land use character. As shown in Figure 4, the spatial form of development would be much as it is today, although the City would become incrementally more urban in character. Federal Way would continue to function as a suburban residential community;

SeaTac Mall and retail-dominated employment would define the City's economic role in the region. Infill development and limited redevelopment would be relatively dispersed throughout the planning area.

The majority of housing growth would be multi-family in type and would be concentrated in the City Center (PAZ 3), West Campus (PAZ 4), in a new urban village around 336th (PAZ 5), and in the unincorporated areas to the north (272nd Street) and east (Weyerhaeuser/312th) of the existing City limits. New single-family housing would generally be dispersed within existing neighborhoods; increases would average about 275 units per PAZ. Outside the PAZs identified previously, development would occur primarily on vacant, unconstrained "infill" sites within existing neighborhoods. Some existing commercially-zoned land would need to be rezoned to provide adequate land to meet household forecasts. Existing neighborhoods will become relatively more densely developed and urbanized. Potential land use conflicts could arise if new development is significantly more dense or larger in scale than adjacent development. Refinements to existing regulations affecting bulk, scale and design could help ensure compatibility.

Under *City Center Concept 1*, the City Center would continue to develop as an auto-oriented retail area, with some low-rise and mid-rise office buildings and higher density housing. Overall, the City Center would become more densely developed but would maintain its current suburban, sprawling form. Continuation of the City's suburban land use pattern would include continued strip development along Pacific Highway South, which would compete with the City Center in an economic sense. While design improvements would improve the City Center's appearance and pedestrian friendliness, its overall feel and function would not change dramatically. The more decentralized land use pattern could also create pressure for development of additional neighborhood-scale retail centers, or expansion of existing centers, to provide everyday goods and services to a larger population.

Land Use Concept 2. The overall land use pattern encouraged by Concept 2 would be similar to Concept 1, but with major changes focused in the City Center and along the Pacific Highway South corridor. In general, the western two-thirds of the City would develop as in Concept 1; land use change would be incremental and comparable in quantity to Concept 1. Future residential growth would be somewhat less dispersed and more focused in the City Center and in 2 other locations along the Pacific Highway South corridor (272nd and 336th). The increase in dwelling units would be comparable to Concept 1. Non-residential development, particularly office development, would be about one-third greater than Concept 1 and more concentrated in location, generally in the City Center, West Campus and adjacent to the Weyerhaeuser corporate campus. The scale of office development would be considerably larger however, with higher densities and mid-rise mixed-use and office buildings.

Concentrations of more intensive development would also occur adjacent to three high capacity transit stations located along the Pacific Highway South corridor (in the general vicinity of 272nd, 320th and 364th). The areas surrounding the transit stations could experience pressure for rezoning to capture perceived economic opportunities associated with these facilities.

City Center Concept 2 involves a more concentrated and more intensively developed City Center with a mix of uses (office, retail, residential, and civic). Buildings would be taller and larger in scale (generally mid-rise). In general, the City Center would be more urban in character; it would look and feel like a "downtown" rather than a suburban shopping center. Higher levels of economic activity focused into a central core would also contribute to more pedestrian traffic in the area.

Land Use Concept 3. Land Use Concept 3 involves the greatest increase in non-residential development (6.4 million square feet) – more than twice as much as Concept 1 and approximately 50 percent greater than Concept 2. The majority of the increase would occur in retail and office uses. Growth in housing would be the same as Concept 2. The emphasis on employment uses and their geographic focus in and adjacent to a central core would have a greater apparent effect on the City's land use pattern.

As with the other concepts, however, land use in most of the City would not change significantly. In the western portion of the City, existing neighborhoods would experience infill development on vacant land at higher but basically compatible densities. Land use change would be incremental and comparable in quantity and type to Concepts 1 and 2. While this portion of the City would become more developed and more urban in character, the basic land use pattern would not change.

Significant change would occur in the Pacific Highway South Corridor and particularly in the City Center. Relative to the other concepts, more intense multi-family housing development would be focused north of the City Center while a distinct business park area would be established in the 336th and 348th/356th PAZs. The new business park area would create the potential for land use conflicts with adjacent areas. The type and density of planned development could create pressure for further intensification of land uses in adjacent neighborhoods; the pressure could be for supportive commercial uses or for more multi-family residential development.

The Pacific Highway South Corridor would be more intensively developed along much of its length through Federal Way. In general, land uses would be better planned and more cohesive, including open spaces and transitions between areas of differing use and density. Concentrations of land uses at higher densities adjacent to the three planned high capacity transit stations would have the potential to generate impacts comparable to those identified for Concept 2.

City Center Concept 3 involves the most concentrated and most intensively developed City Center. Land use would involve a mix of activities (office, retail, residential, and civic), but with significantly higher levels of office and retail growth. Relative to Concept 2, buildings would be taller and larger in scale, including high-rise structures. In general, the City Center would look, feel and function more like an urban "downtown." The contrast with existing conditions and Concept 1 would be substantial.

There would be a greater potential for City Center land uses to spill over into or affect adjacent areas; the potential for land use conflicts at the fringes of the downtown would be significantly greater than the other concepts. However, since

the areas closest to the City Center would also be more intensively developed, the potential for conflict would be lessened.

The nature of the City Center, coupled with infill development at higher densities through other areas, would impart a distinctly urban character to Federal Way. The City would have a more balanced economy and would reflect a better balance between population and employment.

Effects on Adjacent Areas & Jurisdictions

Federal Way's preliminary Urban Growth Area has been defined as the result of regional growth management planning process. Boundaries could change as the result of ongoing planning. For the purposes of this analysis, it is generally assumed that King County will apply compatible land use and zoning designations to unincorporated lands within the planning area. In addition, annexation to Federal Way is assumed to occur incrementally over the course of 20 to 30 years, as services are available.

The unincorporated portion of the planning area is planned to accommodate a proportionate share of future growth. In terms of area, the unincorporated PAZs (1 and 16 north of the City limits, and 6, 17, 28, 29, and 20 east of the City limits) comprise 40 percent of the total land within the Federal Way planning area. It also contains approximately 44% of the supply of vacant unconstrained land. The proportion of future growth planned for these PAZs is shown in Table 20 below.

**Table 20.
Future Development Occurring in Unincorporated PAZs
By Land Use Concept (Percent)**

| Land Use | Concept 1 | Concept 2 | Concept 3 |
|-------------------------|-----------|-----------|-----------|
| <i>Residential:</i> | | | |
| Single Family | 51% | 51% | 51% |
| Multi-Family | 38% | 39% | 40% |
| <i>Non-Residential:</i> | | | |
| Manufacturing | 50% | 100% | 45% |
| Office | 11% | 6% | 11% |
| Retail | 16% | 11% | 9% |
| Community Services | 46% | 42% | 44% |
| Parks/Open Space | 56% | 57% | 57% |

In general, the unincorporated PAZs are predominantly residential in character, with the exception of the Weyerhaeuser corporate headquarters area (PAZ 6) and the 272nd area (PAZ 1). Single-family residences at an average density of about 2 dwelling units per acre characterize most of the area. Most multi-family residences and higher density single family homes, are located in the unincorporated PAZs north of the City (272nd and Redondo).

As is generally the case for the City as a whole, future development in the unincorporated portions of the City's planning area under any of the land use concepts would intensify but not alter the existing mix of land uses or the underlying land use pattern. The degree of change to residential areas would be similar under any of the land use concepts. The character of some areas is likely to change, however, as a result of future growth. Areas currently characterized by low density residential development, for example, will become more densely developed and more urban in character. While land uses would be of the same general type, some residents could perceive the urban scale and character of new development to be incompatible or adverse.

Similarly, changes in the vicinity of the Weyerhaeuser corporate headquarters (PAZ 6) would involve more intensive development of office and manufacturing uses. The most intensive development would occur under Concept 3. Appropriate site planning and development controls (e.g. building orientation, buffering, setbacks, landscaping, building design, etc.) would reduce the potential for conflicts or incompatibilities between adjacent uses.

In general, changes to land use resulting from any of the land use concepts would be consistent with the direction encouraged by state and regional policies (see the discussion in the *Plans and Policies* subsection). Conflicts could also occur at the boundaries between different land uses; impacts would be greatest where differences in intensity or type of use is most extreme.

Potential effects of the land use concepts on adjacent jurisdictions are difficult to determine at this time. Most jurisdictions in King and Pierce County are in the process of developing or updating their comprehensive land use plans. Some significant regional decisions – such as the designation of Urban Centers and implementation of the Regional Transit Plan – will be made in the near future and will, in turn, influence local land use planning. In addition, detailed land use and zoning designations are still being developed by most jurisdictions, including Federal Way. The land use analysis contained here will be revisited – in the Final EIS on the Federal Way Comprehensive Plan, and in the context of subsequent environmental review for proposed implementation programs – and updated as additional information becomes available.

At the current time, land use concepts, plans and designations being developed by Federal Way and adjacent jurisdictions are focused on implementing the vision and policies articulated in the GMA, the Countywide Planning Policies, and by local citizens. They are also motivated by accommodating a preliminary regional allocation of 20-year population and employment growth. Many of the land use impacts identified in this analysis are the result of accommodating this growth. Impacts of the regional land use pattern will also be evaluated in environmental documents prepared for the Countywide Planning Policies, the King County Comprehensive Plan, and the comprehensive plans of individual jurisdictions.

Land Capacity

The following analysis generally evaluates the ability of the City's land supply to accommodate the amounts of development contained in the land use concepts. The

analysis contains several conservative assumptions and is designed to provide information that is useful for future planning. It is assumed, for example, that all future development will occur on vacant unconstrained land (i.e. not affected by environmentally sensitive features) and on unconstrained land that has a high potential for redevelopment (net developable land). The analysis also assumes that at any given time, only a portion of net developable land is likely to be available, in the sense of being for sale. Land markets change over time -- in response to economic conditions, for example -- and the amount of available land may change over time. Some property owners are likely to withhold land from the market -- permanently or for long periods of time -- because of personal reasons, while others will make their land available when land prices rise. The rate, as well as the amount, of development can be affected by property owners behavior.

Table 21 below shows 3 scenarios for calculating and evaluating the City's supply of developable land. In general, the scenarios vary assumptions about the percentage of net developable land that will be available for development/redevelopment during the planning period. Assumptions for vacant land include 100%, 85% and 75%; assumptions for redevelopable land include 100%, 65% and 50%. It should also be noted that different scenarios could apply at different points in the 20-year planning period.

**Table 21.
Land Capacity -- Sensitivity Analysis**

| Land Supply Scenarios (Net Acres) | Concept 1 | Concept 2 | Concept 3 |
|--------------------------------------|--------------|--------------|--------------|
| Scenario 1 - Supply * | 4,739 | 4,739 | 4,739 |
| New Development | <u>3,549</u> | <u>3,557</u> | <u>3,417</u> |
| Net Remaining | 1,190 | 1,182 | 1,322 |
| Scenario 2 - Supply ** | 3,859 | 3,859 | 3,859 |
| New Development | <u>3,549</u> | <u>3,557</u> | <u>3,417</u> |
| Net Remaining | 310 | 302 | 442 |
| Scenario 3 - Supply *** | 3,344 | 3,344 | 3,344 |
| New Development | <u>3,549</u> | <u>3,557</u> | <u>3,417</u> |
| Net Remaining | (205) | (213) | (73) |

Source: City of Federal Way; Huckell/Weinman Associates, Inc.

* Assumes 100 % of vacant/unconstrained land (3,897 acres) and 100% of high redevelopment potential land (842 acres) available for development.

** Assumes 85% of vacant/unconstrained land (3,312 acres) and 65% of high redevelopment potential land (547 acres) available for development.

*** Assumes 75% of vacant/unconstrained land (2,923 acres) and 50% of high redevelopment potential land (421 acres) available for development.

As shown in Table 21, the assumptions in scenarios 1 and 2 result in a net balance of developable land remaining after planned levels of growth are achieved for any of the land use concepts are completed. The amount of land remaining under scenario 2 is small, however, and probably represents a "build-out" condition; 95 percent of

the land supply would have been consumed and future growth would primarily involve redevelopment. Scenario 3 -- which includes the most conservative assumptions -- shows a land supply deficit, i.e., the available land supply would not accommodate planned levels of development. The supply of developable land could vary over time. For example, relatively more land could become available after 2000, as development occurs and property owners respond to changing market conditions. Developable land supply and assumptions should be reexamined as more information about the City's land base becomes available and the land use concepts are further refined.

Mitigation Measures

This section identified a range of programmatic actions that the City will investigate during its planning process. These actions include continued work on the comprehensive plan (land use, transportation, capital facilities), as well as subsequent programs that will be developed to implement the plan (e.g. zoning and other development controls).

1. Land Use Element. The land use and city center policies and land use designations for a preferred alternative -- which will be evaluated in the Final EIS -- should reflect the issues and potential impacts identified in this document. This includes the overall land use pattern, compatibility between adjacent land uses and districts, controlling market pressure for undesired uses and activities, urban design and aesthetics, infill and redevelopment, and cooperative strategies for making the plan a reality. Policies should be clear and unambiguous and reflect the City's underlying goals and objectives.

2. Land Use Pattern. The land use pattern embodied in the Comprehensive Plan should be consistent with regional land use and transportation decisions. Changes to or implementation of the Countywide Policies or Regional Transit Program, for example, could require some changes in the City's land use pattern. Appropriate transitions between land use of different type or intensity should be implemented through land use designations. Open space should also be used to help define the land use pattern and provide visual and physical separation between neighborhoods.

3. Development Controls. The City should review its major development controls, including the zoning code, critical areas regulations, subdivision ordinance, shoreline master program. These regulations should be refined or revised as appropriate to reflect stated policies, achieve consistency between the land use plan and regulations, and ensure fairness for property owners.

- Phasing controls -- to guide the timing and location of development consistent with existing and planned capital facilities -- should also be evaluated. Phasing, or revision of the land use element, may be necessary if ongoing land use and capital facilities planning identifies that projected revenues are insufficient to provide adequate facilities consistent with the requirements of the Growth Management Act (i.e., concurrency).

- The City should also evaluate the use of non-regulatory techniques and incentives as means to accomplish its growth management goals. Such tools -- including tax incentives, acquisition of key parcels, density bonuses and transfers, transfer of development rights -- can be a valuable and effective supplement to regulations.

4. Land Use Compatibility. Address the range of issues affecting compatibility through land use designations and development standards. Many issues of compatibility, for example, can be solved through sensitive site planning and development standards that address setbacks, design, building orientation, landscaping, buffering or screening, and similar factors.

5. Urban Design and Aesthetics. Many potential land use conflicts can be mitigated through new or modified development regulations. Codes and standards should ensure adequate buffering, landscaping, sensitive site design, and high quality development. Incentives may also be appropriate to help achieve design objectives and simultaneously encourage redevelopment, particularly in the City Center.

- The City should consider developing clear, specific design policies or guidelines that reflect its design objectives. Procedures for implementing high quality design could include a design review process (administrative or through a design review board). This procedure could apply city-wide or only in selected districts (e.g. the City Center). Any process should be efficient so as not to burden or act as a disincentive for future growth.

The potential for area-wide and site-specific land use conflicts should be reevaluated in the Final EIS, when land use and zoning designations are proposed.

6. Land Supply Issues.

- The City should continue to update and refine information about its land base.
- "Benchmarks" for the 20 year planning period should be established for factors such as land supply, absorption and cost, density and growth rates. The City should monitor these factors to determine if land supply is being constrained and if targets are being met. Possible responses to any potential deficiencies in land supply or to increases in land/housing cost could include increasing densities and FARs to maximize efficient use of land (either outright or through incentives/bonuses); modifying the City's population and employment targets; or possibly increasing the size of the Federal Way planning area to include additional vacant, suitable land.

B. RELATIONSHIP TO PLANS & POLICIES

State Laws & Policies

Growth Management Act (RCW 36.70A)

Summary: The Growth Management Act (GMA) was first enacted as ESHB 2929 by the 1990 legislature and amended in 1991 and 1992. The GMA contains a comprehensive framework for managing growth and coordinating land use with infrastructure. Many provisions of the act apply to the state's largest and fastest growing jurisdictions, including King County and all its cities; some provisions of the law apply to all local governments in the state. All cities and counties, for example, must designate and regulate critical areas (wetlands, streams, fish and wildlife habitat, geologic hazards, and frequently flooded areas) and resource lands (agricultural, mineral and forest lands). State agencies are also subject to relevant provisions of the act. The act is long and complex; the following is a brief, selective summary of its major provisions.

Among other requirements, jurisdictions subject to the act must prepare and adopt:

- local plans that are consistent with county-wide policies that provide a general framework for regional planning;
- local comprehensive land use plans containing specified elements and embodying state-wide goals;
- regulations consistent with locally adopted land use plans; and
- capital facilities plans (including financing elements) for utilities and transportation systems.

The GMA's general planning goals include: directing growth to urban areas; reducing sprawl; providing efficient transportation systems; promoting a range of residential densities and housing types and encouraging affordable housing; promoting economic development throughout the state; protecting private property rights; ensuring timely and fair processing of applications; maintaining and enhancing resource-based industries; encouraging retention of open space and habitat areas; protecting the environment; involving citizens in the planing process; ensuring that public facilities are provided at adequate levels concurrent with planned development; and preserving lands with historic and archaeological significance.

Local Comprehensive plans must contain elements addressing land use, housing, capital facilities, utilities, rural lands (counties only), and transportation. Optional elements include conservation, solar energy, and recreation, as well as other elements dealing with the physical environment. Sub-area plans (e.g. for specific neighborhoods) are also authorized. Local plans must embody the GMA's general goals.

Counties must designate "planning areas", which are areas already characterized by urban growth and within which future urban growth is encouraged and services and facilities are currently or are planned to be available. All cities must be within a planning area; unincorporated lands within planning areas must be urban in character or adjacent to such lands. Intergovernmental consensus and agreements are intended to establish the planning area boundaries; a dispute resolution process is also set forth.

The planning areas are intended to be large enough, housing densities high enough, and facilities and services sufficient to accommodate the next 20-years population growth forecast by the state. These areas should also include greenbelts and open space. Other lands that must be identified in local comprehensive plans include lands for public purposes, including transportation and utility corridors, sewage treatment facilities, landfills, schools and recreation; and open space corridors within and between planning areas.

The act provides for creation of three Growth Planning Hearings Boards for the state. The Boards hear and determine petitions alleging non-compliance of local plans and regulations with GMA requirements.

Discussion: The City of Federal Way's process for implementing the Growth Management Act is summarized in Section I of the Draft EIS. The City has used pertinent GMA goals and principles to inform its planning process and the substance of plan alternatives. The Countywide Planning Policies, discussed below, are also being used to shape the City's plan. This Draft EIS analyzes three land use and city center concepts that could potentially meet the goals of the GMA. All three focus growth at higher densities in an urban area. The preferred alternative that results from the City's integrated planning and environmental review process is intended to reflect the City's responsibilities under the GMA. The Final EIS will review the consistency of the proposed land use plan and policies with the requirements of the act.

Regional Plans & Policies

Proposed Multicounty Planning Policies (1993)

Summary: Amendments to the Growth Management Act enacted in 1991 require that multi-county policies be adopted by two or more counties, each with a population of 450,000 or greater and with contiguous urban areas (RCW 36.70A.210). King, Pierce and Snohomish Counties are required to adopt such policies; Kitsap County has elected to participate in this process as well.

The Puget Sound Regional Council (PSRC) is responsible for promulgating multi-county policies. The goal of the policies is to coordinate and compliment the work of organizations and agencies that relate to specific growth management issues. PSRC initially identified *Vision 2020* as interim multi-county policies for the four-county region. The following proposed Multicounty Planning Policies were issued in January 1993:

- Concentrate development in urban areas to conserve agricultural, forest, and environmental resources. Promote growth within urban areas into centers that are connected by an efficient, transit-oriented multi-modal transportation system;
- Protect critical areas, conserve resource lands, and preserve lands and resources of regional significance;
- Phase development of public facilities and services to achieve the adopted regional vision;
- Develop a transportation system that emphasizes accessibility, includes a variety of mobility options, and enables the efficient movement of people, goods and freight;
- Provide diversity and choice in housing and employment options; and
- Maintain economic opportunities while managing growth.

The Multicounty Planning Policies will be refined to address major topics identified in the GMA, to provide the framework for addressing multi-county growth management issues, and to focus on specific topics and implementation issues.

Discussion: The Multicounty Planning Policies are intended to be used to help coordinate growth management in the broader Puget Sound region. The policies express the basic goals of the Growth Management Act and are being used by Federal Way to help construct its overall planning framework as well as alternative land use concepts. In general, all of the land use and city center concepts would focus growth at higher densities in an urban area; would protect critical areas; would phase development with the availability of urban services; would expand housing and employment options within the City; and would be coordinated with the Regional Transit Program Draft Plan.

Vision 2020 (1990)

Summary: Vision 2020, developed by the Puget Sound Council of Governments (now the Puget Sound Regional Council) and its member governments, is a growth strategy and transportation plan for the central Puget Sound region. It is intended to provide a coordinated framework for guiding growth and transportation actions over the next thirty years. The plan will be adopted by individual jurisdictions in the region and implemented through their individual land use and capital facilities plans and development regulations.

Vision 2020 is generally intended to create a more compact and intensively developed urban areas, with the majority of growth occurring in several types of "centers." The plan's six-part strategy for managing growth includes the following general goals:

- Create a regional system of central places framed by open space;

- Strategically invest in a variety of mobility options and demand management to support the regional system of central places;
- Maintain economic opportunity while managing growth;
- Conserve environmental resources;
- Mitigate potential adverse effects of concentrating development by early action; and
- Refine Vision 2020 based on collaboration among all agencies in the region.

Goal 1, regarding central places, is intended to focus residential and employment growth at higher densities in a hierarchy of identified activity centers. Major policies include: providing diversity and choice in housing and employment; promoting a balance of jobs and housing; providing higher density residential areas in urban areas within walking distance of jobs and transit service; and promoting community design plans so new development is compatible with existing development and supportive of non-motorized access. Centers are classified according to type, size and function and are denominated as regional, metropolitan, subregional, activity clusters, small towns or pedestrian pockets.

Federal Way is listed as a candidate for two different types of centers: subregional and activity cluster. Subregional centers are intended to serve as a focus for regional growth. They are located in suburban areas along rapid transit routes and served by rapid transit service as well as expanded bus service. They are characterized by a mix and balance of land uses -- residential, employment, civic and cultural -- and an intensively developed, well designed downtown environment that promotes transit ridership. These suburban areas may not currently have identifiable downtowns. Densities are intended to be high: typically 50 employees per acre and a total of 40,000 jobs; and residential densities of 20 dwelling units per acre in the downtown and 8 dwelling units per acre in the urban area. Activity clusters, in contrast, are not intended to be the focus for future regional growth and are not located along transit routes; transit service would connect the clusters with adjacent metropolitan and subregional centers. Employment growth is focused on local services.

Discussion: The Land Use and City Center concepts are generally consistent with Vision 2020's goals and policies. Federal Way would function as a center within the region and would help concentrate growth in an urban area. The land use and city center concepts would also be generally consistent with the goal for central places, although consistency would vary among the land use concepts and would depend on the type of center that Federal Way becomes. All concepts, for example, would provide diversity and choice in housing and employment, would promote a greater balance of jobs and housing, and would achieve higher residential densities proximate to jobs. Land Use and City Center Concept 1 would be comparable to the activity cluster concept; Federal Way would continue to grow primarily as a suburban retail and services center. Concepts 2 and 3, on the other hand, would be consistent with the criteria for a subregional center. The concepts include an expanded employment base, higher density mixed use development in an intensively developed, pedestrian-oriented downtown served by high capacity

transit. Consistency with employment and housing targets is discussed in the context of the Countywide Planning Policies below.

Regional Transit Program Draft System Plan (1992)

Summary: The Regional Transit Program Draft System Plan, approved by the Joint Regional Policy Committee in October 1992, is intended to create an integrated transit system for the Puget Sound region and to improve transportation access, mobility, comfort, speed and reliability. The major components of the system include bus, light rail and commuter transit; transit stations and community transit hubs; expanded HOV lanes; park and ride lots; and pedestrian-oriented improvements.

The system is intended to be coordinated with regional and local land use and growth management plans. Transit service will be focused along identified corridors – to serve concentrations of mixed-use, transit supportive development – and will link major centers identified in regional land use plans. Transit stations will be constructed in major centers and transit-supportive development will be encouraged nearby.

The light rail system identified in the draft plan is intended to be completed by 2015; several phased construction approaches are being evaluated. A number of rail system extensions and upgrades – based on development patterns and current plans – will also be constructed. The rail system would generally extend along I-5, from Seattle to Northgate and to Tacoma; across I-90, going north along I-405 to Totem Lake; and east from I-405 along SR-520 to Redmond. A commuter rail line (either along the Burlington Northern or Union Pacific tracks) would also travel from Seattle south to Fife, passing through Tukwila, Kent and Auburn.

In south King County, the rail line would generally follow Highway 99; corridors are still conceptual at this time. Federal Way is located on the proposed line. Trains would run every 4-6 minutes during peak periods and 8-12 minutes during off-peak times.

Numerous transit stations are indicated along transit corridors, including three stations within Federal Way. Stations would be sited and planned to be consistent with local growth management plans and community objectives. Transit, pedestrian and bicycle improvements would be constructed within 1/4-1/2 mile of the transit stations. Cooperative opportunities for transit-supportive development in the areas surrounding the stations would also be pursued. Connections to regional and community bus services would be provided at the stations. Expanded bus service would also connect south King County neighborhoods with centers and the regional system.

The Transportation Demand Management (TDM) component of the draft plan would consist of partnerships to encourage transit use; parking policies; demand management programs; congestion pricing; and prioritizing investments to transit-supportive land use patterns.

Final decisions on the system elements will be made by the newly created Regional Transit Authority (RTA) and by a public vote on a funding program. Exact alignments and station locations will be determined on a segment-by-segment basis. A public vote on financing for the system will occur in 1994. The draft system plan could also be modified in response to Urban Centers identified by the Growth Management Planning Council (GMPC).

Discussion: Land Use/City Center Concepts 2 and 3 are consistent with the Regional Transit System Draft Plan. They both include three transit stations and are intended to achieve higher densities and a broader mix of land uses along the Highway 99 corridor to support transit use. The City has also nominated itself for designation as an Urban Center. Land Use/City Center Concept 1, however, would essentially continue Federal Way's functioning as a suburban center; densities would probably not support high capacity transit. More detailed analysis of uses and densities adjacent to potential transit station locations will be conducted in the Final EIS.

Countywide Planning Policies (1992)

Summary: The Countywide Planning Policies (CPP), prepared by the Growth Management Planning Council (GMPC), were adopted by King County in July 1992. The CPP are intended to provide a regional policy framework for local jurisdictions to follow in their planning to implement the Growth Management Act. The CPP were adopted on an "interim" basis -- to provide a basis for continuing planning -- and may be revised following environmental review in a Supplemental EIS later in 1993.

The CPP also contain development guidelines, standards and recommended processes to be implemented by individual cities. Subject areas addressed in the policies include critical areas, land use pattern, transportation, community character and open space, affordable housing, contiguous and orderly development, siting regional/statewide capital facilities, and economic development/fiscal impact. Policies generally encourage concentrating urban development in a defined planning area and phasing the provision of adequate services. The interim Urban Growth Area designated in the CPP is intended to accommodate forecast population and employment growth for the next twenty years with a full range of urban services. Federal Way is using an interim Urban Growth Area for planning purposes; this planning area could be modified based on subsequent GMPC decisions.

Discussion: Major CPP policies and the general consistency of the Land Use & City Center Concepts is summarized in Table 22. In general, the City is using the Countywide Planning Policies to guide development of its Comprehensive Plan. Actions planned or contemplated to comply with applicable policies, existing programs that address relevant concerns, mitigation measures identified in the Draft EIS, and/or potential elements of the City's implementation program for GMA planning are indicated in the table. It should be noted that consistency can only be analyzed at a general level at this time, since land use policies and specific implementation programs have not been developed yet. The Final EIS will contain a preferred land use concept and policies; consistency with the CPP will be reanalyzed at that time.

Table 22 Countywide Planning Policies

CCP

Policy Summary

City Action

| | | |
|--|---|--|
| <p>Framework FW-2</p> | <p>Adopt interim minimum density ordinances; review accessory dwelling unit provisions; remove regulatory barriers</p> | <p>Federal Way will address minimum densities and other housing-related regulatory issues as part of its implementation program.</p> |
| <p>Critical Areas - Wetlands CA-1:4</p> | <p>Protect wetlands and buffers; assure no net loss; increase quantity/quality; consider flexible mitigation (systems & corridors)</p> | <p>Addressed in the existing zoning code and SEPA policies/process. Will be addressed further based on Draft EIS mitigation measures.</p> |
| <p>Aquifers CA-5</p> | <p>Protect aquifers; implement management plans; adopt Best Management Practices (BMPs)</p> | <p>Addressed in Draft EIS mitigation measures. Will be further addressed in the Comprehensive Plan Land Use element/map and updated zoning regulations.</p> |
| <p>Fisheries & Wildlife Resources EN-14</p> | <p>Identify/protect critical habitat & species; protect natural drainage systems & habitat networks between jurisdictions; maintain water quality (control runoff & apply BMPs)</p> | <p>Addressed in existing zoning regulations and SEPA policies. Mitigation measures are identified in the Draft EIS</p> |
| <p>Flood Areas CA-11</p> | <p>Protect natural flood storage & conveyance; regulate to reduce flood impacts</p> | <p>Addressed in existing zoning regulations and SEPA policies/process. Will be further addressed in the land Use element and updated zoning regulations</p> |
| <p>Geologic Hazards CA-12</p> | <p>Protect steep slopes, landslide hazards; erosion hazards, coal mine hazards & seismic hazards</p> | <p>Addressed in existing zoning regulations and SEPA policies. Mitigation measures are identified in the Draft EIS. Will be further addressed in the land use element.</p> |

Table 22: Countywide Planning Policies

CCP

Policy Summary

City Action

| | | |
|---|--|---|
| <p>Air/Water Quality CA-13, 14</p> | <p>Promote air quality; implement Puget Sound Water Quality Management Plan.</p> | <p>Addressed in Draft EIS mitigation measures; will also be addressed in the Comprehensive Plan Utilities element.</p> |
| <p>Land Use Pattern Resource Lands LU-1: LU-5</p> | <p>Protect existing resource lands with long-term commercial significance; encourage compatible land uses; adopt BMPs for mining.</p> | <p>No resource lands are located within Federal Way's Planning area</p> |
| <p>Urban Growth Areas LU-14</p> | <p>Lands should be characterized by urban development; contains all land within cities; be able to accommodate 20-year population forecast.</p> | <p>Lands within the City's Planning area are characterized by urban development; the planning area is consistent with the interim UGA identified in the CPP; the Draft EIS indicates how the Land Use concepts can accommodate the 20-year growth forecast.</p> |
| <p>Phasing in Urban Growth Area LU-16:18</p> | <p>Growth is directed to centers & urbanized areas with infrastructure capacity; areas that can be serviced easily; and areas needing major improvements. Cities should develop growth phasing plans for 10 & 20 years (but not beyond potential annex. areas) where infrastructure can be provided. Where services not feasible within next 10 years, phase & limit development; establish process for converting to urban densities when services available.</p> | <p>Federal Way is an existing center within south King County and the City is a candidate Urban Center per the CPPs. The analysis of services and utilities in the Draft and Final EISs will be used to determine whether and where phasing may be appropriate and how it could be applied.</p> |
| <p>Joint Planning LU-19:25</p> | <p>Designate potential annexation areas; adopt annexation criteria; phase annexations with services.</p> | <p>Federal Way has been working cooperatively with King County and other cities in the region to identify Urban Growth Areas and unincorporated lands adjacent to the city that are appropriate for annexation.</p> |

Table 22 Countywide Planning Policies

CCP

Policy Summary

City Action

**Urban Centers
LU-28:38**

Zone to accommodate minimum 15,000 jobs in 1-1/2 sq.mi. and within 1/2 mile of transit station, average of 50 employees per acre, and 15 households per acre; identify/preserve transit station areas and right-of-way limit parking and single occupancy vehicles and adopt commute trip reduction plans; establish strategies that support pedestrian /bicycle/transit use, achieve target housing density/mix, provide capital improvements, emphasize superior urban design and historic preservation, meet human service needs.

Incentives should include preparing non-project EIS for center that can be incorporated in project documents, strategies for land assembly within the center, infrastructure financing strategies, expedient permit and appeals processes.

All of the Land Use/City Center concepts in the Draft EIS provide land use capacity that could meet the Urban Centers criteria for total jobs within a 1.5 square mile area (generally PAZs 3,4,5 and 7). Total jobs within this area could range from approximately 20,000 to 23,000, and employment densities of 27-30 jobs per acre; this is less than the 50 jobs per acre target in the CPP. The above PAZs would also be within 1/2 mile of a transit station. Land Use/City Center Concepts 2 and 3 include significant intensification of housing within the City Center and a better balancing of jobs and housing; however, housing density would range from 8.6-9.2 dwelling units per acre among the alternatives, which is less than the target in the CPPs. See the *Population, Housing and Employment* section of the Draft EIS for more detailed analysis.

The City Center concepts evaluated in the Draft EIS include schematic design and capital improvements; the *Transportation and Capital Facilities* sections of this document identify mitigation measures and implementation strategies designed to meet the CPPs. A range of potential incentives are also addressed in this document and will be evaluated further through the city's integrated planning/SEPA process. Land use designations and zoning -- and possibly different employment and housing mixes or amounts -- will be evaluated in the Final EIS and/or subsequent environmental review.

Table 22 Countywide Planning Policies

| CCP | Policy Summary | City Action |
|---|--|--|
| <p>Mfg/Industrial Centers LU-40:50</p> | <p>Accommodate a minimum of 10,000 jobs (15,000 if to be served by high capacity transit), discourage competing land uses, preserve and encourage aggregation of adequately sized parcels; facilitate transit mobility, identify transit stations and preserve right-of-way; establish strategies to provide supporting capital facilities, and provide buffers to reduce land use conflicts</p> <p>Potential incentives for Mfg/Ind. centers should consider detailed SEPA review at the planning stage, and policies that support normal mfg/ind. practices.</p> | <p>Federal Way is a candidate Urban Center; the policies for manufacturing centers are not applicable at this time.</p> <p>Federal Way is a candidate Urban Center; the policies for manufacturing centers are not applicable at this time.</p> |
| <p>Urban Residential Areas LU-51:52</p> | <p>Establish target numbers of new dwelling units that will be accommodated in the next 20 years; establish minimum densities for new construction in each resid. zone; and establish a target mix of housing types. Establish 20-year targets for employment growth within and outside urban centers.</p> | <p>Federal Way has identified a preliminary 20-year housing unit target for planning purposes (based on PSRC preliminary forecasts). It has also identified economic scenarios involving varying levels and mixes of jobs. The Draft EIS evaluates the ability of the Land Use/City Center Concepts to accommodate these targets. Housing mix and minimum densities will be addressed in a preferred land use concept and policies, and in implementing regulations.</p> |
| <p>Infill Development LU-54</p> | <p>Develop local neighborhood planning and design processes to encourage infill.</p> | <p>The Land Use Concepts all involve some level of infill in existing neighborhoods. The preferred land use concept will contain policies addressing design.</p> |

Table 22 Countywide Planning Policies

| CCP | Policy Summary | City Action |
|---|--|---|
| Activity Centers LU-55:57 | Define boundaries, densities, and uses within activity areas to provide local employment, commercial activities and public facilities; adopt disincentives for SOV use (e.g. parking requirements/charges); encourage bicycle and pedestrian travel. | See the discussion of Urban Centers above |
| Business/Office Parks LU-58:62 | Direct offices to Urban Centers; encourage transit use; establish maximum floor area ratios or minimum employment levels for existing business/office parks; plan to convert them to mixed use centers. | The Land Use Concepts evaluate the impacts of directing varying levels of employment growth to an Urban Center, to a new business park area south of the city center, and/or to an employment area east of I-5. |
| Community Character & Open Space Historic Resources CC-1,2 | Identify, evaluate and protect historic resources; protect/enhance historic resources through land use planning and regulations | Currently addressed in the SEPA process. Will be addressed in the Land Use element and implementing regulations. |
| Urban Design CC-3 | Promote high quality design and site planning | Mitigation measures identified in the Draft EIS; will be further addressed in the Comprehensive Plan Land Use element and implementing regulations. |
| Human/Community Services CC-4,5 | Essential community and human service needs should be identified and included in land use, transportation & capital improvement plans | Addressed in Draft EIS mitigation measures (for SEPA elements of the environment); will be further addressed in the Land Use element. |

Table 22 Countywide Planning Policies

City Action

Policy Summary

CCP

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| <p>Open Space CC-6:13</p> | <p>The regional open space system should provide physical & visual buffers to separate incompatible uses and define urban growth boundaries; provide active & passive recreation; and/or contain natural areas, habitat lands, natural drainage features and/or other environmental/scenic resources. Jurisdictions should cooperatively identify, protect (using a full range of regulatory and preservation tools), and manage regionally significant open space corridors which form a connected system. Develop coordinated level of service standards for parks and open space.</p> | <p>All Land Use Concepts include open space areas intended to perform the functions identified in the CPPs <i>Open Space</i> policies. The Draft EIS identifies additional mitigation measures designed to accomplish the goals of the policy. The City's open space network will be addressed in the preferred land use element and the Capital Facilities Plan, and further evaluated in the Final EIS.</p> |
| <p>Affordable Housing AH-1:5</p> | <p>Incorporate and implement the GMPC's targets, guidelines and strategies (including land use incentives and permit process streamlining) for accommodating a range & amount of housing affordable to low and moderate income households. Evaluate existing housing resources that may be lost due to redevelopment, deterioration or public actions; develop strategies to preserve existing low income housing where feasible; provide relocation assistance to displaced low income residents. Monitor residential development (new units constructed, housing types, densities and remaining capacity). Remove regulatory barriers/inconsistencies and provide opportunity for a full range of housing types.</p> | <p>Affordable housing targets have not been allocated to the cities as of this writing. The City's planning process is addressing the issues raised in the CPPs concerning affordable housing; see the discussion in the <i>Population, Housing & Employment</i> section of the Draft EIS. A draft housing needs assessment has been prepared and will provide additional direction for plan policies and implementation programs.</p> |

Table 22 Countywide Planning Policies

| CCP | Policy Summary | City Action |
|---|---|---|
| <p>Contiguous & Orderly Development, & Provision of Urban Services CO-1:16</p> | <p>Identify the full range of urban services required to support growth and how they will be provided. Coordinate service provision, including surface water management and water supply. Implement conservation programs for water and electricity. Encourage water reuse and consider decentralized waste water treatment systems. Urban water and sewer systems are preferred in the Urban Area identified for the next 10 years' growth. Community drainfields and water systems are preferred for the Urban Area identified for growth beyond 2002. Sewer and water systems should not be extended in rural areas or resource lands except to address health problems.</p> | <p>These issues will be addressed in the Utilities element of the Comprehensive Plan and the Capital Facilities Plan. The adequacy of existing and planned facilities is evaluated in this Draft EIS and will be analyzed further in the Final EIS. The Draft EIS recommends mitigation measures related to conservation.</p> |
| <p>Transportation High Capacity Transit (HCT) T-5</p> | <p>Urban Centers and mfg./ind. centers meeting size/density criteria should be served by HCT; comprehensive plans should reflect future HCT improvement needs (e.g. ROW, stations) and supportive land uses.</p> | <p>Two of the Land Use/City Center Concepts evaluated in the Draft EIS are based on high capacity transit service. See the discussion of the <i>Regional Transit Program Draft Plan</i> in the Draft EIS.</p> |
| <p>Non-Motorized T-7</p> | <p>Comprehensive plans should address pedestrian and bicycle travel.</p> | <p>The Land Use and Transportation elements of the Comprehensive Plan will contain non-motorized components.</p> |
| <p>Freeways, Highways and Arterials T-8</p> | <p>Improvements should help alleviate existing traffic congestion and provide access to new growth areas.</p> | <p>See the Transportation section of the Draft EIS.</p> |

Table 22 Countywide Planning Policies

City Action

Policy Summary

CCP

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|--|---|---|
| <p>Level of Service T-9:14</p> | <p>LOS is a tool to evaluate concurrency and should consider use of transit, HOV, demand management actions, access to transit and non-motorized travel; establish mode split goals for non-SOV travel to employment centers (varying with density, access to transit, alternative travel modes and congestion levels); identify transportation system improvements, demand management and land use strategies to achieve mode-split goals.</p> | <p>See the Transportation section of the Draft EIS. Federal Way will establish transportation levels of service in its Transportation element and Capital Facilities Plan as a tool to help measures and achieve concurrency.</p> |
| <p>Reassessment & Financing T-15:19</p> | <p>If transportation adequacy/concurrency can't be met, consider adjusting land use and LOS standards, use all authorized local option transportation revenues, and seek additional state revenues; give high priority to preserve and maintain facilities; structure impact fees to ensure fair share mitigation for new development, but not to cure existing deficiencies; execute interlocal impact fee agreements with adjoining jurisdictions to address inter-jurisdictional traffic impacts; identify (with King County, WSDOT, other cities, PSRC and Metro) regional land acquisition needs and establish a process for prioritizing and siting transportation needs.</p> | <p>The Land Use Concepts evaluated in the Draft EIS are being used to identify land use and infrastructure policies and mitigation measures necessary to achieve a transportation system meeting adopted levels of service.</p> |

Table 22 Countywide Planning Policies

| CCP | Policy Summary | City Action |
|---------------------------------------|---|---|
| Siting or Capital S-1 | Countywide or statewide capital facilities should be sited through a public process and should support countywide land use patterns & economic activities, mitigate environmental impacts, provide amenities and incentives, and minimize public costs. | Not applicable at this time. |
| Economic Development & Finance ED-1:5 | Local comprehensive plans should include an economic development element and policies that estimate the type and number of jobs to be accommodated within the next 20 years | Federal Way used economic scenarios involving differing employment levels and mixes of jobs as a factor in defining the Land Use/City Center Concepts evaluated in the Draft EIS. |

Plans & Policies of Adjacent Jurisdictions

This subsection generally considers the relationship of the Land Use and City Center Concepts to the adopted plans and land use designations of adjacent jurisdictions, including King County, Auburn, Des Moines, Kent, Algona and Milton. The analysis focuses on potential land use conflicts at the borders between the cities. Because the Land Use Concepts are very generalized and maps have not been prepared at this point, the evaluation is based on the general types and densities of uses occurring in PAZs adjacent to the identified jurisdictions and is not site-specific.

All jurisdictions in the Puget Sound region are currently revising their comprehensive plans and land use/zoning designations to comply with the Growth Management Act and the Countywide Planning Policies; land use in the adjacent cities may change over the next few years. This analysis, therefore, provides a snapshot of existing relationships and is subject to change based on ongoing regional and local planning programs.

King County Comprehensive Plan (1985)

Summary: Plan Concept. King County's Comprehensive Plan, adopted in 1985, provides a general framework for managing growth, guiding development, protecting environmental resources, and coordinating public services and facilities within the region. The Comprehensive Plan is part of King County's three-part planning system, which also includes community plans (see the discussion of the Federal Way Community Plan below) and functional plans (such as transportation).

The "Plan Concept" defines five types of planning areas: Urban, Rural, Transitional, Open Space and Resource Lands. Urban Areas designated by the Plan are committed to urban-level development and are appropriate for intensive land uses. It is expected that much of King County's future growth will be accommodated within Urban Areas, and a major share of this growth will be located within "Urban Activity Centers," which are defined as major concentrations of residential, commercial and/or industrial activity.

Rural Areas are characterized by resource-related activities and designated Resource Lands, such as agriculture and forestry; sensitive areas (e.g. wetlands, steep slopes and erosion prone lands); dispersed low density residential development; and preservation of a rural lifestyle. Public services and facilities are rudimentary and will be maintained at low levels, consistent with a rural pattern of development. These areas are also protected from incompatible urban development and land use conflicts, typically through buffering and low density transition zones.

Regional Planning & Intergovernmental Cooperation. The Comprehensive Plan expresses King County's philosophy of working cooperatively with cities to address major planning issues, including identifying future annexation areas.

Cities should be able to extend services to these areas prior to annexation. Policies reiterate the emphasis of the plan on concentrating growth within cities.

Facilities and Services. The Comprehensive Plan's facilities and services policies are intended to coordinate the provisions of adequate levels of service with the growth planned for Urban and Rural areas. In general, cities and Rural Activity Centers are recognized as the preferred service providers within future annexation areas. The plan also encourages development of common or compatible facility standards between King County, the cities and special districts.

Utility policies deal with water and sewer systems, solid waste, surface water management, energy and telecommunications. The plan's general approach emphasizes utility planning consistent with land use plans, locating utilities in a manner that avoids adverse environmental impacts, and using utility rights-of-way for multiple uses. More specific, surface water management policies encourage use and protection of natural drainage systems; using a watershed approach to surface water management; developing basin plans; and equitable funding for regional stormwater facilities.

Discussion: Federal Way is designated as an Urban Area on the Comprehensive Plan land use map, and the existing city center is designated as an Urban Activity Center. (Note that these designations were applied before Federal Way incorporated.) The type and level of development contemplated in the Land Use Concepts is consistent with the amount and kind of growth encouraged by King County's Comprehensive Plan to occur within cities. Federal Way has identified an interim future annexation area, and this is being used as the Urban Growth Area for planning purposes. The timing of annexation and extension of urban services will be determined according to principles and requirements of the Growth Management Act and Countywide Planning Policies. Facilities, services and utilities will be coordinated with growth consistent with the Growth Management Act.

Federal Way Community Plan (1986)

Summary: The Federal Way Community Plan was last updated in 1986, prior to the City's incorporation. Current unincorporated portions of the planning area include the area east of I-5, the Redondo neighborhood and the 272nd Street area north of the City limits. These areas are included within the City's planning area and would be affected by the land use element.

The unincorporated area east of I-5 is generally zoned for urban residential use, at densities ranging from 1 dwelling unit per acre (S-E along the eastern border of the planning area) to 5-6 dwelling units per acre (RS-7200). The area including and adjacent to the Weyerhaeuser corporate campus is zoned for manufacturing park use (MP classification) and permits a broad range of business uses subject to performance standards. In general, the Redondo area is zoned for urban density residential development (single-family and

townhouses, with limited commercial development); the 272nd Street area is zoned for urban density residential development (single-family and multi-family) and commercial uses along Highway 99. The unincorporated area north of the city's corporate boundary (between Federal Way and Des Moines) is zoned for a mixture of single-family and multi-family residences at urban densities (SR, SE, RS-7200, RM-900, RM-1800, RM-2400), and a broad range of commercial uses (CG-P and BC-P) generally located along Highway 99.

Policy changes and refinements in the Federal Way Community Plan update focused on several areas, including:

- maintaining the community's existing character, including the mix of housing units (72 percent single-family and 28 percent multi-family), and providing criteria for locating and constructing future multi-family housing;
- focusing commercial development in the central business district and designated community and neighborhood centers, and improving the design and function of commercial buildings and areas;
- locating and designing industrial development (including office parks) to be compatible with adjacent areas;
- protecting environmentally sensitive areas;
- improving the transportation system including pedestrian facilities; and
- increasing the supply of parks and recreation areas.

Discussion: The Land Use Concepts evaluated in the Draft EIS appear to be generally consistent with the land use and zoning designations and the policies of the Federal Way Community Plan; this conclusion should be confirmed when the City develops a land use map and policies for its comprehensive plan. The unincorporated area east of I-5 is being planned for medium density single-family and multi-family residential development. Densities are generally somewhat higher than those contemplated in the Community Plan. Similarly, more multi-family housing would occur than contemplated by current zoning. In addition, the amount of commercial and industrial development under Concepts 2 and 3 is probably greater than what was contemplated by the 1986 Community Plan Update. The same situation would generally occur in the 272nd Street area; future development would be of the same general type but would be more intensive than indicated in King County zoning. Changes in the Redondo area would be minor.

Land use changes are generally intended to be consistent with the Growth Management Act and with the Countywide Planning Policies, both of which generally encourage more intensive development within identified urban areas. As noted previously, Federal Way is within the interim Urban Growth Area. It is generally assumed that Federal Way will annex land within the unincorporated portion of the planning area over the next 20 years, consistent with state law, interlocal agreements, the policy direction in the Countywide

Planning Policies, the availability of adequate services and facilities and the input of residents.

City of Auburn

Summary: Auburn is located to the east of the Federal Way planning area. The City's Comprehensive Plan was adopted in 1986. Land uses adjacent to the planning area generally includes lower density residential uses, public uses, open space, light industrial, heavy commercial and business park.

Discussion: Land uses planned for the area adjacent to Auburn would be primarily urban density single-family and multi-family residential; these would be generally compatible with Auburn land use designations although possibly of somewhat higher density. Commercial and manufacturing uses could also be located around the Weyerhaeuser corporate campus under land Use Concepts 2 and 3; these would generally be buffered from adjacent residential areas, however. Potential conflicts between types and/or density of development could be addressed through design controls, such as landscaping and building orientation, or through use of transitional uses or urban separators.

City of Des Moines

Summary: Des Moines is located north of the Federal Way planning area. The City's Comprehensive Plan and land use map were updated in 1992. Land uses adjacent to Federal Way include low density and medium-high density residential, commercial and parks (Salt Water State Park).

Discussion: Land uses occurring in the 272nd Street area, adjacent to Des Moines southern boundary, include a combination of urban density residential (single-family and multi-family) and commercial uses. A high capacity transit station could also be located in this general area. The types of uses that would occur are generally consistent with the land use pattern in Des Moines; densities could be somewhat higher than at present, however. Potential conflicts between types and/or density of development could be addressed through design controls, such as landscaping and building orientation, or through use of transitional uses or urban separators.

City of Kent

Summary: Kent's Comprehensive Plan and Generalized Land Use Map were adopted in 1977. Land use in the portions of Kent adjacent to the Federal Way planning area (generally north of the city's boundaries between Highway 99 and SR-167) are a mixture of residential (single-family, multi-family and mobile home park) and commercial (retail, services, and offices). Community facilities, parks and open space are also interspersed. An area designated for agricultural use is located north of 277th adjacent to the Green River.

Discussion: Land use in the areas adjacent to Kent -- generally PAZs 1 (272nd Street) and 17 (East Side North) would include single-family and multi-family

residences at urban densities and some commercial uses (in the 272nd Street sub-area). These would be generally compatible with existing land uses and designations; densities could be somewhat higher, however. Locating urban uses adjacent to agricultural activities could lead to conflicts. Potential conflicts between types and/or density of development could be addressed through design controls, such as landscaping and building orientation, or through use of transitional uses or urban separators.

City of Algona

Summary: Algona's land use map was updated in 1990. The Valley Freeway (SR 167) separates most of Algona's land area from unincorporated areas to the west. Federal Way's planning area is separated from Algona's corporate boundary by additional unincorporated lands. A strip of city land located west of SR-167 is designated primarily for general commercial and low density residential uses; the general commercial category permits a wide variety of commercial activities. Land uses east of SR-167 are generally single family residential.

Discussion: Land use planned in the portion of the planning area closest to Algona's corporate boundaries are primarily residential (single family and multi family). Office and manufacturing uses are also planned further to the west, around the Weyerhaeuser corporate campus. Planned land uses would not create any land use conflicts with Algona's adopted land use designations.

City of Pacific

Summary: The City of Pacific is adjacent to the Federal Way planning area (PAZ 19, East Side South) on the southeast. The City's corporate boundary extends west of SR-167; most of the City's area, however, is located east of SR-167. Land uses in this portion of Pacific are primarily low density residential; higher density residential uses and community business uses are located adjacent to the freeway.

Discussion: Existing land uses in this portion of Federal Way's unincorporated planning area are generally high density single-family residential. Uses planned for this area under any of the land use concepts include a combination of single-family and multi-family; this would be generally compatible with existing uses in this portion of Pacific. Multi-family land uses could create conflicts if not properly sited and designed; the need for buffering to mitigate potential conflicts would be addressed when a preferred land use concept is identified and implementation measures are developed.

Pierce County

Summary: Pierce County borders Federal Way on the south and southwest. Most of the area along the border with the City is within the Cities of Tacoma and Milton; two areas of unincorporated land are also adjacent to Federal Way, one between Milton, Fife and Tacoma, and another just west and north

of Tacoma's corporate limits. Land use in these areas is primarily residential in character with some commercial uses.

Pierce County's comprehensive planning process has identified a preliminary Urban Growth Area (UGA); a Final Environmental Impact Statement on the UGA was published in September, 1993. The proposed UGA incorporates much of northwestern Pierce County, including the Cities of Tacoma and Milton, and the unincorporated lands between these cities and Federal Way. The proposed UGA would accommodate approximately 85 percent of new residential growth at urban densities; the balance of the County would remain rural. Alternatives evaluated in the EIS include different allocations of growth to Urban Centers and unincorporated areas.

Discussion: Land uses planned for the Federal Way PAZs adjacent to unincorporated Pierce County (Dumas Bay and Olympic View) include residential and community/government facilities. Under any of the land use concepts, these PAZs would not receive a significant share of growth within the planning area. The types of activities being considered are generally compatible with existing uses. Pierce County's unincorporated area is within Pierce County's proposed Urban Growth Area and adjacent to Tacoma. It is likely that this unincorporated area will be subject to infill development and/or could annex to Tacoma in the future.

City of Milton

Summary: The City of Milton is located south of Federal Way's planning area; it is adjacent to PAZs 8 (South 99) and 19 (East Side South). The land use designation for the portion of Milton east of I-5 abutting the Federal Way planning area, is Residential Buffer (RB), which generally permits multi-family residential uses. Further to the south, the area is designated Residential Agriculture (RA); this area is characterized by single-family residences on large lots. Light manufacturing uses are located in the area near I-5, while the remainder of the City is characterized by single-family residential uses. The area west of I-5, abutting Federal Way's corporate limits, is characterized by general business uses.

Discussion: Planned land uses in the PAZs adjacent to Milton are primarily residential, along with some institutional (government and community facility) uses. Proposed land uses under the concepts could create potential conflicts if they are greater in intensity than current development; land use designations and implementing regulations for the preferred alternative would address the potential for conflicts and provide appropriate buffering. It is also possible that land uses in Milton will intensify to some degree in the future consistent with the City's location within Pierce County's Urban Growth Area.

City of Tacoma

Summary: The City of Tacoma Generalized Land Use Plan (1980) designates the area bordering Federal Way for residential use, including single-family (detached and attached) and multi-family units of varying density. Policies

encourage protecting established residential areas from incompatible land uses; providing adequate public services and facilities; preserving views; and maintaining community character.

