City of Sherwood
Oregon
Home of the Tualatin River National Wildlife Refuge

City of Sherwood
PLANNING COMMISSION
Sherwood City Hall
22560 SW Pine Street
Sherwood, OR 97140
October 13, 2009 – 7 PM

Planning Commission will hold a work session on October 13, 2009. Work sessions are informal. Public may attend.

Work sessions are informal meetings where the Commission and staff can discuss topics but no formal action is taken from these meetings. Work sessions are open to the public in accordance with public meeting laws.

Planning Commission Work Session agenda items:

1. Tonquin Employment Area (TEA) (Also known as "Area 48")
2. Industrial Design Standards

Next Regular Business Meeting: October 27, 2009

City of Sherwood Oregon
Home of the Tualatin River National Wildlife Refuge

MEMORANDUM

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Sherwood, OR 97140
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To: Planning Commission

From: Heather Austin, AICP, Senior Planner

Date: October 6, 2009

RE: Work Session October 13, 2009
1. Tonquin Employment Area (Area 48)
2. Industrial Design Standards

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1. Tonquin Employment Area (TEA) (Formerly Area 48)

   Attached is the TEA Preliminary Concept Alternatives Analysis Report. Staff will answer any questions/respond to comments on this report. The report will be reviewed by the Stakeholders Advisory Group on October 7th and by the Technical Advisory Group on October 12th. Comments from these meetings will be presented at the Work Session. The next Open House is scheduled for October 28th.

2. Industrial Design Standards

   Staff has contacted industrial developers (including property owners, developers, engineers and planners) for feedback regarding development in other jurisdictions. All developers reported developing industrial property in other Portland Metro Area jurisdictions, though none could identify specific design standards or process efficiencies/inefficiencies. Staff will continue contacting developers to obtain further information prior to the Work Session.

   The back side of this memo contains the Proposed Goals and Objectives for Industrial Design Standards refined at the last Planning Commission Work Session on this topic (May 26, 2009).

City of Sherwood

Industrial Design Standards

Proposed Goals and Objectives:

- Enable industrial development by providing a clear and objective review process
- Provide an expedited review process for projects proposing a higher level of design
- Foster economic development by encouraging high-value industrial projects that complement and enhance projects developed under these design standards
- Enhance the appearance of industrial developments visible from arterials and collectors
- Sherwood such as Tualatin-Sherwood Road at Oregon Street and Highway 99W/Pacific Highway northeast of Tualatin-Sherwood Road
- Reduce the "bulk" appearance of large industrial buildings as viewed from public streets by applying exterior features such as architectural articulation, windows and/or landscaping (note: this objective is not intended to limit the size of industrial buildings)
- Utilize articulated entries, landscaping and parking/loading placement to bring buildings to more of a human scale to create a more active street façade
- Protect natural resources and encourage integration of natural resources into site design
- Encourage developments to provide access to natural resources and open space amenities to the community at large

Tonquin Employment Area Concept Plan:
Preliminary Concept Alternatives Analysis Report

September 2009

Stakeholder Advisory Committee Draft

City of Sherwood Oregon

Tonquin Employment Area Concept Plan
Project Team

City of Sherwood

Angelo Planning Group

DKS Associates

CH2MHill

Leland Consulting Group

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I. Purpose

The purpose of this phase of the Tonquin Employment Area concept planning process is to explore in more detail three Preliminary Concept Plan Alternatives that were developed in the spring of 2009. The alternatives analysis will lead to a recommended Preferred Concept Plan for future development in the Tonquin Employment Area. This Preliminary Concepts Alternatives Analysis Report provides a description of each alternative and a qualitative and quantitative analysis that will inform the selection of a Preferred Concept Plan. Because the Tonquin Employment Area was included in the Urban Growth Boundary for industrial / employment purposes, the three Preliminary Concept Plan alternatives are fairly homogeneous in terms of the anticipated employment types (light industrial, mixed use commercial, and office) and employment forecasts (1,941 jobs on the high end and 1,637 jobs on the lower end). The key difference between the three alternatives is how the internal transportation circulation system serves each alternative. Land use assumptions and information on infrastructure (transportation, sewer, water and storm drainage) needs and costs are provided for each of the three alternative concepts. The development and refinement of the Preferred Concept Plan will continue into the fall of 2009.

II. Background

The Tonquin Employment Area (previously referred to as Study Area 48) shown on Figure I-1 was added to the Urban Growth Boundary (UGB) by the Metro Council in 2004 (Ordinance 04-1040B). The area includes approximately 300 acres of property adjacent to the City of Sherwood's eastern boundary and south of Tualatin-Sherwood Road.

Figure I-1: Tonquin Employment Area

Before the land in the Tonquin Employment Area (TEA) can be converted from rural to urban use, Metro requires that a Concept Plan complying with Title 11 of the Urban Growth Management Functional Plan be prepared by the city that will provide services for the new urban area. The Cities of Sherwood and Tualatin entered into a Memorandum of Understanding (MOU) agreeing that Sherwood would be the service provider for the area from the existing City limits east to SW 124th (City of Sherwood Resolution 2007-083, see Exhibit A-2 in the *Area 48 Concept Plan: Existing Conditions Report*, March 2009). The MOU further grants the City of Tualatin general control over access onto the future extension of 124th, with both cities agreeing to participate in funding future improvements to the street. The MOU requires both cities to concept plan the areas in a way that limits direct access onto SW Tualatin-Sherwood Road and the future SW

124th extension. Both cities agree that the areas will generally be considered for industrial-type zoning.