Discussion: Federal Way's southwestern boundary abuts the City of Tacoma. PAZs along this border include Olympic View, 356th South and Dumas Bay, and planned land uses within the land use concepts generally include residences (single-family and multi-family), community/government facilities, and a small amount of neighborhood retail use. Uses of different type, density or design located adjacent to each other can generate land use conflicts; whether impacts occurred would primarily depend on the location and design of new development. In general, planned land uses would likely be compatible in type and scale with existing land uses in the adjacent area of Tacoma.

encourage providing established residential areas from incompatible land uses, providing adequate public services and facilities, preserving the area and maintaining a desirable character.

Discussion: Federal Way's east-western boundary along the City of Tacoma, WA, along the border (include Olympic View, 23rd South and Dumas Way) and planned land uses within the land use concepts generally include residential (single-family and multi-family), commercial/government, facilities, and a small amount of neighborhood retail use. Uses of different types, density or design located adjacent to each other can generate land use conflicts which impacts occurred would primarily depend on the location and design of new development. In general, planned land uses would likely be compatible in type and scale with existing land uses in the adjacent area of Tacoma.

C. POPULATION, HOUSING & EMPLOYMENT

Affected Environment

Introduction

The Growth Management Act (GMA) requires that affected jurisdictions plan to accommodate 20-year housing and employment forecasts within their Urban Growth Area (UGA). King County and its cities are working together with the Puget Sound Regional Council (PSRC) to arrive at forecasts that each city will use to accommodate its fair share of regional growth. In late 1993 or early 1994, the Growth Management Planning Council -- a group of elected officials overseeing adoption of the Countywide Planning Policies -- will decide on population, housing and employment allocations for all jurisdictions in the region. In the interim, Federal Way is using PSRC's preliminary (1992) forecasts as "targets" for planning.

In 1992, PSRC prepared three preliminary forecasts for each city, varying according to how many Urban Centers were designated in the region (zero, five or twelve). For Federal Way, the difference between the forecasts is not significant and a single forecast is being used for planning purposes.

This analysis in this section is presented in the context of these preliminary forecasts. The forecasts are based on varying assumptions about the future pattern and density of growth throughout the King County region. They are intended to provide a framework for planning and are subject to modification. They should not be interpreted as predictions of the future.

Population

The 1990 estimated population for the Federal Way planning area was 98,600 (PSRC, 1992); approximately 70 percent is located within the City and 30 percent in the unincorporated potential annexation area (King County, 1993a). Population in the southwest portion of the County, including the Federal Way planning area, grew five-fold between 1960 and 1990; King County's population increased by 60 percent during the same period (City of Federal Way, 1993). Historical population growth is shown in Figure 17.

PSRC's preliminary forecasts for the Federal Way planning area show a total of approximately 139,700 persons by the year 2010. This represents an overall growth rate of 2.2 percent per year over the twenty-year period. Table 23 presents the preliminary PSRC population and housing forecasts for the Federal Way UGA.

Figure 17.
Federal Way Population Growth 1960-1992

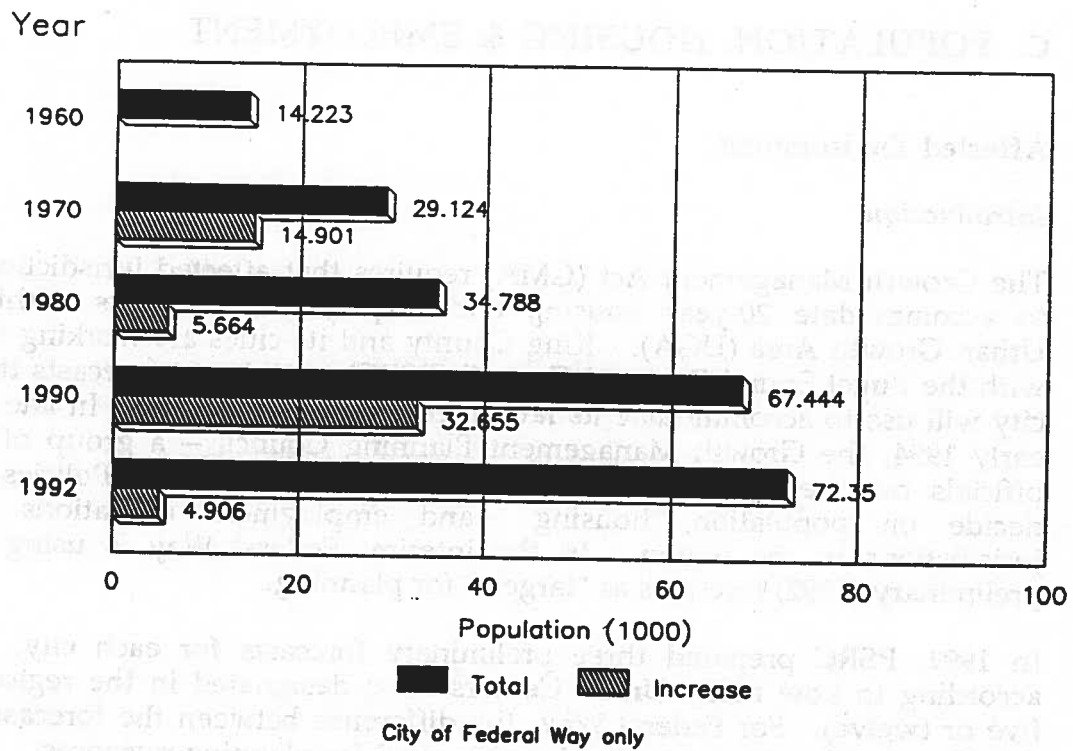


Table 23.
Existing and Forecast Population & Housing
Federal Way Planning Area

| | 1990 Estimates | 2010 Forecast | Increase (%) |
|-----------------------|----------------|---------------|----------------|
| Population | 98,600 | 139,700 | 41,100 (41.7%) |
| Housing Units | 37,762 | 57,000 | 19,238 (44.7%) |
| Persons per household | 2.7 | 2.5 | - 0.2 (-.07%) |

Source: PSRC, 1992

In 1990, the average population per square mile in the planning was approximately 3,081; population density is almost twice as great in the City as compared to the unincorporated portion of the planning area. Average population density in adjacent areas range between 1,471 persons per square mile in the Green River Valley to the north and east of Federal Way, to 3,431 persons per square mile in the Highline Community planning area to the north (King County, 1993a). The PSRC growth forecasts imply a population density of approximately 4,366 persons per square mile, or an increase of 1,285 persons per square mile.

Housing

In 1990, there were 37,762 housing units within the Federal Way planning area; 27,087 (72 percent) are within the City and approximately 10,672 (28 percent) within the unincorporated urban area. Average residential density within the planning area (based on total gross area) is 1.85 units per acre, while net residential density (based on residential land only) is approximately 4.5 dwelling units per acre.

Of the total number of households within the planning area in 1990, 64.4 percent were single family households and 35.6 percent were multifamily households. These percentages are generally similar in the City and unincorporated areas, with the unincorporated areas having a larger percentage of single family units (71.7 percent) than the City (60.3 percent) and a smaller percentage of multifamily units than the City (28.2 percent to 39.7 percent). PSRC forecasts for the distribution of housing types in 2010 are not available.

The estimated 1990 average household size in the Federal Way planning area is 2.7 persons per household. PSRC forecasts that this will decrease to 2.5 persons per household in 2010.

Household Characteristics

In general, Federal Way residents' median incomes are 15 percent to 25 percent greater than those in other southwest King County communities. In 1989, median income in the City of Federal Way was approximately \$38,311, followed by Algona (\$32,798), Pacific (\$32,468), SeaTac (\$32,437), Renton (\$32,393), Kent (\$32,341), Des Moines (\$32,145), and Tukwila (\$30,141) (City of Federal Way, 1993).

Housing Affordability

For the past three years, the average selling price of a single family residence in the Federal Way planning area has been approximately 32 percent less than the average price paid in King County as a whole. Sales data collected between January 1990 and September 1992, indicate a mean sale price of a single family home in the UGA (based on the 13 census tracts that correspond generally with the planning area's boundaries) of approximately \$132,000. During the same period, the average sale price in King County was approximately \$173,000 (SERERC, 1992). Data on mean sales price for the years 1990 to 1992 are presented in Table 24.

**Table 24.
Federal Way Planning Area Housing Costs
Mean Sales Price: 1990-1992**

| | 1990 | 1991 | 1992 (Jan-Sept) |
|------------------------|---------|---------|-----------------|
| Federal Way UGA | 132,585 | 141,257 | 141,347 |
| King County | 169,734 | 173,650 | 176,424 |

Note:

1. Sales prices were weighted by number of sales to produce average annual sales.
2. The Federal Way UGA encompasses, or includes the majority of the following 1980 census tracts: 298.01, 298.02, 299.00, 300.01, 300.02, 301.00, 302.01, 302.02, 303.01, 303.02, 303.03, 303.04, and 304.00.

Source: Seattle-Everett Real Estate Research Committee, 1992.

As of September 1992, average rent for multifamily housing units in King County overall was \$565 per month and apartment vacancies stood at 4.7 percent. Average rents and vacancy rates for multifamily units in areas around Federal Way (within King County) are shown in Table 25 below.

**Table 25.
Apartment Rents & Vacancies**

| Area | Average Rent | Vacancy Rate |
|-------------|--------------|--------------|
| Federal Way | \$ 565. | 4.7% |
| Auburn | \$ 505. | 4.6% |
| Kent | \$ 547. | 5.5% |
| Des Moines | \$ 523. | 6.4% |

Source: SERERC, 1992.

For the past decade, the cost of the average single family house in King County has remained above the affordability level of median income households. According to King County Housing and Community Development calculations, in 1993 the median income household in the Seattle-Everett area was able to afford a \$162,700 house (assuming 20 percent down, 25 percent for principal and interest, and a conventional 30-year mortgage at prevailing interest rates), but the average home cost \$173,123. This left a gap of \$10,400 between the average house cost in King County and what the median income household can afford. Housing for median income households is relatively more affordable in the planning area, with the mean home price being approximately \$22,600 less than the price considered affordable (King County, 1993). Nevertheless, housing affordability remains a significant regional problem.

Employment

In 1990, there were approximately 25,900 jobs in the Federal Way planning area: 21,900 jobs (85 percent) in the City and 4,000 jobs (15 percent) in the unincorporated urban area. These figures represent an increase of approximately 61 percent over the number of jobs in the planning area in 1980. The 1990 ratio of jobs per household was approximately 1.46 within the planning area.

Of the total jobs in the planning area, approximately 40 percent are in the retail category, 30 percent are service jobs, and the remaining jobs are in the categories of Government; Finance, Insurance, and Real Estate (FIRE); Construction; Manufacturing; and Wholesale Trade, Transportation, Communication, and Utilities (WTCU) (City of Federal Way, 1993). Within the City, retail and FIRE are the two largest employers, while in the unincorporated urban area, the largest employers are in FIRE, retail trade and manufacturing. Between 1980 and 1990, job increases were greatest in the services sector (108%), followed by WTCU (93%), retail (45%), government (22%), and manufacturing (11%).

Significant Impacts

Population

Population estimates for the three Land Use Concepts are presented in Table 26. The three concepts would add roughly the same number of persons to the Federal Way planning area. Differences in population capacity among the three concepts is not significant (18 people), and all would provide capacity to accommodate the PSRC population target being used for planning (an addition of 41,000 persons), assuming an average household size of 2.6 persons. The forecast implies an average annual growth rate of approximately 2 percent.

The land use concepts evaluated in this Draft EIS will provide the capacity to accommodate 20-year growth targets. Whether this quantity of growth will occur in fact, however, will depend on a number of uncertain factors, including the future growth rate. The rate of population and job growth will depend on the local and regional economy, land use policy decisions, market conditions and other factors. The timing of future growth is unclear. It could, for example, take some period of time for Federal Way to provide infrastructure, create incentives, and form public-private partnerships that facilitate planned growth of the City Center; it is also likely that the private market will require some period of time to react to the City's vision. Growth might occur more slowly than implied by the forecasts, or could occur slowly through the rest of the 1990's and accelerate after 2000 or 2005. In view of economic conditions, infrastructure needs and financial capability, the entire Puget Sound region may require 30 years, rather than 20, to accomplish its land use vision. Federal Way and the rest of the region may be playing catch up for some period of time. In the short term, some number of households

could be attracted to communities with available capacity, attractive and affordable living environments and healthy economies.

Table 26.
2010 Population and Housing Estimates

| | Existing (1990) | 2010 Forecast Increase | Concept 1 | Concept 2 | Concept 3 |
|---------------------------------------|--------------------|------------------------------|--------------------|--------------------|--------------------|
| Population Increase | 98,600 | 41,000 | 46,202 | 46,184 | 46,184 |
| Total Population +/- 2010 Forecast | | 139,700 | 144,802 + 5,702 | 144,784 + 5,784 | 144,784 + 5,784 |
| Housing Unit Increase | 37,762 | 19,238 | 17,770 | 17,763 | 17,763 |
| Total Housing +/- 2010 Forecast | | 57,000 | 55,532 - 1,408 | 55,525 - 1,475 | 55,525 - 1,475 |
| Density | 1.85 | 2.79 | 2.72 | 2.72 | 2.72 |

Note: An average household size of 2.6 persons was used to calculate estimate population in the preceding table (a mid point between PSRC's 1990 and 2010 estimates). However, PSRC's housing and population forecasts imply a household size of 2.1, which is inconsistent with their household size forecasts. An average of 2.1 persons per household would result in a need for more housing units to accommodate the population forecast.

Source: Federal Way, 1993; PSRC, 1992; Huckell/Weinman Associates, 1993.

Housing

Planned housing growth for each of the Land Use Concepts is shown in Table 26. All three Concepts would be approximately 1,500 dwelling units below the PSRC housing target (see the note to Table 26 above). It should be noted that this apparent shortage may be explained by use of an average persons per household number for the twenty-year period. As noted previously, all three land use concepts could accommodate the population growth target.

Concepts 1 would provide the largest number of housing units at 17,770; 41.4 percent of these units would be single family units and 58.6 percent would be multifamily units. This concept represents a continuation of existing trends, and a modification of existing plans, policies, and regulations in order to reach regional population, housing, and employment targets.

Land Use Concepts 2 and 3 would provide slightly fewer housing units (7) than Concept 1. Concept 2 would provide approximately the same percentage of single family units (41.7 percent) and multifamily units (58.6 percent) as Concept 1. Concept 3 would provide the smallest percentage of single family units (38.8 percent) and the largest percentage of multifamily units (61.2 percent). In both concepts, little change would occur in existing

neighborhoods. Land use patterns associated with each Concept are discussed in the *Land and Shoreline Use* section of this Draft EIS.

Land Capacity Issues

The land capacity analysis in the *Land and Shoreline Use* section of this Draft EIS generally found that, depending on assumptions about the amount and type of land available for development, there could be a shortage of available land to accommodate the levels of growth included in the concepts. This could imply a need to increase densities further (which may not be feasible), to designate additional land for residential use (which could decrease the land available for employment uses), or to modify the population and housing forecast to better reflect the realities of the local land market. Over time, a shortage of available land could cause upward pressure on land and housing costs, as well as pressure for rezoning or redevelopment to achieve higher densities. If Federal Way ultimately were unable to accommodate its forecast growth, some increment of regional growth would in effect be shifted to other communities in the region; these cities and counties may or may not be able to accommodate this additional increment of growth, depending on numerous local factors.

Employment

The Federal Way planning team worked with property owners and the Chamber of Commerce to prepare 20- and 30-year economic growth scenarios. Each scenario made different assumptions about the role of the City, the relative amounts of future retail, office, and industrial growth, and the function and shape of the City Center. Puget Sound Regional Council regional forecasts were used as a control factor (Apogee Research, Inc., 1993). See the discussion in Section II of the Draft EIS.

The Land Use and City Center Concepts embody three different scenarios for the City's future economy: (1) continuation as a suburban bedroom community, surrounding a regional shopping center (Concept 1); (2) emergence of a City with a more intensively developed urban downtown (including high rise buildings), a mix of retail, residential and office uses, and a better balance between jobs and housing (Concept 2); and (3) an intensively developed urban City Center (similar to previous vision), with additional business park areas and residential communities north and south of the downtown, and a City that functions as a major employment center (Concept 3).

Each scenario would result in an increase in non-residential construction; additional and total building space is shown in Table 27 below and in Figure 16 in the *Land Use* section. Additional and total employment is shown by concept in Table 28.

The three concepts would achieve different levels of economic activity, different mixes of uses, and different balances between future residential population and employment. Land Use Concept 1 would retain the current

retail-dominated economic focus of the community, and provide the fewest number of jobs. The development pattern would remain suburban and relatively dispersed.

Table 27.
Non-Residential Development
(Millions of Square Feet of Building Space)

| | Existing (1990) | 2010 Forecast | Concept 1 | Concept 2 | Concept 3 |
|----------------------|--------------------|------------------|--------------|--------------|--------------|
| Total Building Space | 12.9 | 18.6 | 17.3 | 18.3 | 20.8 |
| Retail | 4.3 | 6.1 | 5.0 | 5.0 | 5.6 |
| Office | 2.8 | 4.4 | 4.4 | 5.4 | 6.8 |
| Industrial | 2.7 | 3.5 | 3.3 | 3.3 | 3.8 |
| Institutional | 3.1 | 4.6 | 4.6 | 4.6 | 4.6 |

Employment categories:

- Office: service, FIRE.
- Industrial: manufacturing, WTCU.
- Institutional: schools, government, and miscellaneous.

Source: Apogee Research, Inc., 1993.

Table 28. Projected Employment

| | Concept 1 | Concept 2 | Concept 3 |
|-----------------|-----------|-----------|-----------|
| Additional Jobs | 11,295 | 15,415 | 22,985 |
| Total Jobs | 37,195 | 41,315 | 48,885 |
| % Increase | 44% | 60% | 89% |

1990 Jobs = 25,900

Note: PSRC's preliminary forecasts for Federal Way range from job increases of 9,593-14,449, and total employment of 28,978-33,829. These forecasts represent increases of between 67 percent and 75 percent. The forecasts, which are for the City only, vary based on the number of Urban Centers assumed to be designated in the King County region.

Source: Apogee Research, 1993; City of Federal Way, 1993; Huckell/Weinman Associates, 1993

Land Use Concept 2 would expand the amount of office development approximately one-third more than under Land Use Concept 1. The location of this development would be concentrated in higher density mixed-use and office centers in the City Center, West Campus area, and adjacent to the Weyerhaeuser corporate campus. This Concept would result in more office and total employment than Concept 1.

Land Use Concept 3 would provide the greatest amount of non-residential development. The increase in total jobs would be approximately 21 percent greater than that in Concept 1, and 14 percent more than Concept 2. The

employment increase would occur in all types of employment with the greatest increase office jobs. Increased non-residential development under Concept 3 would be focused on the City Center and along Pacific Highway South.

Mitigation Measures

Population

To be consistent with the Growth Management Act and Countywide Planning Policies, Federal Way's Comprehensive Plan must reflect a balance between land use, levels of service, and financing for capital facilities. Whether the City can in fact accommodate the 20-year growth targets will depend on how residents choose to balance these factors. As indicated in the preceding analysis, the land use concepts provide adequate capacity to accommodate forecast population. This Draft EIS, however, identifies some potential constraints to achieving the targets, including economic and market conditions: desired levels of service and the ability to finance needed capital facilities; the timing of extending services to the unincorporated potential annexation area and the desires of local residents to be annexed; and potential water resource limitations. Depending on how and when these issues are resolved, growth may have to be sequenced or "phased" in accordance with the provision of adequate facilities. Alternatively, the City's growth target could be reduced to reflect any limitations.

The conservative assumptions used in the land capacity analysis also indicate a potential shortage of available land to support forecast levels of population growth. The City should monitor growth and land markets to ensure that assumptions embodied in the preferred alternative, when it is selected, are valid. Possible corrections to constrained land supply could include increasing residential densities further (if feasible and acceptable to residents); rezoning additional land for residential uses (which could reduce employment growth); or revising the preliminary population growth forecast to realistically reflect limitations of the City's land supply.

Housing

The City's housing stock is relatively affordable compared to King County as a whole. The significant amounts of multi-family housing contained in the Land Use Concepts, particularly in Concepts 2 and 3, would help provide affordable housing for those residents who are unable or do not desire to purchase housing.

The City should monitor development activity and real estate market costs to determine if any conditions within its control (e.g. constrained land supply) are contributing to increased housing costs. The City should also strive to facilitate construction of the "least cost housing" possible consistent with its responsibilities to protect the public's health, safety and general welfare. It should, for example, review its development standards and land use approval processes to determine if any regulations contribute to housing costs without

providing a commensurate public benefit or that create barriers to affordable housing. Zoning should provide opportunities for a variety of lot sizes and housing types.

The City's 1991 Comprehensive Housing Affordability Strategy (CHAS) establishes a five-year strategy to address the housing needs of low-income and special needs populations. Continued implementation of this plan's strategies could help provide affordable housing to these groups.

Potential incentives to provide affordable housing should be identified and considered. These might include, for example, density bonuses or process incentives for affordable units. Mandatory provision of affordable units could also be evaluated.

A program to permit accessory housing units should be developed, consistent with the requirements of the Washington Housing Policy Act, Chapter 478, Laws of 1993, SB 5584). The following additional recommendations of the Housing Policy Act should be considered in developing housing policies:

- develop an adequate and affordable supply of housing for all economic segments of the community;
- assist very low income and special needs households;
- encourage and maintain home ownership opportunities;
- reduce life cycle housing costs;
- preserve the supply of affordable housing; and
- provide housing for special needs populations.

Employment

The levels and mix of employment embodied in Concepts 2 and 3 diverge somewhat from the PSRC preliminary forecasts. As noted previously, the land use concepts are based on economic scenarios that make different assumptions about the City's economic role in the region; this differs from PSRC's forecasting methodology. PSRC's forecasts are subject to change as the result of future regional decisions, such as designation of Urban Centers. The City will monitor the regional planning and growth allocation process to determine if its economic scenarios continue to be generally consistent with regional plans. No additional mitigation is required.

Unavoidable Adverse Impacts

Assuming continued regional growth, population, housing, and employment is likely to increase in the Federal Way planning area with or without adoption of any of the Land Use Concepts. As a result of increased growth, more resources will be consumed and greater demand will be placed on existing infrastructure and resources. Land developed for residential and employment will generally be unavailable for other uses.

AESTHETICS, LIGHT AND GLARE

AFFECTED ENVIRONMENT

Federal Way's planning area encompasses a variety of land forms. The topography of the area varies with elevation changes from sea level along the waterfront to 500 feet in the northeastern portion of the City. Steep slopes, bluffs and ravines are located along Puget Sound, affording views from homes and waterfront parks. Southeast of the waterfront, the topography levels somewhat with elevations typically between 300 and 400 feet. The City's commercial district lies in a slight depression and is surrounded by low hills. The planning area extends east of I-5 to the slope of the west edge of the Green River Valley. This area is characterized by rolling hills with some steep slope areas such as Peasley Canyon.

In general, the City is characterized by suburban residential development with strip commercial development along major arterials (i.e., Highway 99, S.W. 320th Street, and S. 348th Street) and a major shopping center. The portion of the planning area east of I-5 is characterized by low density single family residential development, Weyerhaeuser's corporate campus, and tracts of undeveloped land.

Visual Character

Federal Way can be divided into three basic land use districts -- residential, the City Center, and the corridor between Highway 99 and I-5 -- each with a distinct visual character. The City's residential neighborhoods are primarily located west of Highway 99 and east of I-5. Residential development is characterized by older homes on larger lots in the northern portion of the City, and newer subdivisions in the central and southern portions. Newer housing is located along the northern city limits, south of S. 272nd Street and along Highway 99 (to the east). Housing throughout the City varies widely with regard to age, architectural styles, building size, and building setbacks (from the street and side property lines). In older neighborhoods, vegetation has been retained to buffer homes from major roadways (i.e., along SR 509), while in newer neighborhoods fences have been constructed to serve as buffers (i.e., along 21st Avenue S.W.). Vegetation within older neighborhoods and on undeveloped lands is characterized by mature stands of indigenous and introduced plant species.

The area between Highway 99 and I-5 is characterized by commercial, retail and industrial development interspersed with residential development. Much of the commercial land is underutilized with lower-quality buildings and minimum site improvements, and the area could be characterized as "transitional" (i.e., potentially converting to different land uses or structures).

The City's commercial/retail center, located along S.W. 320th Street between I-5 and Highway 99, serves as the major gateway to the community. The overall visual character reflects the dominance of retail and service land uses

located in this area. SeaTac Mall is the center's commercial anchor. In addition to the mall, there are several large chain stores that are grouped with other buildings to form shopping complexes that make up the overall commercial center. Structures are oriented to provide visibility and access from adjacent streets.

Buildings in this area are similar in scale, with the majority being one- or two-stories, and similar in form, with flat roofs and structural canopies/facades that contain tenant signage. Building materials include brick, painted concrete and stucco. The colors of most buildings are earth tones. The area does not reflect the use of strict or consistent design or landscaping standards and, in general, lacks unique visual character.

The majority of land area in the commercial center that is not occupied by buildings is devoted to surface parking. Parking is located in front of most buildings and abuts S.W. 320th and adjacent streets. Streets serving this commercial area are multi-lane; typically four or five lanes. Sidewalks front the commercial and retail buildings and S.W. 320th Street; however, there are no landscaped public walkways or sitting areas. Vegetation in this area is limited to sparse perimeter and some internal "island" landscaping within the parking areas.

Major Visual Features

Views of significant natural or man-made features include Puget Sound, Mt. Rainier, the Federal Way Sewer and Water District's water tower, and a large BPA powerline corridor. Puget Sound and Mt. Rainier are visible from various points in the City. Several points along Highway 99, north of S.W. 320th, present broad vistas of Puget Sound and the Olympic Mountains to the northwest. Puget Sound is also visible from homes located on hillsides as well as parks and roadways adjacent to the waterfront.

Mt. Rainier is visible from the commercial areas along S.W. 320th Street and residential areas in the central and southeastern portions of the City. Large power lines dominate views in this area, however and interrupt views of Mt. Rainier from the commercial area and residential neighborhoods located north and west of the easement. The powerline easement crosses the I-5 corridor from northeast to southwest at the interchange with S.W. 320th then turns west and runs along S. 324th Street before turning southwest at 11th Place South. Along S. 324th Street, the power lines abut parking areas along the south side of SeaTac Mall and pass a mobile home park, apartments and single family residences. The power lines also cross the West Campus area and residential development in the southern portion of the City and are a dominant visual feature for those areas within close proximity.

The water tower is located south of the commercial district and the powerline corridor. The tower is painted with native northwest Indian tribal designs. Views from the north are interrupted by the powerline corridor.

Gateways

The Federal Way Community Profile Summary (1993) identifies six primary entrances to the City considered as "gateways" – I-5 interchange locations at S. 272nd Street, S.W. 320th Street and S. 348th Street/SR 18; Enchanted Parkway; Highway 99 (at the north and south) and 356th Street in the SW portion of Federal Way. Currently, there are no features at these entryways other than highway exit signs or small roadway signs that indicate one is entering the City of Federal Way.

The I-5/S.W. 320th interchange is the primary "gateway" to the City of Federal Way. SeaTac Mall and the commercial district along S.W. 320th Street draw people into the City at this location. Visual characteristics at this entry point include office/commercial development and the BPA power lines.

Visual features at the entryway from the I-5/S. 272nd Street interchange include a Metro park-and-ride lot on the north side of S. 272nd Street (outside city limits) and apartments on the south. The entry point at S. 348th/SR 18 is cluttered in appearance and is not visually distinct; it is characterized by a truck stop, gas stations, convenience stores, and retail development. From Highway 99 at the northern city limits, the entrance to the City is characterized by strip commercial development (e.g., mini-market, real estate office, dry cleaners, etc.). The southern entrance is characterized by lower density development; there is a cemetery, vacant land and some industrial development. The entrance from Enchanted Parkway is characterized by open space and residential development in the area south of I-5 and commercial/retail development in the area north of the freeway.

View Corridors

Several "view corridors" (e.g., linear area offering views of a significant visual feature) have been identified – I-5, Enchanted Parkway, and the southern entrance from Highway 99. Expansive views from I-5 are limited by vegetated buffers along the highway corridor, and the recessed nature of the roadway. Visible features from the highway include residential development along S. 272nd Street, commercial/office development and the BPA power lines at the S.W. 320th interchange; and Weyerhaeuser's corporate headquarters. There are no corridors where the entire City of Federal Way is visible.

The southern end of Highway 99 offers views toward the City of Federal Way. Views include vegetated slopes to the northwest and more level open space with some industrial development to the southeast. Enchanted Parkway offers expansive views of the City's unincorporated planning area to the southeast. Views are of open space interspersed with residential development. Due to the relatively undeveloped nature of the southern portion of the City along Highway 99 and Enchanted Parkway corridors, there is the potential for these areas to experience both positive or negative visual changes.

Light and Glare

A considerable amount of ambient light is generated throughout the City. Principal sources of light and glare include motor vehicles, parking area lighting (shopping complexes), interior and exterior lighting associated with buildings, street lighting, and lighting associated with I-5.

Residential areas emit substantially less ambient light when compared to the commercial and business districts in the City. Key sources of light include motor vehicles, street lighting, and residential lighting.

Light and glare at the perimeters of the City varies with location. At the northern perimeter of the city, ambient light is generated by the commercial development and higher density multi-family housing along S. 272nd. Along the Puget Sound Border, relatively little light is emitted. This is primarily due to the presence of park areas and lower density residential development. Light at the southwestern and southern perimeters are characteristic of residential development. Interstate 5 marks the current eastern city limits and is characterized by a substantial amount of light and glare; however the eastern perimeter of the City's proposed urban growth boundary emits relatively little light and glare with the primary source from cars, street and residential lighting.

SIGNIFICANT IMPACTS

A range of potential visual impacts could result from development under the land use and City Center concepts. Potential impacts to visual resources vary between the three concepts and primarily relate to the location, size, scale, and intensity of future development. Proposed changes are concentrated in the corridor between Highway 99 and I-5, and the area around 21st Avenue S.W. and S.W. 336th Streets.

It is assumed that design policies and standards will be included in the Comprehensive Plan and will be implemented as growth and redevelopment occur. This could result in an overall facelift for the community and have a beneficial impact on visual character. Without design policies and guidelines, the Highway 99 corridor would likely continue to develop in the unorganized fashion that characterizes the area today. Area-specific impacts (negative and positive) for each Concept are described below.

Changes in Visual Character

City Center

Under all land use concepts, the City Center would experience the greatest change in visual character. Changes from existing conditions would include the widening of both S.W. 320th Street and Highway 99 to seven lanes, construction of a civic plaza, landscaping, parks and pedestrian amenities. Incorporation of parks, landscaping and pedestrian amenities to the City

Center area and development pursuant to a plan and design guidelines would be a positive change in the visual character of the area.

Concept 1 represents the least dramatic visual change; land use type, building size and design would be similar to existing conditions. The area would continue to develop as an auto-oriented regional retail area and would continue to lack visual character and a distinct identity. It is assumed, however, that the Comprehensive Plan will include design policies for the City Center, although the exact nature and specificity of these policies is not known. The policies and implementing regulations would, over time, result in an incremental improvement in urban design.

Concept 2 would introduce mid- and high-rise office development, high-rise housing, and three rail transit stations in and adjacent to the City Center. Mid- and high-rise buildings would add dimension and scale to the City Center and would create more of an identity for the area. This concept proposes to develop a "pedestrian spine" which would link parks, civic and office/retail uses together. Under this concept, the area would take on a more urban character, perhaps similar to cities such as Bellevue or mixed use areas in Vancouver, B.C. It is assumed for Concepts 2 and 3 that the Comprehensive Plan would contain a design element specific to the City Center. Policies, incentives and civic improvements would be focused on achieving a defined vision for the appearance and functioning of the City Center.

Changes in visual character under Concept 3 would be similar to Concept 2. The downtown core would contain a mix of high-rise and mid-rise office/retail uses, high-rise housing and an "urban village" with a mix of housing types and densities. The City Center would be distinctly urban in character and appearance. Both Concept 2 and Concept 3 offer the greatest potential for the City to improve its visual image, enhance the primary "gateway", and create a cohesive, urban identity.

In the area between S. 336th Street and S. 348th Street, Concept 3 proposes a business park with a transit station and park and ride. The visual character of this area would change from that of mixed commercial development to a planned office park.

Residential Neighborhoods

Visual changes that would occur in single family and multi-family residential neighborhoods as a result of infill development and intensification of land use would vary between Concepts 1, 2 and 3. The most significant change in residential character would occur in the corridor between Highway 99 and I-5, and the area east of I-5. Under all of the concepts, the area between S. 272nd and S.W. 312th Streets would redevelop as medium to high density single and multi-family residential neighborhoods, and the area east of I-5 would develop as high density single family neighborhoods. These areas would take on a visual character similar to the newer subdivisions in the southwestern portion of the city. Little visual change would occur in existing neighborhoods

throughout the city. Infill development could contrast in building style or size in some neighborhoods. These potential impacts can be mitigated through land use controls and the use of design guidelines, however.

Concept 1 proposes the greatest amount of residential redevelopment, particularly along S.W. 336th Street between West Campus and I-5. The visual character of the area would change from a mix of vacant land and industrial and commercial uses to residential neighborhoods. Concept 2 concentrates higher density residential infill in the area around S.W. 336th and I-5, while Concept 3 concentrates infill in the area north of S. 336th Street, closer to the City Center. All concepts would place the major portion of multi-family housing in the City Center. In general, changes in the visual character of the area are not expected to be significant, assuming that Comprehensive Plan policies and development regulations address design compatibility.

Views of the City

No significant impact to distant views of the City or views from within the City are anticipated.

Views from gateway locations could improve as infill and redevelopment occurs and design improvements are implemented over time. At this time, no specific improvements have been identified for identified gateways to the City. All of the land use concepts would provide an opportunity to enhance primary entry points to the City (e.g., S.W. 320th Street/I-5 and S. 348th Street/I-5). For example, the proposed incorporation of a transit station and park and ride in the vicinity of S. 348th Street and I-5 could provide a focal point for this gateway to the City.

Planning and Design Features

Design policies and a City Center design plan will be included in the City's Comprehensive Plan. The Final EIS will reevaluate design issues for a preferred land use concept. Concepts 2 and 3 generally provide the greatest opportunity for the City to create a coherent visual identity for itself, because they involve the greatest levels of redevelopment. Implementation of standards for building design, signage, lighting and landscaping would help to ensure that future development/redevelopment occurs with minimal visual impacts.

Concepts 1, 2, and 3 would incorporate parks and open space into planned residential and commercial areas; these features would enhance overall visual quality. In addition to providing recreational opportunities, well-designed use of open space can reduce impacts of increased development density, serve as an effective buffer to and from adjacent properties, and provide avenues for pedestrian circulation.

Light and Glare

Changes in existing light and glare would occur primarily within the corridor between Highway 99 and I-5. Light emitted from new residential development would be similar to residential lighting in the southwestern portion of the City. The greatest change in light and glare would result from redevelopment of the City Center under Concepts 2 and 3. The introduction of mid- and high-rise office and residential buildings, would make the City Center more visible from surrounding areas. Use of reflective materials for buildings could generate light and glare impacts.

At this time, no lighting standards for parks, streets, parking, office/retail development is proposed. See the Mitigation section.

MITIGATION MEASURES

Measures to help reduce the potential for visual impacts from future development could include the adoption of design policies, standards, and guidelines in the Comprehensive Plan and development regulations; creation of a design review process; revised sign controls and lighting standards; retention of open space; and creation of/enhancement of public open space. Design requirements and processes should be efficient and should consider other important city objectives -- such as affordable housing -- along with visual quality.

UNAVOIDABLE ADVERSE IMPACTS

The visual character of Federal Way could change from a suburban residential community to a more urbanized City with a distinct business/commercial core and image. Overall, changes in design and visual quality are likely to be positive.

Light and Views

Changes in existing light and view would occur primarily within the corridor between Highway 25 and 10. Large areas of new residential development would be located in residential blocks in the northern portion of the City. The greatest change in light and view would result from redevelopment of the City Center under Paragraphs 1 and 3. The introduction of mid- and high-rise office and residential buildings would make the City Center more visible from surrounding areas. Use of reflective materials for buildings would give additional view effects.

At the same time, we help set standards for noise, street parking, and other development is proposed. See the Mitigation section.

MITIGATION MEASURES

Measures to help reduce the potential for visual impacts from future development could include the adoption of design policies, standards, and guidelines in the Comprehensive Plan and development regulations. Creation of a design review process to check site location and siting standards, reduction of open space and retention of open space, and other measures. Design requirements and processes should be strict and should consider other important city objectives - such as affordable housing - along with visual quality.

ENVIRONMENTAL AND OTHER IMPACTS

The visual impact of Federal Way would change from a suburban landscape community to a more urbanized City with a high density of commercial and office buildings. Visual changes in design and visual quality are likely to be positive.

TRANSPORTATION

AFFECTED ENVIRONMENT

Transportation Alternatives Development Process

As part of CityShape, the City of Federal Way conducted a sketch planning process that included the development of 13 different transportation alternatives. Each alternative included a different mix of specific transportation improvements necessary to accommodate future population and employment growth. The preliminary evaluation of the transportation alternatives considered the level of congested vehicle miles of travel (VMT) and the financial requirements associated with each land use/transportation scenario. Objectives of the transportation evaluation process were to minimize the growth in congested VMT over existing conditions given projected growth, and to identify the greatest return on transportation investments required to meet level of service standards.

The process then reduced the 13 preliminary transportation alternatives to four. More detailed evaluation then identified one transportation alternative (that includes a number of improvements) which is being considered as part of the DEIS. For analysis purposes, this transportation alternative is being held constant for each land use concept.

Existing Travel Patterns and Characteristics

Within Federal Way today, over 350,000 person trips are generated on a typical weekday. As many as half of these trips do not leave the City and many do not require vehicular travel or are accomplished by public transportation (e.g., Metro, school bus transportation). Of all the trips made, 20 percent are to/from work.

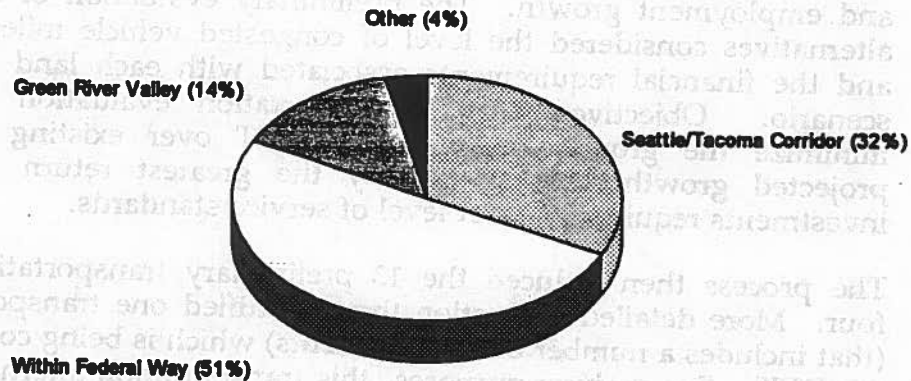
Figure 18 indicates the estimated distribution of daily person trips which originate in Federal Way. As noted above, over half begin and end within the City. Of those which leave the City limits, the predominant orientation is along the north-south corridor of I-5 to Seattle or Tacoma. Approximately one-third of all trips are destined to locations in this corridor. The remaining trips are destined for the Green River Valley (14 percent) and other locations (4 percent).

Street and Highway System

Federal Way is served by a network of publicly maintained streets and highways connecting local communities and urban centers in the Puget Sound region. Major activity centers within Federal Way include commercial activities in the S. 320th Street corridor between Pacific Highway South (SR 99) and Interstate 5 (the City's central business district), strip pattern commercial developments along Pacific Highway South, and several smaller commercial centers located within various residential areas. Concentrations of office uses are located within the central business district (CBD), West

Campus, and the Weyerhaeuser Headquarters area. Major activity centers outside and within proximity to Federal Way, include Seattle, Tacoma, Kent and Auburn.

Figure 18
Distribution of Daily Trips to Metropolitan Subareas
from Federal Way



Source: 1990 PSRC Regional Trip Tables

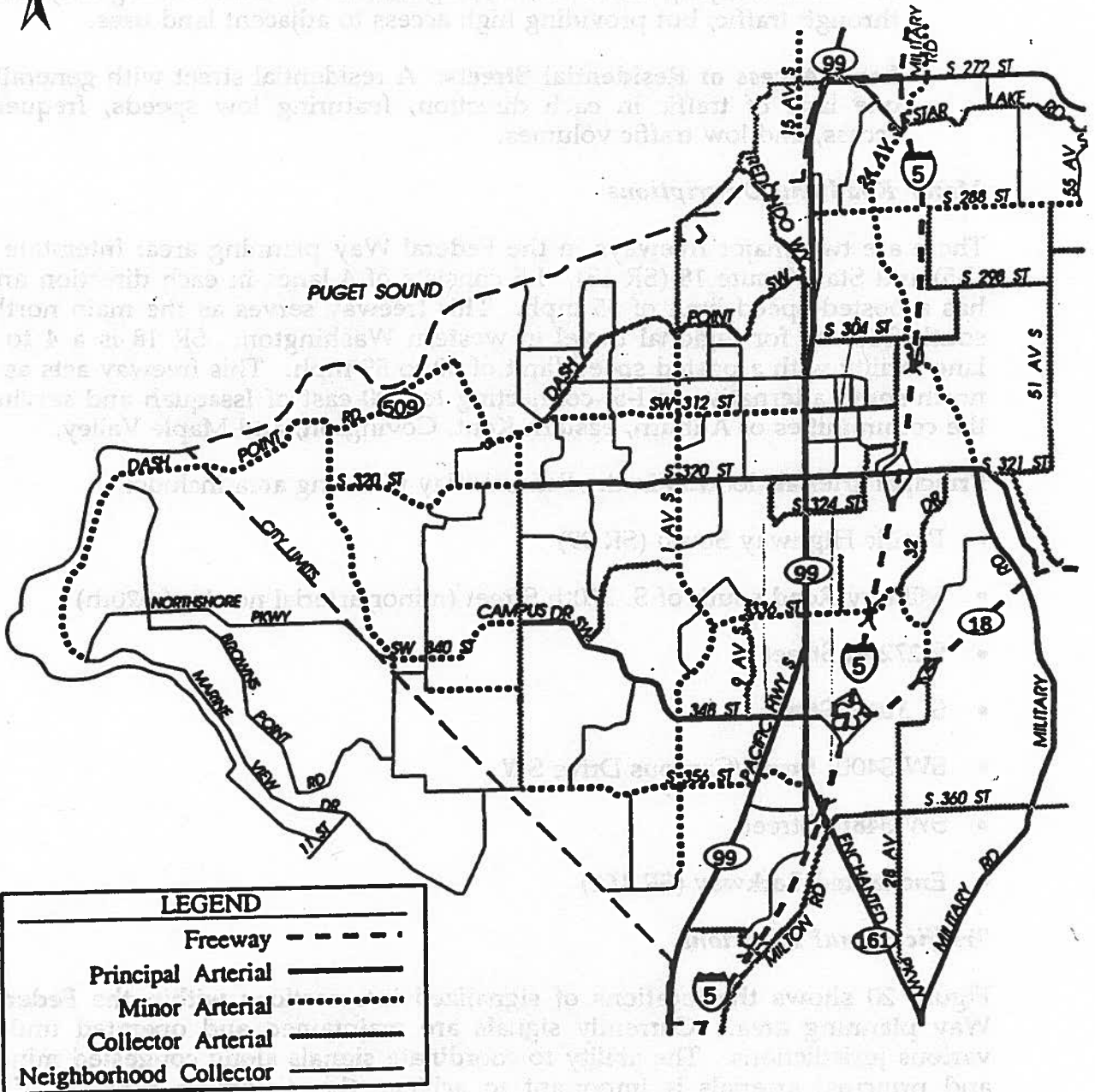
Functional Classification

Public streets are classified according to their functions related to mobility and land access. These functional classifications help facilitate planning for access and circulation, standardize road designs, and provide a hierarchy for roadway funding. The classifications range from residential streets which directly access abutting residences and other properties, to freeways which only serve vehicular traffic needs with limited access. Principal, minor, and collector arterials serve varying degrees of access and circulation needs. The functional classifications adopted by the City of Federal Way are shown in Figure 19 and are described below (Note: neighborhood and residential streets are not shown):

Freeway: A multi-lane, high speed, high capacity roadway intended exclusively for motorized traffic with minimal access controlled by interchanges and road crossing separated by bridges.

Principal Arterial: A roadway connecting major community centers and facilities, often constructed with partial limitations on access and minimum direct access to abutting land uses.

Minor Arterial: A roadway connecting centers and facilities within the community and serving some through traffic while providing greater access to abutting properties.



Source: City of Federal Way, Comprehensive Plan



Figure 19
Arterial Functional Classifications

Federal Way
Comprehensive
Plan EIS

Collector Arterial: A roadway connecting two or more neighborhoods as well as carrying traffic within neighborhoods while serving very little through traffic, but providing high access to adjacent land uses.

Local Access or Residential Streets: A residential street with generally one lane of traffic in each direction, featuring low speeds, frequent access, and low traffic volumes.

Major Roadway Descriptions

There are two major freeways in the Federal Way planning area: Interstate 5 (I-5) and State Route 18 (SR 18). I-5 consists of 4 lanes in each direction and has a posted speed limit of 55 mph. This freeway serves as the main north-south freeway for regional travel in western Washington. SR 18 is a 4 to 6 lane facility with a posted speed limit of 50 to 55 mph. This freeway acts as a north-south alternative to I-5, connecting to I-90 east of Issaquah and serving the communities of Auburn, eastern Kent, Covington, and Maple Valley.

Principal arterials located in the Federal Way planning area include:

- Pacific Highway South (SR 99)
- Military Road south of S. 320th Street (minor arterial north of 320th)
- S 272nd Street
- S. 320th Street
- SW 340th Street/Campus Drive SW
- SW 348th Street
- Enchanted Parkway (SR 161)

Traffic Signal Locations

Figure 20 shows the locations of signalized intersections within the Federal Way planning area. Currently signals are maintained and operated under various jurisdictions. The ability to coordinate signals along congested minor and principal arterials is important to achieve the maximum capacity of a given facility. South 320th Street currently has 13 signalized intersections that are not evenly spaced, and in some cases, spaced too close to each other. As a result, an operational analysis of coordinating the signal system was undertaken and improvements will be implemented in early 1995.

Existing Traffic Volumes

Existing (1992) average weekday traffic volumes on selected arterials are shown in Figure 21. The roadway with the highest daily traffic volume is I-5. This facility carried nearly 158,000 vehicles on an average weekday in 1992 (WSDOT, 1992). Historical growth on I-5 has fluctuated in recent years in the

Federal Way vicinity. Between 1990 and 1992, the average daily traffic decreased at an average annual rate of 4 percent per year. However, since 1985 average daily traffic has increased at an average annual rate of 5.3 percent per year.

By comparison, Federal Way's busiest arterial, S. 320th Street between I-5 and Pacific Highway South (SR 99), carries approximately 55,000 vehicles per day. On S. 320th Street, historical count information indicates an average annual growth rate of 5.8 percent per year since 1985. Other arterial roadways with significant daily traffic are portions of Pacific Highway South (SR 99) and S 348th Street carrying 40,600 and 53,500 vehicle per day, respectively.

Existing Problem Areas

Traffic "problem" areas were identified as locations that currently experience severe peak-hour congestion and/or have a high accident rate. Accident analysis compares the number of accidents at selected intersections to traffic volumes entering the intersection in the determination of an accident rate.

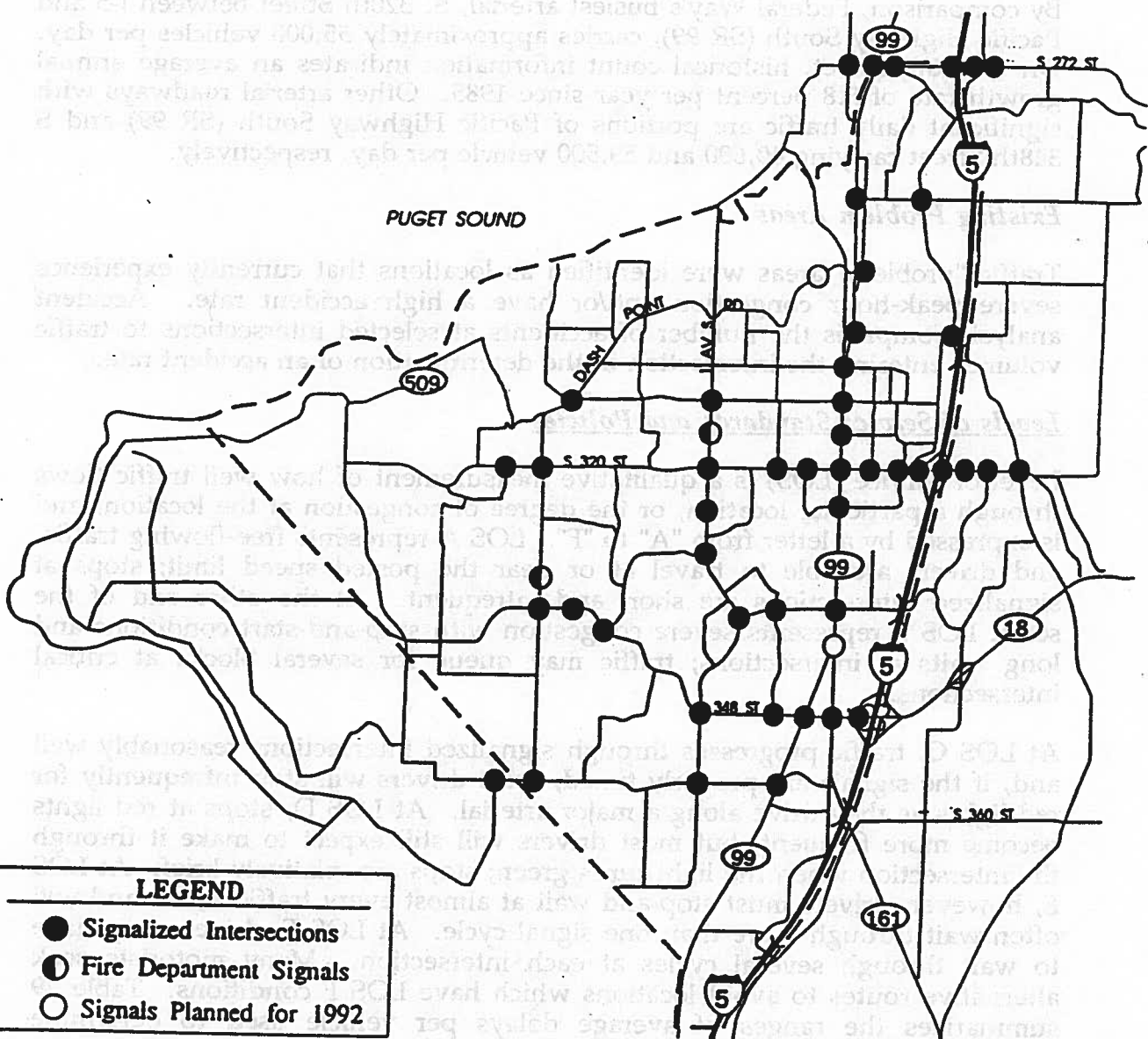
Levels of Service Standards and Policies

Level of service (LOS) is a qualitative measurement of how well traffic flows through a particular location, or the degree of congestion at the location, and is expressed by a letter from "A" to "F". LOS A represents free-flowing traffic, and drivers are able to travel at or near the posted speed limit; stops at signalized intersections are short and infrequent. At the other end of the scale, LOS F represents severe congestion with stop-and-start conditions and long waits at intersections; traffic may queue for several blocks at critical intersections.

At LOS C, traffic progresses through signalized intersections reasonably well and, if the signals are properly timed, most drivers will stop infrequently for red lights as they drive along a major arterial. At LOS D, stops at red lights become more frequent, but most drivers will still expect to make it through the intersection when the light turns green; stops are relatively brief. At LOS E, however, drivers must stop and wait at almost every traffic signal and will often wait through more than one signal cycle. At LOS F, drivers may have to wait through several cycles at each intersection. Many motorists seek alternative routes to avoid locations which have LOS F conditions. Table 29 summarizes the ranges of average delays per vehicle used to determine signalized intersection level of service.



1985 average daily traffic has increased at an average annual rate of 1.5 percent per year. Between 1970 and 1985, the average daily traffic decreased at an average annual rate of 1 percent per year. However, since 1985, the average daily traffic has increased at an average annual rate of 1.5 percent per year.



LEGEND

- Signalized Intersections
- Fire Department Signals
- Signals Planned for 1992

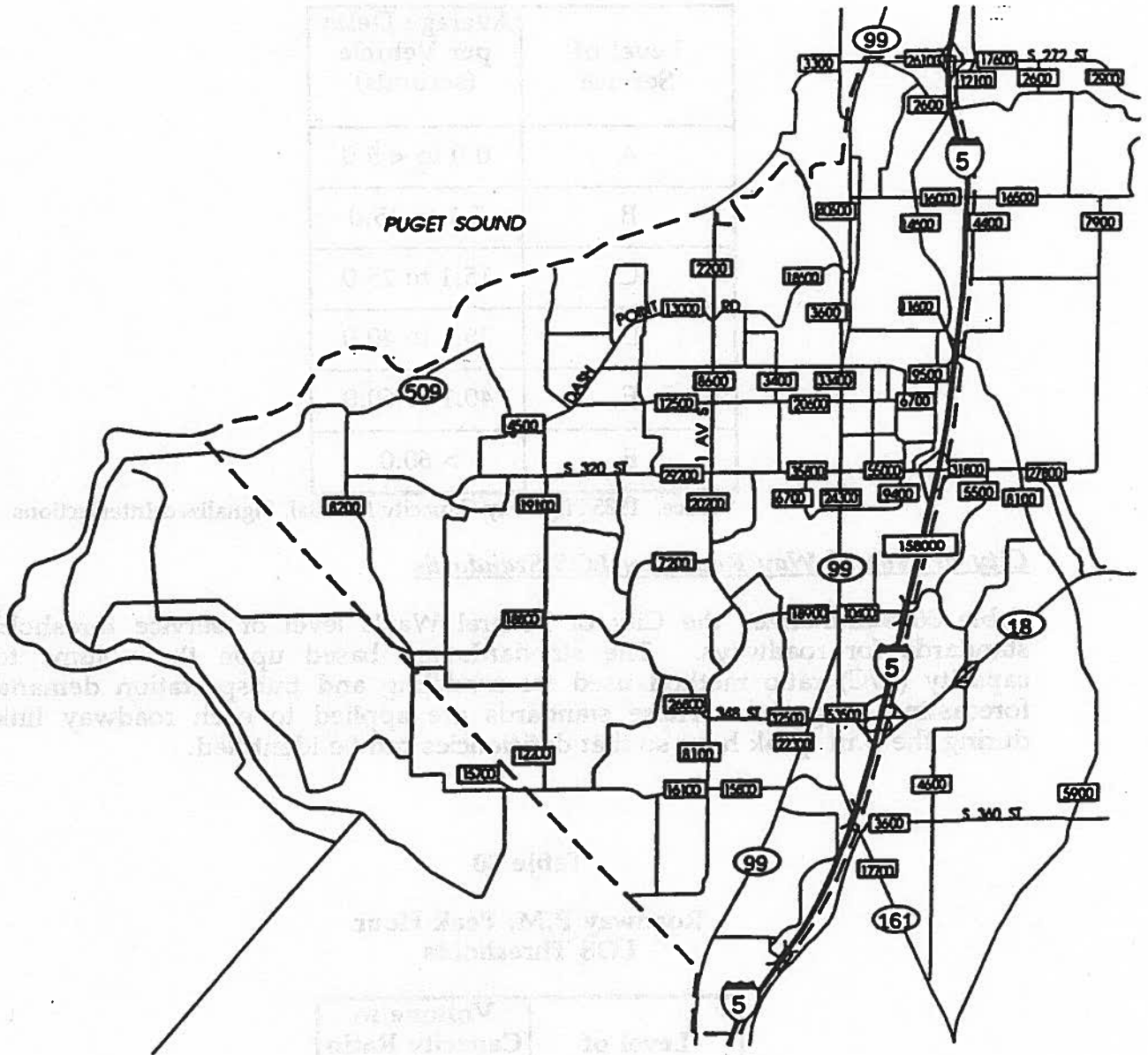
Source: City of Federal Way, Comprehensive Plan



Figure 20

Signalized Intersections

Federal Way
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Source: City of Federal Way, Comprehensive Plan

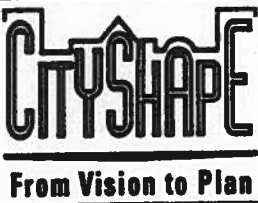


Figure 21
1992 Average Weekday Traffic Volumes

Federal Way
Comprehensive
Plan EIS

Table 29

Signalized Intersection LOS

| Level of Service | Average Delay per Vehicle (seconds) |
|------------------|-------------------------------------|
| A | 0.0 to < 5.0 |
| B | 5.1 to 15.0 |
| C | 15.1 to 25.0 |
| D | 25.1 to 40.0 |
| E | 40.1 to 60.0 |
| F | > 60.0 |

Source: 1985 Highway Capacity Manual, Signalized Intersections

City of Federal Way Roadway LOS Standards

Table 30 summarizes the City of Federal Way's level of service threshold standards for roadways. The standards are based upon the volume to capacity (V/C) ratio method used for modeling and transportation demand forecasting purposes. These standards are applied to each roadway link during the p.m. peak hour so that deficiencies can be identified.

Table 30

Roadway P.M. Peak Hour
LOS Thresholds

| Level of Service | Volume to Capacity Ratio (V/C) |
|------------------|--------------------------------|
| A through D | 0.0 to < 0.75 |
| E | 0.75 to < 0.90 |
| F | > .90 |

Source: City of Federal Way

Existing LOS Deficiencies

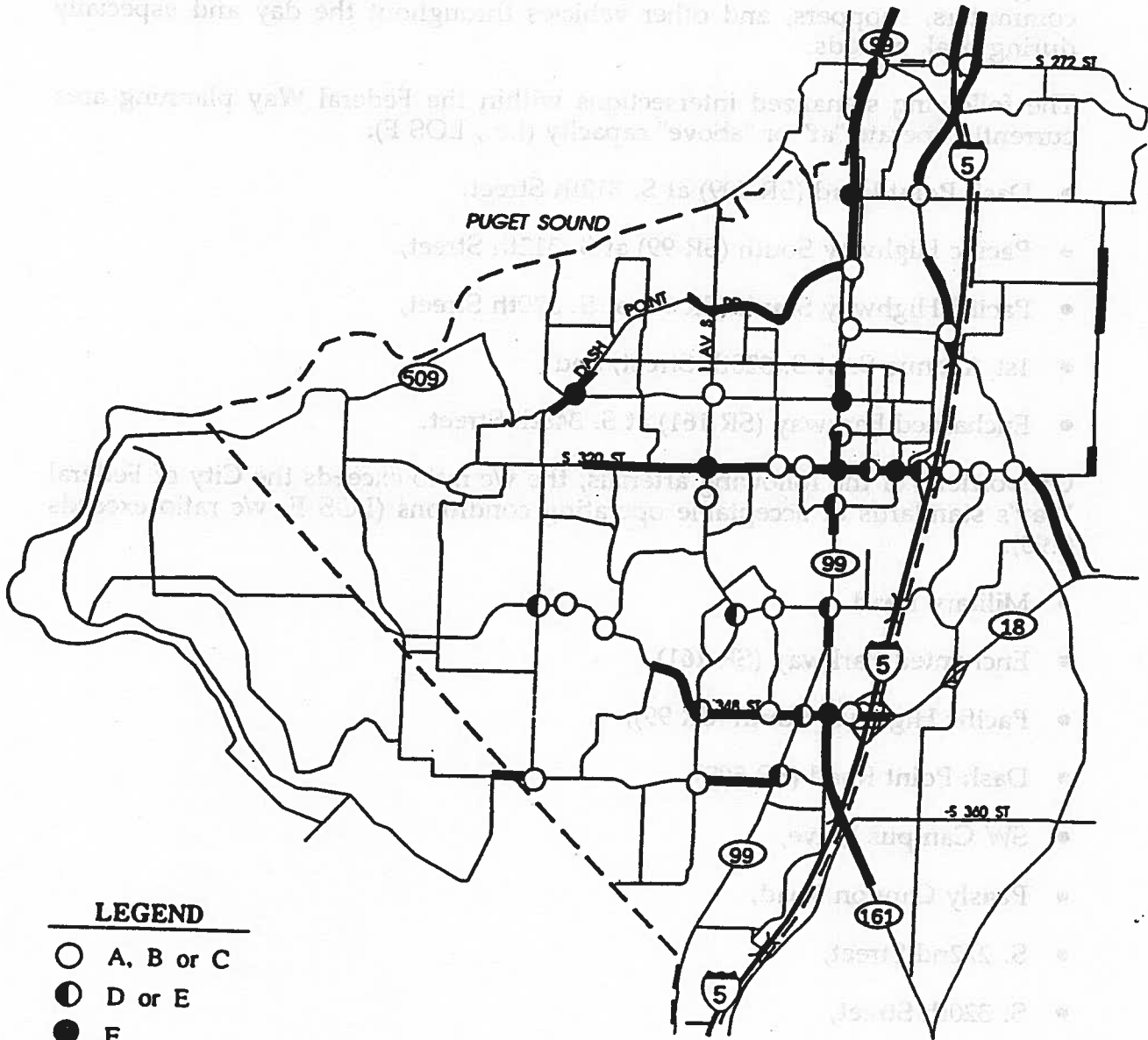
Figure 21a indicates the p.m. peak hour level of service deficiencies on Federal Way's arterials and at major intersections. This figure indicates that levels of service at major intersections along S. 320th Street, Pacific Highway South (SR 99), SR 161 and S. 348th Street operate at LOS F, and result in the most congested corridors in Federal Way. These are the primary routes that carry commuters, shoppers, and other vehicles throughout the day and especially during peak periods.

The following signalized intersections within the Federal Way planning area currently operate "at" or "above" capacity (i.e., LOS F):

- Dash Point Road (SR 509) at S. 312th Street,
- Pacific Highway South (SR 99) at S. 312th Street,
- Pacific Highway South (SR 99) at S. 320th Street,
- 1st Avenue S. at S. 320th Street, and
- Enchanted Parkway (SR 161) at S. 348th Street.

On portions of the following arterials, the v/c ratio exceeds the City of Federal Way's standards of acceptable operating conditions (LOS F, v/c ratio exceeds 0.90):

- Military Road,
- Enchanted Parkway (SR 161),
- Pacific Highway South (SR 99),
- Dash Point Road (SR 509),
- SW Campus Drive,
- Peasley Canyon Road,
- S. 272nd Street,
- S. 320th Street,
- SW 336th Street,
- S. 348th Street,
- S. 356th Street, and
- 51st Avenue S.



LEGEND

- A, B or C
- ◐ D or E
- F
- Arterial Segment
v/c ratio > 0.90

Source: City of Federal Way, Comprehensive Plan



From Vision to Plan

Figure 21a

Existing LOS Deficiencies

Federal Way
Comprehensive
Plan EIS

High Accident Locations (HAL's)

Figure 21b indicates the intersections in the Federal Way planning area that exhibit a higher than average accident severity index (i.e., greater than .46). This severity index is an indicator of the approximate proportion of accidents which resulted in an injury or death. Twenty-two intersections were identified with a high severity index. Of these intersections, five also exhibit high accident rates (i.e., accidents per million entering vehicles was equal to or greater than 2.0).

Transit/HOV Services and Facilities

Transit service in Federal Way is provided primarily by Metro. Recent cooperative agreements between Metro and Pierce Transit provide linked connections to and from Tacoma at park-and-ride lots. Three types of transit service are currently provided:

- Regular local fixed route,
- Express/limited stop service to/from park-and-ride lots, and
- Dial-a-ride (DART) service.

There are currently 24 fixed routes in the Federal Way planning area that provide nearly 250 transit vehicle trips on an average weekday. In total, approximately 3,000 to 3,500 person trips are made via local fixed route, express and the DART transit services each day.

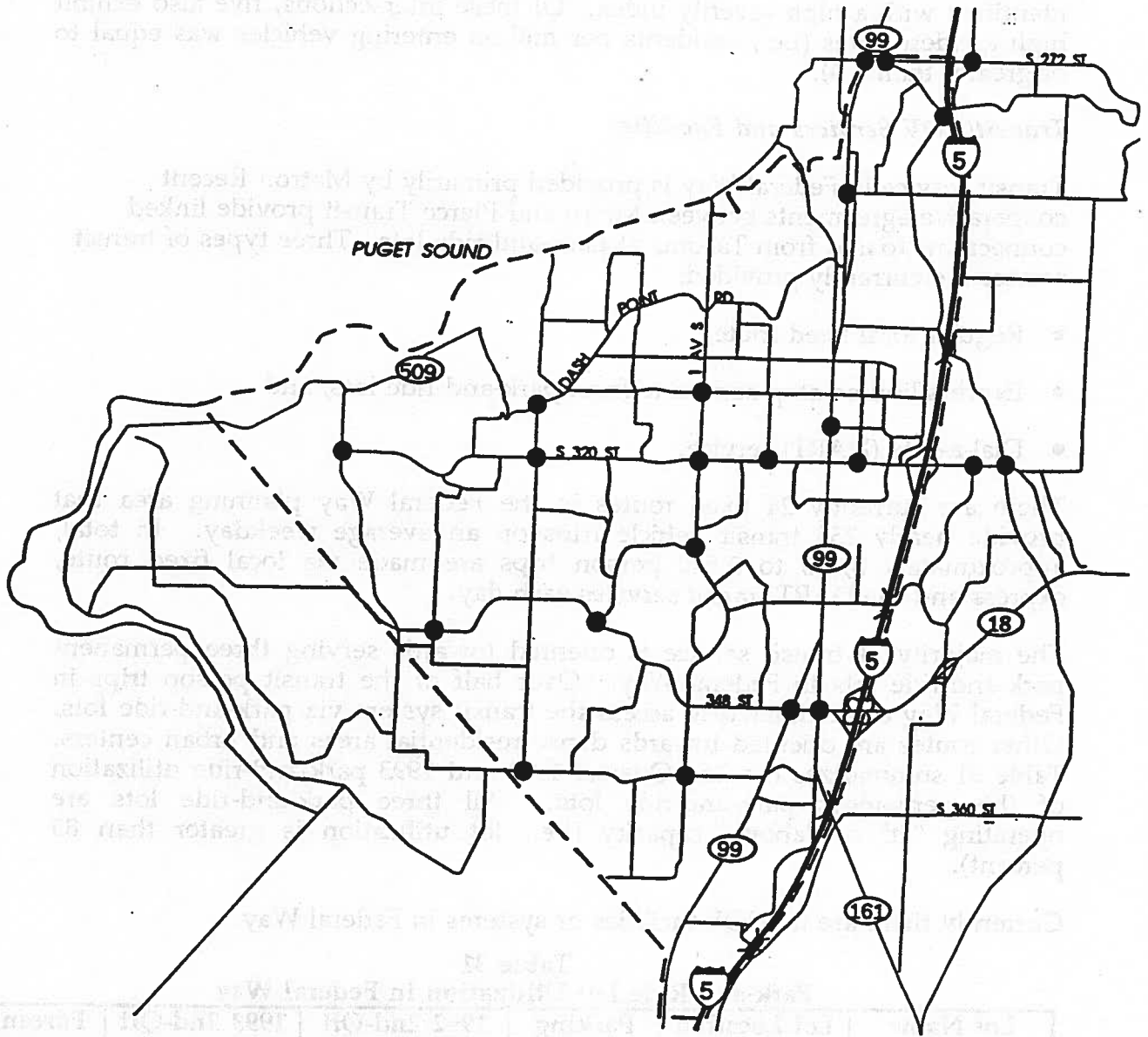
The majority of transit service is oriented towards serving three permanent park-and-ride lots in Federal Way. Over half of the transit person trips in Federal Way are estimated to access the transit system via park-and-ride lots. Other routes are oriented towards dense residential areas and urban centers. Table 31 summarizes the 2nd Quarter 1992 and 1993 park-and-ride utilization of the permanent park-and-ride lots. All three park-and-ride lots are operating "at" or "above" capacity (i.e., lot utilization is greater than 85 percent).

Currently there are no HOV facilities or systems in Federal Way.

**Table 31
Park-and-Ride Lot Utilization in Federal Way**

| Lot Name | Lot Location | Parking Stalls | 1992 2nd-Qrt Utilization | 1993 2nd-Qrt Utilization | Percent Change |
|-------------------|------------------|----------------|--------------------------|--------------------------|----------------|
| Federal Way | 32320 23rd Ave S | 894 | 104% | 104% | 0% |
| South Federal Way | 901 S 348th St | 520 | 83% | 86% | 3% |
| Star Lake | 27015 26th Ave S | 569 | 97% | 93% | -4% |

Source: 2nd Quarter 1993/1992 Park-and-Ride Lot Utilization Report, Metro



Source: City of Federal Way, Comprehensive Plan



From Vision to Plan

Figure 21b

High Accident Locations

Federal Way
Comprehensive
Plan EIS

Nonmotorized Transportation

Pedestrians

An estimated 75 percent of the City's residential streets have sidewalks; less in the unincorporated region of the Federal Way planning areas east of I-5. Pedestrian facilities do not exist on the following arterials:

- Pacific Highway South (SR 99),
- Dash Point Road (SR 509),
- Military Road, and
- 21st Avenue SW.

Bicycles

No solely designated system for bicycles exists on the present street network so most bicycle travel occurs within the pedestrian or vehicular transportation systems. The lone exception is SW 356th Street, which has a bike lane between 1st Avenue S. and 14th Avenue S.

Water/Rail/Air Transportation

Due to its location, Federal way does not possess the infrastructure or demand for water and rail transportation system. However, Federal Way is currently evaluating the use of helicopters in the City as well as the benefits and effects of a public use heliport. The *Federal Way Heliport Master Plan* is currently being developed to address these issues as well as provide assistance in improving the city's priority medical transfer and emergency response system. This effort will be coordinated with the surface transportation plan in the "City Shape" efforts, the *Puget Sound Heliport System Plan*, and the *State Tiltrotor Study* currently being initiated by the State of Washington.

Current uses of helicopters within the City of Federal Way planning area include; corporate uses and commercial charters, medical transfers, emergency responses, law enforcement and military purposes.

Needed Transportation Improvements

City of Federal Way 1993-2002 Transportation Improvement Program (TIP)

Appendix E provides the adopted 1993-2002 TIP for the City of Federal Way. Activities in the TIP include special studies, annual maintenance and minor capital improvement projects, major capital street improvements, and non-motorized capital improvements. In 1993, the total estimated cost of these programs is approximately \$3.5 million. Over the ten year period, a total estimated cost of \$62.7 million in transportation improvements have been identified. Over the 1994-2013 period, improvements would total \$158 million; approximately \$8 million is currently funded.

SIGNIFICANT IMPACTS

Travel Demand Forecasting

Methodology

Federal Way has developed an "EMME/2" travel demand forecasting model, which simulates existing and future travel patterns based on current and future growth trends. The model was used to estimate future traffic volumes for major arterials within the Federal Way planning area, and has been applied to the land use concepts.

The Federal Way planning area was divided into a number of small areas called "traffic analysis zones" (TAZ's) and estimates of households and employees were made for each zone under each concept; TAZ's were also aggregated into planning area zones (or PAZ's). These land activity estimates were then translated into traffic demand on major arterials through the computer modeling process. The key steps in the process are described in more detail below.

For purposes of comparison, the following discussion includes two additional transportation scenarios besides the three land use concepts. Data for 1990 is included to provide a comparison to existing conditions. Concept 1 was also evaluated with those improvements that are included in the adopted TIP. In general, the existing 1993-2002 TIP does not include any significant road improvements. This scenario, therefore, provides a comparison between currently planned/funded improvements and the mitigation measures required to provide acceptable levels of service under the land use concepts.

Trip Generation

In analyzing travel demand, trips are classified as either "productions" or "attractions." For most trips, the trip-maker's home is either the origin or destination: trips are "produced" at the home-end of the trip, and are "attracted" to the non-home end. The two classifications correspond to trips produced by residential uses (productions) and those attracted by retail and/or commercial development (attractions). Each parcel of land generates traffic based on its type of use. Trip productions and attractions are estimated based on the type and intensity of land use activity at each end of the trip. For example, residential areas generate vehicle trips based on the number of dwelling units ("homes") on a given parcel of land.

The number of dwelling units in each traffic zone was estimated for each land use concept. The dwelling unit estimates were then converted to daily trip productions using a range of trip generation factors based on type of household, family income and other factors. Similarly, traffic to and from commercial areas was based on the number and type of employees estimated for each TAZ.

Existing and future dwelling units and employee estimates used to model traffic conditions in Federal Way are identified in the Project Description and Population, Housing, and Employment sections of the Draft EIS.

Table 32 summarizes the estimated existing and future trip productions and attractions resulting from each land use alternative. Table 33 provides a graphic comparison of trip generation between the existing conditions in 1990, and the 2010 land use concepts. In general, between 1990 and the 2010, an increase in total person trips of 40 percent will result from the anticipated growth. In comparing the 2010 land use concept, there are no significant increases in total trips between concepts 1 and 2. The total number of trips generated will increase by 51 percent between concepts 3 and 1990 existing conditions.

Table 32

**Trip Generation Summary in Federal Way
P.M. Peak Hour**

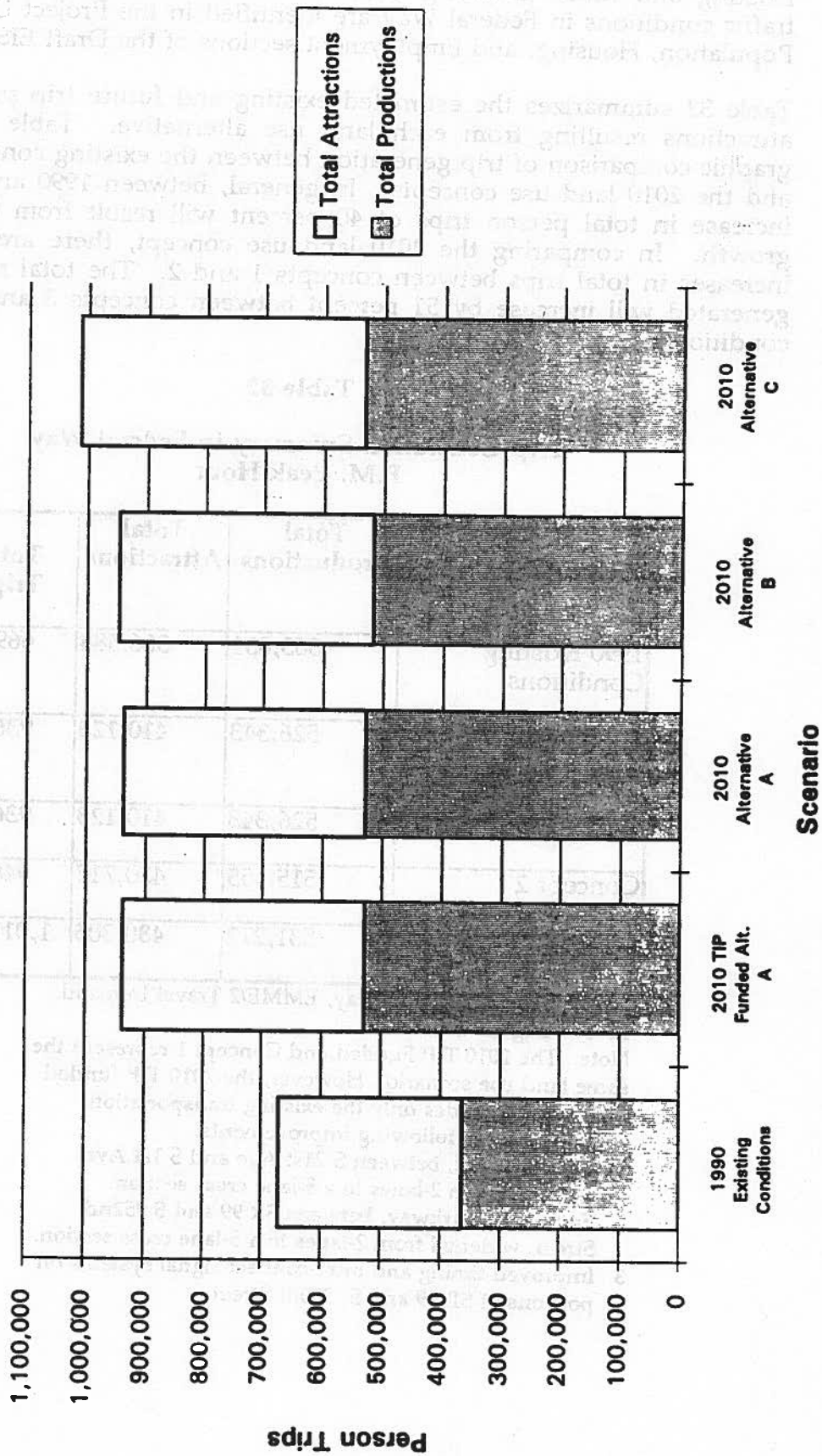
| Alternative | Total Productions | Total Attractions | Total Trips |
|------------------------------|--------------------------|--------------------------|--------------------|
| 1990 Existing Conditions | 363,031 | 306,584 | 669,615 |
| Current TIP Funded/Concept 1 | 526,343 | 410,123 | 936,467 |
| Concept 1 | 526,343 | 410,123 | 936,467 |
| Concept 2 | 515,655 | 430,715 | 946,369 |
| Concept 3 | 531,272 | 480,305 | 1,011,577 |

Source: City of Federal Way, EMME/2 Travel Demand Forecasting Model, 1993

Note: The 2010 TIP Funded and Concept 1 represent the same land use scenario. However, the 2010 TIP funded alternative includes only the existing transportation system plus the following improvements:

1. S 356th Street, between S 21st Ave and S 1st Ave, widened from 2-lanes to a 5-lane cross section.
2. Enchanted Parkway, between SR 99 and S 352nd Street, widened from 2-lanes to a 5-lane cross section.
3. Improved timing and inter-connect signal systems on portions of SR 99 and S. 320th Street.

Table 33 - Trip Generation Comparison



Source: City of Federal Way

Impacts on Travel Patterns

Table 34 summarizes travel characteristics within Federal Way under each land use concept using total vehicle miles traveled (VMT), an indicator of travel demand which accounts for both the distance and volume on a particular roadway, and vehicle hours traveled (VHT), a gross indicator of system travel time.

Table 34

Comparison of Federal Way Travel Characteristics P.M. Peak Hour

| Alternative | Total VMT | Percent Increase from 1990 | Percent Increase from 2010 TIP | Total VHT | Percent Increase from 1990 | Percent Increase from 2010 TIP |
|--------------------------|-----------|----------------------------|--------------------------------|-----------|----------------------------|--------------------------------|
| 1990 Existing Conditions | 107,608 | n/a | n/a | 3,992 | n/a | n/a |
| TIP Funded/Concept 1 | 142,373 | 32% | n/a | 6,246 | 56% | n/a |
| Concept 1 | 151,362 | 41% | 6% | 5,833 | 46% | -7% |
| Concept 2 | 150,997 | 40% | 6% | 5,847 | 46% | -6% |
| Concept 3 | 154,810 | 44% | 9% | 6,139 | 54% | -2% |

Source: City of Federal Way, EMME/2 Travel Demand Forecasting Model, 1993

Comparing the 2010 alternatives, total VMT under Concepts 1 and 2 will increase by approximately 6 percent. However, total VHT will decrease by approximately 7 percent. With Concept 3, total VMT will increase by 9 percent. VHT is reduced under the three land use concepts relative to the TIP Funded/Concept 1 (see note to Table 35) as a result of the "capacity-related" transportation improvements assumed under the land use concepts to reduce congestion, increase overall travel speeds, and reduce travel times.

Appendix E (Tables 1B through 3B) provides a detailed summary and comparison of specific travel characteristics by arterial functional classification and operating levels of service. A brief summary of these results is provided in Table 35.

With the TIP Funded Concept 1, the number of lane-miles of congested arterial roadways in Federal Way will increase from 31.9 to 52.3, an increase of 64 percent from 1990. The land use concepts would result in reductions of 34 percent, 33 percent, and 19 percent (for Concepts 1, 2 and 3 respectively). In addition, with any of the concepts, average speeds will increase (on average over 20 percent) on congested arterials compared to the TIP Funded Concept 1. Thus, savings in travel time and delay, and a reduction in vehicle emissions in the Federal Way planning area, is projected for any of the land use concepts that include the transportation mitigation improvements identified in the Draft EIS.

Table 35
Congested Arterials in Federal Way
P.M. Peak Hour

| Alternative | Lanes Miles | VMT | VHT | Average Speed |
|----------------------------------|-------------|--------|-------|---------------|
| 1990 Existing Conditions | 31.9 | 25,992 | 1,273 | 21.5 |
| Current TIP Funded/ Concept A | 52.3 | 47,492 | 2,770 | 16.0 |
| Concept A | 34.4 | 29,617 | 1,585 | 19.8 |
| Concept B | 35.3 | 30,378 | 1,636 | 19.8 |
| Concept C | 42.3 | 36,408 | 2,002 | 19.0 |

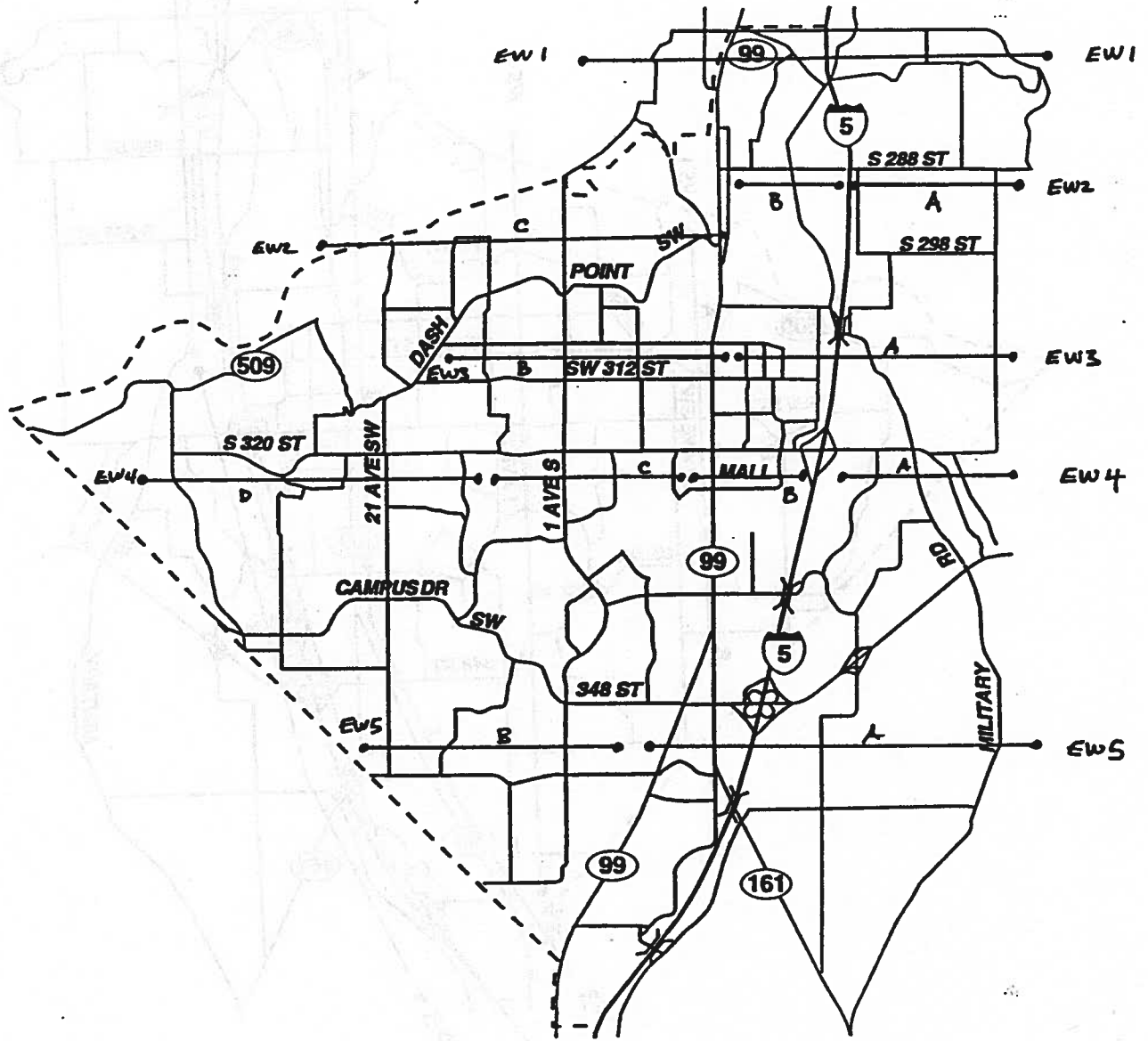
Source: City of Federal Way, EMME/2 Travel Demand Forecasting Model, 1993

Note: Congestion is defined by the arterial v/c ratio exceeding 0.90.

Impacts on Regional Transportation Connections

A screenline is an imaginary line cutting across streets and highways serving a particular direction or corridor of travel into and out of an area. A comparison of total traffic assigned to these roads under various conditions provides a good indication of the relative impact of alternative growth assumptions on key travel corridors.

Figures 10 and 11 indicate the locations of the screenlines. Table 36 summarizes the levels of service and compares the total p.m. peak hour travel across each screenline. Appendix E contains detailed p.m. peak hour volumes, v/c ratios, and levels of service of each screenline and the screenline subsections. The regional transportation facilities in the Federal Way planning area are indicated by two screenlines: EW1 - crossing SR 99 and I-5 south of S

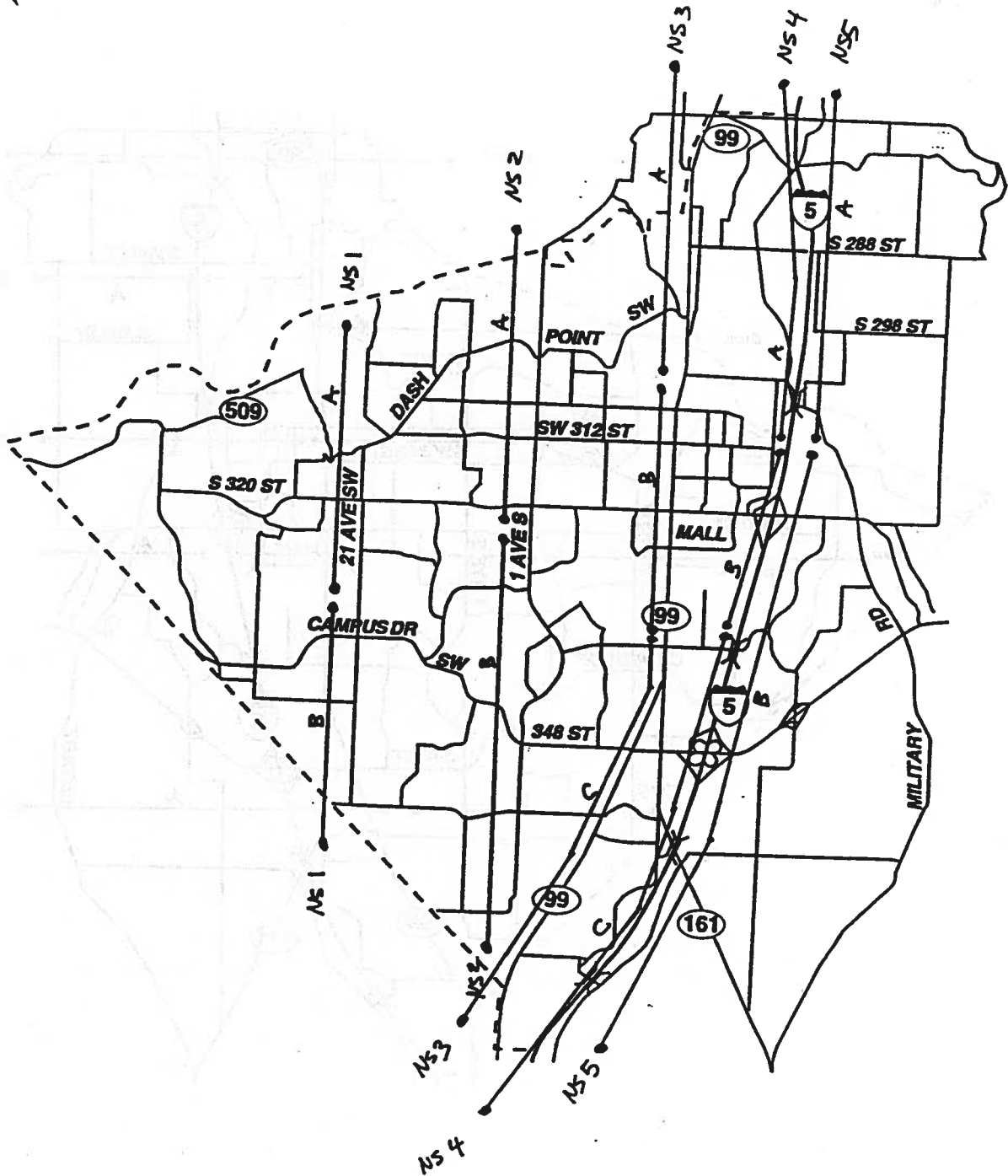


Source: City of Federal Way



Figure 22
East-West Screenlines

Federal Way
Comprehensive
Plan EIS



Source: City of Federal Way

CITYSHAPE

From Vision to Plan

Figure 23

North-South Screenlines

Federal Way
Comprehensive
Plan EIS

272nd Street; and EW5 A - crossing SR 99, SR 161, and I-5 south of S 348th Street.

At EW1, the v/c ratio increases from 0.67 (LOS A-D) in 1990 to 0.80 (LOS E) in 2010, considering the Concept 1 land use plus the TIP funded transportation improvements. Total p.m. peak hour travel across this screenline increases by 20 percent. Assuming implementation of any of the proposed land use concepts with the recommended DEIS transportation improvements, the v/c ratio would decrease to approximately 0.72 in 2010 (LOS A-D). This would have a significant positive effect on traffic volumes and peak period level of service in the regional travel corridor.

A similar improvement is indicated at screenline EW5 A. Between 1990 and 2010 (TIP funded), the v/c ratio increases from 0.81 (LOS E) to 0.95 (LOS F). With all land use concepts, the v/c ratio decreases to approximately 0.87 in 2010, improving the level of service to LOS E.

Impacts on Major Transportation Facilities

Table 36 provides a summary of the screenline comparisons in the Federal Way planning area. Detailed screenline data is included in Appendix D. In general, with any land use concept, 2010 travel demand across screenlines would be reduced. Level of service improvements would occur along facilities crossing screenlines: EW1, EW2, NS2, and NS3.

In 2010, changes in traffic volumes crossing selected screenline locations in Federal Way would occur as a result of the recommended transportation improvements for any one of the land use concepts.

Since the assumed transportation improvements for land use Concepts 1, 2, and 3, are the same, changes in traffic impacts are similar. Significant increases in p.m. peak hour traffic would occur on the following screenlines (and major arterials crossing affected screenlines):

- Screenline EW2 A which includes 51st Avenue S. south of S. 272nd Street (a 7 percent increase in p.m. peak hour volumes; however, no impact in screenline LOS),
- Screenline NS3 B which includes S. 320th Street west of SR 99 (a 9 percent increase in p.m. peak hour volumes; resulting in a decrease in LOS from LOS A-D to LOS E), and
- Screenline NS5 A which includes S. 277th Street/S. 288th Street/S. 356th Street east of I-5 (a 23 percent increase in p.m. peak hour volumes; however, no impact in screenline LOS).

Significant decreases in p.m. peak hour traffic would occur on the following screenlines with any land use concept (assuming recommended mitigation):

Table 36
Screenline LOS and P.M. Peak Hour Traffic Volume Comparisons

| Screenlines | 1990 Existing Conditions | | | 2010 TIP Funded | | | 2010 Alternative A | | | 2010 Alternative B | | | 2010 Alternative C | | |
|-------------|--------------------------|-----|--|-----------------|-----|--|--------------------|-----|--------------------------------------|--------------------|-----|--------------------------------------|--------------------|-----|--------------------------------------|
| | V/C | LOS | | V/C | LOS | | V/C | LOS | Change from 2010 TIP Funded % Volume | V/C | LOS | Change from 2010 TIP Funded % Volume | V/C | LOS | Change from 2010 TIP Funded % Volume |
| EW1 | 0.67 | A-D | | 0.80 | E | | 0.72 | A-D | -2% | 0.71 | A-D | -2% | 0.71 | A-D | -2% |
| EW2 | 0.62 | A-D | | 0.76 | E | | 0.67 | A-D | -5% | 0.67 | A-D | -5% | 0.67 | A-D | -5% |
| EW3 | 0.75 | A-D | | 0.87 | E | | 0.82 | E | -2% | 0.82 | E | -2% | 0.83 | E | -1% |
| EW4 | 0.60 | A-D | | 0.75 | A-D | | 0.67 | A-D | -8% | 0.67 | A-D | -9% | 0.69 | A-D | -7% |
| EW5 | 0.70 | A-D | | 0.84 | E | | 0.78 | E | -2% | 0.79 | E | -1% | 0.80 | E | 0% |
| NS1 | 0.55 | A-D | | 0.60 | A-D | | 0.52 | A-D | 1% | 0.51 | A-D | -3% | 0.51 | A-D | -1% |
| NS2 | 0.70 | A-D | | 0.76 | E | | 0.62 | A-D | -19% | 0.60 | A-D | -21% | 0.61 | A-D | -19% |
| NS3 | 0.64 | A-D | | 0.97 | F | | 0.71 | A-D | -1% | 0.69 | A-D | -4% | 0.71 | A-D | -1% |
| NS4 | 0.92 | F | | 1.00 | F | | 1.00 | F | -58% | 1.02 | F | -57% | 1.05 | F | -56% |
| NS5 | 0.61 | A-D | | 0.67 | A-D | | 0.76 | E | 7% | 0.78 | E | 7% | 0.78 | E | 10% |

Source: City of Federal Way

- Screenline EW2 B which includes Military Road south of S. 288th Street (a 9 percent decrease in p.m. peak hour volumes; improvement in level of service from LOS F to LOS E),
- Screenline EW3 B which includes SR 99 and 1st Ave S. north of S. 312th Street (a 13 percent decrease in p.m. peak hour volumes; no impact in level of service),
- Screenline EW4 A which includes Military Road south of S. 320th Street (a 12 percent decrease in p.m. peak hour volumes; improvement in level of service from LOS E to LOS A-D),
- Screenline EW4 D which includes 47th Avenue SW and 21st Avenue SW south of S. 320th Street (a 26 percent decrease in p.m. peak hour volumes; no impact in level of service),
- Screenline NS2 A which includes S. 320th Street and Dash Point Road west of 1st Avenue S. (a 16 percent decrease in p.m. peak hour volumes; improvement in level of service from LOS E to LOS A-D),
- Screenline NS2 B which includes Campus Drive and S. 356th Street west of 1st Avenue S. (a 21 percent decrease in p.m. peak hour volumes; no impact in level of service),
- Screenline NS4 A which includes S. 272nd Street and S. 288th Street west of I-5 (a 11 percent decrease in p.m. peak hour volumes; no impact in level of service), and
- Screenline NS4 B which includes S. 320th Street west of I-5 (a 25 percent decrease in p.m. peak hour volumes; no impact in level of service).

Impacts on Transit/Ridesharing/TDM/Mode Share and HOV Facilities

Table 37 summarizes the 2010 mode split for various trip types in the Federal Way planning area. Although travel demand will increase, the proportion of travel by transit will not increase by the year 2010; it is expected to remain at 2 percent for home-based work trips. The mode share for travel by transit in Federal Way is significantly less than areas outside Federal Way for all types of trips.

The carpool mode share, however, is assumed to increase by 3 percent between 1990 and 2010 with any of the proposed land use alternatives as a result of recommended carpool/HOV facility improvements in Federal Way. Carpool mode share estimates are comparable to areas outside Federal Way.

It should be noted that the traffic estimates do not incorporate a high capacity rail transit system serving Federal Way. Mode split data for rail transit have not been modeled yet. Effects on Concepts 2 and 3, both of which would

accommodate rail transit (and three transit stations), could be significant. This analysis will be performed for the preferred land use alternative in the Final EIS.

Table 37

2010 Mode Split Summary

| Trip Type | Federal Way | | | Outside Federal Way | | |
|---------------------|-------------|-----------------------------------|---------|---------------------|-----------------------------------|---------|
| | Auto | Carpool (2 or more persons) | Transit | Auto | Carpool (2 or more persons) | Transit |
| Home Based Work | 78% | 20% | 2% | 68% | 22% | 10% |
| Home Based Other | 52% | 48% | 0% | 45% | 51% | 4% |
| Non Home Based | 73% | 27% | 0% | 71% | 28% | 1% |

Source: City of Federal Way, EMME/2 Travel Demand Forecasting Model

Impacts on Nonmotorized Transportation

With any of the land use concepts, additional pedestrian and bicycle facilities would be constructed to encourage the use of non-motorized modes of transportation. Denser mixed use areas would be built in conjunction with pedestrian "friendly" boulevards and corridors in each land use concept. The City should pursue efforts in the context of economic realities, to continue to plan, build, and reconstruct non-motorized facilities throughout the City. Limiting such facilities only to new mixed use areas would also limit the potential for increased use of non-motorized travel.

Impacts on Water/Rail/Air Transportation

No significant impacts would result to water, rail, or air transportation systems in the Federal Way planning area.

Summary of Transportation Impacts

The impacts of Concepts 1, 2, and 3 will generally be similar. By 2010, Concept 1 would generate nearly 936,500 p.m. peak hour trips compared to 946,400 and 1,011,600 trips for Concepts 2 and 3, respectively. Under Concept 2, a greater development emphasis of a "downtown" core results in increased employment in activity centers along the S. 320th corridor.

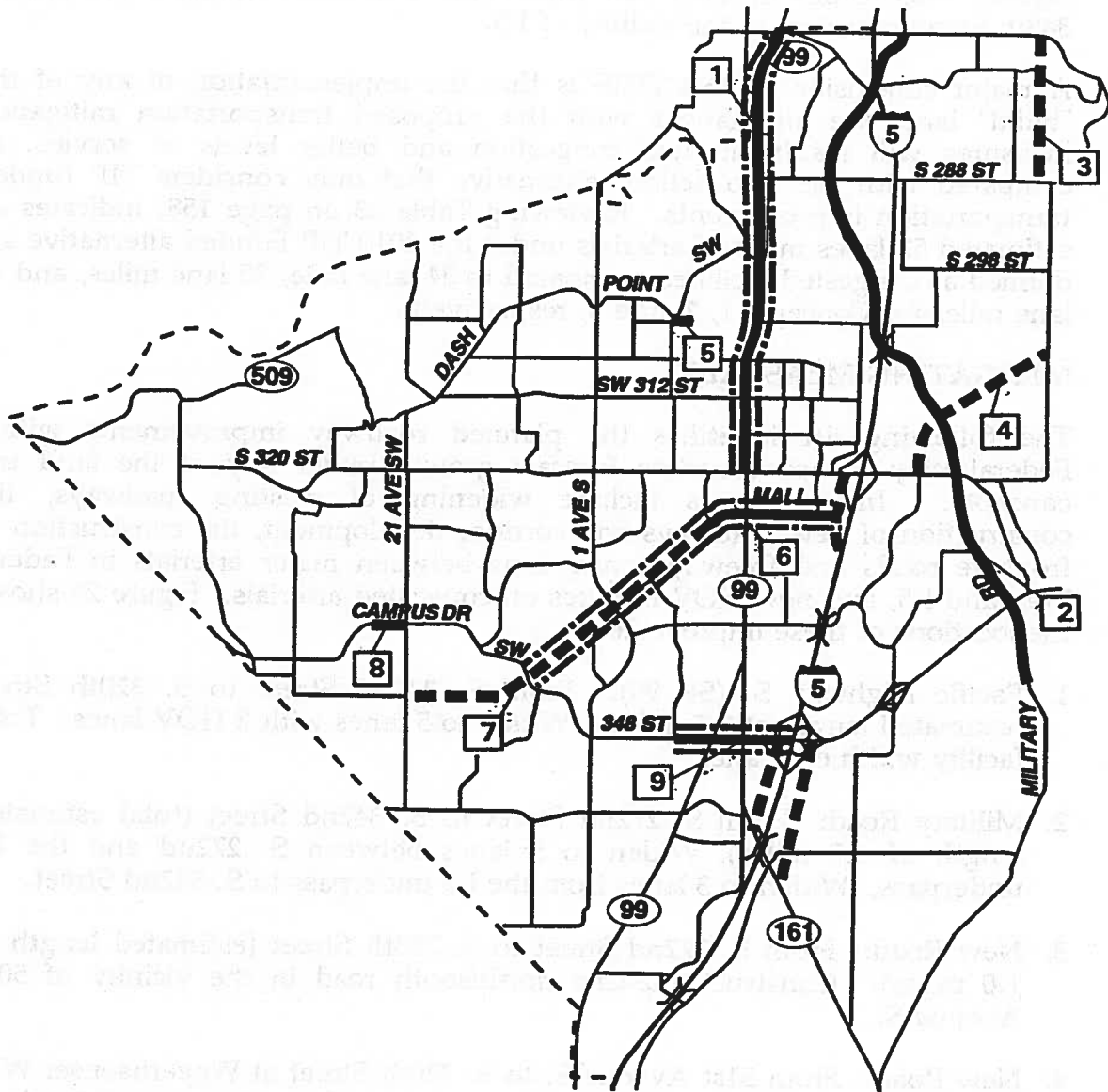
With Concept 3, a higher level of employment is assumed for the "downtown" core, business parks, and other areas between S. 336th Street and S. 356th Street. This results in most new trips focused in the S. 320th Street and S. 348th Street corridors in the vicinity of I-5.

A major conclusion of this DEIS is that the implementation of any of the "build" land use alternatives with the proposed transportation mitigation measures will result in less congestion and better levels of service, as compared with the "No-Action" alternative that only considers TIP funded transportation improvements. Reviewing Table 33 on page 158, indicates an estimated 52 lane miles of arterials under the 2010 TIP Funded alternative are defined as congested facilities, compared to 34 lane mile, 35 lane miles, and 42 lane miles for Concepts 1, 2, and 3, respectively.




MITIGATING MEASURES

The following list identifies the planned roadway improvements within Federal Way to accommodate forecast growth under any of the land use concepts. Improvements include widening of existing roadways, the construction of new roadways and corridor development, the construction of frontage roads and freeway connections between major arterials in Federal Way and I-5, and new HOV facilities on congested arterials. Figure 24 shows the locations of these improvements.

1. Pacific Highway S. (SR 99): From S. 272nd Street to S. 320th Street (estimated length of 2.7 miles). Widen to 5 lanes with 2 HOV lanes. Total facility width of 7 lanes.
2. Military Road: From S. 272nd Street to S. 342nd Street (total estimated length of 4.7 miles). Widen to 5 lanes between S. 272nd and the I-5 underpass. Widen to 3 lanes from the I-5 underpass to S. 342nd Street.
3. New Road: From S. 272nd Street to S. 288th Street (estimated length of 1.0 miles). Construct a 2-lane north/south road in the vicinity of 50th Avenue S.
4. New Road: From 51st Avenue S. to S. 320th Street at Weyerhaeuser Way S. (estimated length of 1.1 miles). Construct a 2-lane roadway in a northeasterly direction from S. 320th Street.
5. New Road: Extend S. 304th Street from 10th Avenue S. to 8th Avenue S. (estimated length of 0.1 miles). Extend roadway westerly in a 2-lane configuration.
6. S. 324th Street: From 25th Avenue S. to 11th Place S. (estimated length of 0.9 miles). Widen to 4 lanes with 2 HOV lanes. Total facility width of 6 lanes. Provide directional connections in to the eastern terminus of S. 324th Street; southbound from S. 320th Street in the vicinity of 25th Avenue S., and southbound to I-5 (direct ramp connection).



Legend

- New Roadway 
- Widening 
- New HOV Lanes 

Source: City of Federal Way

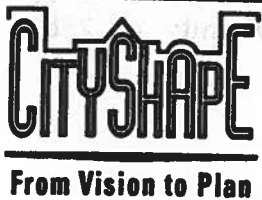


Figure 24

Recommended Transportation Improvements

Federal Way
Comprehensive
Plan EIS

7. **New Road:** Extend S. 324th Street from 11th Place S. to 21st Avenue S. (estimated length of 2.3 miles). Construct a 4-lane roadway with 2 HOV lanes from 11th Place S. to SW Campus Drive. The roadway would then continue on to 21st Avenue S. at SW 344th Street in a 4-lane configuration.
8. **336th Street SW:** From 21st Avenue S. to 26th Place SW (estimated length of 0.2 miles). Widen roadway to 5-lanes.
9. **348th Street SW:** From I-5 to Pacific Highway South (SR99) (estimated length of 0.4 miles). Widen to 5-lanes with 2 HOV lanes. Total 7-lane configuration. Provide directional frontage connections in the vicinity of I-5; southbound from 348th Street SW/I-5 to SR 161/I-5 west of I-5, and northbound from SR 161 to SR18/I-5 east of I-5.
10. Add collector distributor roads on both sides of I-5 between SR-18 and SR-161 to provide access at SR-161 to and from the north on I-5.
11. Add a collector distributor on the west side of I-5 between S. 320th and S. 326th.

Commute Trip Reduction Requirements

The City of Federal Way recently developed a Commute Trip Reduction (CTR) Plan that complies with RCW 70.94.521-551. Federal Way's CTR Ordinance requires that employers with more than 100 full time employees arriving at work between 6:00 a.m. and 9:00 a.m. at a single worksite in the City to implement programs to reduce the proportions or employees commuting in single occupant vehicles. The CTR Plan establishes the following goals for major employers:

- Reduce vehicle miles traveled per employee from the base year value established for the CTR Zone by at least 15 percent by 1/1/95, 25 percent by 1/1/97; and 35 percent by 1/1/99.
- Reduce the proportion of single-occupant vehicle trips from the base value established for the CTR Zone by at least 15 percent by 1/1/95, 25 percent by 1/1/97; and 35 percent by 1/1/99.

Implementation of CTR requirements and attainment of the SOV/VMT goals by affected employers will mitigate congestion; along with the proposed roadway improvements, this will further reduce congestion. The City of Federal Way will also be reviewing its parking requirements and associated policies in relation to CTR efforts.

UNAVOIDABLE ADVERSE IMPACTS

Population and employment growth in the Federal Way planning area under any alternative will result in increased vehicle and total person trips.

Fire District 39 has maintained a rating of 3 from the Washington Survey and Rating Bureau (a rating of 1 is the best rating a fire department can receive and 10 is the worst). The rating is designed to indicate fire preparedness and ability to respond and is based upon factors such as the number of fire hydrants, number of fire apparatus and staffing, water supply, training, and response time (City of Federal Way, 1992b).

Based upon potential growth and associated traffic congestion, Fire District 39 has identified two potential sites for additional stations. Land for these sites has been identified and one lot has been purchased (City of Federal Way, 1992b).

Significant Impacts

Regardless of land use concept, the goals for Fire District 39 will be to ① increase efforts in fire and injury prevention, ② maintain and improve the quality of services provided, and ③ handle the increased number of calls generated by additional city growth. A number of service characteristics will likely be affected by future city growth, including: traffic congestion reducing response times; additional water supply and transmission lines to increase fire flows; additional time needed to review plans, inspect buildings, and perform related activities; additional needs for timely data to forecast service demands, and growth increasing the number of emergency calls (Fire District 39, 1993).

There are many factors that may help mitigate increased demand for services associated with growth. Prevention efforts are proving to be effective. New construction, particularly commercial construction, will likely require less suppression activity per square foot of constructed space than the older facilities currently in Federal Way. District 39 also plans to increase their efforts in injury prevention.

These efforts will not fully mitigate the impact of growth, however. It will become necessary for the fire district to expand fire and emergency medical services in order to maintain existing service levels. It may also be necessary to build additional fire stations to service high growth areas. The need for additional stations will primarily dependent upon traffic congestion and its negative effect on response times. If traffic problems are mitigated, existing facilities are believed to accommodate the equipment and staffing to provide services into the foreseeable future. The expansion of public water supplies to ensure adequate fire flows will also be required (see Water subsection below). It is not believed that an additional aerial truck will be needed under any of the three land use concepts.

As a result of the potential expansion needs noted above, fire district costs could likely increase. Additional revenues provided by increased property valuations after construction may be adequate to fund ongoing operations without increasing the tax burden on existing property owners. Construction of new facilities if needed, would likely require additional funding through bonds, mitigation actions, or other mechanisms (Fire District 39, 1993).

Land Use/City Center Concept 1

Under Concept 1 the city would contain more residents and jobs, but the ratio of future residential to commercial development would stay roughly the same as today. Service call generation rates are currently 63 calls per 1,000 residents. With a population increase of 46,200 residents forecasted for the planning area over the 1993-2010 period, service calls could be expected to increase by approximately 2,910 calls per year by 2010.

In addition to residential service calls, future commercial development will also generate service calls. Estimated commercial service calls are shown in Table 38. Adding the expected 204 commercial service calls to the 2,910 residential calls results in 3,114 total service calls potentially generated under Concept 1. This increase in service calls will primarily create a need for additional firefighters and equipment. Fire District 39 indicates that an additional company would be required to assist with this volume of calls, creating the following needs:

- 13 firefighters;
- 1 fire engine; and
- 1 aid car (Fire District 39, 1993).

These requirements could be expanded if traffic congestion is not mitigated, thereby creating the need to place firefighters closer to the scene. If additional stations were required, the needs identified above could double (Fire District 39, 1993).

With regard to fire station locations, response time is the governing factor. With the additional two stations planned for the area, it is likely that Fire District 39 could maintain its desired level of service, since most of the development proposed under this concept would be near existing or planned fire stations.

The automobile-dependent nature of this land use concept would create a significant amount of additional traffic congestion on local streets. This could hamper achieving low response times and could lead to the need for additional stations near more urbanized portions of the city such as the city center. The additional development associated with this land use concept would also require the fire district to review plans, perform fire inspections, and attend to related duties. As noted above, the additional revenues provided by increased property valuations after construction may be adequate to fund ongoing operations without increasing the tax burden on existing property owners.

Adequate fire flow would also need to be provided to all areas of the city. The district currently has fire flow deficiencies at a number of locations, including most of the local schools. Adequate fire flows would need to be ensured for new construction.

Table 38.

Estimated Annual Commercial Fire District Calls by Land Use Concept

| Land Use Concept | Square Feet | Service Call Generation Rate* | Commercial Service Calls |
|------------------|-------------|-------------------------------|--------------------------|
| Concept 1 | | | |
| Office | 1,600,000 | 6.43/100,000 SF | 103 |
| Retail | 720,000 | 8.57/100,000 SF | 62 |
| Manufacturing | 600,000 | 6.43/100,000 SF | 39 |
| Total | | | 204 |
| Concept 2 | | | |
| Office | 2,600,000 | 6.43/100,000 SF | 167 |
| Retail | 720,000 | 8.57/100,000 SF | 62 |
| Manufacturing | 600,000 | 6.43/100,000 SF | 39 |
| Total | | | 268 |
| Concept 3 | | | |
| Office | 4,000,000 | 6.43/100,000 SF | 257 |
| Retail | 1,300,000 | 8.57/100,000 SF | 111 |
| Manufacturing | 1,100,000 | 6.43/100,000 SF | 71 |
| Total | | | 439 |

Source: Huckell/Weinman Associates, 1992.

*Assumes a service calls generation rates of 8.57 calls/year/100,000 square feet retail GLA (Huckell/Weinman Associates, 1992). It was assumed that other non-residential uses would incur 3/4 this number of calls per 100,000 square feet (i.e., $8.57 \times .75 = 6.43$ calls per 100,000 square feet) (King County, 1993).

Land Use/City Center Concept 2

Under Concept 2, the ratio of residential to commercial development would be more slanted towards commercial development. Thus, the service call increase would be slightly higher than estimated under Concept 1.

Based upon the same residential and commercial call generation rates used for Concept 1, Concept 2 is estimated to generate the same number of residential calls (2,910) and slightly more commercial calls per year (268) due to the additional 1 million square feet of office space (see Table 38). Based upon these service calls estimates, the need for staffing, equipment, and other fire district resources would probably be the same as described under Concept 1.

It is likely that Fire District 39 could provide service to the city while achieving the six-minute response time goal. It may be easier for the fire district to serve the city under this alternative than under Concept 1, since Concept 2

clusters relatively more development in smaller geographical areas. Similar to Concept 1, development of the area east of Interstate 5 or near the city center could require an additional station or station expansion.

This concept would be less automobile-dependent than Concept 1 and, therefore, potentially generate less traffic congestion. This characteristic could allow for slightly faster response times than under Concept 1, particularly around the city center. This may be offset somewhat by the additional commuters associated with the 1 million square feet of office space embodied in Concept 2. This additional office space would also require the fire district to spend more time reviewing plans and to perform more fire inspections than under Concept 1. As with Concept 1, the additional revenues provided by increased property valuations after construction may be adequate to fund ongoing operations without increasing the tax burden on existing property owners.

With the high-density office core envisioned for Concept 2, fire flow requirements may become a problem. Depending on building heights, the city may need to upgrade water transmission and/or storage infrastructure to ensure adequate pressure and water volume. Similar to Concept 1, new construction proposed under this land use concept would need to be assured adequate fire flow before development begins.

Land Use/City Center Concept 3

Concept 3 would include a substantial increase in office, retail, and industrial development. This significant increase in commercial space would generate more service calls and require more resources from Fire District 39 than the other two concepts. It is estimated that the residential portion of Concept 3 would generate 2,910 calls and the commercial development would generate approximately 439 additional calls per year, for a total annual increase 3,349 calls by 2010. Staffing, equipment, and other fire district needs would be slightly greater than those identified for either of the other two alternatives, however, no additional equipment or facility needs would be created beyond those associated with Concepts 1 and 2.

As with the other two land use concepts, Fire District 39 would likely maintain level-of-service goals under this alternative. It may necessary to have an additional station located near the city center, given the high density residential and commercial uses in and near the area. The concentration of development in a smaller geographical area under this concept would help keep response times within the target range.

This concept would be the least automobile-dependent alternative and, therefore, slow the increase of traffic congestion the most. However, the large amount of additional commercial space would create additional commuters and subsequent traffic. The net impact of these two offsetting effects on traffic congestion is unknown. The additional office, retail, and manufacturing space would also require the fire district to review more plans and perform more fire inspections than under the other two concepts.

As with Concept 2, new construction would need to be assured adequate fire flows. Concept 3 would potentially have the tallest buildings and would be most likely to necessitate upgrading water transmission and/or storage infrastructure to ensure adequate pressure and water volume.

Mitigation Measures

Federal Way should require that future development proposals assess and mitigate any impacts on fire services. For example, it will be necessary to provide adequate access for emergency vehicles for new development.

Tax revenues generated by future development and associated increased property valuations will be available to the fire district to finance additional staff and equipment requirements.

Unavoidable Adverse Impacts

Future population growth will increase the demand for fire suppression and emergency medical services from Fire District 39, with or without implementation of any of the land use concepts. Resources will have to be expended to meet these demands.

B. POLICE SERVICES

Affected Environment

Pursuant to contract, the King County Police Department is responsible for all police protection within Federal Way (Beden, 1993). All police departments also cooperate on a state level under the directive of the 1988 Police Powers Act, which allows police departments to respond to calls for assistance, regardless of jurisdictional boundaries.

The contractual agreement between Federal Way and the King County Police Department is reviewed each September and can be modified at that time to change the number of officers needed by the City. Modification of the number of officers utilized by Federal Way or contract cancellation are the only actions allowable during each review period. The City of Federal Way is currently undertaking a study of police services to determine whether it is more cost effective to establish its own municipal police department or continue contracting for officers with the King County Police Department (Beden, 1993).

The King County Police Department currently serves Federal Way via one precinct station located at 34008 9th Avenue S. This precinct station serves the city and the surrounding unincorporated area. Station personnel are shown in Table 39 (Beden, 1993).

In general, Federal Way utilizes between 75 and 85 percent of total precinct resources. In 1992, the city paid approximately \$133,000 per fully equipped officer to King County. Approximately 80 percent of officers are equipped with their own patrol car (the goal is 100 percent) and all officers with cars participate in the take-home patrol car program where officers maintain responsibility for cars in off-duty hours (Beden, 1993).

Based upon the number of commissioned officers, Federal Way employs approximately .55 officer per 1,000 residents ($54/(98,600/1,000)$). This per capita ratio is lower than cities of similar size, such as Everett (1.93 officer per 1,000 residents) and Bellevue (1.63 officer per 1,000 residents). The King County Police Department believes that up to an additional 20 officers are needed to optimally serve the city's existing police demands (Beden, 1993).

As shown in Table 40, the Federal Way precinct has experienced increases of 6 to 16 percent per year in the number of dispatched calls for service over the past few years. This is due, in part, to a substantial number of calls related to Sea-Tac Mall, as well as "spill over" crimes from larger urban areas such as Tacoma and Seattle. Current average response times to high priority calls in Federal Way range between 2.6 and 7.4 minutes, depending on the type of call and location (Beden, 1993).

Table 39

King County Police Department Personnel Stationed at Federal Way Precinct

| Position | Assignments | | | Total |
|----------------------------|-------------|-----------|----------------------------------|------------|
| | Federal Way | Shared* | Unincorporated Urban Growth Area | |
| Administrative | | | | |
| Major | | 1 | | 1 |
| Lieutenants | | 2 | | 2 |
| Sergeants | | 10 | | 10 |
| Lead Clerk | | 1 | | 1 |
| Clerks | | 3 | | 3 |
| Evidence & Supply Clerk | | 1 | | 1 |
| Admin. Volunteers | | 13 | | 13 |
| Community Service Officers | | <u>3</u> | | <u>3</u> |
| Admin. Subtotal | | 34 | | 34 |
| Field Officers | | | | |
| Detectives | 5 | | 0 | 5 |
| Plainclothes | 5 | | 0 | 5 |
| Crime Analysis | 3/4 | | 1/4 | 1 |
| Crime Prevention | 1 | | 0 | 1 |
| D.A.R.E. | 2 1/4 | | 3/4 | 3 |
| Patrol | 24 | | 16 | 50 |
| Traffic | <u>6</u> | | <u>0</u> | <u>6</u> |
| Field Officer Subtotal | 54 | | 20 | 71 |
| Total | 54 | 34 | 17 | 105 |

Source: Beden, 1993.

* Shared by Federal Way and Unincorporated King County, but funded by King County.

Table 40. Federal Way Precinct Dispatched Service Calls

| Year | Federal Way | Unincorp. | Urban Growth Area | Total |
|-------------------|-------------|-----------|-------------------|--------|
| 1990 | 20,309 | | 7,254 | 27,563 |
| 1991 | 23,755 | | 8,327 | 32,082 |
| 1992 | 25,399 | | 8,512 | 33,911 |
| 1993 (Jan.-Sept.) | 21,207 | | 7,029 | 28,236 |

Source: Hillmar, 1993.

Significant Impacts

Future population growth and development under any of the land use concepts would result in increased demand for police protection services, as well as other community programs supported by local police departments (e.g., D.A.R.E. program, community watch programs). In order to meet increased demands, the City of Federal Way could contract for additional officers or establish its own municipal police department.

Since all three land use concepts would accommodate the same population growth, the nature of the development pattern and mix of uses (i.e., the amount of commercial space) are the predominant features that could differentiate the level of required police services. A number of features identified by the King County Police Department as having the potential to affect service calls include: housing density, the form and intensity of the city center, and areas with numerous unattended vehicles such as Park & Ride lots (Beden, 1993). Industrial areas can also generate criminal activity, although to a lesser extent than the aforementioned uses since private security is sometimes provided. No direct cause and effect relationship is known to exist, however, between these factors and the incidence of criminal activity.

Land Use/City Center Concept 1

Future development under Concept 1 would be expected to affect police response times and general service levels. Forecasted population and employment growth would generate additional calls for service. The addition of 46,200 residents under this land use concept will generate approximately 9,520 service calls, using recent ratios of calls to population. Commercial service calls estimates are shown in Table 41. Adding these 2,438 commercial calls to the 9,520 residential calls resulting in an annual increase of 11,958 service calls by 2010. Based upon current service levels, these additional calls would necessitate the hiring of 24 additional officers. In addition to the officers, the department would also need to purchase 24 patrol cars, equipment, and expand/construct facilities.

Land Use/City Center Concept 2

Concept 2 would be expected to affect police response times and general service levels in a manner similar to Concept 1. For residential uses, Concept 2 would generate approximately 9,520 service calls; for commercial uses, an additional 2,918 service calls would be expected. These additional 12,438 calls would necessitate the hiring of 25 additional officers – one more officer than under Concept 1. Once again, the department would also need to purchase 25 patrol cars, equipment, and expand/construct facilities. Overall, Concept 2 could be expected to have a similar impact on the demand for police services and response times as Concept 1.

Table 41.

Estimated Annual Commercial Police Calls by Land Use Concept

| Land Use Concept | Square Feet | Service Call Generation Rate* | Commercial Service Calls |
|------------------|-------------|-------------------------------|--------------------------|
| Concept 1 | | | |
| Office | 1,600,000 | 48/100,000 SF | 768 |
| Retail | 720,000 | 192/100,000 SF | 1,382 |
| Manufacturing | 600,000 | 48/100,000 SF | 288 |
| Total | | | 2,438 |
| Concept 2 | | | |
| Office | 2,600,000 | 48/100,000 SF | 1,248 |
| Retail | 720,000 | 192/100,000 SF | 1,382 |
| Manufacturing | 600,000 | 48/100,000 SF | 288 |
| Total | | | 2,918 |
| Concept 3 | | | |
| Office | 4,000,000 | 48/100,000 SF | 1,920 |
| Retail | 1,300,000 | 192/100,000 SF | 2,496 |
| Manufacturing | 1,100,000 | 48/100,000 SF | 528 |
| Total | | | 4,944 |

Source: Huckell/Weinman Associates, 1992.

*Assumes a service calls generation rates of 192 calls/year/100,000 square feet retail GLA (Huckell/Weinman Associates, 1992). It was assumed that other non-residential uses would incur 1/4 this number of calls per 100,000 square feet (i.e., $192 \times .25 = 48$ calls per 100,000 square feet) (King County, 1993).

Land Use/City Center Concept 3

Concept 3 would be expected to create the greatest demand for police services. Based on existing ratios, residential uses would be anticipated to generate approximately 9,520 service calls; and commercial uses would create an additional 4,944 calls, for a total of 14,464 calls. This level of police service demand represents 2,500 more calls than Concept 1 and 2,025 more calls than Concept 2. These additional 14,464 calls would necessitate the hiring of 30 officers, the purchase of 30 patrol cars and equipment, and expansion and/or construction of facilities.

Mitigation Measures

Measures to improve safety include providing on-site security for construction sites, (e.g., secured areas for equipment, private security guards, and lighting); encouraging site designs that would reduce opportunities for crimes to occur (particularly for transit and rail stations, as well as park-and-ride lots);

adequate street lighting; and promotion of community crime prevention programs (e.g., neighborhood watch programs). Tax revenues generated as the result of development and future population growth could be available to finance additional police requirements.

Unavoidable Adverse Impacts

Future population growth and development will increase the need for police protection services in Federal Way, with or without implementation of any of the alternatives. Resources will have to be expended to meet these needs.

C. SCHOOLS

Affected Environment

The Growth Management Act requires school districts in jurisdictions planning under the Act to prepare a six-year capital facilities plan. The capital facilities plan is intended to help school districts determine when new schools will be needed, and what funds are available for these facilities. The *Federal Way School District No. 210 Capital Facilities Plan* will be incorporated into the Capital Facilities Element of the City's Comprehensive Plan. The following analysis is based on information contained in the District's Capital Facilities Plan and the *City of Federal Way Comprehensive Plan City Facilities Element*.

Existing Facilities

Federal Way School District No. 210 serves the City of Federal Way Urban Growth Area and the southwestern corner of the City of Kent. The District currently has twenty-one elementary schools (grades K-6), five junior high schools (grades 7-9), three senior high schools and one continuation high school (grades 10-12), and five non-instructional facilities. Non-instructional facilities include the District's administration building, maintenance operation transportation (MOT) site, central kitchen, Federal Way Memorial Field, and security.

The District currently has an inventory of eleven undeveloped sites. Not all of the properties are large enough to meet school construction requirements; however, properties may be traded or sold depending on what locations are needed to house students (Federal Way School District, 1992).

Program Capacity

The School District uses an average level of service to calculate the number of students that it can house and to determine its program capacity and future expansion needs. Program capacity takes into account: how many students can be housed at each school; the number of classrooms at each school; how many classes can be held in each classroom each day; and any other operational conditions that affect a school's capacity. Because population changes throughout the year, the District must use temporary facilities or interim measures to house students until permanent facilities can be built or boundary adjustments can be made. In most cases, it does not make sense to build/remodel a facility to accommodate slight changes in enrollment (i.e., 25 students). There are currently 61 portable classrooms and 7 portable support facilities (1992/93) utilized by the District. The District does not consider portables a permanent solution to capacity deficiencies.

A program capacity analysis was prepared by the District for the 1992/93 Capital Facilities Plan and is summarized in Table 42. The analysis accounts for new schools that will be opening/renovated and the availability of interim

facilities; this is referred to as the District's permanent and interim capacity threshold.

Table 42. School Capacity Summary

| Capacity Threshold | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|--------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Elementary | 10,353 | 10,642 | 10,850 | 11,232 | 11,407 | 11,457 | 11,632 |
| Junior High | 4,416 | 4,591 | 5,157 | 5,157 | 5,157 | 5,157 | 5,157 |
| Senior High | 4,206 | 4,206 | 4,206 | 4,206 | 4,256 | 4,356 | 4,431 |
| Total | 18,975 | 19,439 | 20,213 | 20,595 | 20,820 | 20,970 | 21,220 |

Source: Federal Way School District No. 210 and Huckell/Weinman Associates, Inc., 1993.

Enrollment

Table 43 shows the Full Time Equivalent (FTE) student forecast for the period 1992-1998. Forecasts are not available beyond 1988. The School District uses a computer software program called "Microsam" to forecast the student population. For the planning years 1990 - 1992, the District forecast the student population with a 98 percent accuracy rate using this program. Microsam forecasts the increase in student populations by taking into account the following variables: the number of housing units in the district; students moving from one grade to the next; students transferring in from other schools; and students remaining at their current grade level (Federal Way School District, 1992). The District used data on current housing units (1992), as identified by King County's Land Development Information System, plus projected housing units based on building permits issued by King County, City of Federal Way, and City of Kent Building Departments.

**Table 43. Student Forecast
Full Time Equivalent (FTE) Summary**

| Schools | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|--------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Elementary | 10,342 | 10,629 | 10,840 | 11,063 | 11,266 | 11,457 | 11,615 |
| Junior High | 4,440 | 4,585 | 4,766 | 4,870 | 5,011 | 5,073 | 5,143 |
| Senior High | 3,950 | 3,959 | 4,024 | 4,159 | 4,253 | 4,352 | 4,412 |
| Total (FTE) | 18,692 | 19,173 | 19,630 | 20,092 | 20,530 | 20,882 | 21,170 |

Source: Federal Way School District No. 210, 1992.

The District's forecast school capacity (Table 42) is expected to accommodate projected increases in student population (Table 43) through the 1998 planning period.

Planned Improvements

Several new schools and school expansions are planned by the District to house the projected growth in student population during the 1993-1998 planning period. Future improvements include: constructing two elementary schools and one junior high school; renovating one elementary and one junior high school; installing sports fields at one junior high and one senior high school; and closing one elementary school.

With the use of portable classrooms and the addition of new/improved facilities, the Federal Way School District expects to be able to accommodate forecast growth through 1998 and possibly beyond. The Capital Facilities Plan indicates that the District would be operating at surplus capacity; during the six-year planning period the surplus will decrease from 283 in 1992 to approximately 50 in 1998.

School Impact Mitigation

Under GMA, the District is required to prepare a financial plan that shows expected funding for construction/renovation of facilities. The District's six-year finance plan identifies funding sources for capital projects; this information is provided in Appendix E. Funding sources for capital projects total \$55,923,000. New facilities that are proposed can be entirely financed by secured funding sources -- 1988 bond, 1991 bond and interest, impact fees, land sale funds, and State Match Funds (Federal Way School District, 1993). The District also anticipates \$8,259,417 will be available from, as yet, unsecured funds (i.e., State Match Funds). The Plan indicates that State Match Funds and impact mitigation fees, if realized, will be used to decrease the need for future bond issues or used on additional capital fund projects.

As permitted by State laws, King County Ordinance 10162 requires developers to pay impact fees to the School District to help pay for a share of the impact of new housing development on school facilities within unincorporated areas. To participate in this program, the District was required to establish a student mitigation factor that is used to estimate the number of students added by each new single or multi-family unit. This mitigation factor also helps to estimate standard construction costs within the District.

The Federal Way School District student mitigation factor was determined separately for single family units and multi-family units. The average number of students per household (student factor) for single family units is 0.382 for elementary, 0.145 for junior high, 0.140 for senior high and 0.666 for an overall total. For multi-family units, the student average is 0.194 for elementary, 0.063 for junior high, 0.048 for senior high, and 0.301 for the overall total. The current mitigation fee is \$1,951 for single family units and \$965 for multi-family units.

Currently, the city has not adopted an ordinance enabling it to collect impact fees for development within the city limits.

Significant Impacts

The School District's Capital Facilities Plan forecasts student populations and program capacities for a six-year period (1993-1998). Forecasts are updated on an annual basis; however, the District does not typically forecast beyond the six-year planning horizon.

The following analysis of long term school needs is based on 2010 housing projections for the three land use concepts, and the student generation rates provided in the District's Capital Facilities Plan. Table 44 shows student population generated by each of the land use concepts. The total number of students generated does not vary significantly among concepts – Concepts 1 and 2, differ by only 10 students, while Concept 3 would generate approximately 200 fewer students. As Table 44 demonstrates, a demand for additional school services would be generated by any of the land use concepts with elementary schools being in highest demand.

Table 44. Student Generation by Land Use Concept

| School | 2010 Student Population* | | | | | | | | |
|--------------|--------------------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------|--------------|
| | Concept 1 | | | Concept 2 | | | Concept 3 | | |
| | SF | MF | Total | SF | MF | Total | SF | MF | Total |
| Elementary | 2,813 | 2,019 | 4,832 | 2,828 | 2,010 | 4,838 | 2,630 | 2,110 | 4,740 |
| Junior High | 1,068 | 656 | 1,724 | 1,073 | 653 | 1,726 | 988 | 685 | 1,673 |
| Senior High | 1,031 | 500 | 1,531 | 1,036 | 497 | 1,533 | 964 | 522 | 1,486 |
| Total | 4,912 | 3,175 | 8,087 | 4,937 | 3,160 | 8,097 | 4,582 | 3317 | 7,899 |

* Based on 2010 housing projections (see Population, Housing and Employment Section).
Source: Huckell/Weinman Associates, Inc. 1993.

Students generated by the proposed concepts represent increases of between 42 and 43 percent of 1992 FTE. Improvements currently proposed by the District would not be adequate to meet the demands generated by the proposed concepts. The District's Capital Facility Plan provides data on design capacity by school type; the average capacity is 500 students for elementary, 850 for junior high, and 1,500 for senior high. By 2010, there would be a need for approximately 9.6 elementary schools, three junior high schools, and one senior high school using these capacity standards. Facility size and location are factors that will determine the need to construct new facilities or to use portable classrooms as an interim measure to house students.

Future planned improvements that would increase capacity include constructing one elementary school (two are planned for construction, but one existing school would be closed, for a net gain of one school) and one junior high school. Demands calculated above indicate that forecast population would generate needs for an additional 8.6 elementary schools, two junior high schools, and one senior high school. It should be noted that school

district facility plans do no project needs beyond 1998. Furthermore, the use of portable classrooms was not included in calculating available space.

Average school construction costs provided in the Capital Facilities Plan are as follows: \$5,787,509 for elementary, \$11,503,934 for junior high, and \$17,760,000 for high schools. Based on the number of schools required by 2010, construction costs would total \$57,875,090 for elementary schools, \$23,007,868 for junior high schools, and 17,760,000 for senior high schools (based on 1992 dollars).

Future residential development under any of the proposed concepts would be subject to mitigation fees imposed by the District. Current mitigation fees are set at \$1,951 for single family units and \$965 for multi-family units; it should be noted that mitigation fees are reevaluated on an annual basis and could change in the future based on the District's total financing program. Using the current school impact mitigation fees the land use concepts would generate between \$23,930,891 and \$24,439,667. At 1992 dollars, these fees would cover approximately 25 percent of total construction costs. The District would be required to secure additional funding from other sources such as bond issues and state match funds.

Mitigation Measures

The *Federal Way School District No. 210 Capital Facilities Plan* covers a six-year planning period and is updated on an annual basis. It is anticipated that future school needs will be identified during the District's ongoing planning process. The School District should use the population and housing targets in the City's Comprehensive Plan in its ongoing planning. It should also monitor the rate of growth -- in housing students -- to verify planning assumptions. It is assumed that the District will update its capital facilities plan annually, consistent with GMA, to accommodate future growth.

The city should also enact a school impact fee program and collect fees on behalf of the school district for future development occurring within city limits.

Unavoidable Adverse Impacts

As the number of families with school-aged children increases, the demand for school services and facilities would increase. Additional resources would be consumed (e.g., water, energy, police service) in an effort to provide facilities to meet educational needs. Land developed or set aside for school facilities would be unavailable for other uses.

D. PARKS AND RECREATION

Affected Environment

Park and Recreational Facilities

The Federal Way Urban Growth Area currently contains 928.5 acres of park land -- 847 within its city limits including Dash Point State Park which is 295 acres and 81.5 acres in the unincorporated area. Public recreational facilities within the City range from neighborhood/community parks, school play fields, tennis courts and swimming pools to regional and state parks. Major parks within the City include Lakota Beach County Park, Dash Point State Park, Dumas Bay Park, and Steel Lake Park.

Park land in the unincorporated UGA is comprised of neighborhood and community parks, open space, and special use areas. Figure 25 shows the location of parks, recreational facilities and trails within the City and its UGA.

Adjacent Cities and jurisdictions also provide recreational opportunities for local citizens. Larger park and recreation facilities in adjacent areas include Salt Water State Park in Des Moines; Lake Fenwick Park and Riverbend Golf Course in Kent; Lake Geneva Park and Five Mile Lake County Park in King County; and Crescent Heights Park, Alderwood Park, Auburn Municipal Golf Course, and North Shore Golf Course in Tacoma.

Trails

The West Campus Trail is currently the only trail system/linear park within the City. It is partially developed and encompasses 27.8 acres. Several parks in the City also provide trails, including Adelaide Park, Alderbrook Park, Dash Point State Park, Dumas Bay Park, Hylebos State Park, Olympic View Park, and Wildwood Park.

King County, in coordination with its cities, is in the process of developing an off-road urban trail system (King County, 1990). The County's Draft Regional Trails Plan (1990) provides an inventory of existing trail systems, and outlines recommended improvements and strategies for maintaining trails.

Pipeline No. 5 Trail is a partially developed County trail that connects with the West Campus Trail. This trail begins near 21st Avenue S.W. and the Pierce County line in Federal Way, heads eastward to SR-18 near S.E. 304th Street, then follows SR-18 to Maple Valley (within SR-18 right-of-way). Much of the western segment of this trail coincides with the Bonneville Power right-of-way. The Entire route east of I-5 to Maple Valley is unimproved.



Comprehensive Park, Recreation and Open Space Plan

In December 1991, the City of Federal Way adopted the *Comprehensive Park, Recreation, and Open Space Plan*. This plan, intended to comply with GMA requirements, will be incorporated in the Comprehensive Plan. Level of service standards, discussed below, may be revised based on environmental review and capital facilities planning.

The Plan, which covers the City's Urban Growth Area, provides an inventory of existing park and recreation facilities, identifies deficiencies in public services, and recommends capital improvements to eliminate deficiencies. Five goals are identified in the Plan: (1) To provide a comprehensive leisure services program offering high quality recreation facilities and programs; (2) Provide high quality park, open space and specialized facilities; (3) Provide a broad, diverse, flexible and challenging program of recreation services to meet the needs of all age groups and interests; (4) Encourage public involvement in the park and recreation planning process; and (5) Provide high quality and efficient maintenance of park areas and facilities.

Methods proposed to achieve Plan goals include coordinating with the state, county and school district for recreation services; maintaining a high profile in the community to help promote the leisure services program; developing regulations that require developers to meet a minimum standard for on-site recreational facilities or equivalent in-lieu provisions; upgrading existing and developing new park sites; acquiring/reserving park land in advance of development to ensure affordable land prices and choices of sites; monitoring park and recreation preference, needs and trends through questionnaires, surveys and public hearings; and maintaining parks and recreation facilities to make them safe, attractive and positive amenity to the community.

Level of Service Standards

The *Comprehensive Parks, Recreation and Open Space Plan* contains recommended level of service standards for park land. The Plan used PSRC population projections for years 1990 and 2010 to estimate existing and future park and recreation needs within the planning area. The 1990 planning area population of 98,600 is used in the following analysis.

Level of service standards for parks and recreation were adopted in the City's *Comprehensive Plan City Facilities Element* (1992). Table 45 shows adopted level of service standards, population capacities for park and recreation facilities, and existing deficiencies. Under adopted level of service standards, all park and recreation facilities within the City's Urban Growth Area are operating below adopted levels of service. In terms of total park land, the city has a deficit of 757.6 acres (based on 1990 population).

In July 1993, the Mayor and City Council recommended revised level of service standards for parks (Table 46). These standards are lower and more generalized than adopted standards. Using the recommended level of service

standard of 11 acres/1,000 population, 1990 park needs would total 1084.6 acres. Compared to existing facilities, the current deficit would be 156.1 acres.

Table 45. Park and Recreation Levels of Service and Existing Supply and Demand

| Park Type | Adopted Standard | Existing Supply | Service Capacity | 1990 Demand | Existing Deficiency |
|------------------------|-------------------------|-----------------|------------------|---------------|---------------------|
| Neighborhood | 1.4 Ac/1000 pop. | 16.0 | 11,400 | 138.0 | 122.0 |
| Community | 1.8 Ac/1000 pop. | 146.8 | 81,600 | 177.5 | 30.7 |
| Regional | 3.7 Ac/1000 pop. | 346.7 | 93,700 | 364.8 | 18.1 |
| Linear | 1.6 Ac/1000 pop. | 27.8 | 17,400 | 157.8 | 130.0 |
| Open Space | 6.2 Ac/1000 pop. | 169.1 | 27,300 | 611.3 | 442.2 |
| Special Use Area | 2.4 Ac/1000 pop. | 215.9 | 90,000 | 236.6 | 20.7 |
| Total Park Land | 17.1Ac/1000 pop. | 928.5 | 54,300 | 1686.1 | 757.6 |
| Facility Type | | | | | |
| Tennis Courts | 1/1000 pop. | 28 | 56,000 | 98.6 | 70.6 |
| Softball Fields | 1/7500 pop. | 6 | 45,000 | 13.2 | 7.2 |
| Youth Baseball Fields | 1/1520 pop. | 58 | 88,000 | 64.9 | 6.9 |
| Soccer Fields | 1/3000 pop. | 18 | 54,000 | 32.9 | 14.9 |
| Football Fields | 1/30,000 pop. | 2 | 60,000 | 3.3 | 1.3 |
| Golf Courses | 1/50,000 pop. | 1 | 50,000 | 1.97 | 1 |
| Gymnasium Space | 1/12,000 pop. | 4 | 48,000 | 8.2 | 4.2 |
| Trails Walking/Hiking | .2 miles/1000 pop. | 1.5 | 7,500 | 19.7 | 18.2 |
| Indoor Pool Area | 142.7 sf/1000 pop. | 11,445 sf | 80,200 | 14,070.22 sf | 2,625.2 |
| Swimming Beaches | 100.8 lf/1000 pop. | 5960 lf | 59,100 | 9938.9 lf | 3,978.9 |

*Based on 1990 Planning Area Population of 98,600
 Source: City of Federal Way, Huckell/Weinman Associates, 1993

**Table 46. Levels of Service for Parks
 1993 Capital Facilities Forum**

| Parks | Levels of Service |
|---|--|
| Community/Neighborhood Parks Linear Parks/Open Space Special Facilities | 4.5 acres per 1,000 population 5.25 acres per 1,000 population 1.25 acres per 1,000 population |
| Total Parks | 11 acres per 1,000 population |

Source: City of Federal Way, July 1993

Funding Strategy

The *Comprehensive Park, Recreation and Open Space Plan* includes a list of recommended projects and indicates project priority and possible funding sources. The Plan also includes a list of seven criteria that are recommended for prioritizing projects, relating to land acquisition, upgrading existing park sites, and development of new sites/facilities. This method for prioritizing projects enables the city to coordinate capital improvements with funding.

Twenty-two potential sources for funding the parks program were identified in the Plan. Examples of funding sources include: Washington Wildlife and Recreation Coalition, property transfer excise tax, city general fund, capital improvement fund, park impact fees and revenue bonds. Development fees imposed by the City for park land acquisition and development are charged to developers to offset the needs generated by new growth; fees are based on a set amount per residential unit.

In response to GMA requirements, a six year finance plan for parks and recreation facilities is included in the City's Capital Facilities Plan (CCFP, 1991-1997). The parks component of the CCFP identifies park projects to be implemented and identifies funding sources for each individual project (Appendix F).

Significant Impacts

Impacts to park and recreation services would be similar for all of the land use concepts since the 2010 population would be comparable. Incremental park needs and additional park lands associated with each of the three land use concepts are shown in Table 47. As this table illustrates, Concept 1 would result in the greatest deficit in park acreage (103-380 acres), whereas, Concepts 2 and 3 would both result in slightly smaller deficits (82-359 acres) due to their higher proposed amount of park and open space land.

**Table 47.
Park Requirements for Land Use Concepts**

| Concept | Additional Population | Park Needs | | Proposed | Deficit |
|-----------|--------------------------|-------------------|-------------------|----------|------------|
| | | 11 ac./1,000 pop. | 17 ac./1,000 pop. | | |
| Concept 1 | 46,202 | 508 ac. | 785 ac. | 405 ac. | 103-380 ac |
| Concept 2 | 46,184 | 508 ac. | 785 ac. | 426 ac. | 82-359 ac |
| Concept 3 | 46,184 | 508 ac. | 785 ac. | 426 ac. | 82-359 ac |

Source: See text and previous tables.

Another approach to evaluating park deficiencies is from a cumulative perspective. As noted above, the city is operating at a deficit of 757.6 acres of park land under existing conditions. The City's *Comprehensive Parks, Recreation and Open Space Plan* has identified future facilities/improvements to the parks

system that would increase the park land inventory by 1,295.5 acres, resulting in a surplus capacity of 537.9 acres.

Concept 1 would add 405 acres of parks and open space while Concepts 2 and 3 would each add 426 acres. Assuming all park expansion projects identified in the Plan are implemented, the 2010 inventory of park land would be 942.9 acres under Concept 1 and 963.9 acres under Concepts 2 and 3.

Using the adopted standard for total park land (17.1 acres/1,000 population) would result in a deficit of 1,533.2 acres under Concept 1 and 1,511.91 acres under Concepts 2 and 3. The Capital Facilities Forum standard of 11 acres/1,000 population would yield a deficit of 649.9 acres under Concept 1 and 628.7 acres under Concepts 2 and 3.

As indicated, the City would be operating at deficit levels for park land under any of the land use concepts. Concepts 2 and 3 would result in a slightly lower deficit of park land. Parks provided under any of the concepts would be below either of the level of service standards. The financial implications of using the 1993 revised level of service standards are addressed in the *Capital Facilities* section of the Draft EIS.

Mitigation Measures

Ongoing land use and capital facility planning should seek to identify additional needs for park and recreation land and facilities. The information in the *Capital Facilities* section of the Draft EIS should be used to identify a park level of service standard that City residents can support financially and politically. Consistent with this standard, the preferred land use concept, analyzed in the Final EIS, should identify additional parks and open space.

Unavoidable Adverse Impacts

Over time, population growth will place increased demands on existing park and recreational facilities and programs and create a need for additional facilities and programs. If additional acquisitions are not made, existing deficiencies would be exacerbated. Additional costs for improvements, and operation and maintenance would be incurred.

UTILITIES

A. WATER SYSTEM

Affected Environment

The City of Federal Way Urban Growth Area is served by three independent water purveyors (see Figure 26). The largest of these is Federal Way Water and Sewer District which provides water service to more than more than 89,000 persons (Federal Way Water and Sewer District, 1991). A small area in the southwest corner of the City is served by the City of Tacoma Water Division. On the north, a small portion of the City of Federal Way Planning area is served by Highline Water District. This section of the EIS provides an overview of the three water systems serving the Urban Growth Area; it focuses primarily on Federal Way Water and Sewer District which is the primary purveyor.

Federal Water and Sewer District water supply sources include eighteen wells that are used for normal supply, and interties with the Tacoma Water system (two) and the Highline Water District System (three) that can be used for emergency back-up supply. Except for three small wells (16, 22 and 22A), the district's wells are located within a polygon formed by Interstate 5 on the east, South 356th Street on the South, 21st Avenue Southwest/Dash Point Road on the west and South 298th Street on the north. The total pumping capacity of the district's wells is about 37 million gallons per day (MGD) or nearly 26,000 gallons per minute (GPM). (Federal Way Water and Sewer District, 1992) The eighteen wells of the district penetrate four different aquifer formations. The estimated sustainable capacity of those aquifers is about 10.9 MGD (7560 GPM) on an average annual basis. (Federal Way Water and Sewer District, 1991) This means that while the district has the capacity to pump high volumes of water from its wells to meet peak summer demands, sustained long term pumping at those rates would "mine" the aquifers and destroy the water resource.

The City of Tacoma Water Division relies on a complex system of surface water and wells to supply water to its customers. The water supply foundation for Tacoma is a diversion on the Green River located just downstream from Howard Hanson Dam. Water from this diversion flows southwesterly in a major transmission pipeline through Enumclaw and Buckley and then westerly to Tacoma. This surface source is augmented with major wellfields located in the City of Tacoma. By operating their surface and ground water sources in a complementary conjunctive fashion, Tacoma maximizes both the yield and reliability of their supply. For example, the Green River surface source allows Tacoma to turn off or "rest" wells during periods of low demand; during periods of high turbidity in the river, wells can be used instead.

Highline Water District relies primarily on the City of Seattle for its water supply. In recent years, Highline Water District has developed wells to supplement its supply from Seattle. The district is currently adding treatment

facilities to its wells in order to allow better "blending" of the ground water with surface water the district purchases from Seattle. The surface water Seattle sells to Highline Water District comes almost entirely from the Landsburg diversion on the Cedar River near Maple Valley. Seattle is a major water purveyor of water in the region, directly or indirectly supplying about two-thirds of the people in King County. Demand on the Seattle Water Supply system is currently equal to supply. Since Seattle is not currently constructing or developing additional supply sources, it is relying on conservation to free up enough water from its current sources to meet projected demand for at least the next 10 years. (City of Seattle, 1992)

The Federal Way water distribution system serves the plateau and parts of hillsides descending to Puget Sound, the Green River Valley and Hylebos Creek. As a result of Federal Way's topography, the City has 13 hydraulically interrelated pressure zones ranging from a 578 foot hydraulic gradient to a 162 foot gradient. Pumping is accomplished by wells and three booster pump stations that are located throughout the City.

Currently there are twelve reservoirs in the Federal Way Water and Sewer District system, located to provide equalizing and fireflow reserves. Thirty-two pressure reducing valves are used to supply lower pressure zones from higher pressure zones that contain most of the water storage reservoirs.

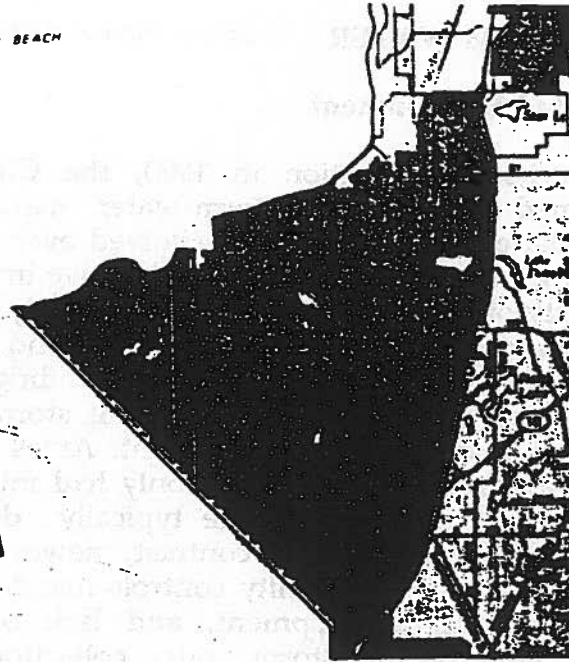
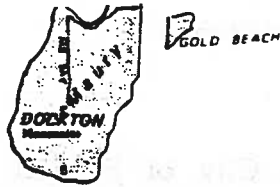
All of the pressure zones are hydraulically interrelated with the 538 pressure zone which contains most of the storage and wells. In the Federal Way system, water moves up through the well pumps and pump stations and down through the pressure reducing valves. It is desirable to have two or more connections (or supply points) that allow water to move upward to a higher pressure zone or downward to a lower pressure zone. This maximizes system reliability by providing multiple paths or routes that the water can take when moving between pressure zones.

Federal Way has two main challenges related to water supply: 1) Federal Way is wholly dependent on supply from an aquifer system that is vulnerable to contamination, and 2) the aquifers serving Federal Way appear to be over appropriated.

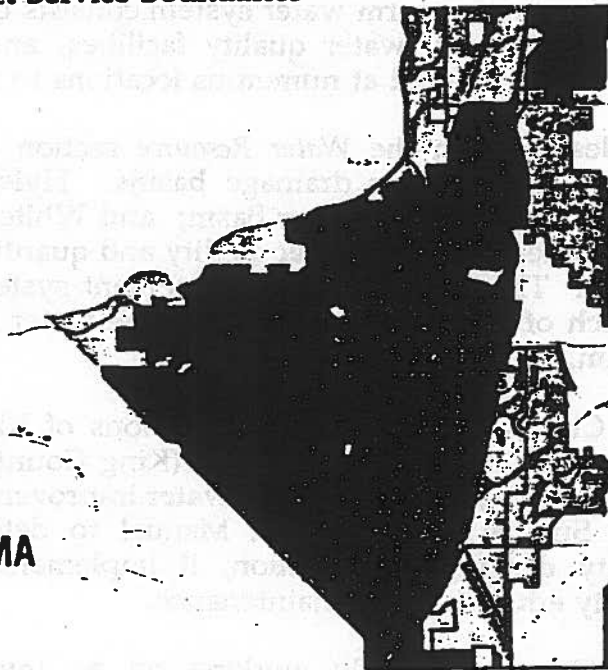
Within this context, the following section evaluates the impacts of the three land use concepts Alternatives on the water systems serving the City of Federal Way's planning area.

Significant Impacts

This section examines two kinds of impacts to the water system: impacts of the land use concepts on total water demands within the planning area, and the distribution of those demands by pressure zone/service area. The analysis focuses on the broader water supply issues rather than the details of specific pipeline, pumping or other water system issues; a detailed hydraulic analysis of the water systems is beyond the scope of this study. The water purveyors that serve the study area are constantly monitoring and upgrading their



Water District Service Boundaries



Sewer District Service Boundaries

CITYSHAPE

From Vision to Plan

Figure 26

**Water and Sewer District
Service Boundaries**

**Federal Way
Comprehensive
Plan EIS**

C. STORM WATER

Affected Environment

Upon its incorporation in 1990, the City of Federal Way inherited and assumed control of the storm water management system existing within its boundaries. This system had evolved over many years under the management of King County. While a comprehensive inventory of storm water facilities in the City of Federal Way does not currently exist, the system generally consists of an amalgamation of open ditches and channels, pipes, vaults and open retention/detention facilities. Depending on when individual properties developed, King County's changing storm water requirements affected the level of storm water management. Areas that were developed more than 20 years ago, for example, commonly had minimal or no storm water facilities; where they exist, they were typically designed to move water off-site as quickly as possible. In contrast, newer developments contain both water quantity and water quality controls mandated by current regulations. Given this historical development, and lack of a facility inventory, a detailed description of the storm water collection and conveyance system is not possible.

The man-made storm water system consists of retention and detention ponds, drainage swales, water quality facilities, and pipes for conveyance. Storm water is discharged at numerous locations to surface water bodies.

As described in the *Water Resource* section of this DEIS, the planning area contains four major drainage basins: Hylebos Creek Basin; Lower Puget Sound Basin; Green River Basin; and White River Basin. The *Water Resource* section describes the water quality and quantity characteristics of each of those basins. The storm water management system in Federal Way will discharge to each of these basins and affect the water quality and flows of each basin's stream.

The City is currently using provisions of King County's Hylebos Creek and Lower Puget Sound Basin Plans (King County, 1991) as interim policy and to identify some needed surface water improvements. It also uses King County's 1992 Surface Water Design Manual to determine appropriate storm water facility design. In addition, it implements programs dealing with water quality education and maintenance.

The City is currently working on an inventory of existing storm water facilities, using King County records, construction drawings and field surveys. When completed, this data will be incorporated into the City's Geographic Information System (GIS).

City staff is also working on a Comprehensive Storm Water Management Plan which will be completed in 1994. As part of this work effort, staff will identify the capacity of the City's natural and man-made drainage systems. This data will be used to develop a computer model for storm water planning. The model will enable the City to determine facility needs based on planned future

land uses and potential effects on resources. The model will incorporate 2010 "worst case" development and impervious surface coverage as the basis for future improvements. Analysis using the model will be included in the Final EIS.

The City Facilities element of the Comprehensive Plan, adopted in 1992, includes an interim list of drainage facilities; this capital program totals more than \$9 million and extends through 2002. This list of capital facility needs will be revised as part of the Comprehensive Storm Water Management Plan. The overall system will maintain the natural drainage system and the drainage and water quality functions of wetlands. Incorporation of natural drainage features as well as construction of man-made facilities is seen as being cost effective and environmentally sensitive.

Significant Impacts

Each of the alternative land use concepts would increase storm water runoff quantities and could degrade surface water quality unless controlled. The magnitude of these effects is described in the *Water Resource* section of this DEIS and summarized in Appendix B. Based on amount of clearing that would occur and impervious surface that would be constructed, impacts would not be significantly different among the concepts.

Even though peak flows from new development would be regulated to predevelopment levels, total volumes of flow would increase under each of the land use alternatives; see the *Water Resource* section (and Appendix B) for quantification of these increases. Development that contributes flows to storm water facilities with inadequate capacity could exacerbate capacity problems even though they may comply with all storm water rate control requirements. In addition, the total volumes of runoff would increase in future development areas, resulting in increased erosion and sedimentation and reduced surface water quality.

The combination of these factors (increased total flows and pollutant loading) would require on-site management and additional regional improvements to the storm water system. These improvements could take several forms. In certain areas, such as within the Puget Sound Basin, tightlines to divert peak flows from natural drainages could be effective. In other basins, large scale regional retention/detention ponds may be required to maintain water quality and mitigate increases in total stream flows. Finally, where the geology is favorable, infiltration of storm water may be desirable to achieve both surface water and groundwater objectives; see both the *Water Resources* and *Water Service* sections of the DEIS for discussion of groundwater recharge and withdrawals for water supply.

These types of programs and improvements identified above would be required under each of the three land use scenarios. Implementation of such improvements would require substantial investments by the City in comprehensive stormwater management planning and capital improvements.

Mitigation Measures

As part of its Growth Management Act planning effort, the City will also review its existing drainage requirements. Where appropriate, guidelines from DOE's Stormwater Management Manual for the Puget Sound Basin (1991) or their equivalent should be incorporated.

Other mitigation measures include preparing a Comprehensive Storm Water Plan, identifying needed capital improvements and implementing site-specific drainage and water quality controls.

FISCAL IMPACTS

INTRODUCTION AND GENERAL ANALYTIC APPROACH

This section summarizes the fiscal impacts of the 3 land use concepts for the City of Federal Way. A capital facility financing model was created to evaluate fiscal impacts. The model includes projections of all city revenues and expenditures for the 20 year period ending in 2010. The model includes detailed cost analyses for transportation, parks and open space and surface water management. Other city responsibilities are included at a more aggregate level of detail to ensure that all potential financial obligations are accounted for. More detailed costs for other services and facilities will be evaluated in the Final EIS. Revenue and cost projections are based on projected socioeconomic characteristics of the city as it grows over time, under the land use concepts. Therefore, both the revenue generating capacity and the municipal costs of providing service are dependent on the land use and growth assumptions for each of the land use concepts evaluated in the Draft EIS.

The purpose of this analysis is to use the financial planning model as a planning tool and to evaluate the potential fiscal impacts of each of the three land use concepts for the City of Federal Way. Policy assumptions regarding level of service and future municipal tax policy are held constant while the socioeconomic characteristics of the land use concepts are varied. The policy guidance for this analysis came from a 1993 forum on capital facility planning and tax policy impacts. This working session included representatives from the City Council, School Board, Water and Sewer Board, all City Board and Commission members, State representatives, citizens of Federal Way and City staff. This effort produced a series of policy assumptions for level of service and taxation to be used in the environmental impact analysis of the comprehensive plan.

The major municipal services where explicit level of service assumptions were made include transportation and parks and open space. For this analysis the level of service and associated capital costs of identified transportation improvements were taken from the transportation modeling process and coded as a programmed 20-year Transportation Improvement Program. This ensured that the fiscal analysis was consistent with the transportation network assumptions used in the transportation impact section of this document. As a result, there will not be any difference between the land use concepts in terms of the capital costs required for transportation.

The parks and open space level of service assumptions varied according to the type of facility with the following policy targets established for the EIS evaluation:

| | |
|------------------------------|---------------------------------|
| Community/neighborhood parks | 4.5 acres per 1,000 population |
| Linear parks/open space | 5.25 acres per 1,000 population |
| Special facilities | 1.25 acres per 1,000 population |
| Total park facilities | 11.0 acres per 1,000 population |

The tax policy guidance from the City included using some new revenue sources, an adjustment to the property tax rate policy and the use of special issue bonds to fund any unfunded capital improvements after all other sources have been depleted. The new sources of revenue assumed in this analysis include utility taxes on all relevant local public and private utilities and the use of impact fees for transportation and parks and open space.

Utility taxes were assumed to be levied according to the following schedule of rates.

| Source | Tariff Rate |
|------------------------------|--|
| Sewer utility taxes | 3% of sewer utility revenues per year |
| Electric utility taxes | 3% of electric utility revenues per year |
| Gas utility taxes | 3% of gas utility revenues per year |
| Garbage utility taxes | 3% of garbage utility revenues per year |
| Cable utility taxes | 3% of cable utility revenues per year |
| Phone utility taxes | 3% of phone utility revenues per year |
| Storm drainage utility taxes | 3% of storm drainage revenues per year |

Impact fees were assumed to be levied on all new residential construction in the city. The fees assumed for this analysis include \$750 on each new dwelling unit for parks and open space and \$1,750 on each new dwelling unit for transportation impacts. These funds were restricted to capital expenditures for parks and transportation.

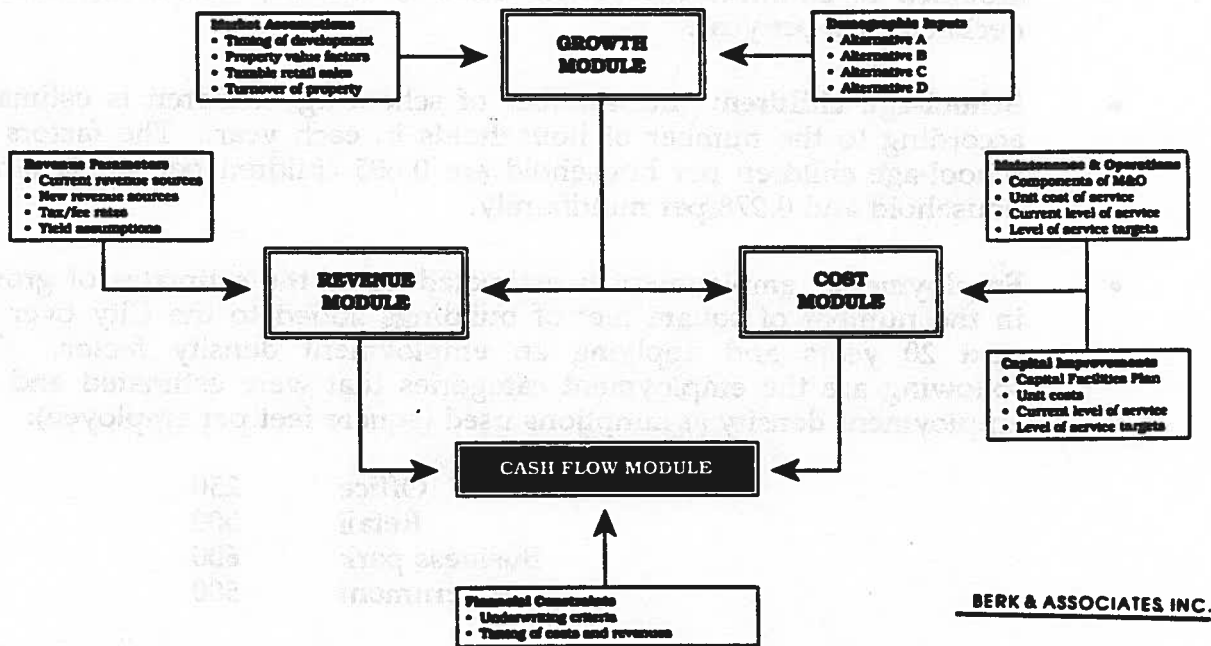
The property tax levy rate for the City of Federal Way is assumed to be increased at 2% per year. These increases are limited to the statutory limit on property tax assessment growth of 6% per year. Therefore the actual property tax assessments are based on the lesser of a 2% increase in rate or a 6% increase in assessments. Property tax collections are assumed to be 99% of the annual assessments with the other 1% assumed for delinquencies.

If there are unfunded capital improvements remaining after all other revenues have been committed the balance is assumed to be funded through the use of special issue bonds supported by a levy on property values. The financing terms of these bonds are assumed to be 7% for 20 years; each time the minimum threshold of unfunded projects is reached a new issue is sold to pay for the projects. The minimum threshold sets the smallest bond package that would be issued. It is assumed to be \$1 million for this analysis. The maximum value of a single bond issue is capped at \$5 million.

A more detailed description of the model and the underlying assumptions follows.

Modeling Framework And Major Assumptions

The model used for this analysis is a detailed spreadsheet model that links city revenues and costs to units of growth, such as population, employment, housing, and commercial building square footage. The intent of the model is to allow the user the flexibility to test the fiscal impact of alternative growth scenarios, level of service assumptions, and tax policy directions. The following is a graphic depiction of the general model structure.



The following is a more detailed description of each of the four primary model modules and the relevant assumptions used in this analysis.

Growth Module

General description: The growth module includes the assumptions about how the City of Federal Way will grow and develop over the next 20 years. This growth is the driving variable for the cost and revenue modules, which vary according to the amount and timing of planned growth.

- **Growth scenarios:** There are three planned growth scenarios coded in the model, based on the work done as part of the CityShape process.

Each scenario contains a vision for the amount and location of planned development activity in each of 20 Planning Analysis Zones (PAZ). These are used as the primary inputs to the Capital Facilities Model. Growth over the 20-year period was allocated to annual increments according to assumptions about when the growth was expected to occur in each PAZ.

- **Population:** population is determined on the basis of the additional housing units built in each PAZ in each year. These housing units are converted to population by using the Census estimates of occupancy rates (97.4% for single family and 89.7% for multifamily) to estimate occupied units and then applying an average household size (2.99 for single family and 2.06 for multifamily). The average household size is assumed to continue the recent trend of decline, and is assumed to decline at 1% per year.
- **School-age children:** the number of school age children is estimated according to the number of households in each year. The factors for school-age children per household are 0.605 children per single family household and 0.278 per multifamily.
- **Employment:** employment is estimated using the estimates of growth in the number of square feet of buildings added to the City over the next 20 years and applying an employment density factor. The following are the employment categories that were estimated and the employment density assumptions used (square feet per employee):

| | |
|---------------|-----|
| Office | 250 |
| Retail | 500 |
| Business park | 600 |
| Government | 500 |

- **Property values:** Based on current PAZ level assessed values of property and linked to the value of new construction activity in the Growth Module. The estimate of the value of taxable base is increased for the value of new construction each year, and for reevaluations every two years. The assumed increase due to biennial reevaluations is 7.5%. The increase due to new construction is based on the value of new construction which is estimated using per unit and per square foot average values which are escalated at 5.0% per year. The following are the assumed per unit values of new construction by type:

| | |
|---------------|-----------------|
| Single family | \$88,000 /unit |
| Multifamily | \$40,000 /unit |
| Office | \$32.65 /sq.ft. |
| Retail | \$47.70 /sq.ft. |
| Business park | \$76.56 /sq.ft. |
| Government | \$32.65 /sq.ft. |

- Value of property turnover: an estimate of the value of property sales is provided to estimate annual real estate excise taxes. The annual estimate of property sales is based on an assumption that 8.75% of the value of property in the City will turnover annually.
- Taxable retail sales: taxable retail sales are based on sales volumes per square foot of commercial building which are escalated at 4% per year. The following are the assumed sales volumes by type of commercial activity, which have been adjusted to current year collections:

| | |
|---------------|------------------|
| Office | \$9.20 /sq.ft. |
| Retail | \$141.64 /sq.ft. |
| Business park | \$9.54 /sq.ft. |
| Government | \$8.32 /sq.ft. |

Cost Module

General description: The cost module contains estimates and assumptions about the cost of providing government services and policy variables regarding level of service for each of three primary cost categories: parks and open space; transportation; and surface water management. In order to account for all government expenditures, all other government costs are tracked under a cost category called Other government costs.

- Parks and OS: capital costs for parks and open space are based on the City's policy regarding amount of park space per capita (LOS), and maintenance and operations (M&O) costs are based on current year averages. Costs are determined according to the current inventory of park in each category and the relevant LOS to determine new construction requirements. The assumptions about the cost per acre for capital and M&O and the policy LOS for each park type is as follows:

| <u>Park type</u> | <u>Land cost</u> | <u>Facility cost</u> | <u>M&O cost</u> | <u>LOS</u> |
|------------------|------------------|----------------------|---------------------|------------|
| Neighborhood | \$35,000 | \$86,000 | \$1,900 | 2.0 |
| Community | \$70,000 | \$110,000 | \$3,700 | 2.5 |
| Linear | \$35,000 | \$12,000 | \$1,900 | 1.6 |
| Open space | \$27,400 | \$35,000 | \$500 | 6.2 |
| Special use | \$196,000 | \$100,000 | \$5,000 | 2.4 |

The costs are escalated at an annual rate of 4%.

- Transportation: transportation costs can be determined in two ways. The first method allows the user to program a given capital improvement program, such as the long-range Transportation Improvement Plan (TIP) to generate the capital facility requirements. This was the method used for the fiscal analysis in this report.

The other method builds up a capital cost estimate at the PAZ level on the basis of the estimates of traffic congestion and level of service. This

method allows the user to set a policy variable that relates to current congestion levels and this policy level of congestion is maintained throughout the 20-year model horizon. Growth in vehicle miles traveled on congested arterials is linked to the growth in population and employment growth in the growth module. The policy LOS is calculated each year and when the deficiency reaches a maximum threshold (currently assumed to be 1 arterial lane mile) new capital improvements are required to return the system to the adopted LOS. The cost per mile of right of way and construction is assumed to be \$950,000 and \$3,560,000 respectively. These costs are escalated each year at 4%.

The cost of maintenance is based on the number of arterial lane miles in each PAZ and the per mile cost of maintaining these roads. The per mile cost is assumed to adjust from the current \$2,250 to an eventual \$17,900, which is the cost to fully fund the street overlay program. This adjustment is assumed to take place over 10 years. The costs are also escalated a 4% per year due to general inflation.

- **Surface water management:** surface water management costs were provided by the City of Federal Way
- **Other government costs:** are based on current budget and escalated at 4% per year.

Revenue Module

General description: The revenue module contains all of the estimates and assumptions regarding the taxable base and revenue yields of each source of City revenues. Much of this work is based on data provided by the City, and has been modified to reasonably link the revenue estimates to variables of growth.

- **Property tax levy:** Based on current PAZ level assessed values of property and linked to the value of new construction activity in the Growth Module. The estimate of taxable base is increased for the value of new construction each year, and for reevaluations every two years. The assumed increase due to biennial reevaluations is 7.5%. The increase due to new construction is based on the value of new construction which is estimated using per unit and per square foot average values which are escalated at 5.0% per year.

The estimate of property tax revenues generated annually depends on the mill rate assumptions which are a reflection of the taxing policies of the City. The model is set up to impose a revenue neutral policy or allow the user the flexibility to select any other levy rate to simulate an alternative policy. The growth in revenues are capped by the 106%

District

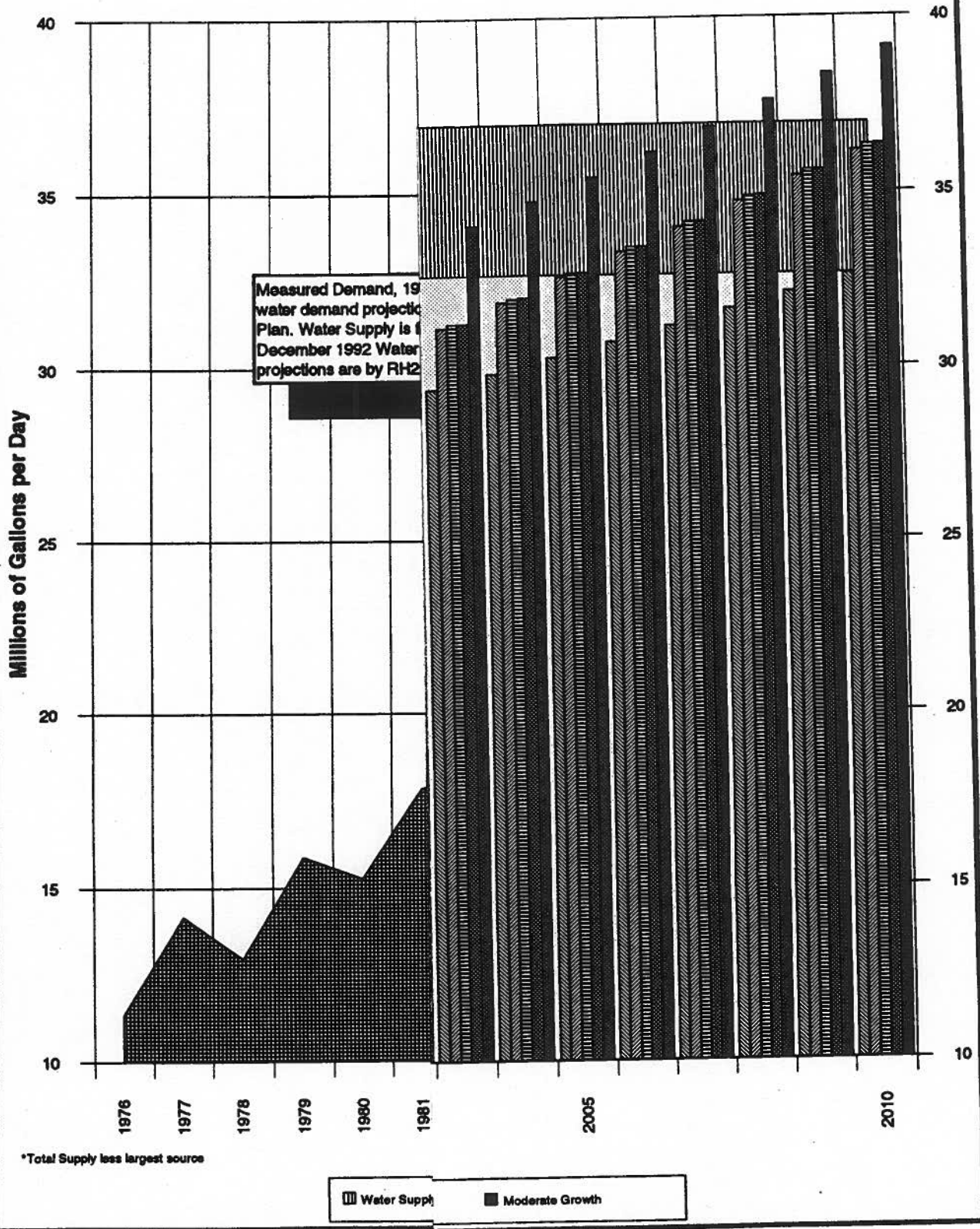
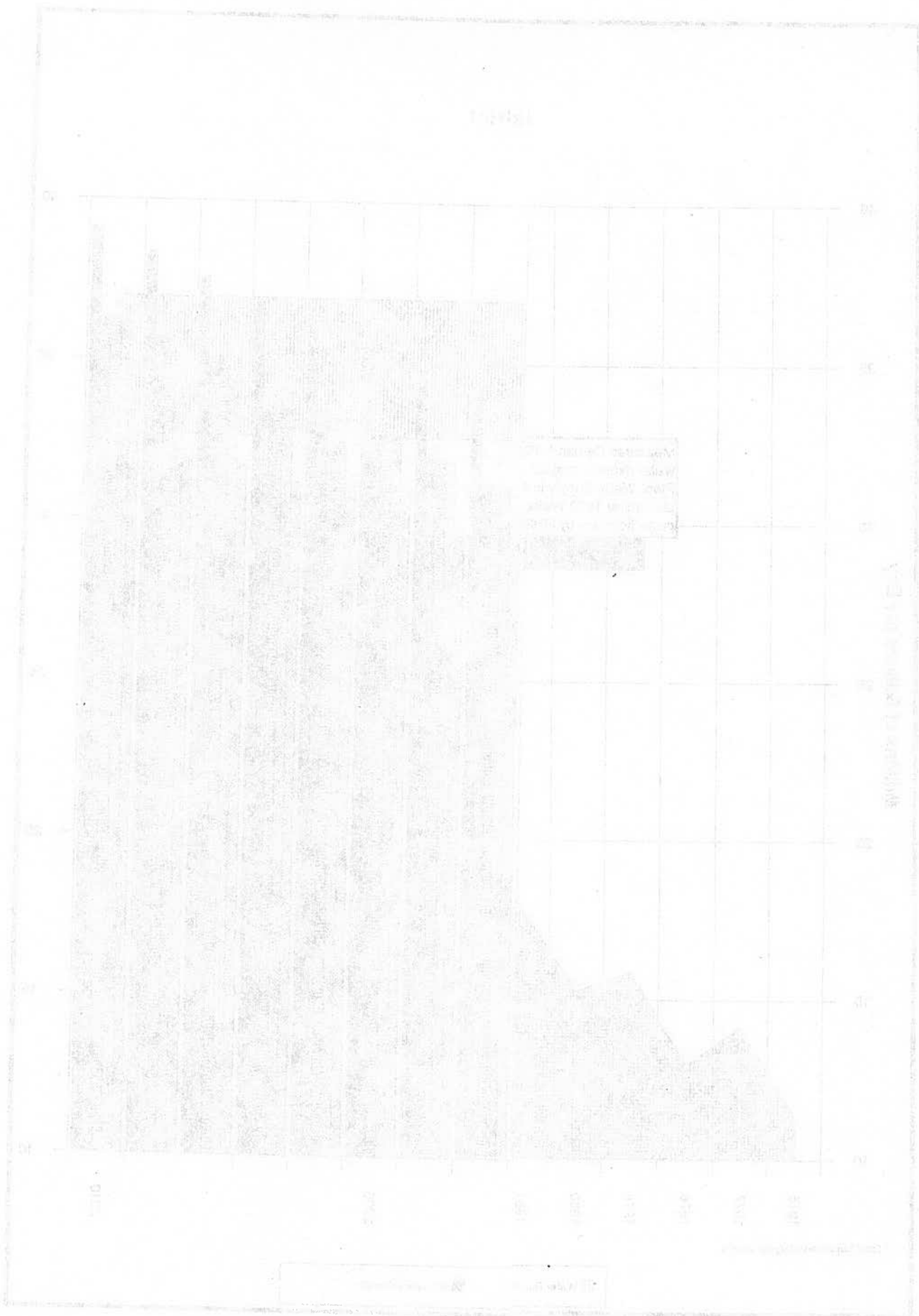


Figure 1



statutory limit. Property tax collections are assumed to be 99% of the annual levy (1% assumed delinquencies). For this analysis the mill rate was assumed to be increased the lesser of 2% per year or the maximum statutory increase given the 106% limit.

- **Local sales tax:** Local option sales tax is based on the value of taxable retail sales in the City of Federal Way which is determined in the growth module on the basis of average per square foot sales volumes for commercial space. The per foot estimates of sales volume are escalated at the rate of general inflation (4%), and the total value of taxable retail sales are linked to the growth in the square footage of commercial buildings in the City.
- **Criminal justice sales tax:** Based on current per capita revenues and increases linked to population growth. The per capita rate is adjusted according to growth in taxable retail sales.
- **MVET:** Based on current per capita revenues and increases linked to population growth. The per capita rate is escalated at 3.0% per year, based on recent trends.
- **Liquor profits:** Based on current per capita revenues and increases linked to population growth. The per capita rate is kept constant through the period.
- **Liquor excise tax:** Based on current per capita revenues and increases linked to population growth. The per capita rate is kept constant through the period.
- **Franchise Fees:** Taken from estimates provided by the City, annual growth of 4.0%.
- **Gambling Tax:** Taken from estimates provided by the City, annual growth of 4.0%.
- **Licenses & Permits:** Taken from estimates provided by the City, annual growth of 4.0%.
- **Sales & Use Equalization:** Taken from estimates provided by the City.
- **Zoning Fees:** Taken from estimates provided by the City, annual growth of 4.0%.
- **Sale of Publications:** Taken from estimates provided by the City, annual growth of 4.0%.

- **False Alarm Fees:** Taken from estimates provided by the City, annual growth of 4.0%.
- **Plan Check Fees:** Taken from estimates provided by the City, annual growth of 4.0%.
- **Fines & Forfeits:** Taken from estimates provided by the City, annual growth of 4.0%.
- **State Criminal Justice Grant:** Taken from estimates provided by the City, annual growth of 4.0%.
- **Interest Earnings:** Taken from estimates provided by the City, annual growth of 4.0%.
- **County Park Payment:** Taken from estimates provided by the City, annual growth of 4.0%.
- **Recreation Fees:** Taken from estimates provided by the City, annual growth of 4.0%.
- **Transfer-In IAC Grant:** Taken from estimates provided by the City.
- **Transfer-In CDBG:** Taken from estimates provided by the City.
- **Miscellaneous:** Taken from estimates provided by the City.
- **B&O tax collections:** B&O tax is assessed on an the total value of business transactions in the City of Federal Way, in retail, wholesale, manufacturing, and services. The estimate of B&O base is measured as 122% of the value of taxable retail sales. B&O taxes are not assumed to be used for this analysis.
- **Utility tax collections:** The following utility tax revenue options are included in the model framework. The street utility tax rate is assumed to be \$12 per household or employee per year. All other utility tax rates are assumed to be charged at 3%.

Street utility taxes: street utility taxes are based on a per household and per job charge.

Electric utility tax: electric utility taxes are determined by applying a tax rate to the value of electric utility revenues in the City of Federal Way. Revenue estimates were provided by the City and are escalated at 1.0% per year, based on recent trends.

Gas utility tax: gas utility taxes are determined by applying a tax rate to the value of gas utility revenues in the City of Federal Way.

Revenue estimates were provided by the City and are escalated at 1.0% per year, based on recent trends.

Garbage utility tax: garbage utility taxes are determined by applying a tax rate to the value of garbage utility revenues in the City of Federal Way. Revenue estimates were provided by the City and are escalated at 2.0% per year, based on recent trends.

Cable utility tax: cable utility taxes are determined by applying a tax rate to the value of cable utility revenues in the City of Federal Way. Revenue estimates were provided by the City and are escalated at 4.0% per year, based on recent trends.

Phone utility tax: phone utility taxes are determined by applying a tax rate to the value of telephone company revenues in the City of Federal Way. Revenue estimates were provided by the City and are escalated at 1.0% per year, based on recent trends.

Storm drainage utility tax: storm drainage utility taxes are determined by applying a tax rate to the value of storm drainage utility revenues in the City of Federal Way. Revenue estimates were provided by the City and are escalated at 1.0% per year, based on recent trends.

- **SWM Utility Revenues:** SWM revenues are assumed to adjust to reflect the cost of providing SWM services, and are therefore tied to growth in SWM costs.

Cash Flow Module

General description: The cash flow module brings together the cost and revenue module outputs and determines the balance of cash in and cash out. This module is where the unfunded capital needs are funded with the use of voter approved property tax levy bonds.

- **Maintenance and operations:** General fund revenues are matched with the estimated annual City maintenance and operations costs (excluding transportation). Any funds remaining are transferred to the Street Fund.
- **Street fund:** Transportation maintenance is paid for by dedicated transportation funds from the motor fuel tax and vehicle registration fees. Any funds left over each year are available for capital spending.
- **SWM Fund:** Surface water management costs and expenditures are balanced using SWM user fees. There are not assumed to be any transfers in or out of this fund.

- **Arterial Street Fund:** Transportation capital projects are funded using motor fuel tax revenues.
- **Impact Fees:** Annual impact fees are determined for transportation and parks and open space on a per new housing unit basis. These impact fees are available to pay for unfunded capital improvements. Impact fee rates for this analysis assumes \$750 per new dwelling unit for parks and open space and \$1,750 per new dwelling unit for transportation.
- **Transfers from 1/4% REET:** Any available funds remaining from either REET fund are available for unfunded capital improvements.
- **Special Issue Bonds:** All remaining unfunded capital improvements are funded using special issue bonds supported by a special levy on property values. The financing terms of these bonds is assumed to be 7% for 20 years and each time the minimum threshold of unfunded projects is reached a new issue is sold to pay for the projects.

FISCAL IMPACTS

The fiscal impacts to the City of Federal Way of each of the 3 land use concepts are summarized in Table 48. Overall, the differences in the net fiscal impact of these alternative development patterns are relatively minor. In each of the land use concepts, the residential component varies only slightly; therefore all of the costs and revenues which are sensitive to changes in residential population are similarly affected. The major fiscal differences between the concepts arise from differences in the commercial element of each concept. Generally, the more intense the commercial development assumed, the better the city's fiscal balance.

The primary impact of the different commercial elements is felt in property tax revenues. The concepts with more extensive commercial/industrial development raise the assessed value of property in the city and as a result property tax revenues grow more rapidly. To illustrate, one need only look at how the General Fund revenues vary under each concept. Property tax revenues are expected to grow more rapidly than other sources and are estimated to account for over 30% of Federal Way's General Fund revenues by 2010. Concept 3, the most intense commercial buildout scenario, generates almost \$25 million more in General Fund revenues over 20 years than does Concept 1.

Despite the differences in revenue generating capacity of the commercial element, the net fiscal impact of each concept is not significantly different, as measured by the total unfunded capital facility requirements. For all 3 concepts the cumulative unfunded capital needs exceed \$100 million. When these needs are met through the use of special issue bonds, backed by property assessments, the rate impact varies from a high of \$1.09 per \$1,000 of assessed value of property to a low of \$1.05 per \$1,000 of assessed value.

Detailed annual cash flow tables for each of the land use concepts are presented in Appendix G.

As shown in Table 48, between \$93.5 and \$113.4 million in unfunded capital improvements would be required under the land use concepts for identified facilities, assuming that other revenues sources (e.g., tax rates) are held constant. The analysis shows costs associated with bond financing of the capital facilities. Other capital facilities – including sewer and water system improvements, stormwater facilities, and other governmental facilities – may also be required to serve future growth and will be provided by a variety of governmental entities. Fiscal impacts of these facilities will be evaluated as the land use plan is refined.

The Growth Management Act requires integration of land use and capital facility planning. This Draft EIS is intended to help the public and city decision makers evaluate some of the relationships and tradeoffs among land use, capital facility needs, public costs, and growth. The Final EIS will evaluate these issues further.

A number of options are available if identified facility needs cannot be financed. In general, these options involve different levels of service, land use modifications, and/or alternative funding approaches to accommodate growth. Service standards (e.g., parks acreage per city resident) could be reduced to lower the cost of needed facilities. This also implies "less" service, however, and possibly a reduced "quality of life".

Another option could involve changing the city's land use mix. For example, Table 48 illustrates that additional commercial development embodied in Concept 3 reduces the unfunded capital need from Concept 1 levels. A land use pattern with more commercial development, for example, could reduce reliance on bonds. It is not clear, however, whether the market could support significantly more commercial uses in Federal Way. If capital facilities to support forecasted growth cannot be provided, land use could possibly be adjusted to accommodate lower levels of growth. This is required by the GMA and CPPs.

The City could also consider different types of financing mixes to increase revenues and reduce reliance on bond financing. The City could evaluate its current tax structure and tax rates. Authorized but currently unused taxes, for example, could be imposed to increase revenues. Alternatively, tax rates that are below permitted levels could be increased. Such measures may not be popular with taxpayers, however. Increased use of incentives or joint (public/private) financing could also be considered.

A "hybrid" solution might include a combination of adjustments to land use, service standards, and financing methods. Some combination of bond issuance, service standard changes, and change of land uses might accomplish the funding objectives in a feasible and acceptable way. Alternately, the City may have to reduce its growth target if workable combination of land use, service standards, and financing cannot be achieved.

**Table 48
Summary of Fiscal Impacts
(Current year dollars)**

| | Existing | Concept 1 | Concept 2 | Concept 3 |
|---|-----------|---------------|---------------|---------------|
| Commercial Activity | | | | |
| Office Space | 2,535,000 | 4,135,000 | 5,135,000 | 6,535,000 |
| Retail Space | 4,594,000 | 5,314,000 | 5,314,000 | 5,894,000 |
| Manufacturing space | 2,637,000 | 3,237,000 | 3,237,000 | 3,737,000 |
| Government space | 3,293,000 | 5,013,000 | 5,073,000 | 5,033,000 |
| Residential activity | | | | |
| New SF | 24,760 | 32,122 | 32,162 | 31,644 |
| New MF | 13,428 | 23,835 | 23,789 | 24,305 |
| Employment | | | | |
| Population | 30,309 | 42,589 | 46,709 | 54,222 |
| | 97,397 | 124,943 | 124,973 | 124,470 |
| Cumulative Revenues | | | | |
| General Fund | | \$772,620,077 | \$776,232,491 | \$796,810,942 |
| Street Fund* | | \$358,604,002 | \$362,189,325 | \$382,886,804 |
| Arterial Street Fund* | | \$23,118,871 | \$23,131,691 | \$23,038,919 |
| Impact fees for transportation | | \$57,334,564 | \$57,202,463 | \$56,822,816 |
| Impact fees for parks and O/S | | \$22,229,552 | \$22,111,677 | \$22,594,669 |
| SWM fee revenues | | \$79,180,545 | \$79,180,545 | \$79,180,545 |
| Cumulative Costs | | | | |
| General Fund expenditures | | \$465,424,653 | \$465,479,182 | \$465,161,636 |
| Transportation M&O | | \$123,340,159 | \$123,240,159 | \$123,240,159 |
| SWM M&O | | \$44,925,867 | \$44,925,867 | \$44,925,867 |
| Capital: parks & O/S | | \$133,096,660 | \$133,216,716 | \$134,420,382 |
| Capital: transportation | | \$137,135,602 | \$137,135,602 | \$137,135,602 |
| Capital: SWM | | \$43,232,430 | \$43,232,430 | \$43,232,430 |
| Capital reserve account at end of period | | \$93,500,131 | \$96,249,716 | \$113,467,353 |
| Special levy bonds issued | | \$24,778,635 | \$24,457,198 | \$21,282,571 |
| Annual debt service (end of period) | | \$2,338,928 | \$2,308,586 | \$2,008,924 |
| Special assessments per \$1000 prop value | | \$0.26 | \$0.25 | \$0.22 |

IV. IMPLEMENTATION STRATEGIES

The discussion below identifies some broad potential directions for the Comprehensive Plan and implementation program; it also suggests ways to tie together some related plan elements. The discussion builds on some of the mitigation measures identified in the Draft EIS and suggests a number of options for dealing with potential impacts. These ideas are preliminary and are presented here to promote thought and discussion. These and other ideas here will be amplified and refined throughout the comprehensive planning and environmental review process.

A preferred Comprehensive Plan land use alternative will be prepared by the City using the environmental analysis in this Draft EIS along with input from citizens, elected officials and interested governmental agencies, and the findings of ongoing technical studies. The City will also begin work on a program to implement the plan, including zoning and other regulations, incentives, and capital improvement/financing proposals. In general, these policies, plans and programs will be designed to accomplish the City's overall growth management objectives; these include mitigating environmental impacts identified in the Draft EIS. One of the City's primary goals is to integrate solutions to environmental issues in its Comprehensive Plan and implementation program. This section discusses some of the implications of the analysis in the Draft EIS and suggests some potential strategies for resolving issues as the City moves forward.

ENVIRONMENTAL PROTECTION

Geologic Hazards & Water Resources

- Land use designations (i.e. the location of uses and densities) will reflect the presence of known geologic hazards, including areas with potential for landslides, erosion and aquifer recharge. The City will continue to identify and map these areas over time, as a result of research and inventories and in connection with development proposals. The Comprehensive Plan's land use map may be amended, as appropriate, to reflect the presence of newly identified geologic hazards.
- Alternative approaches for protecting the City's drinking water supplies will be investigated. Ongoing geohydrologic studies should enable the City to identify aquifer recharge areas more clearly and to adjust land uses in response. An option that would enable the City to further protect its ground water supplies involves classifying recharge areas based on geology and hydrology and its vulnerability to contamination (e.g. high, medium or low sensitivity). Land uses and activities posing a threat of contamination could be limited or prohibited through regulations in highly sensitive recharge areas. In all recharge areas, storm water planning could

emphasize appropriate Best Management Practices (BMPs) and use of infiltration systems. Siting and operational planning should also emphasize proper handling, storage, transport and disposal of substances that could potentially contaminate ground water.

- ❑ The City's storm water requirements will also be reviewed and adjusted to reflect requirements in the Storm Water Management Manual for the Puget Sound Basin (DOE, 1992). Modifications would be focused on preventing erosion, sedimentation and flooding, and preserving water quality.
- ❑ In cooperation with adjacent jurisdictions and interested agencies, the City will consider preparing basin plans for individual drainage basins. The plans could provide a means for further integrating growth management planning with resource protection (e.g. streams, wetlands, habitat, aquifers) and storm water management.

Habitat and Wetlands

- ❑ The City's existing wetland inventory will be updated and supplemented over time, both through field studies and in connection with specific development proposals. As required by GMA, Federal Way will also review its Environmentally Sensitive Areas regulations to ensure that critical environmental resources are protected and that resource management is coordinated with planned land use. This review will evaluate the pros and cons of classifying wetlands according to functions and values, and establishing buffers that reflect wetland sensitivity and adjacent land use. The review will also consider the potential for using non-regulatory techniques for wetland management, including acquisition and incentives. Overall, the City's implementation program will reflect the GMA requirement to protect critical areas while accomplishing other important public objectives.
- ❑ Habitat for priority species will be identified and the City will consider whether additional protection of such areas is warranted. Department of Wildlife management guidelines will be reviewed to help identify appropriate levels of protection. The City will review its site planning and landscaping requirements and seek to better coordinate them with habitat concerns (as well as with water conservation needs); potential incentives for preserving locally important habitat will be considered. Habitat will also be used to help identify an open space system to support the preferred land use alternative.

Land Use and Housing

- ❑ The basic land use pattern embodied in land use concepts 2 and 3 are consistent with residents' expressed vision for Federal Way, with existing community character, and with the objectives of the GMA and Countywide Planning Policies (CPP). The City's preferred land use alternative will reflect that regional framework; zoning designations and other implementing regulations will be consistent with the plan. The City will monitor changes to the CPP over the coming months and will reflect any significant changes to policies and standards, particularly with regards to the Urban Center.
- ❑ The City will continue to develop its parcel-based Geographic Information System (GIS). This will provide a tool for collecting and evaluating data about the land base, including environmental features and services and utilities.
- ❑ To confirm that the plan's development assumptions are realistic, the City will perform additional analysis of land supply in the Final EIS. The plan will also identify quantifiable measures (or "benchmarks") that can be monitored over time to indicate any changes in market conditions or land supply/demand relationships that would hinder accomplishing the Comprehensive Plan's multiple objectives. Factors that could be monitored include land supply, land absorption, development density, land cost, housing cost, household size, and redevelopment trends. The monitoring program will also identify potential corrective actions.
- ❑ The City will evaluate the pros and cons of including a "minimum density" requirement in its zoning ordinance. The intent is to ensure that density targets and assumptions underlying the plan are being achieved.
- ❑ The City will evaluate information in the Draft EIS and ongoing studies relating to potential constraints to growth associated with water supply, needs for public services and capital facilities, and limitations of public financing. These data will be used to determine if, when and where growth "phasing" may be necessary or appropriate. Phasing is a tool to help manage the location and timing of growth consistent with any identified constraints. Potential tools to implement phasing could include designation of priority or sequential growth areas, targeting infrastructure to encourage development, and/or interim controls to prevent premature development.
- ❑ In cooperation with King County and affected residents, and based on information in the EIS and other studies, the City will identify the potential sequence and timing of annexation of adjacent unincorporated lands within the Urban Growth Area. It will also work with King County to negotiate interlocal agreements relating to development standards, levels of service and other issues affecting the transition of unincorporated lands.

- ❑ The City will evaluate a broad range of land use and financial incentives and non-regulatory tools that could help accomplish objectives for an Urban Center. These could include infrastructure investments, density bonuses, process incentives, public-private partnerships and joint development programs.
- ❑ A review of existing City ordinances, programs and processes will be undertaken as part of the Comprehensive Plan implementation program. Among other things, this review will seek to identify any regulatory barriers (substantive or procedural) to achieving construction of the least cost housing possible consistent with public health and safety. This will include identification of standards that are excessive or that add to housing cost without commensurate public benefit.
- ❑ To provide choice of housing types and costs, zoning should permit small lot single-family units, zero lot line development, and townhouse units, as well as multi-family units. A broad range of housing types and tenure is most likely to maximize housing choice.
- ❑ Potential actions that could expand the City's supply of affordable housing, and that will be evaluated further, might include permitting accessory units, and incentives or requirements for a percentage of affordable units in development proposals.

Visual Quality and Design

- ❑ Improving urban design will be an important objective of the Comprehensive Plan. The preferred land use alternative will include clearly stated policies and guidelines that reflect residents' goals and expectations for visual quality and an integrated design vision for the Federal Way. Clear design policies and guidelines are seen as one way of mitigating potential land use incompatibilities and protecting existing and new neighborhoods. Zoning regulations will embody these policies and apply them to development and redevelopment proposals. The City may also consider alternatives for conducting design review (e.g. administrative or commission). Open space and capital facilities are other plan elements aimed at achieving a high level of quality and consistency in the City's visual appearance.
- ❑ A City Center element of the Comprehensive Plan will include policies and guidelines for desired physical improvements, design and amenities that will occur in the central business district. Implementation is likely to require a combination of public and private actions that focus on a consistent vision of how the City Center is intended to look and function. Techniques could include public-private partnerships and joint development, targeted infrastructure spending, and provision of economic incentives.

Capital Facilities/Transportation

- The EIS identifies a range of road improvements designed to improve traffic congestion, safety and mobility. The costs of these improvements, and revenues likely to be available to fund them, is identified in the *Fiscal Impacts* section of the Draft EIS. Ongoing traffic and financial planning will evaluate alternatives for levels of service and combined public and private financing of these improvements, consistent with the GMA.
- Decisions on a regional rail system will likely be made in 1994; a public vote must occur before such a system can be constructed. The City will continue to make provision for a rail system (right-of-way corridors and station locations, etc.) in its planning. The potential transportation and land use effects of high capacity rail transit service to Federal Way and location of rail transit stations will be evaluated in the Final EIS. Similarly, the Final EIS (and the SEIS on the Countywide Planning Policies) will evaluate the implications of no rail system (to the City and region).
- Alternative level of service standards for parks and open space, and the costs of providing necessary facilities, will be further studied. The use of fees, dedications and other forms of private funding, as permitted by state law, and public financing programs will be evaluated to determine equitable sharing of costs, timing and other issues.
- The City will continue to work cooperatively with other service providers, including the School District, Sewer and Water District, Fire District and Police Department. Capital improvement programs of each service provider will be coordinated with planned growth, consistent with state law and the mission of these special districts and departments.
- The Comprehensive Plan's Capital Facilities element will identify cumulative service and facility needs and provide a means for coordinating them with the plan's land use element. Ongoing monitoring and periodic Comprehensive Plan updates will provide a means to achieve concurrent provision of services and facilities with growth. Phasing, discussed above, or adjustments to the City's growth targets and land use plan, could become necessary if acceptable levels of service and funding for capital facilities cannot be achieved.
- The financial analysis for the Capital Facilities element will include review of permitted financing sources, rates and techniques. The City's objective will be to develop a financing program that accommodates growth consistent with GMA requirements, does not place an unacceptable burden on taxpayers, and results in equitable sharing of costs as between existing development and new growth.

The first identifies a range of road improvements designed to improve traffic congestion, safety and mobility. The costs of these improvements and revenues to be available to fund them is identified in the fiscal impact section of the Local FIS. Capital investment financial planning will be done in accordance with the fiscal impact and combined public and private financing of these projects consistent with the CMA.

Estimate on a regional rail system will likely be made in 1994. A rail system with a cost of \$1 billion can be constructed. The City will continue to make provision for a rail system (light rail system) and station locations (etc) in its planning. The potential transportation and land use impacts of high capacity rail transit service to Federal Way and location of rail transit stations will be analyzed in the final FIS. Similarly, the final FIS and the City's on the Greenway Planning Program will evaluate the implications of the rail system for the City and region.

Alternative level of service standards for parks and open space and the costs of providing necessary facilities will be further studied. The cost of land, dedications and other forms of private funding to be provided by state, local and public financing programs will be evaluated to determine equitable sharing of costs, state, local and private.

The City will continue to work cooperatively with other service providers including the School District, Port and Water District, Fire District and other agencies. Capital investment programs of each agency will be coordinated with the City's capital program to ensure consistency with state and the mission of the regional district and agencies.

The Comprehensive Urban Capital Budget or current will identify innovative services and facilities and provide a means for providing them with the City's own resources. Capital investment programs will be coordinated with the City's capital program to ensure consistency with state and the mission of the regional district and agencies. Planning, financing, and other forms of private funding to be provided by state, local and public financing programs will be evaluated to determine equitable sharing of costs, state, local and private.

The financial analysis for the Capital facilities program will include review of potential financing sources, state and local. The City's objectives will be to develop a financing program that accounts for growth consistent with CMA requirements. The program will also be consistent with the City's goals for growth and land use planning and will be consistent with the fiscal impact and combined public and private financing of these projects consistent with the CMA.

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DIR - LOCAL GOVT AFFAIRS
2155 - 112TH AVENUE NE #100
BELLEVUE WA 98004

WATER DISTRICT #54
922 SOUTH 219TH STREET
DES MOINES WA 98198-6392

HIGHLINE WATER DISTRICT
P.O. BOX 3867
KENT WA 98032-0367

MIDWAY SEWER DISTRICT
P.O. BOX 3487
KENT WA 98032

WATER DISTRICT #111
27224 - 144TH AVENUE SE
KENT WA 98042-9058

COVINGTON WATER
DISTRICT
18631 SE 300TH PLACE
KENT WA 98042-9208

SO KING COUNTY
REG WATER AUTHORITY
13335 SE 248TH PLACE
KENT WA 98042

TERRY LUKENS
CITY OF BELLEVUE
CITY COUNCIL OFFICE
P.O. BOX 90012
BELLEVUE WA 98009-9012

PIERCE COUNTY BOUNDARY
REVIEW BOARD
2401 SOUTH 35TH STREET
TACOMA WA 98409

MICHAEL SPENCE
DIRECTOR OF GOV'T AFFAIRS
SEA/KING CO ASSOC. OF
REALTORS
12015 115TH AVE. NE, STE 295
KIRKLAND WA 98034

LEAGUE OF WOMEN VOTERS
OF SOUTH KING COUNTY
800 SW 152ND
SEATTLE WA 98166

FED WAY WOMEN'S
NETWORK
P.O. BOX 3064
FEDERAL WAY WA 98003

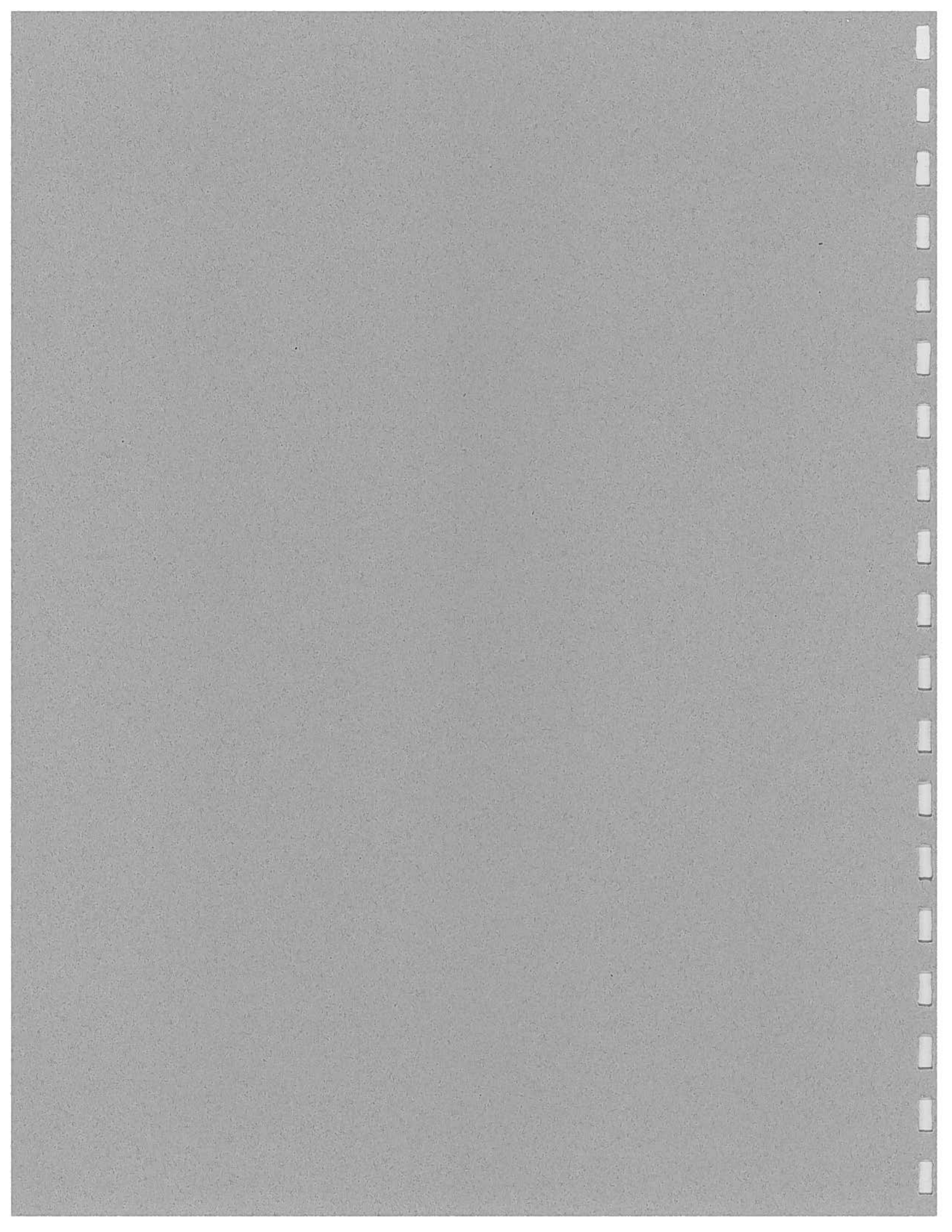
FED WAY COMMUNITY
COUNCIL
HOPE ELDER
30105 - 2ND PLACE SW
FEDERAL WAY WA 98023

KING CO PARKS &
RECREATION
2645 SOUTH 312TH STREET
FEDERAL WAY WA 98003

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MAY 10 1964
FEDERAL BUREAU OF INVESTIGATION
U.S. DEPARTMENT OF JUSTICE
WASHINGTON, D.C. 20535
COMMUNICATIONS SECTION
TELETYPE UNIT
MAY 10 1964

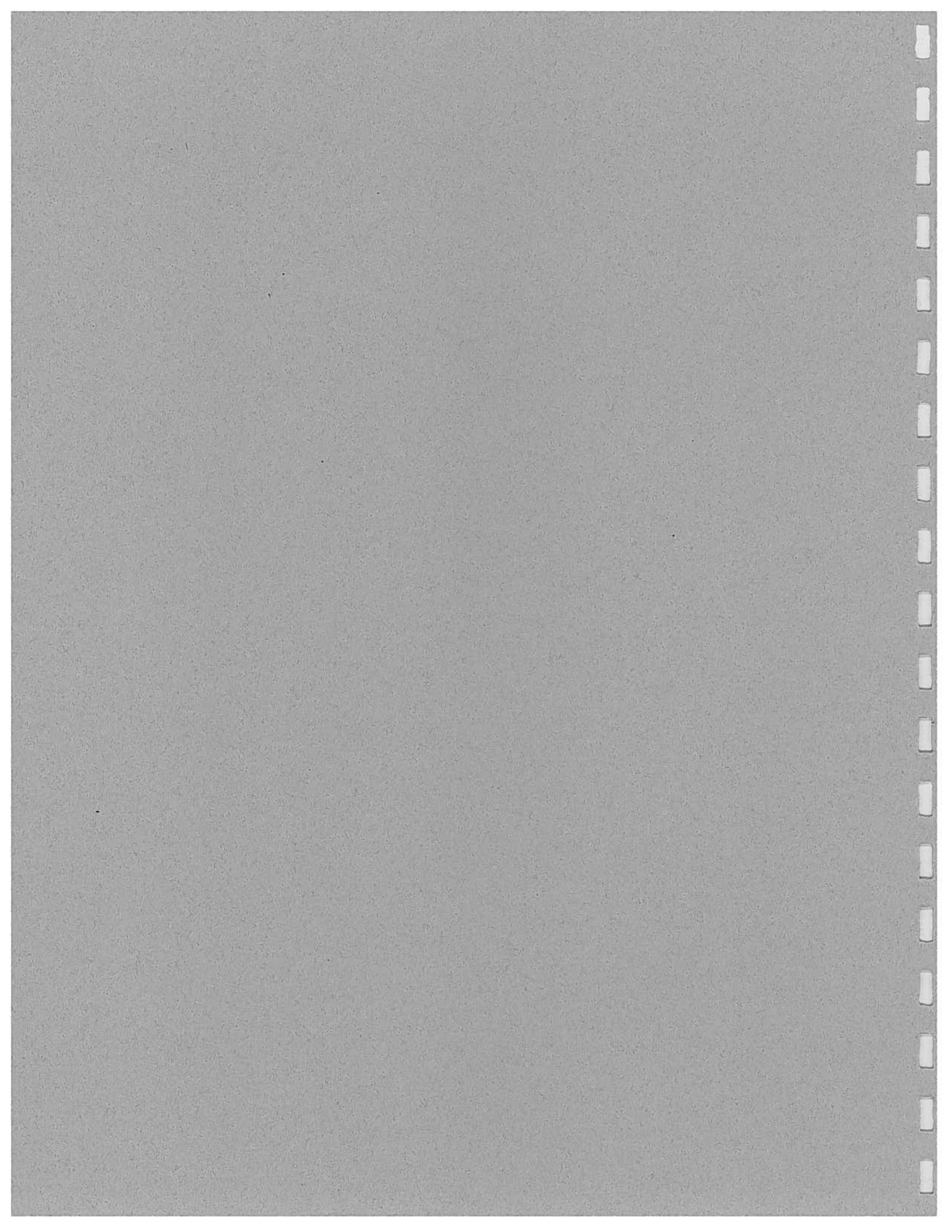
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From Vision to Plan



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| 1990 Existing Conditions | | | | | | | | | | |
|--------------------------|---------------------------|---------------------------------|---------------------------------|-----------------------|---|-------|------|------------------------------|-------|-----|
| Level of Service | Functional Classification | Vehicle-Miles Traveled (veh-mi) | Vehicle-Hours Traveled (veh-hr) | Average Speed (mi/hr) | Emission Factor (g/veh-mi) ^a | | | Peak-Hour Emissions (pounds) | | |
| | | | | | HC | CO | NOx | HC | CO | NOx |
| A,B,C,D | Neighborhood Collectors | 8,488 | 327 | 26 | 3.96 | 44.13 | 3.87 | 74 | 826 | 72 |
| | Collector Arterials | 14,644 | 474 | 31 | 3.37 | 37.64 | 3.90 | 109 | 1,215 | 126 |
| | Minor Arterials | 17,475 | 552 | 32 | 3.27 | 36.58 | 3.91 | 126 | 1,409 | 151 |
| | Principle Arterials | 21,204 | 648 | 33 | 3.18 | 35.59 | 3.92 | 149 | 1,664 | 183 |
| E | Neighborhood Collectors | 557 | 26 | 21 | 4.60 | 51.23 | 3.88 | 6 | 63 | 5 |
| | Collector Arterials | 3,609 | 132 | 27 | 3.70 | 41.27 | 3.88 | 29 | 328 | 31 |
| | Minor Arterials | 3,376 | 132 | 26 | 3.96 | 44.13 | 3.87 | 29 | 328 | 29 |
| | Principle Arterials | 12,263 | 428 | 29 | 3.58 | 39.98 | 3.88 | 97 | 1,081 | 105 |
| F | Neighborhood Collectors | 1,237 | 55 | 20 | 4.79 | 53.39 | 3.88 | 13 | 146 | 11 |
| | Collector Arterials | 2,114 | 106 | 21 | 4.60 | 51.23 | 3.88 | 21 | 239 | 18 |
| | Minor Arterials | 1,954 | 93 | 21 | 4.60 | 51.23 | 3.88 | 20 | 221 | 17 |
| | Principle Arterials | 20,687 | 1,019 | 24 | 4.10 | 45.71 | 3.87 | 187 | 2,085 | 177 |
| TOTAL = | | 107,608 | 3,992 | 23 | | | | 860 | 9,602 | 923 |

Source: City of Federal Way, KJS Associates, Inc., and McCulley, Frick and Gilman, Inc.
 Computed with Mobile5.OA. Based on 1990 Washington vehicle registration and the Inspection & Maintenance Program.

2010 Concept 1

| Level of Service | Functional Classification | Vehicle-Miles Traveled (veh-mi) | Vehicle-Hours Traveled (veh-hr) | Average Speed (mi/hr) | Emission Factor (g/veh-mi) * | | | Peak-Hour Emissions (pounds) | | |
|------------------|---------------------------|---------------------------------|---------------------------------|-----------------------|------------------------------|-------|------|------------------------------|--------------|------------|
| | | | | | HC | CO | NOx | HC | CO | NOx |
| A,B,C,D | Neighborhood Collectors | 11,986 | 456 | 26 | 2.32 | 26.26 | 2.48 | 61 | 694 | 66 |
| | Collector Arterials | 20,388 | 626 | 33 | 1.95 | 20.42 | 2.49 | 88 | 918 | 112 |
| | Minor Arterials | 20,512 | 626 | 33 | 1.95 | 20.42 | 2.49 | 88 | 923 | 113 |
| | Principle Arterials | 24,565 | 804 | 31 | 2.06 | 22.10 | 2.48 | 112 | 1,197 | 134 |
| | Carpool Lanes | 3,773 | 101 | 37 | 1.73 | 17.03 | 2.51 | 14 | 142 | 21 |
| E | Neighborhood Collectors | 2,213 | 95 | 23 | 2.58 | 30.33 | 2.48 | 13 | 148 | 12 |
| | Collector Arterials | 5,816 | 250 | 23 | 2.58 | 30.33 | 2.48 | 33 | 389 | 32 |
| | Minor Arterials | 7,604 | 301 | 25 | 2.40 | 27.50 | 2.48 | 40 | 461 | 42 |
| | Principle Arterials | 22,465 | 911 | 25 | 2.49 | 28.86 | 2.48 | 123 | 1,429 | 123 |
| | Carpool Lanes | 2,423 | 78 | 31 | 2.00 | 21.24 | 2.49 | 11 | 113 | 13 |
| F | Neighborhood Collectors | 386 | 29 | 13 | 3.80 | 45.86 | 2.63 | 3 | 39 | 2 |
| | Collector Arterials | 6,458 | 407 | 18 | 3.13 | 38.19 | 2.51 | 45 | 544 | 36 |
| | Minor Arterials | 2,042 | 100 | 21 | 2.80 | 33.69 | 2.48 | 13 | 152 | 11 |
| | Principle Arterials | 19,834 | 1,013 | 22 | 2.69 | 31.93 | 2.48 | 118 | 1,396 | 108 |
| | Carpool Lanes | 897 | 36 | 25 | 2.49 | 28.86 | 2.48 | 5 | 57 | 5 |
| TOTAL = | | 151,362 | 5,833 | 26 | | | | 766 | 8,602 | 829 |

Source: City of Federal Way, KJS Associates, Inc., and McCulley, Frick and Gilman, Inc.
 * Computed with Mobile5.OA. Based on 1990 Washington vehicle registration and the Inspection & Maintenance Program.

2010 Concept 2

| Level of Service | Functional Classification | Vehicle-Miles Traveled (veh-mi) | Vehicle-Hours Traveled (veh-hr) | Average Speed (mi/hr) | Emission Factor (g/veh-mi) * | | | Peak-Hour Emissions (pounds) | | |
|------------------|---------------------------|---------------------------------|---------------------------------|-----------------------|------------------------------|-------|------|------------------------------|--------------|------------|
| | | | | | HC | CO | NOx | HC | CO | NOx |
| A,B,C,D | Neighborhood Collectors | 12,017 | 460 | 26 | 2.32 | 26.26 | 2.48 | 61 | 696 | 66 |
| | Collector Arterials | 20,539 | 632 | 32 | 1.95 | 20.42 | 2.49 | 88 | 925 | 113 |
| | Minor Arterials | 20,905 | 642 | 33 | 1.95 | 20.42 | 2.49 | 90 | 941 | 115 |
| | Principle Arterials | 22,037 | 721 | 31 | 2.06 | 22.10 | 2.48 | 100 | 1,074 | 120 |
| | Carpool Lanes | 3,883 | 105 | 37 | 1.77 | 17.63 | 2.51 | 15 | 151 | 21 |
| E | Neighborhood Collectors | 1,972 | 83 | 24 | 2.58 | 30.33 | 2.48 | 11 | 132 | 11 |
| | Collector Arterials | 5,963 | 253 | 24 | 2.58 | 30.33 | 2.48 | 34 | 399 | 33 |
| | Minor Arterials | 6,600 | 259 | 25 | 2.40 | 27.50 | 2.48 | 35 | 400 | 36 |
| | Principle Arterials | 24,772 | 994 | 25 | 2.49 | 28.86 | 2.48 | 136 | 1,576 | 135 |
| | Carpool Lanes | 1,931 | 62 | 31 | 2.00 | 21.24 | 2.49 | 9 | 90 | 11 |
| F | Neighborhood Collectors | 623 | 40 | 15 | 3.48 | 42.19 | 2.58 | 5 | 58 | 4 |
| | Collector Arterials | 6,135 | 389 | 17 | 3.24 | 39.37 | 2.53 | 44 | 532 | 34 |
| | Minor Arterials | 2,415 | 119 | 21 | 2.80 | 33.69 | 2.48 | 15 | 179 | 13 |
| | Principle Arterials | 20,101 | 1,043 | 21 | 2.80 | 33.69 | 2.48 | 124 | 1,493 | 110 |
| | Carpool Lanes | 1,104 | 45 | 25 | 2.40 | 27.50 | 2.48 | 6 | 67 | 6 |
| TOTAL = | | 150,997 | 5,847 | 26 | | | | 773 | 8,713 | 828 |

Source: City of Federal Way, KJS Associates, Inc., and McCulley, Frick and Gilman, Inc.
 * Computed with Mobile5.OA. Based on 1990 Washington vehicle registration and the Inspection & Maintenance Program.

2010 Concept 3

| Level of Service | Functional Classification | Vehicle-Miles Traveled (veh-mi) | Vehicle-Hours Traveled (veh-hr) | Average Speed (mi/hr) | Emission Factor (g/veh-mi)* | | | Peak-Hour Emissions (pounds) | | |
|------------------|---------------------------|---------------------------------|---------------------------------|-----------------------|-----------------------------|-------|------|------------------------------|--------------|------------|
| | | | | | HC | CO | NOx | HC | CO | NOx |
| A,B,C,D | Neighborhood Collectors | 11,841 | 458 | 26 | 2.40 | 27.50 | 2.48 | 63 | 718 | 65 |
| | Collector Arterials | 20,587 | 635 | 32 | 1.95 | 20.42 | 2.49 | 89 | 927 | 113 |
| | Minor Arterials | 20,007 | 610 | 33 | 1.95 | 20.42 | 2.49 | 86 | 901 | 110 |
| | Principle Arterials | 22,561 | 735 | 31 | 2.06 | 22.10 | 2.48 | 102 | 1,099 | 123 |
| | Carpool Lanes | 3,582 | 97 | 37 | 1.77 | 17.63 | 2.51 | 14 | 139 | 20 |
| E | Neighborhood Collectors | 2,916 | 121 | 24 | 2.49 | 28.86 | 2.48 | 16 | 186 | 16 |
| | Collector Arterials | 5,729 | 253 | 23 | 2.69 | 31.93 | 2.48 | 34 | 403 | 31 |
| | Minor Arterials | 7,595 | 303 | 25 | 2.40 | 27.50 | 2.48 | 40 | 460 | 42 |
| | Principle Arterials | 20,948 | 842 | 25 | 2.49 | 28.86 | 2.48 | 115 | 1,333 | 115 |
| | Carpool Lanes | 2,636 | 86 | 31 | 2.06 | 22.10 | 2.48 | 12 | 128 | 14 |
| F | Neighborhood Collectors | 415 | 33 | 12 | 4.00 | 48.14 | 2.67 | 4 | 44 | 2 |
| | Collector Arterials | 7,254 | 450 | 18 | 3.13 | 38.19 | 2.51 | 50 | 611 | 40 |
| | Minor Arterials | 2,916 | 146 | 20 | 3.04 | 37.13 | 2.49 | 20 | 239 | 16 |
| | Principle Arterials | 24,809 | 1,333 | 20 | 2.90 | 35.11 | 2.48 | 159 | 1,920 | 136 |
| | Carpool Lanes | 1,014 | 40 | 25 | 2.40 | 27.50 | 2.48 | 5 | 61 | 6 |
| TOTAL = | | 154,810 | 6,142 | 25 | | | | 824 | 9,170 | 848 |

Source: City of Federal Way, KJS Associates, Inc., and McCulley, Frick and Gilman, Inc.
 Computed with Mobile5.OA. Based on 1990 Washington vehicle registration and the Inspection & Maintenance Program.

CITYSHAPE

From Vision to Plan

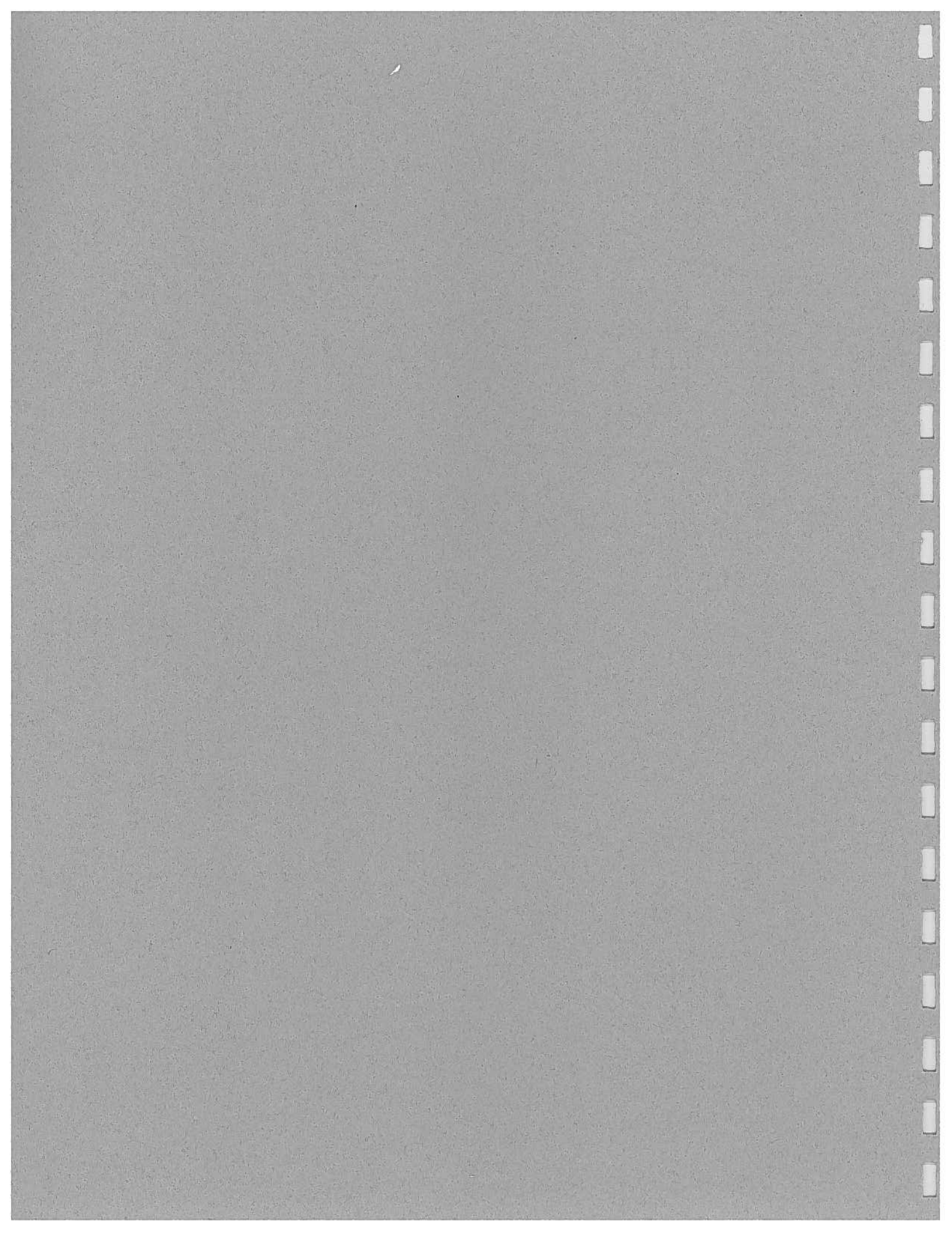


Table W-1. Subbasins within the Federal Way planning area.

| Drainage basin | Area^a (acres) |
|--------------------------------|---------------------------------|
| Hylebos Creek basin | |
| West branch subbasin | 5,629 |
| East branch subbasin | 2,920 |
| Lower Puget Sound basin | |
| Joe's Creek subbasin | 1,136 |
| Lakota Creek subbasin | 2,142 |
| Cold Creek subbasin | 869 |
| Redondo Creek subbasin | 721 |
| Remaining area ^b | 2,795 |
| Green River basin | |
| Mill Creek subbasin | 1,335 |
| Remaining area ^b | 1,814 |
| White River basin | 1,049 |

a Area of portion of basin within Federal Way planning area

b Consists of many small drainages

Table W-2. Estimated existing impervious surface area by drainage basin (acres).

| <u>Drainage basin</u> | <u>Total area</u> | <u>Existing impervious surface area assuming 15% coverage in developed areas</u> | <u>Existing impervious surface area assuming 10% coverage in developed areas</u> |
|--------------------------------|-------------------|--|--|
| Hylebos Creek basin | | | |
| West branch subbasin | 5,629 | 599 | 399 |
| East branch subbasin | 2,920 | 314 | 209 |
| Lower Puget Sound basin | | | |
| Joe's Creek subbasin | 1,136 | 152 | 102 |
| Lakota Creek subbasin | 2,142 | 288 | 192 |
| Cold Creek subbasin | 869 | 115 | 77 |
| Redondo Creek subbasin | 721 | 93 | 62 |
| Remaining area ^b | 2,795 | 373 | 248 |
| Green River basin | | | |
| Mill Creek subbasin | 1,335 | 142 | 95 |
| Remaining area ^b | 1,814 | 223 | 149 |
| White River basin | 1,049 | 105 | 70 |

a Area of portion of basin within Federal Way planning area

b Consists of many small drainages

Table W-3. Flow rates for streams within the Federal Way planning area at four storm recurrence intervals (cfs).

| Drainage basin | 2-year storm | 10-year storm | 25-year storm | 100-year storm |
|--------------------------------|--------------|---------------|---------------|----------------|
| Hylebos Creek basin | | | | |
| West brancha | 121 | 189 | 227 | 287 |
| East brancha | 119 | 193 | 231 | 290 |
| Lower Puget Sound basin | | | | |
| Joe's Creeka | 94 | 134 | 151 | 175 |
| Lakota Creeka | 58 | 81 | 92 | 106 |
| Cold Creeka | 38 | 54 | 61 | 70 |
| Redondo Creeka | 60 | 87 | 100 | 117 |
| Green River basin | | | | |
| Mill Creekb | 131 | 187 | 207 | 231 |

a At creek mouth; source - Federal Way and King County (1990).

b In Peasley Canyon; source - King County (1992)

cfs cubic feet per second

Table W-4. Washington Department of Ecology surface water quality standards and characteristic uses for class A freshwaters.

| | Standard |
|--|--|
| Fecal coliform bacteria | Shall not exceed a geometric mean value of 100 organisms/100 mL, with not more than 10 percent of samples exceeding 200 organisms/100 mL. |
| Dissolved oxygen | Shall exceed 8.0 mg/L. |
| Total dissolved gas | Shall not exceed 110 percent saturation at any point of sample collection. |
| Temperature | Shall not exceed 18.0°C due to human activities. When natural conditions exceed 18°C, no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3°C. Incremental temperature increases from nonpoint source activities shall not exceed 2.8°C. |
| pH | Shall be within the range of 6.5 to 8.5 with a human-caused variation within a range of less than 0.5 units. |
| Turbidity | Shall not exceed 5 NTU over background turbidity when the background turbidity is 50 NTU or less, or have more than a 10 percent increase in turbidity when the background turbidity is more than 50 NTU. |
| Toxic, radioactive, or deleterious material concentrations | Shall be below concentrations which have the potential either singularly or cumulatively to adversely affect characteristic water uses, cause acute or chronic conditions to the most sensitive biota dependent on those waters, or adversely affect public health, as determined by the department. |
| Aesthetic values | Shall not be impaired by the presence of materials or their effects, excluding those of natural origin, which offend the senses of sight, smell, touch, or taste. |
| Characteristic uses | |

Shall include, but not be limited to, the following: domestic, industrial, and agricultural water supply; stock watering; salmonid and other fish migration, rearing, spawning, and harvesting; shellfish rearing, spawning, and harvesting; wildlife habitat; general recreation and aesthetic enjoyment; and commerce and navigation.

Source: WAC 173-201A
mL milliliters
mg/L milligrams per liter
NTU Nephelometric turbidity units

Table W-5. Projected area of new development and redevelopment under each alternative by drainage basin (acres).

| Drainage basin | Total area | New development and redevelopment area | | |
|--------------------------------|--------------|--|------------|------------|
| | | Alt. A | Alt. B | Alt. C |
| Hylebos Creek basin | | | | |
| West branch subbasin | 5,629 | 1,323 | 1,325 | 1,382 |
| East branch subbasin | 2,920 | 641 | 664 | 656 |
| Lower Puget Sound basin | | | | |
| Joe's Creek subbasin | 1,136 | 101 | 100 | 101 |
| Lakota Creek subbasin | 2,142 | 185 | 186 | 188 |
| Cold Creek subbasin | 869 | 85 | 88 | 88 |
| Redondo Creek subbasin | 721 | 86 | 86 | 87 |
| Remaining area | 2,795 | 259 | 254 | 257 |
| Green River basin | | | | |
| Mill Creek subbasin | 1,335 | 314 | 310 | 313 |
| Remaining area | 1,814 | 263 | 255 | 254 |
| White River basin | 1,049 | 285 | 279 | 281 |

Table W-6. Projected new impervious surface area under each alternative by drainage basin (acres).

| Drainage basin | Total area | New impervious surface area | | |
|--------------------------------|--------------|-----------------------------|-----------|-----------|
| | | Alt. A | Alt. B | Alt. C |
| Hylebos Creek basin | | | | |
| West branch subbasin | 5,629 | 348 | 344 | 406 |
| East branch subbasin | 2,920 | 164 | 174 | 186 |
| Lower Puget Sound basin | | | | |
| Joe's Creek subbasin | 1,136 | 19 | 17 | 19 |
| Lakota Creek subbasin | 2,142 | 36 | 35 | 39 |
| Cold Creek subbasin | 869 | 17 | 18 | 18 |
| Redondo Creek subbasin | 721 | 18 | 19 | 19 |
| Remaining area | 2,795 | 54 | 52 | 54 |
| Green River basin | | | | |
| Mill Creek subbasin | 1,335 | 78 | 74 | 78 |
| Remaining area | 1,814 | 56 | 52 | 55 |
| White River basin | 1,049 | 64 | 60 | 63 |

Table W-7. Estimated runoff volume from a 2-year, 24-hour design storm at downstream end of planning area under existing condition and each alternative (acre-feet).

| Drainage basin | Existing condition | Alt. A | Alt. B | Alt. C |
|--------------------------------|---------------------------|---------------|---------------|---------------|
| Hylebos Creek basin | | | | |
| West branch subbasin | 354.2 | 389.8 | 389.3 | 395.7 |
| East branch subbasin | 210.1 | 225.3 | 226.2 | 227.3 |
| Lower Puget Sound basin | | | | |
| Joe's Creek subbasin | 84.1 | 85.8 | 85.7 | 85.8 |
| Lakota Creek subbasin | 158.6 | 161.9 | 161.9 | 162.3 |
| Cold Creek subbasin | 64.2 | 65.7 | 65.8 | 65.9 |
| Redondo Creek subbasin | 53.1 | 54.8 | 54.8 | 54.9 |
| Remaining area | 206.7 | 211.7 | 211.6 | 211.7 |
| Green River basin | | | | |
| Mill Creek subbasin | 96.0 | 103.2 | 102.9 | 103.2 |
| Remaining area | 132.7 | 137.9 | 137.5 | 137.8 |
| White River basin | | | | |
| | 74.9 | 80.8 | 80.5 | 80.7 |

Table W-8. Projected new impervious surface area subject to vehicular use and expected runoff volume from those surfaces under each alternative.

| Drainage basin | New impervious surface area subject to vehicular use (acres) | | | | | | 2-year, 24-hour design storm runoff volume (acre-feet) |
|--------------------------------|--|--------|--------|---------------------------|--------|--------|--|
| | to vehicular use (acres) | | | runoff volume (acre-feet) | | | |
| | Alt. A | Alt. B | Alt. C | Alt. A | Alt. B | Alt. C | |
| Hylebos Creek basin | | | | | | | |
| West branch subbasin | 186.91 | 189.31 | 219.62 | 29.2 | 29.6 | 34.2 | |
| East branch subbasin | 84.99 | 86.61 | 94.71 | 13.3 | 13.5 | 14.8 | |
| Lower Puget Sound basin | | | | | | | |
| Joe's Creek subbasin | 10.57 | 10.05 | 10.58 | 1.65 | 1.57 | 1.65 | |
| Lakota Creek subbasin | 20.63 | 20.54 | 22.16 | 3.22 | 3.21 | 3.46 | |
| Cold Creek subbasin | 9.32 | 9.98 | 10.04 | 1.46 | 1.56 | 1.57 | |
| Redondo Creek subbasin | 9.67 | 10.22 | 10.2 | 1.51 | 1.6 | 1.59 | |
| Remaining area | 28.06 | 26.97 | 27.59 | 4.38 | 4.21 | 4.31 | |
| Green River basin | | | | | | | |
| Mill Creek subbasin | 42.74 | 41.23 | 43.28 | 6.67 | 6.44 | 6.76 | |
| Remaining area | 31.04 | 29.3 | 30.06 | 4.85 | 4.57 | 4.69 | |
| White River basin | | | | | | | |
| | 37.05 | 35.46 | 36.48 | 5.78 | 5.54 | 5.7 | |

Table W-9. Projected pollutant loadings in untreated runoff from new impervious surfaces subject to vehicular use during a 2-year, 24-hour design storm under each alternative (pounds).

| Drainage basin | Copper | | | Total phosphorus | | | Total suspended solids | | |
|-------------------------|--------|--------|--------|------------------|--------|--------|------------------------|---------|---------|
| | Alt. A | Alt. B | Alt. C | Alt. A | Alt. B | Alt. C | Alt. A | Alt. B | Alt. C |
| Hylebos Creek basin | | | | | | | | | |
| West branch subbasin | 1.67 | 1.69 | 1.96 | 20.66 | 20.94 | 24.27 | 3973.25 | 4027.68 | 4667.21 |
| East branch subbasin | 0.76 | 0.77 | 0.85 | 9.41 | 9.55 | 10.47 | 1809.73 | 1836.95 | 2013.84 |
| Lower Puget Sound basin | | | | | | | | | |
| Joe's Creek subbasin | 0.09 | 0.09 | 0.09 | 1.17 | 1.11 | 1.17 | 224.52 | 213.63 | 224.52 |
| Lakota Creek subbasin | 0.18 | 0.18 | 0.20 | 2.28 | 2.27 | 2.45 | 438.15 | 436.79 | 470.80 |
| Cold Creek subbasin | 0.08 | 0.09 | 0.09 | 1.03 | 1.10 | 1.11 | 198.66 | 212.27 | 213.63 |
| Redondo Creek subbasin | 0.09 | 0.09 | 0.09 | 1.07 | 1.13 | 1.13 | 205.47 | 217.71 | 216.35 |
| Remaining area | 0.25 | 0.24 | 0.25 | 3.10 | 2.98 | 3.05 | 595.99 | 572.86 | 586.46 |
| Green River basin | | | | | | | | | |
| Mill Creek subbasin | 0.38 | 0.37 | 0.39 | 4.72 | 4.56 | 4.78 | 907.59 | 876.29 | 919.84 |
| Remaining area | 0.28 | 0.26 | 0.27 | 3.43 | 3.23 | 3.32 | 659.94 | 621.84 | 638.17 |
| White River basin | 0.33 | 0.32 | 0.33 | 4.09 | 3.92 | 4.03 | 786.49 | 753.83 | 775.60 |

Table W-10. Projected pollutant loadings in treated runoff from new impervious surfaces subject to vehicular use during a 2-year, 24-hour design storm under each alternative (pounds).

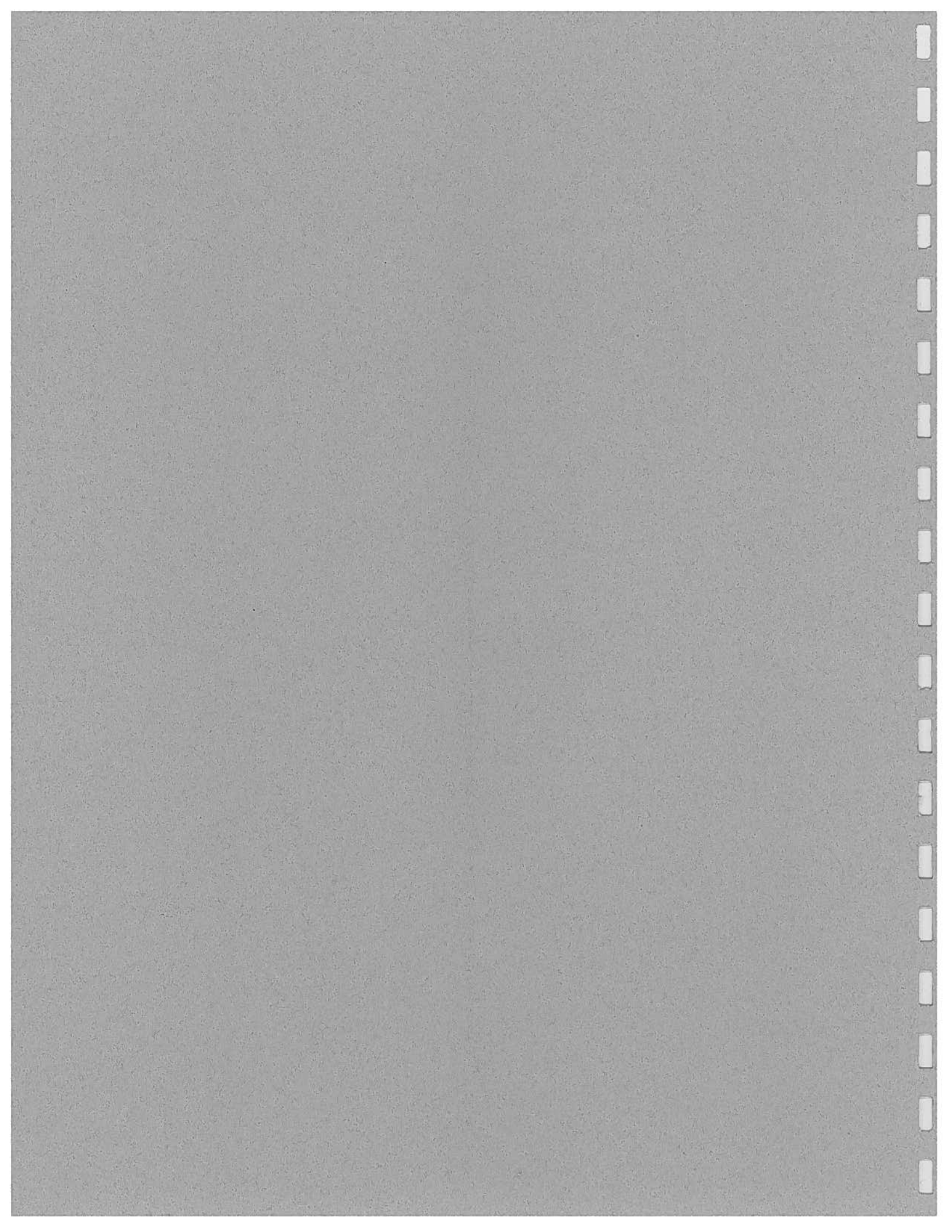
| <u>phosphorus</u> <u>solids</u> | <u>Copper</u> | | | <u>Total</u> | | | Alt. |
|------------------------------------|------------------------|--------|--------|--------------|--------|--------|-------|
| | <u>Total suspended</u> | | | | | | |
| <u>Drainage basin</u> | Alt. A | Alt. B | Alt. C | Alt. A | Alt. B | Alt. C | |
| Hylebos Creek basin | | | | | | | |
| West branch subbasin | 0.92 | 0.93 | 1.08 | 12.40 | 12.57 | 14.56 | 794.6 |
| East branch subbasin | 0.42 | 0.42 | 0.47 | 5.65 | 5.73 | 6.28 | 361.9 |
| Lower Puget Sound basin | | | | | | | |
| Joe's Creek subbasin | 0.05 | 0.05 | 0.05 | 0.70 | 0.67 | 0.70 | 44.9 |
| Lakota Creek subbasin | 0.10 | 0.10 | 0.11 | 1.37 | 1.36 | 1.47 | 87.6 |
| Cold Creek subbasin | 0.05 | 0.05 | 0.05 | 0.62 | 0.66 | 0.67 | 39.7 |
| Redondo Creek subbasin | 0.05 | 0.05 | 0.05 | 0.64 | 0.68 | 0.68 | 41.0 |
| Remaining area | 0.14 | 0.13 | 0.14 | 1.86 | 1.79 | 1.83 | 119.2 |
| Green River basin | | | | | | | |
| Mill Creek subbasin | 0.21 | 0.20 | 0.21 | 2.83 | 2.73 | 2.87 | 181.5 |
| Remaining area | 0.15 | 0.14 | 0.15 | 2.06 | 1.94 | 1.99 | 131.9 |
| <u>White River basin</u> | 0.18 | 0.17 | 0.18 | 2.45 | 2.35 | 2.42 | 157.3 |

This report is a summary of the results of the study conducted during the period from 1964 to 1965. The data presented herein are based on the records maintained by the Department of Health and Human Services, and are subject to change as more information becomes available.

| Year | Total | 1964 | | 1965 | |
|------|--------|--------|--------|--------|--------|
| | | Male | Female | Male | Female |
| 1964 | 12,345 | 6,789 | 5,556 | 7,890 | 6,455 |
| 1965 | 13,456 | 7,123 | 6,333 | 8,234 | 7,022 |
| 1966 | 14,567 | 7,456 | 7,111 | 8,765 | 7,512 |
| 1967 | 15,678 | 7,789 | 7,889 | 9,234 | 7,944 |
| 1968 | 16,789 | 8,123 | 8,666 | 9,765 | 8,374 |
| 1969 | 17,890 | 8,456 | 9,434 | 10,234 | 8,800 |
| 1970 | 18,901 | 8,789 | 10,112 | 10,765 | 9,226 |
| 1971 | 19,012 | 9,123 | 9,889 | 11,234 | 9,658 |
| 1972 | 19,123 | 9,456 | 9,667 | 11,765 | 10,090 |
| 1973 | 19,234 | 9,789 | 9,445 | 12,234 | 10,522 |
| 1974 | 19,345 | 10,123 | 9,222 | 12,765 | 10,954 |
| 1975 | 19,456 | 10,456 | 9,000 | 13,234 | 11,386 |
| 1976 | 19,567 | 10,789 | 8,777 | 13,765 | 11,818 |
| 1977 | 19,678 | 11,123 | 8,555 | 14,234 | 12,250 |
| 1978 | 19,789 | 11,456 | 8,333 | 14,765 | 12,682 |
| 1979 | 19,890 | 11,789 | 8,111 | 15,234 | 13,114 |
| 1980 | 19,901 | 12,123 | 7,778 | 15,765 | 13,546 |
| 1981 | 20,012 | 12,456 | 7,556 | 16,234 | 13,978 |
| 1982 | 20,123 | 12,789 | 7,333 | 16,765 | 14,410 |
| 1983 | 20,234 | 13,123 | 7,111 | 17,234 | 14,842 |
| 1984 | 20,345 | 13,456 | 6,889 | 17,765 | 15,274 |
| 1985 | 20,456 | 13,789 | 6,667 | 18,234 | 15,706 |
| 1986 | 20,567 | 14,123 | 6,445 | 18,765 | 16,138 |
| 1987 | 20,678 | 14,456 | 6,222 | 19,234 | 16,570 |
| 1988 | 20,789 | 14,789 | 6,000 | 19,765 | 17,002 |
| 1989 | 20,890 | 15,123 | 5,777 | 20,234 | 17,434 |
| 1990 | 20,901 | 15,456 | 5,555 | 20,765 | 17,866 |
| 1991 | 21,012 | 15,789 | 5,333 | 21,234 | 18,298 |
| 1992 | 21,123 | 16,123 | 5,111 | 21,765 | 18,730 |
| 1993 | 21,234 | 16,456 | 4,889 | 22,234 | 19,162 |
| 1994 | 21,345 | 16,789 | 4,667 | 22,765 | 19,594 |
| 1995 | 21,456 | 17,123 | 4,445 | 23,234 | 20,026 |
| 1996 | 21,567 | 17,456 | 4,222 | 23,765 | 20,458 |
| 1997 | 21,678 | 17,789 | 4,000 | 24,234 | 20,890 |
| 1998 | 21,789 | 18,123 | 3,777 | 24,765 | 21,322 |
| 1999 | 21,890 | 18,456 | 3,555 | 25,234 | 21,754 |
| 2000 | 21,901 | 18,789 | 3,333 | 25,765 | 22,186 |
| 2001 | 22,012 | 19,123 | 3,111 | 26,234 | 22,618 |
| 2002 | 22,123 | 19,456 | 2,889 | 26,765 | 23,050 |
| 2003 | 22,234 | 19,789 | 2,667 | 27,234 | 23,482 |
| 2004 | 22,345 | 20,123 | 2,445 | 27,765 | 23,914 |
| 2005 | 22,456 | 20,456 | 2,222 | 28,234 | 24,346 |
| 2006 | 22,567 | 20,789 | 2,000 | 28,765 | 24,778 |
| 2007 | 22,678 | 21,123 | 1,777 | 29,234 | 25,210 |
| 2008 | 22,789 | 21,456 | 1,555 | 29,765 | 25,642 |
| 2009 | 22,890 | 21,789 | 1,333 | 30,234 | 26,074 |
| 2010 | 22,901 | 22,123 | 1,111 | 30,765 | 26,506 |
| 2011 | 23,012 | 22,456 | 989 | 31,234 | 26,938 |
| 2012 | 23,123 | 22,789 | 867 | 31,765 | 27,370 |
| 2013 | 23,234 | 23,123 | 745 | 32,234 | 27,802 |
| 2014 | 23,345 | 23,456 | 623 | 32,765 | 28,234 |
| 2015 | 23,456 | 23,789 | 501 | 33,234 | 28,666 |
| 2016 | 23,567 | 24,123 | 379 | 33,765 | 29,098 |
| 2017 | 23,678 | 24,456 | 257 | 34,234 | 29,530 |
| 2018 | 23,789 | 24,789 | 135 | 34,765 | 29,962 |
| 2019 | 23,890 | 25,123 | 13 | 35,234 | 30,394 |
| 2020 | 23,901 | 25,456 | 555 | 35,765 | 30,826 |

CITYSHAPE

From Vision to Plan



PUGET SOUND AIR TRANSPORTATION COMMITTEE

THE FLIGHT PLAN PROJECT

DRAFT FINAL REPORT

and

TECHNICAL APPENDICES

**(INCLUDING DRAFT PROGRAMMATIC
ENVIRONMENTAL IMPACT STATEMENT)**



**PUGET SOUND REGIONAL COUNCIL
PORT OF SEATTLE**

JANUARY 1992

ROTTENBURG AIR FORCE BASE, MISSOURI

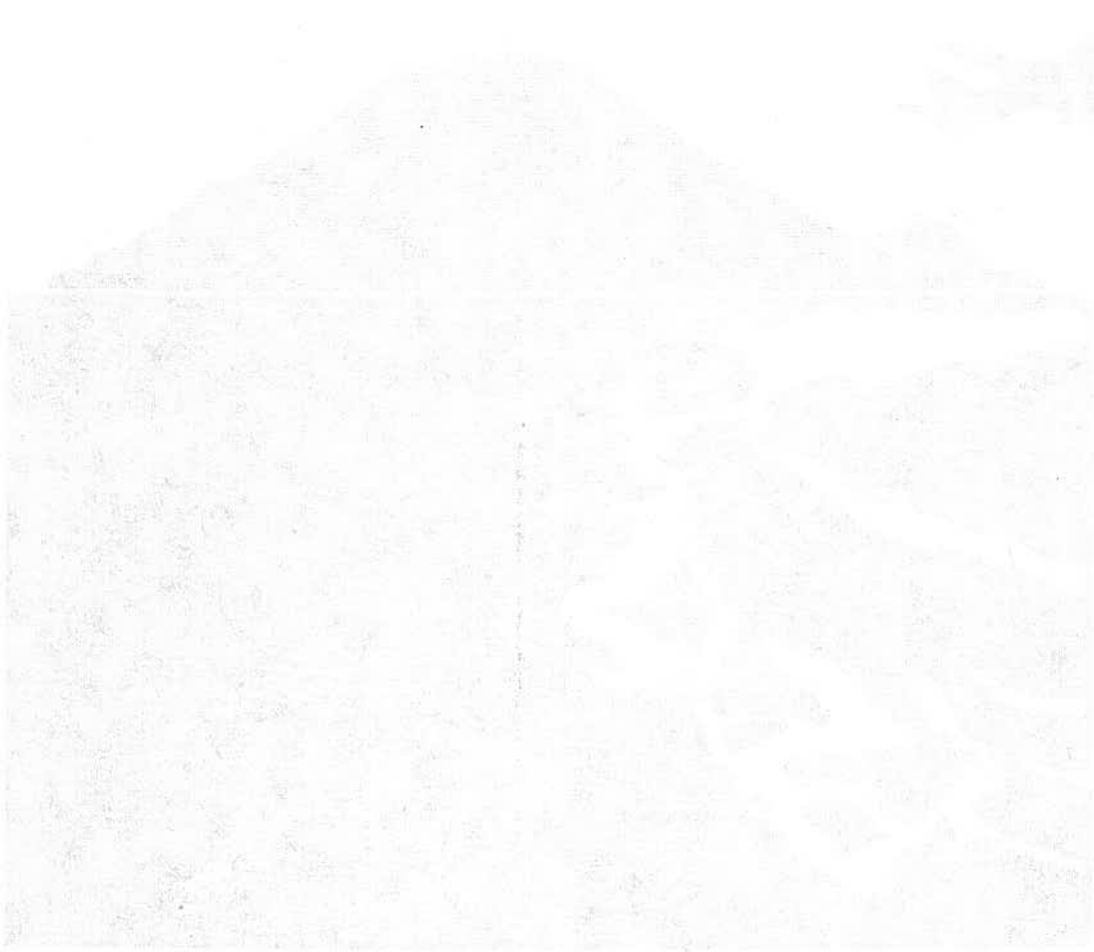
THE AIR FORCE PROJECT

OF THE AIR FORCE

AND

CONSTRUCTION PROJECTS

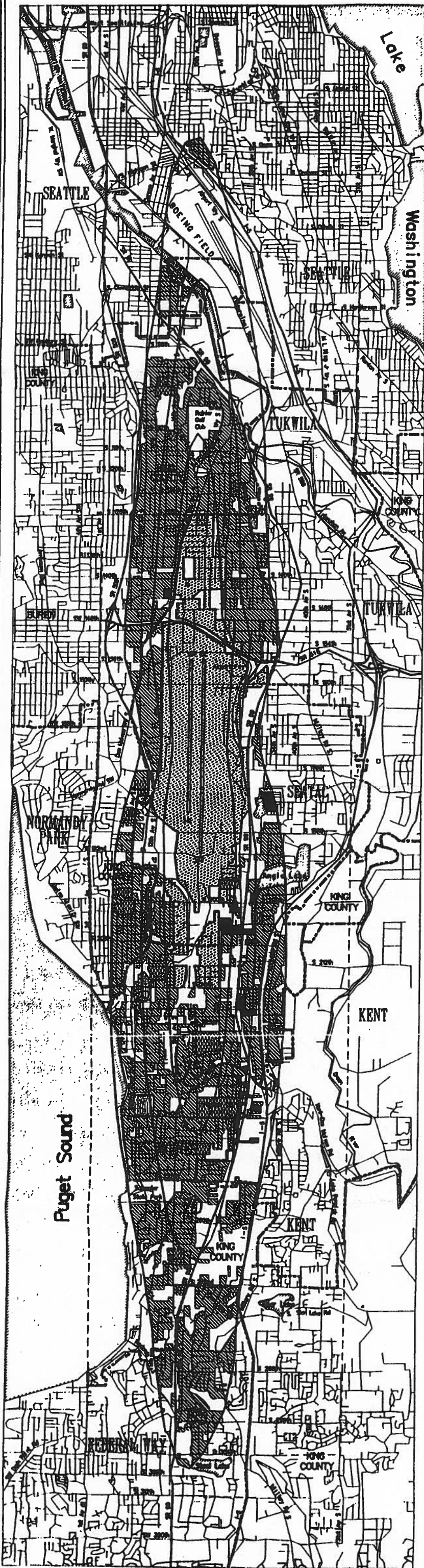
FOR THE AIR FORCE



FOR THE AIR FORCE










CONSTRUCTION PROJECTS

OF THE AIR FORCE



Sea-Tac International Airport

Existing Noise Exposure Map 1991

-  Residential
-  Mobile Home Park
-  School
-  Hospital; Nursing Home
-  Airport
-  Historic Site
-  Study Area Boundary
-  Jurisdictional Boundary
-  Ldn Noise Contour

NOTE: Only noncompatible land uses as defined in Table 1, Appendix A, of FAR Part 150 are designated within the noise contours.

The Ldn 65 contour contains approximately 14,128 acres and 67,000 people.

The Ldn 70 contour contains approximately 7,100 acres and 28,977 people.

The Ldn 75 contour contains approximately 3,254 acres and 7,357 people.

Note: All contour figures are cumulative; figures for the larger contours include those within of smaller contours.

Flight tracks and noise monitoring sites are depicted on the regional and study area INM flight track exhibits.

The Noise Exposure Map and accompanying documentation for the Noise Exposure Map for Seattle-Tacoma International Airport, submitted in accordance with F.A.R. Part 150 with the best available information, are hereby certified as true and complete to the best of my knowledge and belief. Adequate opportunity has been afforded to the public for review of all relevant information and comments received from interested persons are included in this submission. A copy of this submission, including copies of all written comments have been filed with the Regional Director, Federal Aviation Administration.

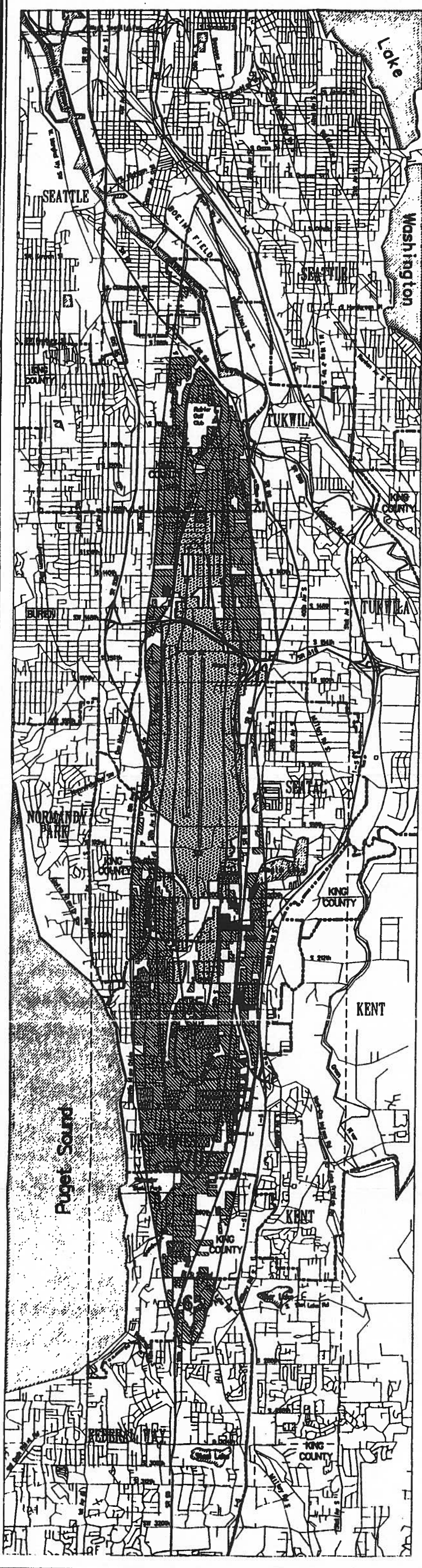
Signed  Date April 15, 1993










Title
Mr. R. Barr Stewart
Director, Aviation Planning
Seattle-Tacoma International Airport
Port of Seattle



Scale 1:36,000
1" = 3,000'

Sea-Tac International Airport Future Noise Exposure Map 1996



-  Residential
-  Mobile Home Park
-  School
-  Hospital; Nursing Home
-  Airport
-  Historic Site
-  Study Area Boundary
-  Jurisdictional Boundary
-  Ldn Noise Contour

NOTE: Only noncompatible land uses as defined in Table 1, Appendix A, of FAR Part 150 are designated within the noise contours.

The Ldn 65 contour contains approximately 9,532 acres and 44,037 people.
 The Ldn 70 contour contains approximately 4,456 acres and 13,985 people.
 The Ldn 75 contour contains approximately 1,756 acres and 1,306 people.
Note: All contour figures are cumulative; figures for the larger contours include those within of smaller contours.

Flight tracks and noise monitoring sites are depicted on the regional and study area INM flight track exhibits.

The Noise Exposure Map and accompanying documentation for the Noise Exposure Map for Seattle-Tacoma International Airport, submitted in accordance with F.A.R. Part 150 with the best available information, are hereby certified as true and complete to the best of my knowledge and belief. Adequate opportunity has been afforded in the public for review of all relevant information and comments received from interested persons are included in this submission. A copy of this submission, including copies of all written comments have been filed with the Regional Director, Federal Aviation Administration.

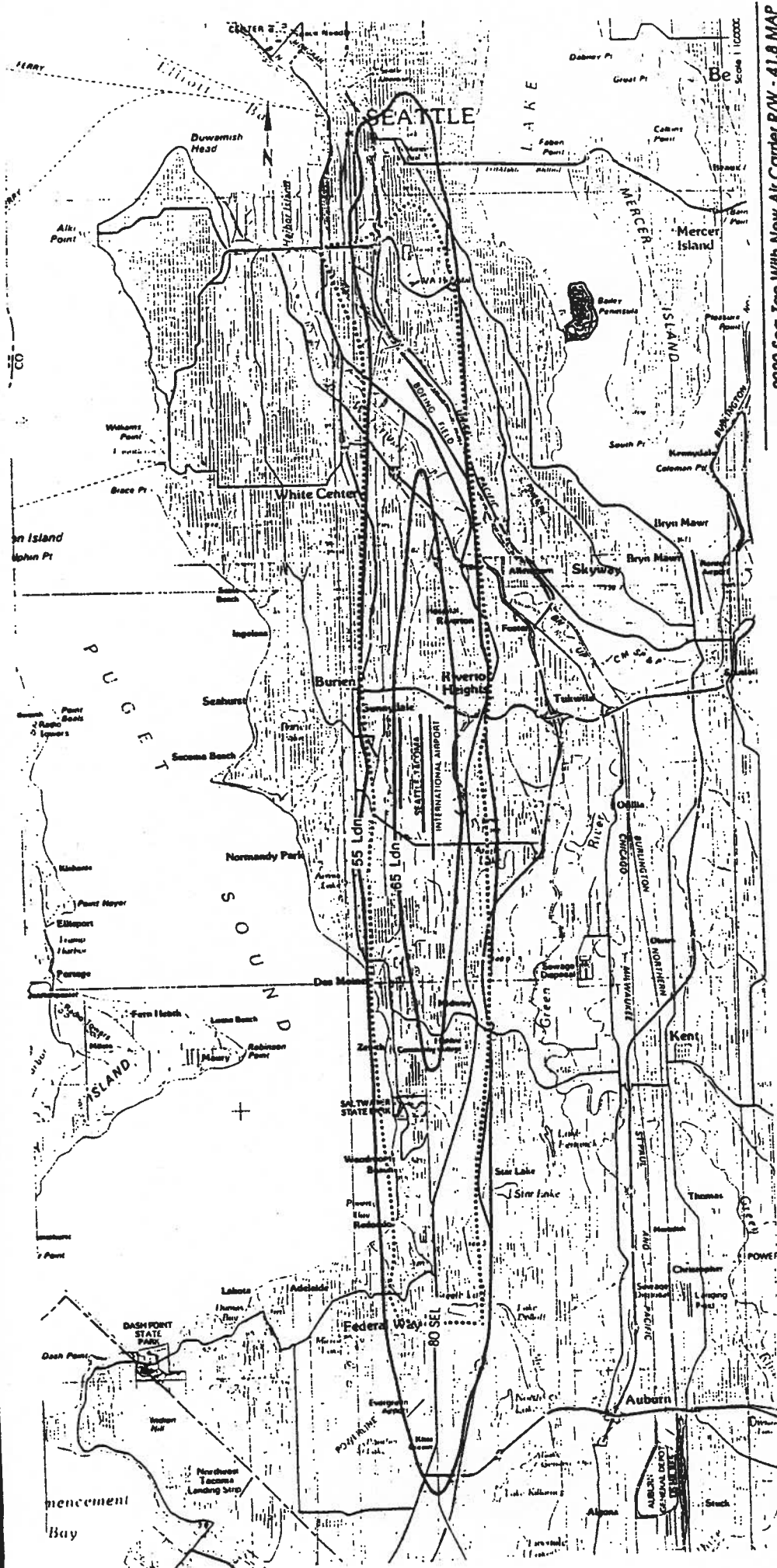
Signed R. Burr Stewart Date April 15, 1993
 Title _____
 Mr. R. Burr Stewart
 Director, Aviation Planning
 Seattle-Tacoma International Airport
 Port of Seattle

↑
N
↓

Scale 1:36,000
1" = 3,000'



The Flight Plan Project Phase III
PUGET SOUND AIR TRANSPORTATION COMMITTEE



2020 Sea-Tac With New Air Carrier R/W - 41.8 MAP

Scale 1:10000

• Dependent Air Carrier R/W used only for arrivals & only during daylight hours

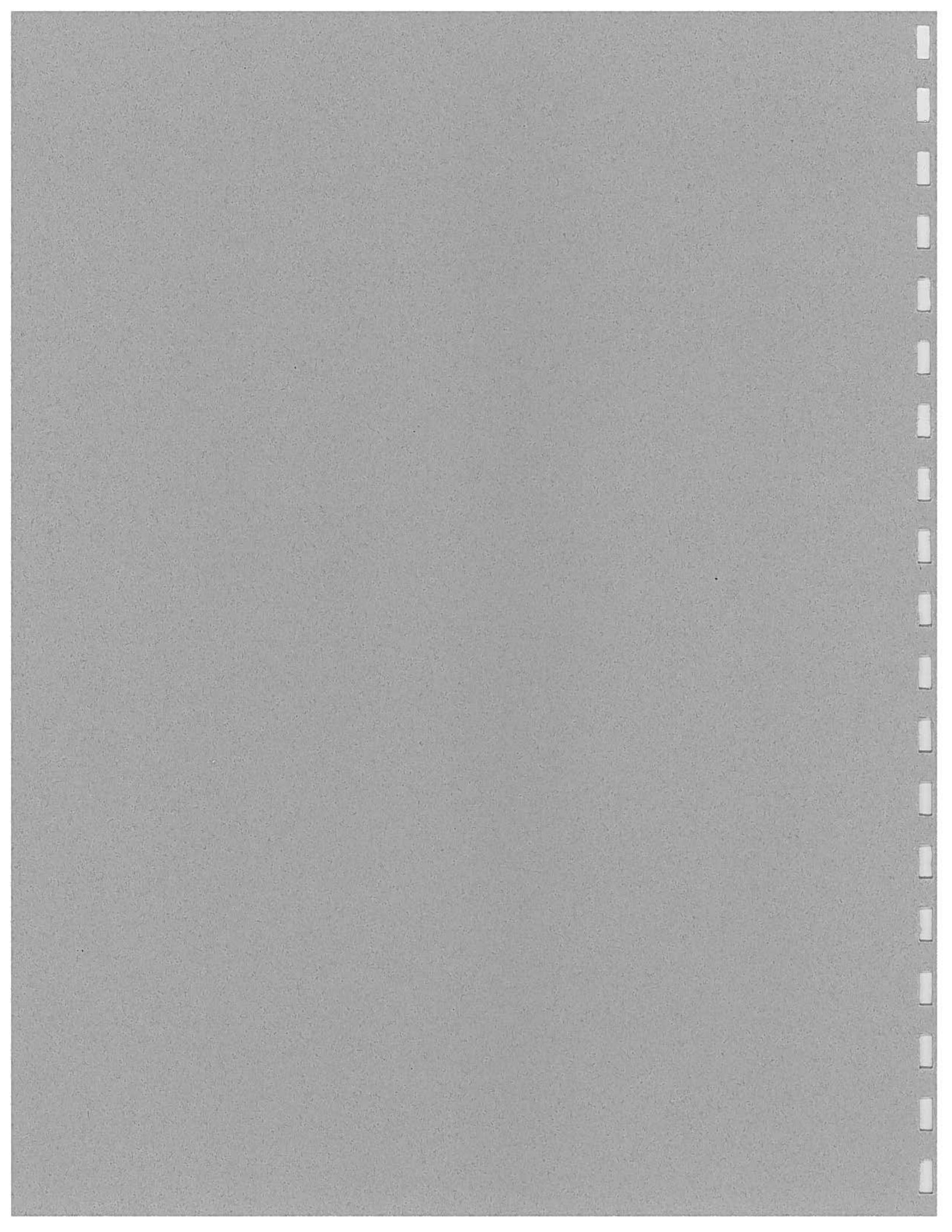
Exhibit
SE-5

Alternatives 13 through 22

The Flight Plan Project Phase III

CITYSHAPE

From Vision to Plan



Concept 1

Alternative A - Total New Development

| PAZ | TOTAL (acres) | REMAIN (Undev) | PARK/OS (acres) | SCHOOL (new) | COMMUN (sq ft) | OFFICE (sq ft) | RETAIL (sq ft) | MANUF (sq ft) | GOVT (sq ft) | JOBS | SF (units) | MF (units) | TOTAL (pop.) | SCHOOL (enroll) | % (MF) |
|-----------------|---------------|----------------|-----------------|--------------|----------------|----------------|----------------|---------------|--------------|--------|------------|------------|--------------|-----------------|--------|
| 272nd St. | 167 | 16% | 20 | 1 | 60,000 | 0 | 50,000 | 0 | 30,000 | 220 | 194 | 1,021 | 3,072 | 439 | 84% |
| Widwood/290th | 110 | 17% | 10 | 0 | 40,000 | 0 | 20,000 | 0 | 0 | 80 | 167 | 527 | 1,758 | 271 | 76% |
| 312th/320th St. | 152 | 22% | 8 | 0 | 60,000 | 880,000 | 150,000 | 0 | 100,000 | 4,070 | 0 | 1,201 | 3,039 | 365 | 100% |
| West Campus | 192 | 17% | 0 | 1 | 60,000 | 300,000 | 20,000 | 0 | 45,000 | 1,390 | 278 | 899 | 2,976 | 458 | 76% |
| 336th St. | 254 | 18% | 27 | 1 | 60,000 | 200,000 | 50,000 | 0 | 60,000 | 1,100 | 126 | 1,797 | 4,866 | 630 | 93% |
| Weyerhoeuser | 381 | 27% | 60 | 1 | 70,000 | 150,000 | 20,000 | 300,000 | 30,000 | 1,270 | 272 | 983 | 3,175 | 480 | 78% |
| 348th/358th | 193 | 27% | 20 | 1 | 40,000 | 50,000 | 320,000 | 300,000 | 30,000 | 1,440 | 60 | 708 | 1,992 | 268 | 90% |
| South 99 | 264 | 23% | 24 | 0 | 25,000 | 0 | 0 | 0 | 0 | 26 | 346 | 72 | 1,058 | 253 | 17% |
| Dumas Bay | 95 | 21% | 2 | 2 | 20,000 | 0 | 5,000 | 0 | 60,000 | 150 | 232 | 84 | 801 | 180 | 27% |
| Lakota | 116 | 16% | 15 | 0 | 20,000 | 0 | 30,000 | 0 | 40,000 | 180 | 247 | 114 | 812 | 199 | 32% |
| Seapines | 177 | 16% | 15 | 0 | 30,000 | 0 | 0 | 0 | 20,000 | 70 | 426 | 169 | 1,504 | 335 | 28% |
| Olympic View | 132 | 14% | 14 | 0 | 30,000 | 0 | 0 | 0 | 0 | 30 | 295 | 225 | 1,314 | 265 | 43% |
| Twin Lakes | 30 | 17% | 0 | 0 | 30,000 | 0 | 0 | 0 | 0 | 30 | 60 | 0 | 201 | 53 | 0% |
| Twin Lakes N.C. | 159 | 17% | 20 | 1 | 30,000 | 0 | 10,000 | 0 | 30,000 | 110 | 381 | 168 | 1,389 | 305 | 31% |
| 356th West | 423 | 15% | 25 | 2 | 60,000 | 0 | 0 | 0 | 60,000 | 210 | 926 | 473 | 3,539 | 761 | 34% |
| Rodondo | 71 | 16% | 10 | 0 | 20,000 | 20,000 | 15,000 | 0 | 0 | 130 | 131 | 144 | 695 | 131 | 52% |
| E. Side North | 361 | 19% | 30 | 0 | 60,000 | 0 | 10,000 | 0 | 0 | 100 | 807 | 421 | 3,106 | 665 | 34% |
| E. Side Central | 430 | 17% | 35 | 2 | 100,000 | 0 | 0 | 0 | 60,000 | 220 | 817 | 702 | 3,844 | 758 | 46% |
| E. Side South | 596 | 20% | 45 | 2 | 104,000 | 0 | 0 | 0 | 130,000 | 364 | 1,415 | 363 | 4,498 | 1,053 | 20% |
| E. Side/SR-161 | 67 | 21% | 5 | 0 | 25,000 | 0 | 20,000 | 0 | 20,000 | 105 | 147 | 337 | 1,224 | 200 | 70% |
| Total | 4,369 | 19% | 405 | 14 | 1,005,000 | 1,600,000 | 720,000 | 600,000 | 715,000 | 11,275 | 7,366 | 10,407 | 44,964 | 8,069 | 59% |

This spreadsheet shows the amount of growth that is anticipated under Alternative A by the year 2010. These figures must be added to those in the "Existing Conditions" section of this report to get the complete land use mix for 2010.

Notes:
Land with High Redevelopment potential is derived by comparing land values with building value. Where land value is significantly higher than building value, it is recorded as having high redevelopment potential.

Critical Areas includes wetlands, steep slopes, and lakes as defined by the City's Critical Areas Map.

SF = Single Family Housing
MF = Multi-Family Housing
%MF = Shows how much new housing will be achieved in multi-family projects.

Concept 2

Alternative B - Total New Development

| PAZ | TOTAL (acres) | REMAIN (Undev) | PARK/OS (acres) | SCHOOL (new) | COMMUN (sq ft) | OFFICE (sq ft) | RETAIL (sq ft) | MANUF (sq ft) | GOVT (sq ft) | JOBS | SF (units) | MF (units) | TOTAL (pop.) | SCHOOL (enroll) | % (MF) |
|-----------------|---------------|----------------|-----------------|--------------|----------------|----------------|----------------|---------------|--------------|--------|------------|------------|--------------|-----------------|--------|
| 272nd St. | 167 | 18% | 29 | 1 | 75,000 | 0 | 50,000 | 0 | 30,000 | 235 | 94 | 1,430 | 3,856 | 487 | 94% |
| Wildwood/290th | 110 | 25% | 10 | 0 | 52,000 | 0 | 20,000 | 0 | 0 | 92 | 120 | 590 | 1,786 | 259 | 83% |
| 312th/320th St. | 181 | 13% | 10 | 0 | 50,000 | 2,100,000 | (150,000) | 0 | 175,000 | 8,500 | 0 | 1,987 | 5,027 | 604 | 100% |
| West Campus | 192 | 18% | 0 | 1 | 60,000 | 300,000 | 20,000 | 0 | 30,000 | 1,380 | 274 | 898 | 2,968 | 456 | 77% |
| 338th St. | 254 | 26% | 27 | 1 | 100,000 | 0 | 0 | 0 | 60,000 | 220 | 115 | 1,991 | 5,330 | 682 | 95% |
| Weyhauser | 381 | 20% | 80 | 1 | 70,000 | 150,000 | 20,000 | 600,000 | 30,000 | 1,770 | 272 | 983 | 3,175 | 480 | 78% |
| 348th/356th | 193 | 27% | 20 | 1 | 40,000 | 50,000 | 670,000 | 0 | 30,000 | 1,640 | 80 | 729 | 2,046 | 275 | 90% |
| South 99 | 264 | 23% | 24 | 0 | 26,000 | 0 | 0 | 0 | 0 | 26 | 346 | 72 | 1,058 | 253 | 17% |
| Dumas Bay | 95 | 21% | 2 | 2 | 20,000 | 0 | 5,000 | 0 | 60,000 | 150 | 240 | 42 | 714 | 173 | 15% |
| Lakota | 116 | 17% | 15 | 0 | 20,000 | 0 | 30,000 | 0 | 40,000 | 160 | 263 | 54 | 801 | 191 | 17% |
| Seacrest | 177 | 14% | 15 | 0 | 30,000 | 0 | 0 | 0 | 20,000 | 70 | 453 | 67 | 1,367 | 328 | 16% |
| Olympic View | 132 | 16% | 14 | 0 | 30,000 | 0 | 0 | 0 | 0 | 30 | 316 | 72 | 983 | 233 | 19% |
| Twin Lakes | 30 | 17% | 0 | 0 | 30,000 | 0 | 0 | 0 | 0 | 30 | 80 | 0 | 201 | 53 | 0% |
| Twin Lakes N.C. | 158 | 17% | 20 | 1 | 30,000 | 0 | 10,000 | 0 | 30,000 | 110 | 381 | 168 | 1,389 | 305 | 31% |
| 356th West | 423 | 16% | 25 | 2 | 90,000 | 0 | 0 | 0 | 60,000 | 210 | 954 | 296 | 3,162 | 725 | 24% |
| Redondo | 71 | 20% | 10 | 0 | 20,000 | 0 | 15,000 | 0 | 0 | 50 | 149 | 24 | 437 | 106 | 14% |
| E. Side North | 361 | 22% | 30 | 0 | 60,000 | 0 | 10,000 | 0 | 0 | 80 | 837 | 135 | 2,459 | 599 | 14% |
| E. Side Central | 430 | 20% | 35 | 2 | 83,000 | 0 | 0 | 0 | 60,000 | 203 | 866 | 275 | 2,887 | 660 | 24% |
| E. Side South | 596 | 21% | 45 | 2 | 94,000 | 0 | 0 | 0 | 130,000 | 354 | 1,430 | 232 | 4,206 | 1,023 | 14% |
| E. Side/SR-161 | 87 | 21% | 15 | 0 | 25,000 | 0 | 20,000 | 0 | 20,000 | 105 | 132 | 295 | 1,080 | 178 | 69% |
| Total | 4,418 | 20% | 426 | 14 | 1,005,000 | 2,600,000 | 720,000 | 600,000 | 775,000 | 15,395 | 7,402 | 10,361 | 44,942 | 8,080 | 56% |

This spreadsheet shows the amount of growth that is anticipated under Alternative B by the year 2010. These figures must be added to those in the "Existing Conditions" section of this report to get the complete land use mix for 2010.

Notes:

Land with High Redevelopment potential is derived by comparing land values with building value. Where land value is significantly higher than building value, it is recorded as having high redevelopment potential.

Critical Areas includes wetlands, steep slopes, and lakes as defined by the City's Critical Areas Map.

SF = Single Family Housing

MF = Multi-Family Housing

%MF = Shows how much new housing will be achieved in multi-family projects.

Concept 3 Total New Development

| PAZ | TOTAL (acres) | REMAIN (Undev) | PARK/OS (acres) | SCHOOL (new) | COMMUN (sq ft) | OFFICE (sq ft) | RETAIL (sq ft) | MANUF (sq ft) | GOVT (sq ft) | JOBS | SF (units) | MF (units) | TOTAL (pop.) | SCHOOL (enroll) | % (MF) |
|-----------------|---------------|----------------|-----------------|--------------|----------------|----------------|----------------|---------------|--------------|--------|------------|------------|--------------|-----------------|--------|
| 272nd St. | 167 | 18% | 29 | 1 | 75,000 | 0 | 50,000 | 0 | 30,000 | 235 | 94 | 1,430 | 3,866 | 487 | 94% |
| Windwood/296th | 110 | 25% | 10 | 0 | 52,000 | 0 | 20,000 | 0 | 0 | 92 | 120 | 590 | 1,796 | 259 | 83% |
| 312th/320th St. | 181 | 14% | 10 | 0 | 50,000 | 1,900,000 | 200,000 | 0 | 176,000 | 8,400 | 0 | 1,791 | 4,531 | 644 | 100% |
| West Campus | 192 | 16% | 0 | 1 | 60,000 | 500,000 | 20,000 | 100,000 | 30,000 | 2,327 | 207 | 894 | 2,762 | 407 | 81% |
| 336th St. | 254 | 16% | 27 | 1 | 60,000 | 600,000 | 300,000 | 500,000 | 30,000 | 3,853 | 58 | 1,096 | 2,894 | 369 | 95% |
| Weyerhaeuser | 381 | 23% | 80 | 1 | 70,000 | 450,000 | 20,000 | 500,000 | 30,000 | 2,803 | 180 | 983 | 2,941 | 418 | 85% |
| 348th/386th | 193 | 11% | 20 | 1 | 40,000 | 550,000 | 600,000 | 0 | 30,000 | 3,500 | 80 | 686 | 1,935 | 261 | 90% |
| South B9 | 264 | 22% | 24 | 0 | 26,000 | 0 | 0 | 0 | 0 | 26 | 337 | 198 | 1,328 | 262 | 36% |
| Dunes Bay | 95 | 19% | 2 | 2 | 20,000 | 0 | 5,000 | 0 | 60,000 | 150 | 234 | 108 | 685 | 189 | 32% |
| Lakota | 116 | 15% | 15 | 0 | 20,000 | 0 | 30,000 | 0 | 40,000 | 160 | 254 | 132 | 976 | 209 | 34% |
| Secajawas | 177 | 14% | 15 | 0 | 30,000 | 0 | 0 | 0 | 20,000 | 70 | 432 | 192 | 1,579 | 346 | 31% |
| Olympic View | 132 | 15% | 14 | 0 | 30,000 | 0 | 0 | 0 | 0 | 30 | 308 | 137 | 1,129 | 248 | 31% |
| Twin Lakes | 30 | 16% | 0 | 0 | 30,000 | 0 | 0 | 0 | 30,000 | 90 | 46 | 0 | 116 | 31 | 0% |
| Twin Lakes N.C. | 158 | 16% | 20 | 1 | 30,000 | 0 | 10,000 | 0 | 30,000 | 110 | 372 | 248 | 1,567 | 323 | 40% |
| 356th West | 423 | 16% | 26 | 2 | 90,000 | 0 | 0 | 0 | 60,000 | 210 | 922 | 464 | 3,506 | 755 | 33% |
| Redondo | 71 | 19% | 10 | 0 | 20,000 | 0 | 15,000 | 0 | 0 | 50 | 143 | 72 | 543 | 117 | 34% |
| E. Side North | 381 | 22% | 30 | 0 | 60,000 | 0 | 10,000 | 0 | 0 | 80 | 762 | 490 | 3,167 | 656 | 39% |
| E. Side Central | 430 | 18% | 36 | 2 | 83,000 | 0 | 0 | 0 | 60,000 | 203 | 866 | 455 | 3,342 | 715 | 34% |
| E. Side South | 596 | 21% | 45 | 2 | 94,000 | 0 | 0 | 0 | 130,000 | 364 | 1,338 | 647 | 5,023 | 1,088 | 33% |
| E. Side/SR-161 | 87 | 21% | 15 | 0 | 25,000 | 0 | 20,000 | 0 | 20,000 | 105 | 132 | 295 | 1,080 | 178 | 69% |
| Total | 4,418 | 18% | 426 | 14 | 865,000 | 4,000,000 | 1,300,000 | 1,100,000 | 775,000 | 22,948 | 6,884 | 10,877 | 44,936 | 7,881 | 61% |

This spreadsheet shows the amount of growth that is anticipated under Alternative C by the year 2010. These figures must be added to those in the "Existing Conditions" section of this report to get the complete land use mix for 2010.

Notes:

Land with High Redevelopment potential is derived by comparing land values with building value. Where land value is significantly higher than building value, it is recorded as having high redevelopment potential.

Critical Areas includes wetlands, steep slopes, and lakes as defined by the City's Critical Areas Map.

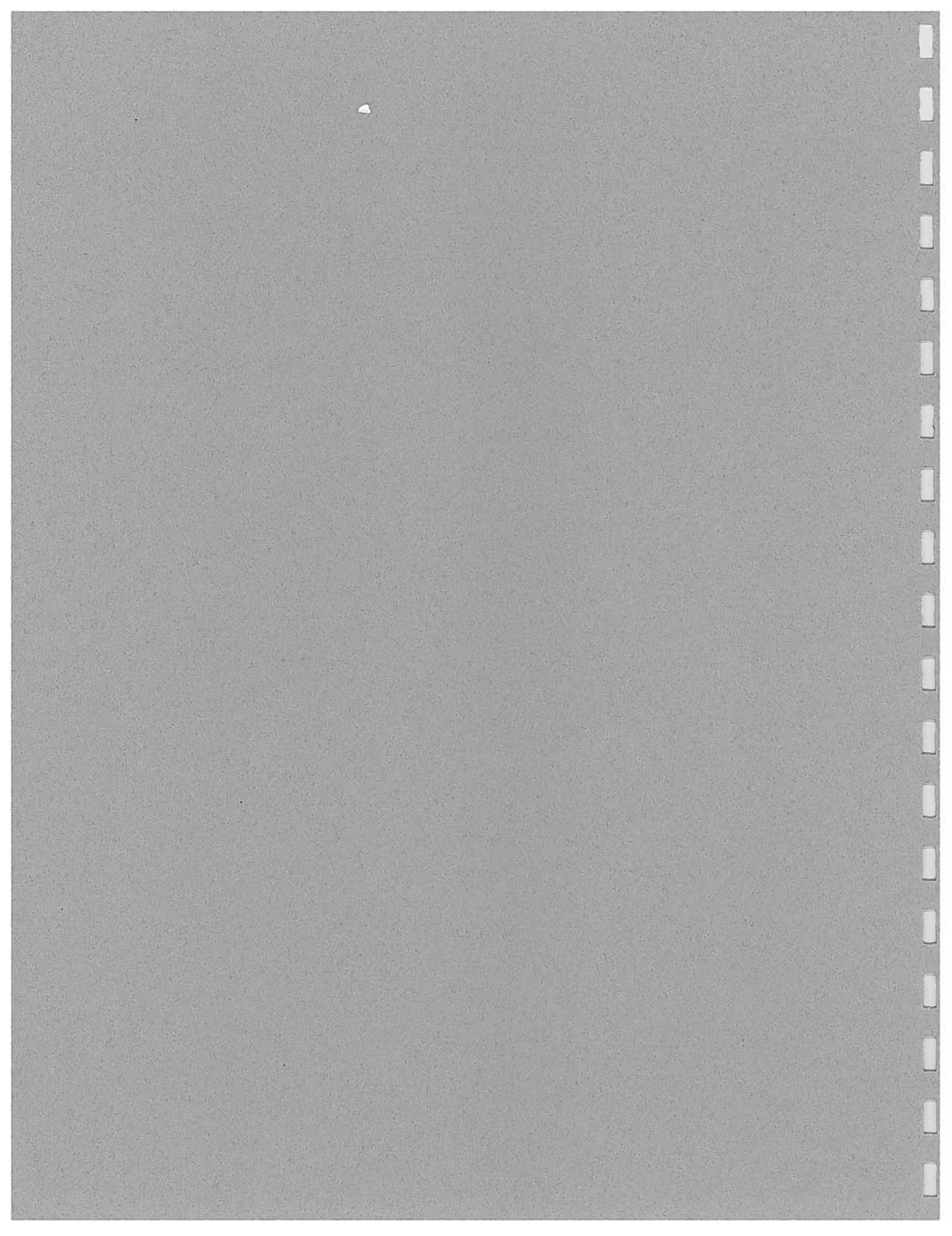
SF = Single Family Housing

MF = Multi-Family Housing

%MF = Shows how much new housing will be achieved in multi-family projects.

CITYSHAPE

From Vision to Plan



TRANSPORTATION IMPROVEMENT PROGRAM (TIP) 1993 - 2002

Public Works Department
City of Federal Way

4 August 1992

1992 data shown for reference only. Costs for subsequent years are in 1993 dollars x 1,000 and include a 4%/year inflation factor.

| | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | TOTAL |
|---|------------|------------|------------|------------|------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|
| SPECIAL STUDIES | | | | | | | | | | | | |
| Comprehensive Transportation Plan | 149 | 122 | | | | | | | | | | 271 |
| (1) Dash Point Rd Study - Lakota Plant to I-5 | 20 | 20 | | | | | | | | | | 40 |
| Helipad Master Plan | 40 | | | | | | | | | | | 40 |
| Right of Way Vegetation Plan | 30 | | | | | | | | | | | 30 |
| ANNUAL PROGRAMS | | | | | | | | | | | | |
| Resurfacing Program and Emergencies | 253 | 500 | 520 | 541 | 562 | 585 | 608 | 633 | 658 | 684 | 712 | 6,256 |
| Neighborhood Traffic Management Program | 75 | 100 | 104 | 108 | 112 | 117 | 122 | 127 | 132 | 137 | 142 | 1,276 |
| Minor Capital Improvement Projects | | | | | | | | | | | | |
| Wheelchair Ramps, Pedestrian Improvements | 30 | 31 | 32 | 34 | 35 | 36 | 38 | 39 | 41 | 41 | 43 | 360 |
| Sidewalk Completion Program | 50 | 52 | 54 | 56 | 58 | 61 | 63 | 66 | 68 | 71 | 71 | 600 |
| Street & Shoulder Pavement Safety Program | 100 | 104 | 108 | 112 | 117 | 122 | 127 | 132 | 137 | 142 | 142 | 1,201 |
| Traffic Signal Operation/Safety Improvements | 80 | 83 | 87 | 90 | 94 | 97 | 101 | 105 | 109 | 114 | 114 | 900 |
| Annual Program Subtotals | 808 | 860 | 894 | 920 | 947 | 1,000 | 1,040 | 1,080 | 1,120 | 1,177 | 1,224 | 10,669 |

MAJOR CAPITAL STREET IMPROVEMENTS

| No. | Note | Project | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | TOTAL |
|-----|------|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|
| 1 | (2) | 16th Ave S - SR 18 to SR 99 | 206 | | | | | | | | | | | 206 |
| 2 | (3) | SW 356th St - 21st Ave SW to 1st Ave S | 205 | 274 | | | | | | | | | | 479 |
| 3 | | 16th Ave SW at Adelaide Park | 82 | | | | | | | | | | | 82 |
| 4 | | Dash Point Rd at 11th Pl S & Sacajawea | 170 | | | | | | | | | | | 170 |
| 5 | | Traffic Signal Coordination - S 320th St, SR 99 | | 228 | | | | | | | | | | 228 |
| 6 | (4) | S 348th St - I-5 to SR 99 | 150 | 254 | | | | | | | | | | 404 |
| 7 | (5) | S 356th St - 1st Ave S to SR 99 | 80 | 242 | | | | | | | | | | 322 |
| 8 | | SW 336th St - 21st Ave SW to Hoyt Road | 186 | 1,042 | | | | | | | | | | 1,228 |
| 9A | | 4th Ave S - S 312th St to S 316th St | 15 | 85 | | | | | | | | | | 100 |
| 9 | (6) | 23rd Ave S - S 317th St to S 324th St | 150 | 153 | 1,239 | | | | | | | | | 1,542 |
| 10 | | Campus Dr SW - 7th Avenue SW to 34500 Btk | | 217 | 997 | | | | | | | | | 1,215 |
| 11 | | S 304th St - 28th Ave S to Military Rd | | 156 | 1,071 | | | | | | | | | 1,227 |
| 12 | (7) | S 312th St - SR 99 to 23rd Ave S | 216 | 50 | | 692 | 2,362 | | | | | | | 3,320 |
| 13 | | 21st Ave SW/Dash Point Sidewalk - 356th to 312th St | | | | 238 | | | | | | | | 238 |
| 14 | | S 288th St/Military Rd Signal Upgrade | | | | 45 | | | | | | | | 45 |
| 15 | | Military Rd at Star Lake Rd | | | | | 162 | 1,234 | | | | | | 1,396 |
| 16 | | Dash Point Road - Spot Safety Improvements | | | | | 169 | | | | | | | 169 |
| 17 | | S 336th St at SR 99 | | | | 947 | 3,842 | | | | | | | 4,789 |
| 18 | | S 317th St - 23rd Ave S to 28th Ave S | | | | | 43 | 274 | | | | | | 317 |
| 19 | | S 312th St at 8th Ave S Signal | | | | | | 44 | 161 | | | | | 204 |
| 20 | | 1st Ave S - S 320th St to S 316th St | | | | | | 74 | 304 | | | | | 378 |
| 21 | | 21st Ave SW/Dash Point Widening - 356th to 312th St | | | | | | | 2,581 | 7,185 | | | | 9,766 |
| 22 | | CBD Ring Road Completion | | | | | 326 | 4,753 | 2,500 | | | | | 7,580 |
| 23 | | S 340th St at Hoyt Rd Signal | | | | | | | 95 | 416 | | | | 511 |
| 24 | | 1st Ave S - S 348th St to S 356th St | | | | | | | 174 | 899 | | | | 1,073 |
| 25 | | 1st Ave S - SW 356th St to SW 368th St | | | | | | | 779 | 117 | | | | 896 |
| 26 | | SW 320th St at 47th Ave SW Signalization | | | | | | | 68 | 389 | | | | 457 |
| 27 | | S 324th St - SR 99 to 17th Ave S | | | | | | | | 401 | 742 | | | 1,143 |
| 28 | | Military Rd Widening - I-5 (S) to I-5 (N) | | | | | | | | 1,196 | 5,199 | | | 6,395 |
| 29 | | S 356th St - SR 99 to SR 161 | | | | | | | | 517 | 1,208 | | | 1,726 |
| 30 | | SW 368th St - 2nd Ave S to 6th Ave S | | | | | | | | 82 | 470 | | | 552 |
| 31 | | 8th Ave SW - SW 316th to SW 312th St | | | | | | | | 246 | | | | 246 |
| 32 | | Dash Point Rd & Hoyt Road Signalization | | | | | | | | 99 | 433 | | | 531 |
| 33 | | S 304th Street - SR 99 to 28th Ave S | | | | | | | | 324 | 1,571 | | | 1,896 |
| 34 | | S 336th St - 20th Ave S to I-5 | | | | | | | | 234 | 971 | | | 1,205 |
| | | | 1,445 | 2,258 | 1,677 | 2,998 | 3,685 | 5,446 | 5,145 | 5,546 | 8,301 | 4,921 | 10,594 | 52,835 |

NON-MOTORIZED CAPITAL IMPROVEMENTS

| | | | | | | | | | | | | | | |
|---|--|--|------------|------------|------------|--|--|--|--|--|--|--|--|-----|
| 35 | | BPA Trail Phase I - City Center Segment | 358 | | | | | | | | | | | 358 |
| 36 | | BPA Trail Phase II - City Center to Panther Lake | | 734 | | | | | | | | | | 734 |
| 37 | | BPA Trail Phase II - Panther Lake Segment | | | 636 | | | | | | | | | 636 |
| Non-Motorized Capital Improvements Subtotals | | | 358 | 734 | 636 | | | | | | | | | |

Total City Expenditure 1,982 3,476 3,325 4,564 4,652 6,452 6,192 6,634 9,433 6,098 11,818 62,689

WSDOT Projects

| | | | | | | | | | | | | | | |
|----|-----|--|--|--|--|--|--|--|--|--|--|--|--|------------------|
| 37 | (8) | SR 161/SR 18 - SR 18 to S 360th St | | | | | | | | | | | | Constr. |
| 38 | | I-5 Interchange Study at SR 161 | | | | | | | | | | | | Study |
| 39 | | Park & Ride Lnt, 21st Ave SW & SW 344th St | | | | | | | | | | | | Buy Site Constr. |

Notes:

- (1) Study to determine improvements needs to SR 500 and best location for new interchange with I-5.
- (2) \$3,617 project total. City \$206. Other funding from King County, WSDOT and FAUS.
- (3) \$6,269 project total. City \$506. Other funding from King County and UATA.
- (4) \$1,770 project total. City \$404. Other funding from TIA, WSDOT and Metro.
- (5) \$4,190 project total. City \$312, King County \$822, UATA \$3,000.
- (6) \$1,490 project total. \$120 funded by mitigation fees. \$180 will be expended on the project in 1992 resulting in a \$30,000 net expenditure.
- (7) \$2,800 project total. \$216 is funded by mitigation fees.
- (8) Three projects which are fully funded by WSDOT are listed for information only.

TRANSPORTATION IMPROVEMENT PROGRAM (TIP)

1993 - 2003



TRANSPORTATION IMPROVEMENT PROGRAM (TIP) 1993 - 2002

A. SPECIAL STUDIES

COMPREHENSIVE TRANSPORTATION PLAN
DASH POINT ROAD STUDY - LAKOTA PLANT TO I-5

B. ANNUAL PROGRAMS

RESURFACING PROGRAM AND EMERGENCIES

NEIGHBORHOOD TRAFFIC MANAGEMENT PROGRAM

MINOR CAPITAL IMPROVEMENT PROJECTS

- WHEELCHAIR RAMPS, PEDESTRIAN IMPROVEMENTS
- SIDEWALK COMPLETION PROGRAM
- STREET & SHOULDER PAVEMENT SAFETY PROGRAM
- TRAFFIC SIGNAL OPERATION/SAFETY IMPROVEMENTS

C. MAJOR CAPITAL STREET IMPROVEMENTS

1. 16TH AVE S - SR 18 TO SR 99
WIDEN STREET TO 5 LANES, SIDEWALKS, ILLUMINATION, SIGNAL MODIFICATION AT S 345TH STREET, NEW SIGNAL AT SR 99
2. SW 356TH ST - 21ST AVE SW TO 1ST AVE S
WIDEN STREET TO 5 LANES, WITH PROVISIONS FOR BICYCLES, SIDEWALKS, ILLUMINATION, STREET TREES, SIGNAL MODIFICATIONS AT 21ST AVENUE SW AND 1ST AVENUE S
3. 16TH AVE SW AT ADELAIDE PARK
WIDEN TO FULL 36' WIDE STREET ADJACENT TO ADELAIDE PARK WITH SIDEWALK ON WEST SIDE
4. DASH POINT RD AT 11TH PL S & SACAJAWEA
INSTALL PEDESTRIAN AND VEHICLE ACTUATED TRAFFIC SIGNAL
5. TRAFFIC SIGNAL COORDINATION - S 320TH ST, SR 99
INSTALL CONTROLLERS AND INTERCONNECT EQUIPMENT TO COORDINATE TRAFFIC SIGNALS IN CITY CENTER ON S 320TH STREET FROM I-5 TO 8TH AVENUE S, AND ON SR 99 FROM S 304TH STREET TO S 324TH STREET
6. S 348TH ST - SR 161 TO I-5
REALIGN ROADWAY TO CORRECT LANE OFFSET AT SR 99; HOV LANE, SIDEWALKS, SIGNAL MODIFICATION, ILLUMINATION, STREET TREES, PROPERTY ACQUISITION
7. S 356TH ST - 1ST AVE S TO SR 99
WIDEN TO 5 LANES WITH PROVISIONS FOR BICYCLES, SIDEWALKS, SIGNAL MODIFICATION, ILLUMINATION (KING COUNTY ADMINISTERED)
8. SW 336TH ST - 21ST AVE SW TO HOYT ROAD
FROM 21ST AVENUE SW TO 26TH PLACE SW WIDEN TO 5 LANES, SIDEWALKS, SIGNAL MODIFICATION, ILLUMINATION, PROPERTY ACQUISITION. FROM 26TH PLACE SW TO HOYT ROAD RESURFACE PAVEMENT AND CHANNELIZE WITH A CENTER TWO-WAY LEFT TURN LANE.
- 8A. 4TH AVE S - S 312TH ST TO S 316TH ST
REALIGN ROADWAY TO ELIMINATE SIGHT DISTANCE PROBLEM DUE TO VERTICAL CURVE AND HALF STREET TRANSITION.
9. 23RD AVE S - S 317TH ST TO S 324TH ST
WIDEN TO 5 LANES WITH PROVISIONS FOR BICYCLES, SIDEWALKS, SIGNAL MODIFICATION, ILLUMINATION, STREET TREES, PROPERTY ACQUISITION

- 10 **CAMPUS DR SW - 7TH AVE SW TO 34500 BLOCK**
WIDEN TO 5 LANES WITH PROVISIONS FOR BICYCLES, SIDEWALKS, SIGNALIZE 6TH WAY SW INTERSECTION, REALIGN POOL AND BALL FIELD DRIVEWAYS, STREET TREES, PROPERTY ACQUISITION
- 11 **S 304TH ST - 28TH AVE S TO MILITARY RD**
WIDEN TO 3 LANES WITH PROVISIONS FOR BICYCLES, IMPROVE SIGHT DISTANCE, NB LEFT TURN POCKET ON MILITARY RD, NB LEFT TURN ON 28TH AVE S, SIDEWALKS, ILLUMINATION, STREET TREES, PROPERTY ACQUISITION
- 12 **S 312TH ST - SR 99 TO 23RD AVE S**
WIDEN TO 5 LANES WITH PROVISIONS FOR BICYCLES, SIDEWALKS, ILLUMINATION, SIGNAL MODIFICATION, STREET TREES, PROPERTY ACQUISITION.
- 13 **21ST AVE SW/DASH POINT SIDEWALK - 356TH ST TO 312TH ST**
INSTALL SIDEWALKS WHERE NO SIDEWALKS EXIST
- 14 **S 288TH ST/MILITARY ROAD SIGNAL UPGRADE**
MODIFY TRAFFIC SIGNAL DISPLAYS AND REPLACE SIGNAL CONTROLLER TO INCREASE CAPACITY
- 15 **MILITARY RD AT STAR LAKE RD**
CONSTRUCT NB LEFT TURN POCKET, WIDEN STAR LAKE RD APPROACH, ILLUMINATION
- 16 **DASH POINT ROAD - SPOT SAFETY IMPROVEMENT**
CONSTRUCT MINOR WIDENING FOR TURN POCKETS, CHANNELIZATION, ILLUMINATION AND SIGNING IMPROVEMENTS AT VARIOUS SPOT LOCATIONS TO BE IDENTIFIED IN THE TRANSPORTATION ELEMENT OF THE COMPREHENSIVE PLAN
- 17 **S 336TH ST AT SR 99**
WIDEN TO 5 LANES WITH PROVISIONS FOR BICYCLES, SIDEWALKS, SIGNAL MODIFICATION, ILLUMINATION, STREET TREES, PROPERTY ACQUISITION
- 18 **S 317TH ST - 23RD AVE S TO 28TH AVE S**
WIDEN & REALIGN S 317TH AT BOTH INTERSECTIONS TO PROVIDE LEFT TURN POCKETS
- 19 **S 312TH ST @ 8TH AVE S SIGNAL**
SIGNALIZE INTERSECTION TO IMPROVE SOUTHBOUND TRAFFIC MOVEMENTS
- 20 **1ST AVE S - S 320TH ST TO S 316TH ST**
WIDEN TO 5 LANES WITH PROVISIONS FOR BICYCLES, SIDEWALKS, DRAINAGE, ILLUMINATION, PROPERTY ACQUISITION
- 21 **21ST AVE SW/DASH POINT WIDENING - 356TH ST TO 312TH ST**
WIDEN TO 5 LANES WITH PROVISIONS FOR BICYCLES, SIDEWALKS, DRAINAGE, ILLUMINATION, PROPERTY ACQUISITION
- 22 **CBD RING ROAD COMPLETION**
CONSTRUCT COMMERCIAL STREET LINKING 11TH AVENUE S TO 14TH AVENUE S WITH A CONNECTION TO SR 99 AT S 316TH STREET, SIDEWALKS, ILLUMINATION, STREET TREES, PROPERTY ACQUISITION
- 23 **S 340TH ST AT HOYT RD SIGNAL**
INSTALL TRAFFIC SIGNAL, WIDEN INTERSECTION APPROACHES TO 3 LANES, ILLUMINATION, PROPERTY ACQUISITION
- 24 **1ST AVE S - S 348TH ST TO S 356TH ST**
WIDEN TO 5 LANES WITH PROVISIONS FOR BICYCLES, SIDEWALKS, ILLUMINATION, STREET TREES, PROPERTY ACQUISITION
- 25 **1ST AVE S - SW 356TH ST TO SW 368TH ST**
WIDEN TO 3 LANES WITH SIDEWALKS, ILLUMINATION
- 26 **SW 320TH STREET @ 47TH AVE SW SIGNALIZATION**
INSTALL TRAFFIC SIGNAL, WIDEN 47TH AVE SW APPROACHES TO 3 LANES

- 27 **S 324TH ST - SR 99 TO 17TH AVE S**
WIDEN TO 5 LANES WITH PROVISIONS FOR BICYCLES, SIDEWALKS, SIGNAL MODIFICATION, ILLUMINATION, CHANNELIZE MALL INTERSECTION, PROPERTY ACQUISITION
- 28 **MILITARY RD WIDENING - I-5 (S) TO I-5 (N)**
WIDEN TO 5 LANES WITH PROVISIONS FOR BICYCLES, SIDEWALKS, SIGNALIZE 6TH WAY SW INTERSECTION, REALIGN POOL AND BALL FIELD DRIVEWAYS, STREET TREES, PROPERTY ACQUISITION
- 29 **S 356TH ST - SR 99 TO SR 161**
NEW ALIGNMENT, 5 LANES WITH PROVISIONS FOR BICYCLES, SIDEWALKS, ILLUMINATION, STREET TREES, BIKE LANES, COORDINATE REGIONAL STORM DETENTION WITH THIS PROJECT, PROPERTY ACQUISITION
- 30 **SW 368TH ST - 2ND AVE S TO 6TH AVE S**
WIDEN TO FULL WIDTH STREET
- 31 **8TH AVE SW - SW 316TH TO SW 312TH ST**
WIDEN TO FULL WIDTH STREET
- 32 **DASH POINT RD & HOYT RD SIGNALIZATION**
INSTALL TRAFFIC SIGNAL WITH MINOR APPROACH WIDENING
- 33 **S 304TH - SR 99 TO 28TH AVE S**
WIDEN TO 3 LANES WITH PROVISIONS FOR BICYCLES, SIDEWALKS, ILLUMINATION, STREET TREES, RE-GRADE ROAD, ADDITIONAL WIDENING AT SR 99, SIGNAL MODIFICATION, PROPERTY ACQUISITION
- 34 **S 336TH ST - 20TH AVE S TO I-5**
WIDEN TO 5 LANES WITH PROVISIONS FOR BICYCLES, SIDEWALKS, ILLUMINATION, RE-GRADE ROAD, PROPERTY ACQUISITION

NON-MOTORIZED CAPITAL IMPROVEMENTS

- 35 **BPA TRAIL PHASE I - CITY CENTER SEGMENT**
- 36 **BPA TRAIL PHASE II - CITY CENTER TO PANTHER LAKE**
- 37 **BPA TRAIL PHASE II - PANTHER LAKE SEGMENT**

WSDOT PROJECTS

- 38 **SR 161/SR 18 - I-5 OVERCROSSING TO I-5 INTERCHANGE**
WIDEN SR 161 TO 5 LANES WITH PROVISIONS FOR BICYCLES, SIGNALIZE SW 356TH INTERSECTION, SIDEWALKS, BIKE LANES, ILLUMINATION, ADD LANES ON SR 161 AND ON SR 18 AT INTERSECTION
- 39 **I-5 INTERCHANGE STUDY AT SR 161**
NORTH ORIENTED ON/OFF RAMP, WILL INVOLVE SR 18 INTERCHANGE, CONSIDER SB OFF RAMP TO SW 356TH
- 40 **PARK & RIDE LOT, 21ST AVE SW & SW 344TH ST**
WSDOT WILL ACQUIRE SITE IN 1993. CONSTRUCTION DATE UNCERTAIN. NO FUNDING AT THIS TIME.

7/28/92

APPENDIX B

**2010 TRAVEL CHARACTERISTICS
SUMMARIZED BY FACILITY CLASS AND LOS**

| Facility Class | 2010 | | LOS | Total |
|----------------|---------------|---------------|------------|---------------|
| | Admissions | Discharges | | |
| Acute Care | 12,345 | 11,234 | 1.0 | 23,579 |
| Subacute | 5,678 | 5,432 | 1.0 | 11,110 |
| Long Term Care | 3,456 | 3,210 | 1.0 | 6,666 |
| Psychiatric | 2,109 | 2,000 | 1.0 | 4,109 |
| Other | 1,234 | 1,123 | 1.0 | 2,357 |
| Total | 24,822 | 23,003 | 1.0 | 47,825 |

Table 1B
Average Speeds and VMT by Functional Classification During PM Peak Hour
Level of Service A through D (V/C Ratio 0.0 to 0.75)

| 1990 Existing Conditions | | | | |
|---------------------------------|--------------------|------------|------------|----------------------|
| | Lanes Miles | VMT | VHT | Average Speed |
| Neighborhood Collectors | 78.7 | 8,488 | 327 | 26 |
| Collector Arterials | 66.7 | 14,644 | 474 | 31 |
| Minor Arterials | 50.8 | 17,475 | 552 | 32 |
| Principle Arterials | 46.2 | 21,204 | 648 | 33 |
| <i>Totals</i> | 242.4 | 61,811 | 2,001 | 30.5 |

| 2010 TIP Funded | | | | |
|-------------------------|--------------------|------------|------------|----------------------|
| | Lanes Miles | VMT | VHT | Average Speed |
| Neighborhood Collectors | 76.2 | 11,670 | 468 | 25 |
| Collector Arterials | 58.6 | 17,237 | 584 | 30 |
| Minor Arterials | 43.3 | 17,029 | 543 | 31 |
| Principle Arterials | 34.7 | 18,715 | 621 | 30 |
| <i>Totals</i> | 212.8 | 64,651 | 2,216 | 29 |

| 2010 Alternative A | | | | |
|---------------------------|--------------------|------------|------------|----------------------|
| | Lanes Miles | VMT | VHT | Average Speed |
| Neighborhood Collectors | 78.6 | 11,986 | 456 | 26 |
| Collector Arterials | 71.6 | 20,388 | 626 | 33 |
| Minor Arterials | 53.7 | 20,512 | 626 | 33 |
| Principle Arterials | 45.9 | 24,565 | 804 | 31 |
| Carpool Lanes | 20.1 | 3,773 | 101 | 37 |
| <i>Totals</i> | 269.9 | 81,224 | 2,613 | 32 |

| 2010 Alternative B | | | | |
|---------------------------|--------------------|------------|------------|----------------------|
| | Lanes Miles | VMT | VHT | Average Speed |
| Neighborhood Collectors | 78.4 | 12,017 | 460 | 26 |
| Collector Arterials | 72.1 | 20,539 | 632 | 32 |
| Minor Arterials | 55.5 | 20,905 | 642 | 33 |
| Principle Arterials | 43.5 | 22,037 | 721 | 31 |
| Carpool Lanes | 20.4 | 3,883 | 105 | 37 |
| <i>Totals</i> | 269.9 | 79,381 | 2,560 | 31.8 |

| 2010 Alternative C | | | | |
|---------------------------|--------------------|------------|------------|----------------------|
| | Lanes Miles | VMT | VHT | Average Speed |
| Neighborhood Collectors | 77.1 | 11,841 | 458 | 26 |
| Collector Arterials | 71.0 | 20,587 | 635 | 32 |
| Minor Arterials | 52.8 | 20,007 | 610 | 33 |
| Principle Arterials | 42.5 | 22,561 | 735 | 31 |
| Carpool Lanes | 19.8 | 3,582 | 97 | 37 |
| <i>Totals</i> | 263.2 | 78,578 | 2,535 | 31.8 |

Table 3B
Average Speeds and VMT by Functional Classification During PM Peak Hour
Level of Service F (V/C Ratio Greater than 0.90)

| 1990 Existing Conditions | | | | |
|---------------------------------|--------------------|------------|------------|----------------------|
| | Lanes Miles | VMT | VHT | Average Speed |
| Neighborhood Collectors | 1.6 | 1,237 | 55 | 20 |
| Collector Arterials | 2.9 | 2,114 | 106 | 21 |
| Minor Arterials | 2.5 | 1,954 | 93 | 21 |
| Principle Arterials | 24.9 | 20,687 | 1,019 | 24 |
| <i>Totals</i> | 31.9 | 25,992 | 1,273 | 21.5 |

| 2010 TIP Funded | | | | |
|-------------------------|--------------------|------------|------------|----------------------|
| | Lanes Miles | VMT | VHT | Average Speed |
| Neighborhood Collectors | 1.5 | 1,089 | 81 | 13 |
| Collector Arterials | 6.8 | 4,819 | 279 | 16 |
| Minor Arterials | 7.2 | 6,020 | 340 | 18 |
| Principle Arterials | 36.8 | 35,564 | 2,070 | 17 |
| <i>Totals</i> | 52.3 | 47,492 | 2,770 | 16 |

| 2010 Alternative A | | | | |
|---------------------------|--------------------|------------|------------|----------------------|
| | Lanes Miles | VMT | VHT | Average Speed |
| Neighborhood Collectors | 0.5 | 386 | 29 | 13 |
| Collector Arterials | 9.2 | 6,458 | 407 | 18 |
| Minor Arterials | 2.5 | 2,042 | 100 | 21 |
| Principle Arterials | 21.2 | 19,834 | 1,013 | 22 |
| Carpool Lanes | 1.0 | 897 | 36 | 25 |
| <i>Totals</i> | 34.4 | 29,617 | 1,585 | 19.8 |

| 2010 Alternative B | | | | |
|---------------------------|--------------------|------------|------------|----------------------|
| | Lanes Miles | VMT | VHT | Average Speed |
| Neighborhood Collectors | 0.9 | 623 | 40 | 15 |
| Collector Arterials | 8.6 | 6,135 | 389 | 17 |
| Minor Arterials | 3.0 | 2,415 | 119 | 21 |
| Principle Arterials | 21.6 | 20,101 | 1,043 | 21 |
| Carpool Lanes | 1.2 | 1,104 | 45 | 25 |
| <i>Totals</i> | 35.3 | 30,378 | 1,636 | 19.8 |

| 2010 Alternative C | | | | |
|---------------------------|--------------------|------------|------------|----------------------|
| | Lanes Miles | VMT | VHT | Average Speed |
| Neighborhood Collectors | 0.56 | 415 | 33 | 12 |
| Collector Arterials | 10.3 | 7,254 | 450 | 18 |
| Minor Arterials | 3.7 | 2,916 | 146 | 20 |
| Principle Arterials | 26.6 | 24,809 | 1,333 | 20 |
| Carpool Lanes | 1.1 | 1,014 | 40 | 25 |
| <i>Totals</i> | 42.3 | 36,408 | 2,002 | 19 |

Table 2B
Average Speeds and VMT by Functional Classification During PM Peak Hour
Level of Service E (V/C Ratio 0.75 to 0.90)

| 1990 Existing Conditions | | | | |
|---------------------------------|--------------------|------------|------------|----------------------|
| | Lanes Miles | VMT | VHT | Average Speed |
| Neighborhood Collectors | 1.1 | 557 | 26 | 22 |
| Collector Arterials | 6.7 | 3,609 | 132 | 27 |
| Minor Arterials | 4.8 | 3,376 | 132 | 26 |
| Principle Arterials | 18.2 | 12,263 | 428 | 29 |
| <i>Totals</i> | 30.8 | 19,805 | 718 | 26 |

| 2010 TIP Funded | | | | |
|-------------------------|--------------------|------------|------------|----------------------|
| | Lanes Miles | VMT | VHT | Average Speed |
| Neighborhood Collectors | 5.1 | 2,829 | 115 | 25 |
| Collector Arterials | 10.6 | 6,298 | 294 | 21 |
| Minor Arterials | 10.3 | 6,438 | 272 | 24 |
| Principle Arterials | 19.1 | 14,665 | 579 | 25 |
| <i>Totals</i> | 45.1 | 30,230 | 1,260 | 23.75 |

| 2010 Alternative A | | | | |
|---------------------------|--------------------|------------|------------|----------------------|
| | Lanes Miles | VMT | VHT | Average Speed |
| Neighborhood Collectors | 4.2 | 2,213 | 95 | 23 |
| Collector Arterials | 10.1 | 5,816 | 250 | 23 |
| Minor Arterials | 11.0 | 7,604 | 301 | 25 |
| Principle Arterials | 29.1 | 22,465 | 911 | 25 |
| Carpool Lanes | 3.0 | 2,423 | 78 | 31 |
| <i>Totals</i> | 57.4 | 40,521 | 1,635 | 25.4 |

| 2010 Alternative B | | | | |
|---------------------------|--------------------|------------|------------|----------------------|
| | Lanes Miles | VMT | VHT | Average Speed |
| Neighborhood Collectors | 3.9 | 1,972 | 83 | 24 |
| Collector Arterials | 10.4 | 5,963 | 253 | 24 |
| Minor Arterials | 95 | 6,600 | 259 | 25 |
| Principle Arterials | 31.0 | 24,772 | 994 | 25 |
| Carpool Lanes | 2.4 | 1,931 | 62 | 31 |
| <i>Totals</i> | 142.7 | 41,238 | 1,651 | 25.8 |

| 2010 Alternative C | | | | |
|---------------------------|--------------------|------------|------------|----------------------|
| | Lanes Miles | VMT | VHT | Average Speed |
| Neighborhood Collectors | 5.7 | 2,916 | 121 | 24 |
| Collector Arterials | 9.9 | 5,729 | 250 | 23 |
| Minor Arterials | 10.9 | 7,595 | 303 | 25 |
| Principle Arterials | 25.8 | 20,948 | 842 | 25 |
| Carpool Lanes | 3.2 | 2,636 | 86 | 31 |
| <i>Totals</i> | 55.5 | 39,824 | 1,602 | 25.6 |

1990 Conditions

| Screenlines | 1990 Model Volumes | V/C | LOS |
|------------------------|--------------------|------|-----|
| E/W Screenlines | | | |
| EW1 | 17,720 | 0.67 | A-D |
| EW2A | 3,754 | 0.34 | A-D |
| EW2B | 15,351 | 0.83 | E |
| EW2C | 748 | 0.31 | A-D |
| EW2 | 19,853 | 0.62 | A-D |
| EW3A | 15,863 | 0.78 | E |
| EW3B | 1,765 | 0.55 | A-D |
| EW3 | 17,628 | 0.75 | A-D |
| EW4A | 3,525 | 0.57 | A-D |
| EW4B | 15,569 | 0.65 | A-D |
| EW4C | 2,736 | 0.51 | A-D |
| EW4D | 1,020 | 0.46 | A-D |
| EW4 | 22,850 | 0.60 | A-D |
| EW5A | 17,197 | 0.81 | E |
| EW5B | 1,675 | 0.30 | A-D |
| EW5 | 18,872 | 0.70 | A-D |
| N/S Screenlines | | | |
| NS1A | 2,384 | 0.36 | A-D |
| NS1B | 3,077 | 0.91 | F |
| NS1 | 5,461 | 0.55 | A-D |
| NS2A | 5,123 | 0.69 | A-D |
| NS2B | 4,208 | 0.70 | A-D |
| NS2 | 9,331 | 0.70 | A-D |
| NS3A | 2,939 | 0.49 | A-D |
| NS3B | 5,303 | 0.63 | A-D |
| NS3C | 6,359 | 0.76 | E |
| NS3 | 14,601 | 0.64 | A-D |
| NS4A | 9,863 | 0.85 | E |
| NS4B | 5,406 | 1.04 | F |
| NS4C | 1,705 | 1.07 | F |
| NS4 | 16,974 | 0.92 | F |
| NS5A | 3,281 | 0.41 | A-D |
| NS5B | 10,399 | 0.72 | A-D |
| NS5 | 13,680 | 0.61 | A-D |

2010 TIP Funded

| Screenlines | 2010 Base Volumes | V/C | LOS | 1990 Actual Volumes | % Change |
|------------------------|-------------------|------|-----|---------------------|----------|
| E/W Screenlines | | | | | |
| EW1 | 21,375 | 0.80 | E | 17,789 | 20% |
| EW2A | 5,605 | 0.50 | A-D | 3,373 | 66% |
| EW2B | 18,205 | 0.95 | F | 14,930 | 22% |
| EW2C | 1,015 | 0.42 | A-D | 420 | 142% |
| EW2 | 24,825 | 0.76 | E | 18,723 | 33% |
| EW3A | 18,806 | 0.90 | F | 15,781 | 19% |
| EW3B | 2,060 | 0.64 | A-D | 2,005 | 3% |
| EW3 | 20,866 | 0.87 | E | 17,786 | 17% |
| EW4A | 5,118 | 0.83 | E | 3,695 | 39% |
| EW4B | 19,008 | 0.78 | E | 15,008 | 27% |
| EW4C | 3,383 | 0.63 | A-D | 2,600 | 30% |
| EW4D | 1,141 | 0.52 | A-D | 1,030 | 11% |
| EW4 | 28,650 | 0.75 | A-D | 22,333 | 28% |
| EW5A | 20,588 | 0.95 | F | 15,421 | 34% |
| EW5B | 2,500 | 0.45 | A-D | 2,024 | 24% |
| EW5 | 23,088 | 0.84 | E | 17,445 | 32% |
| N/S Screenlines | | | | | |
| NS1A | 2,951 | 0.45 | A-D | 2,586 | 14% |
| NS1B | 4,008 | 0.80 | E | 3,124 | 28% |
| NS1 | 6,959 | 0.60 | A-D | 5,710 | 22% |
| NS2A | 6,191 | 0.79 | E | 5,268 | 18% |
| NS2B | 5,516 | 0.73 | A-D | 4,125 | 34% |
| NS2 | 11,707 | 0.76 | E | 9,393 | 25% |
| NS3A | 3,619 | 1.40 | F | 3,190 | 13% |
| NS3B | 6,409 | 0.72 | A-D | 5,215 | 23% |
| NS3C | 8,094 | 0.94 | F | 6,251 | 29% |
| NS3 | 18,122 | 0.97 | F | 14,656 | 24% |
| NS4A | 11,998 | 0.97 | F | 9,437 | 27% |
| NS4B | 6,305 | 1.25 | F | 4,985 | 26% |
| NS4 | 18,303 | 1.00 | F | 14,422 | 27% |
| NS5A | 4,226 | 0.40 | A-D | 3,717 | 14% |
| NS5B | 12,677 | 0.81 | E | 10,456 | 21% |
| NS5 | 16,903 | 0.67 | A-D | 14,173 | 19% |

2010 ALTERNATIVE A

| Screenlines | 2010 Alt A Volumes | V/C | LOS | 1990 Actual Volumes | % Change | 2010 TIP Funded | % Change |
|------------------------|--------------------|------|-----|---------------------|----------|-----------------|----------|
| E/W Screenlines | | | | | | | |
| EW1 | 21,011 | 0.72 | A-D | 17,789 | 18% | 21,375 | -2% |
| EW2A | 5,975 | 0.44 | A-D | 3,373 | 77% | 5,605 | 7% |
| EW2B | 16,645 | 0.87 | E | 14,930 | 11% | 18,205 | -9% |
| EW2C | 1,019 | 0.42 | A-D | 420 | 143% | 1,015 | 0% |
| EW2 | 23,639 | 0.67 | A-D | 18,723 | 26% | 24,825 | -5% |
| EW3A | 18,729 | 0.86 | E | 15,781 | 19% | 18,806 | 0% |
| EW3B | 1,793 | 0.56 | A-D | 2,005 | -11% | 2,060 | -13% |
| EW3 | 20,522 | 0.82 | E | 17,786 | 15% | 20,866 | -2% |
| EW4A | 4,509 | 0.64 | A-D | 3,695 | 22% | 5,118 | -12% |
| EW4B | 17,583 | 0.72 | A-D | 15,008 | 17% | 19,008 | -7% |
| EW4C | 3,326 | 0.62 | A-D | 2,600 | 28% | 3,383 | -2% |
| EW4D | 850 | 0.39 | A-D | 1,030 | -17% | 1,141 | -26% |
| EW4 | 26,268 | 0.67 | A-D | 22,333 | 18% | 28,650 | -8% |
| EW5A | 20,132 | 0.86 | E | 15,421 | 31% | 20,588 | -2% |
| EW5B | 2,571 | 0.46 | A-D | 2,024 | 27% | 2,500 | 3% |
| EW5 | 22,703 | 0.78 | E | 17,445 | 30% | 23,088 | -2% |
| N/S Screenlines | | | | | | | |
| NS1A | 2,974 | 0.45 | A-D | 2,586 | 15% | 2,951 | 1% |
| NS1B | 4,054 | 0.60 | A-D | 3,124 | 30% | 4,008 | 1% |
| NS1 | 7,028 | 0.52 | A-D | 5,710 | 23% | 6,959 | 1% |
| NS2A | 5,178 | 0.66 | A-D | 5,268 | -2% | 6,191 | -16% |
| NS2B | 4,345 | 0.57 | A-D | 4,125 | 5% | 5,516 | -21% |
| NS2 | 9,523 | 0.62 | A-D | 9,393 | 1% | 11,707 | -19% |
| NS3A | 3,398 | 0.57 | A-D | 3,190 | 7% | 3,619 | -6% |
| NS3B | 7,005 | 0.79 | E | 5,215 | 34% | 6,409 | 9% |
| NS3C | 7,510 | 0.74 | A-D | 6,251 | 20% | 8,094 | -7% |
| NS3 | 17,913 | 0.71 | A-D | 14,656 | 22% | 18,122 | -1% |
| NS4A | 10,676 | 1.04 | F | 9,437 | 13% | 11,998 | -11% |
| NS4B | 4,757 | 0.91 | F | 4,985 | -5% | 6,305 | -25% |
| NS4C | | | | 1,612 | | 18,303 | |
| NS4 | 15,433 | 1.00 | F | 16,034 | -4% | 36,606 | -58% |
| NS5A | 5,212 | 0.59 | A-D | 3,717 | 40% | 4,226 | 23% |
| NS5B | 12,810 | 0.85 | E | 10,456 | 23% | 12,677 | 1% |
| NS5 | 18,022 | 0.76 | E | 14,173 | 27% | 16,903 | 7% |

2010 ALTERNATIVE B

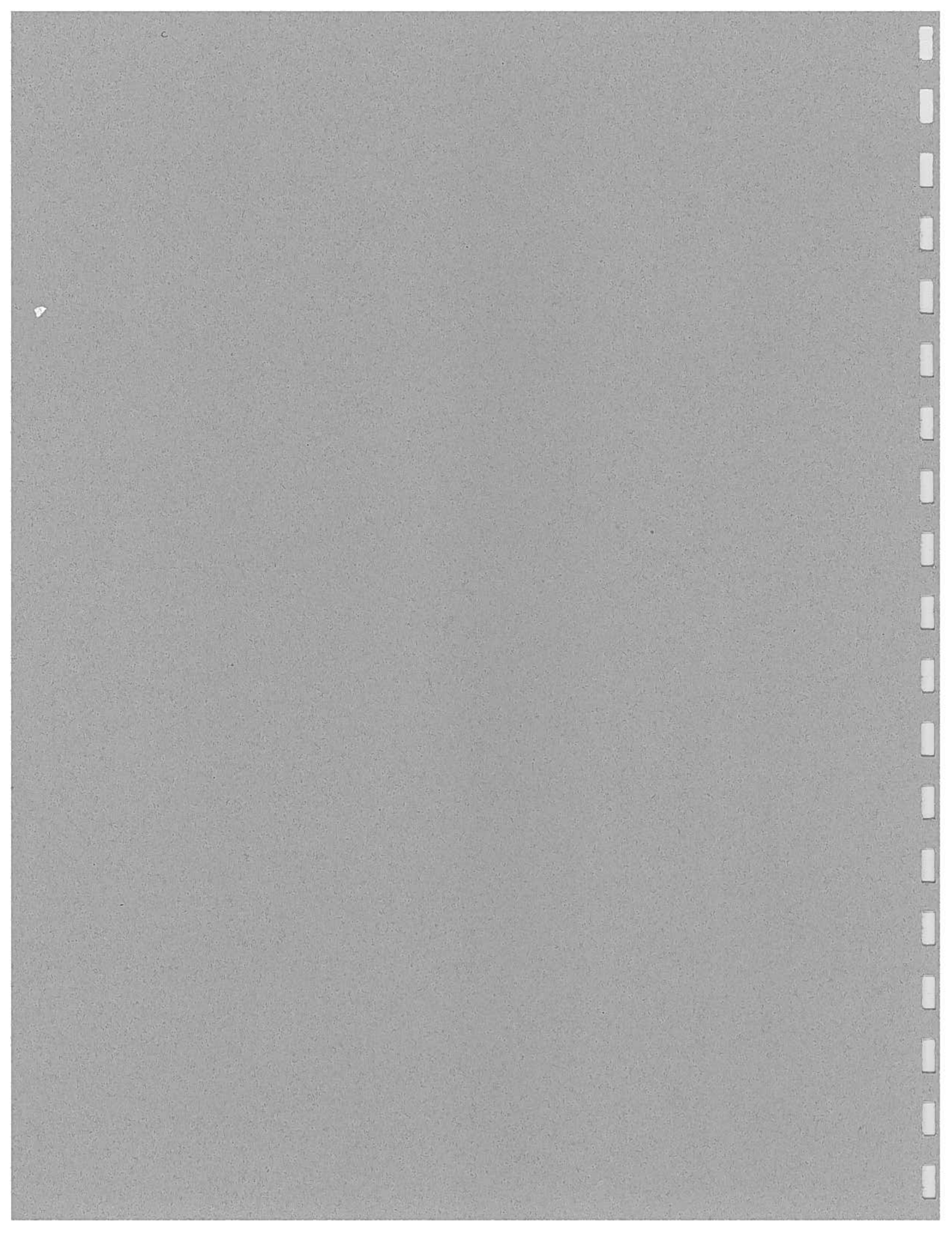
| Screenlines | 2010 Alt B Volumes | V/C | LOS | 1990 Actual Volumes | % Change | 2010 TIP Funded | % Change |
|------------------------|--------------------|------|-----|---------------------|----------|-----------------|----------|
| E/W Screenlines | | | | | | | |
| EW1 | 20,910 | 0.71 | A-D | 17,789 | 18% | 21,375 | -2% |
| EW2A | 5,951 | 0.44 | A-D | 3,373 | 76% | 5,605 | 6% |
| EW2B | 16,593 | 0.87 | E | 14,930 | 11% | 18,205 | -9% |
| EW2C | 926 | 0.39 | A-D | 420 | 120% | 1,015 | -9% |
| EW2 | 23,470 | 0.67 | A-D | 18,723 | 25% | 24,825 | -5% |
| EW3A | 18,702 | 0.86 | E | 15,781 | 19% | 18,806 | -1% |
| EW3B | 1,806 | 0.56 | A-D | 2,005 | -10% | 2,060 | -12% |
| EW3 | 20,508 | 0.82 | E | 17,786 | 15% | 20,866 | -2% |
| EW4A | 4,462 | 0.64 | A-D | 3,695 | 21% | 5,118 | -13% |
| EW4B | 17,533 | 0.72 | A-D | 15,008 | 17% | 19,008 | -8% |
| EW4C | 3,204 | 0.59 | A-D | 2,600 | 23% | 3,383 | -5% |
| EW4D | 793 | 0.36 | A-D | 1,030 | -23% | 1,141 | -30% |
| EW4 | 25,992 | 0.67 | A-D | 22,333 | 16% | 28,650 | -9% |
| EW5A | 20,232 | 0.87 | E | 15,421 | 31% | 20,588 | -2% |
| EW5B | 2,565 | 0.46 | A-D | 2,024 | 27% | 2,500 | 3% |
| EW5 | 22,797 | 0.79 | E | 17,445 | 31% | 23,088 | -1% |
| N/S Screenlines | | | | | | | |
| NS1A | 2,807 | 0.43 | A-D | 2,586 | 9% | 2,951 | -5% |
| NS1B | 3,966 | 0.58 | A-D | 3,124 | 27% | 4,008 | -1% |
| NS1 | 6,773 | 0.51 | A-D | 5,710 | 19% | 6,959 | -3% |
| NS2A | 4,944 | 0.63 | A-D | 5,268 | -6% | 6,191 | -20% |
| NS2B | 4,339 | 0.57 | A-D | 4,125 | 5% | 5,516 | -21% |
| NS2 | 9,283 | 0.60 | A-D | 9,393 | -1% | 11,707 | -21% |
| NS3A | 3,291 | 0.55 | A-D | 3,190 | 3% | 3,619 | -9% |
| NS3B | 6,789 | 0.76 | E | 5,215 | 30% | 6,409 | 6% |
| NS3C | 7,227 | 0.71 | A-D | 6,251 | 16% | 8,094 | -11% |
| NS3 | 17,307 | 0.69 | A-D | 14,656 | 18% | 18,122 | -4% |
| NS4A | 10,975 | 1.07 | F | 9,437 | 16% | 11,998 | -9% |
| NS4B | 4,744 | 0.91 | F | 4,985 | -5% | 6,305 | -25% |
| NS4C | | | | 1,612 | | 18,303 | |
| NS4 | 15,719 | 1.02 | F | 16,034 | -2% | 36,606 | -57% |
| NS5A | 5,174 | 0.59 | A-D | 3,717 | 39% | 4,226 | 22% |
| NS5B | 12,954 | 0.86 | E | 10,456 | 24% | 12,677 | 2% |
| NS5 | 18,128 | 0.76 | E | 14,173 | 28% | 16,903 | 7% |

2010 ALTERNATIVE C

| Screenlines | 2010 Alt C Volumes | V/C | LOS | 1990 Actual Volumes | % Change | 2010 TIP Funded | % Change |
|------------------------|--------------------|------|-----|---------------------|----------|-----------------|----------|
| E/W Screenlines | | | | | | | |
| EW1 | 20,845 | 0.71 | A-D | 17,789 | 17% | 21,375 | -2% |
| EW2A | 5,916 | 0.44 | A-D | 3,373 | 75% | 5,605 | 6% |
| EW2B | 16,665 | 0.87 | E | 14,930 | 12% | 18,205 | -8% |
| EW2C | 947 | 0.39 | A-D | 420 | 125% | 1,015 | -7% |
| EW2 | 23,528 | 0.67 | A-D | 18,723 | 26% | 24,825 | -5% |
| EW3A | 18,813 | 0.87 | E | 15,781 | 19% | 18,806 | 0% |
| EW3B | 1,831 | 0.57 | A-D | 2,005 | -9% | 2,060 | -11% |
| EW3 | 20,644 | 0.83 | E | 17,786 | 16% | 20,866 | -1% |
| EW4A | 4,595 | 0.66 | A-D | 3,695 | 24% | 5,118 | -10% |
| EW4B | 18,028 | 0.74 | A-D | 15,008 | 20% | 19,008 | -5% |
| EW4C | 3,385 | 0.63 | A-D | 2,600 | 30% | 3,383 | 0% |
| EW4D | 776 | 0.35 | A-D | 1,030 | -25% | 1,141 | -32% |
| EW4 | 26,784 | 0.69 | A-D | 22,333 | 20% | 28,650 | -7% |
| EW5A | 20,345 | 0.87 | E | 15,421 | 32% | 20,588 | -1% |
| EW5B | 2,671 | 0.48 | A-D | 2,024 | 32% | 2,500 | 7% |
| EW5 | 23,016 | 0.80 | E | 17,445 | 32% | 23,088 | 0% |
| N/S Screenlines | | | | | | | |
| NS1A | 2,844 | 0.43 | A-D | 2,586 | 10% | 2,951 | -4% |
| NS1B | 4,032 | 0.59 | A-D | 3,124 | 29% | 4,008 | 1% |
| NS1 | 6,876 | 0.51 | A-D | 5,710 | 20% | 6,959 | -1% |
| NS2A | 5,032 | 0.64 | A-D | 5,268 | -4% | 6,191 | -19% |
| NS2B | 4,397 | 0.58 | A-D | 4,125 | 7% | 5,516 | -20% |
| NS2 | 9,429 | 0.61 | A-D | 9,393 | 0% | 11,707 | -19% |
| NS3A | 3,336 | 0.56 | A-D | 3,190 | 5% | 3,619 | -8% |
| NS3B | 6,892 | 0.78 | E | 5,215 | 32% | 6,409 | 8% |
| NS3C | 7,685 | 0.75 | E | 6,251 | 23% | 8,094 | -5% |
| NS3 | 17,913 | 0.71 | A-D | 14,656 | 22% | 18,122 | -1% |
| NS4A | 11,158 | 1.09 | F | 9,437 | 18% | 11,998 | -7% |
| NS4B | 5,028 | 0.97 | F | 4,985 | 1% | 6,305 | -20% |
| NS4C | | | | 1,612 | | 18,303 | |
| NS4 | 16,186 | 1.05 | F | 16,034 | 1% | 36,606 | -56% |
| NS5A | 5,260 | 0.60 | A-D | 3,717 | 42% | 4,226 | 24% |
| NS5B | 13,373 | 0.89 | E | 10,456 | 28% | 12,677 | 5% |
| NS5 | 18,633 | 0.78 | E | 14,173 | 31% | 16,903 | 10% |

CITYSHAPE

From Vision to Plan



CITY FACILITIES PLAN - 1993 TO 2002
PARKS COMPONENT

| FUNDING SOURCES | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | TOTAL |
|-----------------------|--------------------|--------------------|---------------------|------------------|--------------------|------------------|------------------|---------------------|--------------------|---------------------|---------------------|
| Pay-As-You-Go | \$250,000 | \$1,156,480 | \$1,227,616 | \$773,906 | \$1,546,553 | \$413,662 | \$316,330 | \$1,361,728 | \$3,421,423 | \$355,828 | \$10,443,326 |
| Countywide G.O. Bonds | 2,944,000 | | 10,816,000 | | | | | 13,159,318 | | 11,366,494 | 38,305,812 |
| King County Bond | 3,000,000 | | | | | | | | | | 3,000,000 |
| Fee In Lieu | | 10,400 | | 21,497 | 23,397 | | | | | | 56,294 |
| Grants (IAC) | | 312,000 | 200,096 | | | | | | | | 512,096 |
| Grants | | | 389,376 | 109,112 | | | | 394,780 | | | 894,268 |
| Other | | | | | | | | 394,780 | | | 394,780 |
| G.O. Bonds | | | | | | | | | | | 0 |
| TOTAL SOURCES | \$6,224,000 | \$1,478,880 | \$12,633,088 | \$903,516 | \$1,569,950 | \$413,662 | \$316,330 | \$15,330,605 | \$3,421,423 | \$11,742,322 | \$54,033,776 |

| CAPITAL PROJECTS | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | TOTAL |
|---------------------------|--------------------|--------------------|---------------------|------------------|--------------------|------------------|------------------|---------------------|--------------------|---------------------|---------------------|
| Park Acquisition | \$250,000 | \$260,000 | \$270,400 | \$281,216 | \$292,465 | \$304,163 | \$316,330 | \$328,963 | \$342,142 | \$355,828 | \$3,001,527 |
| Compass Drive Park | 2,944,000 | | | | | | | | | | 2,944,000 |
| Open Space Acquisition | 3,000,000 | | | | | | | | | | 3,000,000 |
| Steel Lake Park/Auxax | | 686,400 | 600,192 | 92,239 | 112,306 | 109,499 | | | | | 1,600,636 |
| Heritage Woods | | 78,000 | 81,120 | | | | | | | | 159,120 |
| Powerty Bay Park | | 72,800 | 464,720 | | | | | | | | 537,520 |
| West Campus Trail | | 145,000 | | | | | | | | | 145,000 |
| Golf Fun Park | | 104,000 | | | | | | | | | 104,000 |
| Dumas Bay Park | | 31,200 | | | | | | | | | 31,200 |
| Seafarmer Park | | 100,800 | | | | | | 13,159,318 | | | 13,260,198 |
| Lake Park Upgrade | | | 281,216 | 134,984 | | | | | | | 416,200 |
| City Center Park | | | 10,816,000 | | | | | | | | 10,816,000 |
| Powerty Bay Park | | | 297,440 | | | | | | | | 297,440 |
| Alberbrook Park | | | | 62,992 | | | | | | | 62,992 |
| Deak Poles Highlands | | | | 112,486 | | | | | | | 112,486 |
| Cumulet Park | | | | 221,598 | | | | | | | 221,598 |
| Park Maintenance Facility | | | | | 941,736 | | | | | | 941,736 |
| Alberdale Park | | | | | 29,246 | | | | | | 29,246 |
| Adelaide Park | | | | | 194,197 | | | | | | 194,197 |
| Panther Lake Park | | | | | | | | 1,842,304 | | | 1,842,304 |
| Sports Field Complex | | | | | | | | | 3,079,280 | | 3,079,280 |
| Golf Course | | | | | | | | | | | 0 |
| TOTAL PROJECTS | \$6,224,000 | \$1,478,880 | \$12,633,088 | \$903,516 | \$1,569,950 | \$413,662 | \$316,330 | \$15,330,605 | \$3,421,423 | \$11,742,322 | \$54,033,776 |

**CITY FACILITIES PLAN - 1991 TO 2002
SCHOOL DISTRICT COMPONENT**

| FUNDING SOURCES | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | TOTAL |
|-------------------------|--------------------|---------------------|---------------------|---------------------|------------------|------------------|------|------|------|------|------|------|---------------------|
| SECURED FUNDS | | | | | | | | | | | | | |
| 1984/1988 Bond Proceeds | \$1,275,972 | \$4,804,078 | | | | | | | | | | | \$6,080,000 |
| 1991 Bond & Interest | 1,953,500 | 15,413,744 | \$20,422,322 | \$16,137,422 | \$800,922 | \$800,922 | | | | | | | 55,528,832 |
| Surplus Land Sale Fund | 1,281,000 | 410,000 | | | | | | | | | | | 1,691,000 |
| TOTAL | \$4,510,472 | \$20,627,822 | \$20,422,322 | \$16,137,422 | \$800,922 | \$800,922 | | | | | | | \$63,299,832 |

| | | | | | | | | | | | | | |
|------------------------|--|--|--|--|--|--|--|--|--|--|--|--|---------------------|
| UNSECURED FUNDS | | | | | | | | | | | | | |
| State Match Funds | | | | | | | | | | | | | UNKNOWN DATE |
| Mitigation Fees | | | | | | | | | | | | | \$20,554,960 |
| TOTAL | | | | | | | | | | | | | 4,900,000 |
| | | | | | | | | | | | | | \$25,454,960 |

| | | | | | | | | | | | | | |
|-------------------------------------|--------------------|---------------------|---------------------|---------------------|------------------|------------------|--|--|--|--|--|--|---------------------|
| CAPITAL PROJECTS | | | | | | | | | | | | | |
| Decatur Performing Arts | \$100,000 | | | | | | | | | | | | \$100,000 |
| Elementary #20 (Rainier View) | 1,281,000 | \$5,324,000 | | | | | | | | | | | 6,605,000 |
| Elementary #21 | 1,434,000 | 6,475,700 | | | | | | | | | | | 7,909,700 |
| Elementary #22 | 153,000 | 549,000 | \$3,976,200 | \$3,485,000 | | | | | | | | | 8,163,200 |
| Elementary #23 | 153,000 | 549,000 | 3,976,200 | 3,485,000 | | | | | | | | | 8,163,200 |
| Mark Twain Elementary Modernization | 86,000 | 271,500 | 2,440,000 | | | | | | | | | | 13,522,500 |
| Junior High #6 | 347,000 | 967,000 | 6,506,000 | 5,702,500 | | | | | | | | | 2,797,500 |
| Kilo Junior High Modernization | 84,000 | 537,000 | 2,733,000 | 2,664,000 | | | | | | | | | 6,018,000 |
| Sport Fields | 81,500 | 714,600 | | | | | | | | | | | 976,100 |
| Security Fences | | 250,000 | | | | | | | | | | | 250,000 |
| MOT/ESC Debt | | 3,839,100 | | | | | | | | | | | 3,839,100 |
| Portables | | 360,000 | | | | | | | | | | | 360,000 |
| Facilities Dept | 500,000 | 500,000 | 500,000 | 510,000 | \$510,000 | \$510,000 | | | | | | | 3,030,000 |
| Contingency Funds | 290,922 | 290,922 | 290,922 | 290,922 | 290,922 | 290,922 | | | | | | | 1,745,532 |
| TOTAL PROJECTS | \$4,510,472 | \$20,627,822 | \$20,422,322 | \$16,137,422 | \$800,922 | \$800,922 | | | | | | | \$63,299,832 |

CITYSHAPE

From Vision to Plan



Capital Facilities Planning & Policy Model
Cash Flow Module
City of Federal Way, WA
Berk and Associates
Prepared for City of Federal Way, WA

Alternative A

FINANCIAL PLAN FOR THE PERIOD 1991 TO 2010
(Modified Accrual Basis of Accounting)

| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---------------------|--------|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Inflation escalator | 1.000 | 1.035 | 1.035 | 1.035 | 1.035 | 1.035 | 1.035 | 1.035 | 1.035 | 1.035 | 1.035 | 1.035 | 1.035 | 1.035 | 1.035 | 1.035 | 1.035 | 1.035 | 1.035 | 1.035 |
| Inflation escalator | 1.000 | 1.035 | 1.071 | 1.109 | 1.148 | 1.188 | 1.229 | 1.272 | 1.317 | 1.363 | 1.411 | 1.460 | 1.510 | 1.564 | 1.621 | 1.679 | 1.734 | 1.795 | 1.857 | 1.923 |
| Population | 97,297 | 99,510 | 101,599 | 103,665 | 105,708 | 107,727 | 109,724 | 110,901 | 112,461 | 114,002 | 115,524 | 117,022 | 118,506 | 119,607 | 120,595 | 121,488 | 122,370 | 123,239 | 124,097 | 124,943 |
| Housing Units | 38,188 | 39,359 | 40,530 | 41,701 | 42,872 | 44,043 | 45,213 | 46,002 | 46,981 | 47,961 | 48,940 | 49,919 | 50,898 | 51,877 | 52,856 | 53,835 | 54,814 | 55,793 | 56,772 | 57,751 |

OPERATIONS AND MAINTENANCE

GENERAL FUND

| | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Revenues: | | | | | | | | | | | | | | | | | | | | | |
| Property tax levy | \$4,721,069 | \$5,124,815 | \$5,325,631 | \$5,778,223 | \$6,237,428 | \$6,764,380 | \$7,271,621 | \$7,859,421 | \$8,448,639 | \$9,129,334 | \$9,811,492 | \$10,565,967 | \$11,316,569 | \$12,185,681 | \$13,053,236 | \$14,054,504 | \$15,045,440 | \$16,189,549 | \$17,330,646 | \$18,647,360 | \$19,960,507 |
| Local sales tax | \$6,103,196 | \$6,407,049 | \$6,725,446 | \$7,059,064 | \$7,408,610 | \$7,774,825 | \$8,158,484 | \$8,560,396 | \$8,981,407 | \$9,422,402 | \$9,884,307 | \$10,368,088 | \$10,874,757 | \$11,405,370 | \$11,961,033 | \$12,542,900 | \$13,152,179 | \$13,790,132 | \$14,458,078 | \$15,157,394 | \$15,889,524 |
| Criminal justice sales tax | \$1,133,789 | \$1,216,055 | \$1,303,287 | \$1,395,752 | \$1,493,730 | \$1,597,517 | \$1,701,191 | \$1,810,758 | \$1,926,524 | \$2,048,811 | \$2,177,955 | \$2,305,131 | \$2,439,085 | \$2,580,156 | \$2,728,697 | \$2,885,077 | \$3,047,629 | \$3,218,636 | \$3,398,512 | \$3,587,691 | \$3,786,624 |
| MVET | \$1,521,239 | \$1,602,308 | \$1,686,545 | \$1,772,463 | \$1,861,611 | \$1,954,094 | \$2,042,544 | \$2,134,182 | \$2,229,115 | \$2,327,447 | \$2,429,291 | \$2,524,706 | \$2,623,364 | \$2,724,919 | \$2,829,085 | \$2,936,372 | \$3,046,396 | \$3,159,682 | \$3,276,852 | \$3,398,536 | \$3,525,394 |
| Liquor profits | \$743,140 | \$759,260 | \$775,201 | \$790,964 | \$806,549 | \$821,959 | \$834,140 | \$846,178 | \$858,075 | \$869,833 | \$881,451 | \$892,930 | \$904,390 | \$915,734 | \$926,965 | \$938,082 | \$949,096 | \$959,997 | \$970,784 | \$981,456 | \$991,913 |
| Liquor excise tax | \$313,619 | \$320,422 | \$327,149 | \$333,801 | \$340,379 | \$346,882 | \$353,202 | \$357,103 | \$362,124 | \$367,085 | \$371,988 | \$375,339 | \$378,647 | \$381,912 | \$385,135 | \$388,317 | \$391,193 | \$394,031 | \$396,830 | \$399,592 | \$402,317 |
| Franchise fees | \$259,731 | \$270,553 | \$279,558 | \$287,149 | \$294,328 | \$301,461 | \$307,520 | \$313,513 | \$319,461 | \$325,274 | \$331,054 | \$336,727 | \$342,391 | \$347,946 | \$353,391 | \$358,727 | \$363,954 | \$369,072 | \$374,081 | \$378,981 | \$383,772 |
| Gaming tax | \$206,585 | \$214,078 | \$221,132 | \$227,812 | \$234,079 | \$240,000 | \$245,614 | \$250,949 | \$256,024 | \$260,869 | \$265,494 | \$270,019 | \$274,444 | \$278,779 | \$282,924 | \$286,889 | \$290,674 | \$294,289 | \$297,734 | \$301,019 | \$304,144 |
| Licenses & Permits | \$353,677 | \$368,414 | \$383,513 | \$397,908 | \$410,854 | \$423,312 | \$435,314 | \$446,878 | \$457,994 | \$468,661 | \$478,881 | \$488,654 | \$497,979 | \$506,854 | \$515,289 | \$523,284 | \$530,839 | \$537,954 | \$544,629 | \$550,864 | \$556,669 |
| Sales & Use Equalization | \$706,897 | \$736,351 | \$763,758 | \$789,108 | \$812,492 | \$833,924 | \$854,403 | \$873,930 | \$892,514 | \$910,154 | \$926,859 | \$942,629 | \$957,464 | \$971,364 | \$984,329 | \$996,359 | \$1,007,454 | \$1,017,614 | \$1,026,839 | \$1,035,119 | \$1,042,454 |
| Zoning Fees | \$34,069 | \$35,489 | \$36,965 | \$38,498 | \$39,988 | \$41,436 | \$42,842 | \$44,206 | \$45,528 | \$46,808 | \$48,046 | \$49,242 | \$50,396 | \$51,508 | \$52,578 | \$53,604 | \$54,586 | \$55,524 | \$56,418 | \$57,268 | \$58,074 |
| Sale of Publications | \$4,067 | \$4,236 | \$4,379 | \$4,554 | \$4,736 | \$4,926 | \$5,123 | \$5,328 | \$5,541 | \$5,762 | \$5,993 | \$6,233 | \$6,482 | \$6,741 | \$7,011 | \$7,291 | \$7,583 | \$7,886 | \$8,202 | \$8,530 | \$8,871 |
| False Alarm Fees | \$2,741 | \$2,855 | \$2,971 | \$3,088 | \$3,206 | \$3,326 | \$3,448 | \$3,571 | \$3,695 | \$3,821 | \$3,948 | \$4,076 | \$4,206 | \$4,337 | \$4,470 | \$4,605 | \$4,742 | \$4,881 | \$5,022 | \$5,165 | \$5,311 |
| Plan Check Fees | \$216,655 | \$225,682 | \$235,713 | \$245,862 | \$256,141 | \$266,560 | \$277,129 | \$287,858 | \$298,747 | \$309,796 | \$321,015 | \$332,404 | \$343,973 | \$355,722 | \$367,651 | \$379,760 | \$392,049 | \$404,518 | \$417,167 | \$430,006 | \$443,035 |
| Fines & Forfeits | \$273,983 | \$285,399 | \$297,445 | \$309,145 | \$321,518 | \$334,583 | \$348,359 | \$362,856 | \$378,094 | \$394,093 | \$410,864 | \$428,417 | \$446,762 | \$465,909 | \$485,858 | \$506,609 | \$528,164 | \$550,524 | \$573,699 | \$600,000 | \$628,547 |
| State Criminal Justice Grant | \$155,751 | \$162,241 | \$142,785 | \$148,496 | \$154,436 | \$160,614 | \$167,038 | \$173,720 | \$180,669 | \$187,895 | \$195,411 | \$203,228 | \$211,357 | \$219,811 | \$228,603 | \$237,748 | \$247,258 | \$257,148 | \$267,434 | \$278,131 | \$289,256 |
| Interest Earnings | \$602,650 | \$627,760 | \$203,761 | \$220,388 | \$229,388 | \$238,372 | \$247,906 | \$257,823 | \$268,136 | \$278,861 | \$289,915 | \$301,316 | \$313,081 | \$325,228 | \$337,767 | \$350,707 | \$364,054 | \$377,807 | \$391,964 | \$406,534 | \$421,517 |
| County Park Payment | \$110,400 | \$115,000 | \$62,000 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Recreation Fees | \$80,061 | \$83,397 | \$87,000 | \$90,882 | \$94,946 | \$99,192 | \$103,620 | \$108,239 | \$113,050 | \$118,064 | \$123,282 | \$128,715 | \$134,364 | \$140,229 | \$146,311 | \$152,611 | \$159,130 | \$165,878 | \$172,856 | \$180,064 | \$187,501 |
| Transfer-In IAC Grant | \$0 | \$0 | \$299,487 | \$311,466 | \$323,925 | \$336,882 | \$350,357 | \$364,347 | \$378,847 | \$393,856 | \$409,384 | \$425,431 | \$442,006 | \$459,119 | \$476,770 | \$494,960 | \$513,689 | \$532,958 | \$552,768 | \$573,119 | \$594,062 |
| Transfer-In CDBG | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | |
| Miscellaneous | \$47,349 | \$49,066 | \$84,284 | \$18,442 | \$18,940 | \$19,508 | \$20,191 | \$20,897 | \$21,629 | \$22,386 | \$23,169 | \$23,980 | \$24,820 | \$25,688 | \$26,587 | \$27,518 | \$28,481 | \$29,478 | \$30,510 | \$31,577 | \$32,683 |
| B&O tax collections | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Utility tax collections | \$5,091,646 | \$5,162,371 | \$5,233,842 | \$5,306,074 | \$5,379,085 | \$5,452,096 | \$5,525,112 | \$5,598,142 | \$5,671,185 | \$5,744,240 | \$5,817,306 | \$5,890,383 | \$5,963,471 | \$6,036,570 | \$6,109,680 | \$6,182,791 | \$6,255,913 | \$6,329,045 | \$6,402,187 | \$6,475,339 | \$6,548,491 |
| Total General Fund revenues | \$22,682,314 | \$23,772,802 | \$24,324,802 | \$25,367,191 | \$26,574,132 | \$27,879,033 | \$29,176,464 | \$30,587,355 | \$32,034,036 | \$33,608,107 | \$35,221,155 | \$36,918,697 | \$38,652,057 | \$40,545,377 | \$42,480,425 | \$44,594,381 | \$46,799,687 | \$49,087,180 | \$51,482,838 | \$54,107,549 | \$56,784,485 |

| | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|--|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Finance | \$842,163 | \$877,253 | \$892,809 | \$977,839 | \$1,016,953 | \$1,057,631 | \$1,099,936 | \$1,143,933 | \$1,189,691 | \$1,237,278 | \$1,286,769 | \$1,338,240 | \$1,391,770 | \$1,447,441 | \$1,505,338 | \$1,565,552 | \$1,628,174 | \$1,693,301 | \$1,761,033 | \$1,831,474 | \$1,904,733 |
| Law enforcement | \$6,227,098 | \$6,486,560 | \$6,867,000 | \$7,201,529 | \$7,489,590 | \$7,789,174 | \$8,100,741 | \$8,424,770 | \$8,761,761 | \$9,112,232 | \$9,476,721 | \$9,855,790 | \$10,250,021 | \$10,660,022 | \$11,086,423 | \$11,529,880 | \$11,991,075 | \$12,470,718 | \$12,969,547 | \$13,488,329 | \$14,027,862 |
| Community development | \$1,665,353 | \$1,734,743 | \$2,023,712 | \$2,243,972 | \$2,333,731 | \$2,427,080 | \$2,524,163 | \$2,625,130 | \$2,729,135 | \$2,836,940 | \$2,948,330 | \$3,063,933 | \$3,183,372 | \$3,307,103 | \$3,434,492 | \$3,564,917 | \$3,700,000 | \$3,840,378 | \$3,985,833 | \$4,136,917 | \$4,294,264 |
| Parks and recreation | \$1,286,500 | \$1,471,652 | \$1,669,558 | \$1,866,599 | \$2,068,768 | \$2,276,208 | \$2,489,183 | \$2,707,695 | \$2,931,730 | \$3,161,291 | \$3,397,291 | \$3,639,493 | \$3,887,529 | \$4,147,102 | \$4,418,839 | \$4,692,353 | \$4,968,247 | \$5,246,113 | \$5,526,554 | \$5,809,179 | \$6,093,594 |
| Other government costs | \$2,284,744 | \$2,379,942 | \$2,384,148 | \$3,355,556 | \$3,489,778 | \$3,629,369 | \$3,774,544 | \$3,925,526 | \$4,082,547 | \$4,245,849 | \$4,415,683 | \$4,592,310 | \$4,776,002 | \$4,967,043 | \$5,165,724 | \$5,372,353 | \$5,587,247 | \$5,810,737 | \$6,043,167 | \$6,284,893 | \$6,536,289 |
| Total General Fund expenditures | \$12,305,858 | \$12,950,150 | \$13,837,227 | \$15,645,495 | \$16,418,820 | \$17,216,462 | \$18,062,567 | \$18,937,854 | \$19,862,664 | \$20,821,990 | \$21,836,034 | \$22,902,304 | \$23,866,695 | \$24,934,471 | \$25,951,850 | \$27,041,069 | \$28,187,204 | \$29,314,692 | \$30,487,280 | \$31,806,632 | \$33,157,735 |

| | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|-------------------------|--------------|--------------|--------------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| General Fund Balance | \$10,376,456 | \$10,822,652 | \$10,487,575 | \$9,721,695 | \$10,155,312 | \$10,662,571 | \$11,113,897 | \$11,649,900 | \$12,171,372 | \$12,786,117 | \$13,385,122 | \$14,116,393 | \$14,785,362 | \$15,610,906 | \$16,548,576 | \$17,553,312 | \$18,552,483 | \$19,772,487 | \$20,995,558 | \$22,300,916 | \$23,626,750 |
| TRANSFER TO STREET FUND | \$10,376,456 | \$10,822,652 | \$10,487,575 | \$9,721,695 | \$10,155,312 | \$10,662,571 | \$11,113,897 | \$11,649,900 | \$12,171,372 | \$12,786,117 | \$13,385,122 | \$14,116,393 | \$14,785,362 | \$15,610,906 | \$16,548,576 | \$17,553,312 | \$18,552,483 | \$19,772,487 | \$20,995,558 | \$22,300,916 | \$23,626,750 |

Capital Facilities Planning & Policy Model

Cash Flow Module

City of Federal Way, WA

Berk and Associates

Prepared for City of Federal Way, WA

FINANCIAL PLAN FOR THE PERIOD 1991 TO 2010

(Modified Accrual Basis of Accounting)

Alternative A

STREET FUND

| | | | | | | | | | | | | | | | | | | | | | |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Motor fuel tax | \$1,639,990 | \$1,660,835 | \$1,681,413 | \$1,701,142 | \$1,719,918 | \$1,737,880 | \$1,748,643 | \$1,758,801 | \$1,768,370 | \$1,777,363 | \$1,786,562 | \$1,786,987 | \$1,787,077 | \$1,786,841 | \$1,786,288 | \$1,784,223 | \$1,781,890 | \$1,779,297 | \$1,776,451 | \$1,773,360 | |
| Vehicle Registration Fee | \$208,729 | \$210,837 | \$594,097 | \$619,558 | \$625,754 | \$632,011 | \$638,331 | \$644,715 | \$651,162 | \$657,673 | \$664,250 | \$670,893 | \$677,601 | \$684,377 | \$691,221 | \$698,133 | \$705,115 | \$712,166 | \$719,288 | \$726,480 | \$733,745 |
| Transfers-In | \$10,376,456 | \$10,822,652 | \$10,487,575 | \$9,721,695 | \$10,155,312 | \$10,662,571 | \$11,113,897 | \$11,649,900 | \$12,171,372 | \$12,786,117 | \$13,385,122 | \$14,116,393 | \$14,785,362 | \$15,610,906 | \$16,548,576 | \$17,553,312 | \$18,552,483 | \$19,772,487 | \$20,995,558 | \$22,300,916 | \$23,626,750 |
| ROW Permits & Miscellaneous | \$0 | \$81,720 | \$78,319 | \$43,000 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| TDM Distribution | \$0 | \$0 | \$0 | \$77,516 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ISTEA for TDM | \$0 | \$0 | \$0 | \$20,000 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Project Specific Revenues - ISTEA & Metro | \$0 | \$0 | \$7,820 | \$291,000 | \$1,401,501 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Plan Review Fees | \$0 | \$19,505 | \$50,192 | \$1,401,501 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Solid Waste Rates | \$0 | \$0 | \$156,190 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Interest Earnings | \$0 | \$49,592 | \$65,153 | \$26,000 | \$26,250 | \$26,523 | \$26,788 | \$27,056 | \$27,326 | \$27,600 | \$27,876 | \$28,154 | \$28,436 | \$28,720 | \$29,007 | \$29,297 | \$29,590 | \$29,886 | \$30,185 | \$30,487 | \$30,792 |
| Less: Paths & Trails | \$0 | \$0 | \$0 | (\$5,936) | (\$8,600) | (\$8,689) | (\$8,743) | (\$8,794) | (\$8,842) | (\$8,887) | (\$8,929) | (\$8,933) | (\$8,935) | (\$8,935) | (\$8,934) | (\$8,931) | (\$8,921) | (\$8,909) | (\$8,895) | (\$8,882) | (\$8,867) |
| Total Street Fund Revenues | \$12,224,575 | \$12,845,142 | \$13,120,799 | \$12,634,476 | \$12,518,643 | \$13,050,296 | \$13,518,916 | \$14,071,678 | \$14,609,388 | \$15,239,865 | \$15,854,112 | \$16,593,069 | \$17,289,452 | \$18,102,145 | \$19,046,711 | \$20,058,100 | \$21,062,490 | \$22,287,521 | \$23,515,432 | \$24,825,453 | \$26,155,780 |
| Maintenance and operations expense | \$1,499,119 | \$1,559,084 | \$2,945,300 | \$3,309,103 | \$3,574,630 | \$3,861,723 | \$4,160,878 | \$4,489,959 | \$4,859,736 | \$5,244,523 | \$5,660,895 | \$6,104,328 | \$6,610,959 | \$7,095,521 | \$7,525,371 | \$7,910,340 | \$8,383,866 | \$8,848,530 | \$9,340,436 | \$9,855,826 | \$10,400,031 |
| Street fund balance/available for capital | \$10,725,456 | \$11,286,058 | \$10,175,459 | \$9,325,373 | \$8,944,013 | \$9,188,573 | \$9,358,038 | \$9,581,719 | \$9,749,653 | \$9,995,342 | \$10,193,217 | \$10,488,741 | \$10,658,492 | \$11,006,624 | \$11,521,340 | \$12,147,760 | \$12,678,624 | \$13,438,991 | \$14,174,996 | \$14,969,628 | \$15,755,749 |

SURFACE WATER MANAGEMENT FUND

| | | | | | | | | | | | | | | | | | | | | |
|----------------------------------|-------------|-------------|-------------|-------------|-------------|---------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| User Fees | \$985,116 | \$2,516,051 | \$2,531,111 | \$2,592,726 | \$2,748,290 | \$2,913,187 | \$3,087,978 | \$3,273,257 | \$3,468,652 | \$3,677,831 | \$3,898,501 | \$4,132,411 | \$4,380,356 | \$4,643,177 | \$4,921,768 | \$5,217,074 | \$5,530,099 | \$5,861,904 | \$6,213,619 | \$6,586,436 |
| Transfer-In Street Fund | \$144,000 | \$457,185 | \$457,185 | \$461,757 | \$466,374 | \$471,038 | \$475,749 | \$480,506 | \$485,311 | \$490,164 | \$495,066 | \$500,017 | \$505,017 | \$510,067 | \$515,168 | \$520,319 | \$525,522 | \$530,778 | \$536,085 | \$541,446 |
| Interest Earnings | \$0 | \$32,840 | \$32,515 | \$32,840 | \$33,169 | \$33,500 | \$33,835 | \$34,174 | \$34,515 | \$34,860 | \$35,209 | \$35,561 | \$35,917 | \$36,276 | \$36,639 | \$37,005 | \$37,375 | \$37,749 | \$38,126 | \$38,508 |
| Total | \$1,129,116 | \$3,257,010 | \$3,020,811 | \$3,087,323 | \$3,247,833 | \$3,417,725 | \$3,597,562 | \$3,787,936 | \$3,989,479 | \$4,202,856 | \$4,428,776 | \$4,667,989 | \$4,921,289 | \$5,189,520 | \$5,473,574 | \$5,774,398 | \$6,092,996 | \$6,430,431 | \$6,787,831 | \$7,166,390 |
| Expenditures | \$696,373 | \$1,103,794 | \$1,723,243 | \$1,525,564 | \$1,607,143 | \$1,827,618 | \$2,061,558 | \$2,133,712 | \$2,208,392 | \$2,285,686 | \$2,365,685 | \$2,448,484 | \$2,534,181 | \$2,622,877 | \$2,714,678 | \$2,809,692 | \$2,908,031 | \$3,009,812 | \$3,115,156 | \$3,224,186 |
| Pay Plan Adjustment | \$0 | \$0 | \$0 | \$1,121 | \$1,160 | \$1,201 | \$1,243 | \$1,286 | \$1,331 | \$1,378 | \$1,426 | \$1,476 | \$1,528 | \$1,581 | \$1,636 | \$1,694 | \$1,753 | \$1,814 | \$1,878 | \$1,944 |
| Pay for Performance | \$0 | \$0 | \$8,479 | \$8,776 | \$9,083 | \$9,401 | \$9,730 | \$10,070 | \$10,423 | \$10,788 | \$11,165 | \$11,556 | \$11,960 | \$12,379 | \$12,812 | \$13,261 | \$13,725 | \$14,205 | \$14,702 | \$15,217 |
| Operating Expenditures | \$696,373 | \$1,103,794 | \$1,731,722 | \$1,535,461 | \$1,617,386 | \$1,838,220 | \$2,077,531 | \$2,145,689 | \$2,220,147 | \$2,297,852 | \$2,378,276 | \$2,461,516 | \$2,547,669 | \$2,636,838 | \$2,729,127 | \$2,824,646 | \$2,923,509 | \$3,025,832 | \$3,131,736 | \$3,241,347 |
| Capital Projects | \$32,038 | \$371,945 | \$2,439,000 | \$2,981,500 | \$3,108,325 | \$1,541,464 | \$1,437,996 | \$1,952,947 | \$2,025,358 | \$2,027,372 | \$2,108,467 | \$2,192,806 | \$2,280,518 | \$2,371,739 | \$2,466,609 | \$2,565,273 | \$2,667,884 | \$2,774,599 | \$2,886,583 | \$3,001,006 |
| Total Expenditures | \$728,411 | \$1,475,739 | \$4,170,722 | \$4,516,961 | \$4,725,711 | \$3,379,684 | \$3,510,526 | \$4,099,016 | \$4,245,505 | \$4,325,224 | \$4,486,744 | \$4,654,322 | \$4,828,187 | \$5,008,577 | \$5,195,736 | \$5,389,919 | \$5,591,393 | \$5,800,431 | \$6,017,319 | \$6,242,353 |
| Beginning Fund Balance January 1 | \$388,032 | \$788,737 | \$2,550,008 | \$1,400,097 | (\$29,541) | (\$1,477,878) | (\$8,041) | (\$310,080) | (\$256,026) | (\$122,368) | (\$57,968) | (\$13,667) | (\$93,102) | (\$180,944) | (\$277,839) | (\$384,479) | (\$501,603) | (\$630,000) | (\$770,511) | (\$924,037) |
| Ending Fund Balance December 31 | \$319,312 | \$8,770 | \$8,578 | \$9,912 | \$12,619 | \$12,830 | \$12,904 | \$12,975 | \$13,041 | \$13,102 | \$13,108 | \$13,111 | \$13,111 | \$13,110 | \$13,106 | \$13,091 | \$13,073 | \$13,054 | \$13,034 | \$13,011 |

PATH & TRAILS FUND

| | | | | | | | | | | | | | | | | | | | | |
|-------------------------------------|-------|---------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Revenues: | \$0 | \$8,770 | \$8,578 | \$9,912 | \$12,619 | \$12,750 | \$12,830 | \$12,904 | \$12,975 | \$13,041 | \$13,102 | \$13,108 | \$13,111 | \$13,110 | \$13,106 | \$13,091 | \$13,073 | \$13,054 | \$13,034 | \$13,011 |
| Motor Fuel Tax | \$0 | \$8,770 | \$8,578 | \$9,912 | \$12,619 | \$12,750 | \$12,830 | \$12,904 | \$12,975 | \$13,041 | \$13,102 | \$13,108 | \$13,111 | \$13,110 | \$13,106 | \$13,091 | \$13,073 | \$13,054 | \$13,034 | \$13,011 |
| Total revenues | \$0 | \$8,770 | \$8,578 | \$9,912 | \$12,619 | \$12,750 | \$12,830 | \$12,904 | \$12,975 | \$13,041 | \$13,102 | \$13,108 | \$13,111 | \$13,110 | \$13,106 | \$13,091 | \$13,073 | \$13,054 | \$13,034 | \$13,011 |
| Expenditures: | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Capital Projects-Operating Transfer | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Total Expenditures | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Beginning Fund Balance January 1 | 2,048 | 2,048 | 10,818 | 19,421 | 29,333 | 41,952 | 54,702 | 67,532 | 80,436 | 93,411 | 106,452 | 119,554 | 132,662 | 145,773 | 158,885 | 171,995 | 185,100 | 198,191 | 211,264 | 224,318 |
| Ending Fund Balance December 31 | 2,048 | 10,818 | 19,296 | 29,333 | 41,952 | 54,702 | 67,532 | 80,436 | 93,411 | 106,452 | 119,554 | 132,662 | 145,773 | 158,885 | 171,995 | 185,100 | 198,191 | 211,264 | 224,318 | 237,352 |

Capital Facilities Planning & Policy Model
 Cash Flow Module
 City of Federal Way, WA
 Berk and Associates
 prepared for City of Federal Way, WA

FINANCIAL PLAN FOR THE PERIOD 1991 TO 2010
 (Modified Accrual Basis of Accounting)

FUNDING REMAINING CAPITAL OBLIGATIONS

| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Cumulative unfunded capital projects | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Threshold bond issue (Policy) | \$1,000,000 | \$1,000,000 | \$1,000,000 | \$1,000,000 | \$1,000,000 | \$1,000,000 | \$1,000,000 | \$1,000,000 | \$1,000,000 | \$1,000,000 | \$1,000,000 | \$1,000,000 | \$1,000,000 | \$1,000,000 | \$1,000,000 | \$1,000,000 | \$1,000,000 | \$1,000,000 | \$1,000,000 | \$1,000,000 |
| Maximum bond issue (Policy) | \$5,000,000 | \$5,000,000 | \$5,000,000 | \$5,000,000 | \$5,000,000 | \$5,000,000 | \$5,000,000 | \$5,000,000 | \$5,000,000 | \$5,000,000 | \$5,000,000 | \$5,000,000 | \$5,000,000 | \$5,000,000 | \$5,000,000 | \$5,000,000 | \$5,000,000 | \$5,000,000 | \$5,000,000 | \$5,000,000 |
| Amount financed with special bond issue | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Terms | | | | | | | | | | | | | | | | | | | | |
| Interest rate (inflation + real int) | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% |
| Term of bond issue | 20 yrs | 20 yrs | 20 yrs | 20 yrs | 20 yrs | 20 yrs | 20 yrs | 20 yrs | 20 yrs | 20 yrs | 20 yrs | 20 yrs | 20 yrs | 20 yrs | 20 yrs | 20 yrs | 20 yrs | 20 yrs | 20 yrs | 20 yrs |
| Value of current bond issue | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Total outstanding bond debt | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| New annual debt service | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Total annual debt service | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Assessed value of property (\$'000) | \$3,100,052 | \$3,332,556 | \$3,412,789 | \$3,752,992 | \$3,841,448 | \$4,222,436 | \$4,319,960 | \$4,732,548 | \$4,825,569 | \$5,285,158 | \$5,387,713 | \$5,899,475 | \$5,993,516 | \$6,541,773 | \$6,645,454 | \$7,252,727 | \$7,367,035 | \$8,035,391 | \$8,157,010 | \$8,896,486 |
| Implicit levy rate to cover D/S | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00010 | 0.00019 | 0.00026 | 0.00035 | 0.00040 | 0.00039 | 0.00036 | 0.00035 | 0.00032 | 0.00032 | 0.00029 | 0.00029 | 0.00029 | 0.00026 |

Capital Facilities Planning & Policy Model

Cash Flow Module
City of Federal Way, WA
Berk and Associates
prepared for City of Federal Way, WA

Alternative B

FINANCIAL PLAN FOR THE PERIOD 1991 TO 2010
(Modified Accrual Basis of Accounting)

| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---------------------|--------|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Inflation escalator | 1,000 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 |
| Population | 97,297 | 99,511 | 101,600 | 103,667 | 105,710 | 107,730 | 109,730 | 111,710 | 113,670 | 115,610 | 117,530 | 119,430 | 121,310 | 123,170 | 125,010 | 126,830 | 128,630 | 130,410 | 132,170 | 133,910 |
| Housing Units | 36,188 | 39,357 | 40,526 | 41,695 | 42,864 | 44,033 | 45,202 | 46,371 | 47,540 | 48,709 | 49,878 | 51,047 | 52,216 | 53,385 | 54,554 | 55,723 | 56,892 | 58,061 | 59,230 | 60,399 |

OPERATIONS AND MAINTENANCE

GENERAL FUND

| | | | | | | | | | | | | | | | | | | | | | |
|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Revenues: | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
| Property tax levy | \$4,715,438 | \$5,121,757 | \$5,325,631 | \$5,781,445 | \$6,244,134 | \$6,775,184 | \$7,287,899 | \$7,882,042 | \$8,478,016 | \$9,166,629 | \$9,857,164 | \$10,620,922 | \$11,381,236 | \$12,261,731 | \$13,141,193 | \$14,156,341 | \$15,156,220 | \$16,311,120 | \$17,463,182 | \$18,792,601 | \$20,118,645 |
| Local sales tax | \$6,103,196 | \$6,411,286 | \$6,734,258 | \$7,072,811 | \$7,427,672 | \$7,799,606 | \$8,189,411 | \$8,597,920 | \$9,026,007 | \$9,474,585 | \$9,944,607 | \$10,437,071 | \$10,953,022 | \$11,493,548 | \$12,059,793 | \$12,652,947 | \$13,274,258 | \$13,925,029 | \$14,606,623 | \$15,320,464 | \$16,068,042 |
| Criminal justice sales tax | \$1,132,206 | \$1,215,275 | \$1,303,304 | \$1,396,666 | \$1,495,650 | \$1,600,560 | \$1,705,863 | \$1,817,221 | \$1,934,950 | \$2,059,383 | \$2,190,868 | \$2,329,382 | \$2,465,868 | \$2,607,676 | \$2,755,172 | \$2,908,917 | \$3,068,551 | \$3,234,631 | \$3,406,885 | \$3,585,060 | \$3,768,914 |
| MVET | \$1,521,239 | \$1,602,318 | \$1,686,567 | \$1,772,497 | \$1,861,656 | \$1,954,152 | \$2,043,093 | \$2,135,247 | \$2,229,720 | \$2,326,645 | \$2,426,922 | \$2,529,558 | \$2,634,558 | \$2,741,927 | \$2,851,672 | \$2,963,799 | \$3,078,314 | \$3,195,224 | \$3,314,534 | \$3,436,249 | \$3,560,266 |
| Liquor profits | \$743,140 | \$759,265 | \$775,211 | \$790,978 | \$806,569 | \$821,994 | \$834,364 | \$846,600 | \$858,694 | \$870,645 | \$882,455 | \$894,122 | \$905,647 | \$917,030 | \$928,272 | \$939,374 | \$950,336 | \$961,158 | \$971,840 | \$982,382 | \$992,784 |
| Liquor excise tax | \$313,619 | \$320,424 | \$327,153 | \$333,807 | \$340,387 | \$346,892 | \$352,117 | \$357,281 | \$362,384 | \$367,428 | \$372,412 | \$377,335 | \$382,197 | \$387,000 | \$391,743 | \$396,426 | \$401,049 | \$405,612 | \$410,115 | \$414,558 | \$418,941 |
| Franchise Fees | \$259,731 | \$270,553 | \$303,558 | \$315,700 | \$328,328 | \$341,461 | \$352,117 | \$359,325 | \$366,098 | \$372,412 | \$378,274 | \$383,684 | \$389,542 | \$394,847 | \$399,594 | \$404,784 | \$409,417 | \$414,444 | \$418,865 | \$423,680 | \$427,891 |
| Changeing Tax | \$213,132 | \$220,592 | \$228,312 | \$236,203 | \$244,574 | \$252,503 | \$260,083 | \$267,314 | \$274,189 | \$280,694 | \$286,832 | \$292,604 | \$298,012 | \$303,056 | \$307,734 | \$312,047 | \$316,094 | \$319,874 | \$323,387 | \$326,634 | \$329,614 |
| Licenses & Permits | \$353,677 | \$368,414 | \$433,513 | \$453,758 | \$471,908 | \$490,785 | \$510,416 | \$530,833 | \$552,066 | \$574,149 | \$597,115 | \$620,999 | \$645,839 | \$671,673 | \$698,540 | \$726,481 | \$755,540 | \$785,762 | \$817,193 | \$850,880 | \$886,875 |
| Sales & Use Equalization | \$706,897 | \$736,351 | \$453,758 | \$453,758 | \$453,758 | \$453,758 | \$453,758 | \$453,758 | \$453,758 | \$453,758 | \$453,758 | \$453,758 | \$453,758 | \$453,758 | \$453,758 | \$453,758 | \$453,758 | \$453,758 | \$453,758 | \$453,758 | \$453,758 |
| Zoning Fees | \$34,069 | \$35,489 | \$62,065 | \$64,548 | \$67,130 | \$69,815 | \$72,607 | \$75,512 | \$78,524 | \$81,648 | \$84,889 | \$88,242 | \$91,704 | \$95,280 | \$98,967 | \$102,764 | \$106,671 | \$110,688 | \$114,815 | \$119,052 | \$123,400 |
| Sale of Publications | \$4,067 | \$4,236 | \$4,379 | \$4,554 | \$4,736 | \$4,926 | \$5,123 | \$5,328 | \$5,541 | \$5,762 | \$5,993 | \$6,233 | \$6,482 | \$6,741 | \$7,011 | \$7,291 | \$7,583 | \$7,886 | \$8,202 | \$8,530 | \$8,871 |
| False Alarm Fees | \$2,741 | \$2,855 | \$7,820 | \$8,133 | \$8,458 | \$8,796 | \$9,148 | \$9,514 | \$9,895 | \$10,291 | \$10,702 | \$11,130 | \$11,576 | \$12,039 | \$12,520 | \$13,021 | \$13,542 | \$14,083 | \$14,647 | \$15,233 | \$15,842 |
| Plan Check Fees | \$216,655 | \$225,589 | \$253,713 | \$263,862 | \$274,416 | \$285,393 | \$296,808 | \$308,681 | \$321,028 | \$333,869 | \$347,224 | \$361,113 | \$375,557 | \$390,580 | \$406,203 | \$422,451 | \$439,349 | \$456,902 | \$475,131 | \$494,058 | \$513,696 |
| Fines & Forfeits | \$285,993 | \$285,999 | \$423,445 | \$423,445 | \$423,445 | \$423,445 | \$423,445 | \$423,445 | \$423,445 | \$423,445 | \$423,445 | \$423,445 | \$423,445 | \$423,445 | \$423,445 | \$423,445 | \$423,445 | \$423,445 | \$423,445 | \$423,445 | \$423,445 |
| State Criminal Justice Grant | \$155,751 | \$162,241 | \$142,785 | \$148,496 | \$154,436 | \$160,614 | \$167,038 | \$173,720 | \$180,669 | \$187,895 | \$195,411 | \$203,228 | \$211,357 | \$219,811 | \$228,602 | \$237,748 | \$247,257 | \$257,148 | \$267,334 | \$277,817 | \$288,606 |
| Interest Earnings | \$602,650 | \$627,760 | \$203,761 | \$211,911 | \$229,203 | \$238,372 | \$247,906 | \$257,823 | \$268,136 | \$278,861 | \$290,015 | \$301,616 | \$313,681 | \$326,228 | \$339,277 | \$352,848 | \$366,962 | \$381,641 | \$396,906 | \$412,782 | \$429,289 |
| County Park Payment | \$110,400 | \$115,000 | \$62,000 | \$62,000 | \$62,000 | \$62,000 | \$62,000 | \$62,000 | \$62,000 | \$62,000 | \$62,000 | \$62,000 | \$62,000 | \$62,000 | \$62,000 | \$62,000 | \$62,000 | \$62,000 | \$62,000 | \$62,000 | \$62,000 |
| Recreation Fees | \$80,061 | \$83,397 | \$29,487 | \$31,466 | \$32,925 | \$33,882 | \$35,037 | \$36,437 | \$37,947 | \$39,410 | \$40,869 | \$42,263 | \$43,314 | \$44,046 | \$44,488 | \$44,988 | \$45,488 | \$45,988 | \$46,488 | \$46,988 | \$47,488 |
| Transfer-in IAC Grant | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Transfer-in CD8C | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Miscellaneous | \$47,349 | \$49,066 | \$84,284 | \$18,442 | \$18,940 | \$19,508 | \$20,191 | \$20,897 | \$21,629 | \$22,386 | \$23,169 | \$23,980 | \$24,820 | \$25,688 | \$26,587 | \$27,518 | \$28,481 | \$29,478 | \$30,510 | \$31,577 | \$32,683 |
| B&O tax collections | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Utility tax collections | \$5,091,646 | \$5,164,826 | \$5,238,751 | \$5,313,437 | \$5,388,902 | \$5,464,368 | \$5,539,667 | \$5,613,763 | \$5,689,671 | \$5,766,409 | \$5,843,996 | \$5,919,648 | \$5,996,188 | \$6,073,634 | \$6,152,009 | \$6,231,334 | \$6,310,774 | \$6,391,208 | \$6,472,660 | \$6,555,154 | \$6,638,715 |
| Total General Fund revenues | \$22,675,199 | \$23,775,673 | \$24,338,575 | \$25,392,490 | \$26,611,711 | \$27,930,025 | \$29,244,105 | \$30,673,150 | \$32,139,071 | \$33,734,253 | \$35,369,627 | \$37,090,676 | \$38,848,782 | \$40,769,374 | \$42,733,124 | \$44,878,717 | \$47,048,094 | \$49,222,394 | \$51,845,971 | \$54,501,330 | \$57,210,151 |

| | | | | | | | | | | | | | | | | | | | | | |
|--|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Expenses: | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
| Finance | \$842,163 | \$877,253 | \$892,809 | \$977,839 | \$1,016,953 | \$1,057,631 | \$1,099,936 | \$1,143,933 | \$1,189,691 | \$1,237,278 | \$1,286,769 | \$1,338,240 | \$1,391,770 | \$1,447,441 | \$1,505,338 | \$1,565,552 | \$1,628,174 | \$1,693,301 | \$1,761,033 | \$1,831,474 | \$1,904,733 |
| Law enforcement | \$6,227,098 | \$6,486,560 | \$6,867,000 | \$7,201,529 | \$7,489,590 | \$7,789,174 | \$8,100,741 | \$8,424,770 | \$8,761,761 | \$9,112,232 | \$9,476,721 | \$9,855,790 | \$10,250,021 | \$10,660,422 | \$11,086,423 | \$11,529,880 | \$11,991,075 | \$12,470,718 | \$12,969,547 | \$13,488,329 | \$14,027,862 |
| Community development | \$1,666,353 | \$1,734,743 | \$2,023,712 | \$2,243,972 | \$2,333,731 | \$2,427,080 | \$2,524,163 | \$2,625,130 | \$2,730,135 | \$2,839,340 | \$2,952,914 | \$3,071,031 | \$3,193,872 | \$3,321,627 | \$3,454,492 | \$3,592,671 | \$3,736,378 | \$3,885,833 | \$4,041,267 | \$4,202,917 | \$4,371,034 |
| Parks and recreation | \$1,286,500 | \$1,471,652 | \$1,669,558 | \$1,866,599 | \$2,088,773 | \$2,313,213 | \$2,563,191 | \$2,818,104 | \$3,098,691 | \$3,387,458 | \$3,704,281 | \$3,945,282 | \$4,257,589 | \$4,541,208 | \$4,772,857 | \$4,985,894 | \$5,253,283 | \$5,463,415 | \$5,681,951 | \$5,906,461 | \$6,322,218 |
| Other government costs | \$2,284,744 | \$2,379,942 | \$2,384,148 | \$3,355,556 | \$3,489,778 | \$3,629,369 | \$3,774,544 | \$3,925,526 | \$4,082,547 | \$4,245,949 | \$4,415,683 | \$4,592,310 | \$4,776,002 | \$4,967,043 | \$5,165,724 | \$5,372,353 | \$5,587,247 | \$5,810,737 | \$6,043,167 | \$6,284,993 | \$6,536,289 |
| Total General Fund expenditures | \$12,305,858 | \$12,950,150 | \$13,837,227 | \$15,645,495 | \$16,418,825 | \$17,216,467 | \$18,062,575 | \$18,937,463 | \$19,862,825 | \$20,822,157 | \$21,836,368 | \$22,892,652 | \$23,869,255 | \$24,937,340 | \$25,934,834 | \$27,046,351 | \$28,196,158 | \$29,324,004 | \$30,496,965 | \$31,814,075 | \$33,162,136 |

| | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|--------------|--------------|--------------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| General Fund Balance | \$10,569,341 | \$10,825,523 | \$10,501,348 | \$9,746,995 | \$10,192,886 | \$10,713,558 | \$11,181,530 | \$11,735,687 | \$12,276,246 | \$12,912,096 | \$13,533,259 | \$14,208,024 | \$14,979,527 | \$15,832,033 | \$16,798,289 | \$17,832,366 | \$18,851,936 | \$20,098,390 | \$21,349,007 | \$22,687,255 | \$24,048,014 |
| TRANSFER TO STREET FUND | \$10,569,341 | \$10,825,523 | \$10,501,348 | \$9,746,995 | \$10,192,886 | \$10,713,558 | \$11,181,530 | \$11,735,687 | \$12,276,246 | \$12,912,096 | \$13,533,259 | \$14,208,024 | \$14,979,527 | \$15,832,033 | \$16,798,289 | \$17,832,366 | \$18,851,936 | \$20,098,390 | \$21,349,007 | \$22,687,255 | \$24,048,014 |