Once concept planned, the Tonquin Employment Area can be annexed to the City of Sherwood. To assist in the concept planning process, the City has hired a team of land use planning, transportation and economic development consultants who will work with City staff throughout the process.

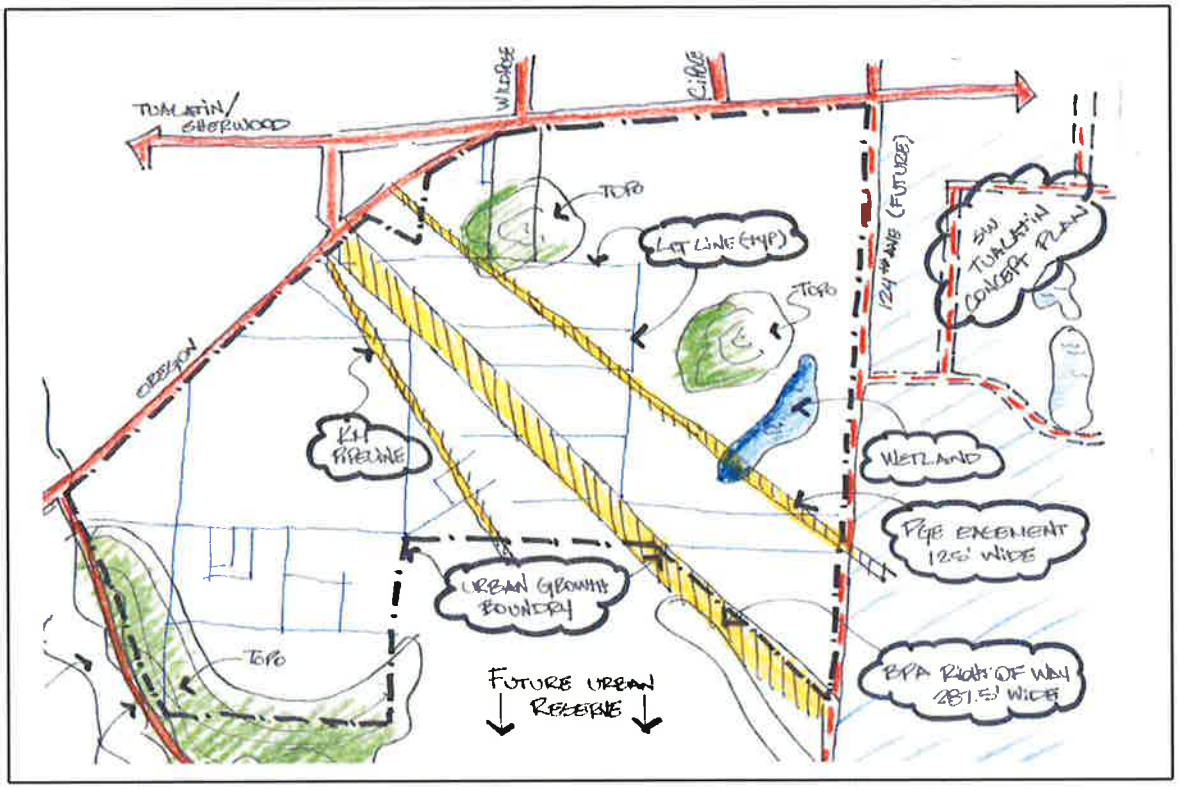
III. Concept Planning Process Overview

A. Phase I: Existing Conditions

Phase I of the planning process included surveying and documenting the existing conditions on the site and developing some preliminary development concepts. City staff and project consultants generated, reviewed, and refined the information for this phase of the project. Guiding the process was a Technical Advisory Committee (TAC) and a Stakeholder Advisory Committee (SAC) consisting of area property owners. The SAC met two times during Phase I to discuss project objectives and to provide feedback on future land uses and transportation facilities on the site. Both groups will continue to meet during Phase II of the project.

A public open house was also held in the spring of 2009 to provide an opportunity for property owners outside of the study area and other interested parties to review the project objectives and background information.

Figure II-1: Existing Conditions



Phase I work resulted in an existing conditions report (Area 48 Concept Plan: Existing Conditions Report March 2009) that details the existing physical conditions on the site. The information found in this report, including information on utility infrastructure, public facilities, natural resources, cultural and historic resources, and the transportation system, informed a series of two Project Team design workshops held in April and May 2009 to explore possible development concepts for the area. The outcome of the two design workshops was three Preliminary Concept Plan Alternatives.

Project staff and the SAC developed a set of Project Goals and Evaluation Criteria during Phase I of the project. These are listed in Table III-1.

Table III-1: Tonquin Employment Area Goals and Evaluation Criteria

Goals	Evaluation Criteria	Criteria Type
Adequate public and private utilities are proposed.	The plan can be served by public and private utilities per the Water, Stormwater and Sanitary Sewer Master Plans	Qualitative
Transportation connectivity is provided.	The plan provides local vehicular connectivity as well as multimodal (bike/ped) options.	Quantitative
Transportation performace standards are maintained.	The resultant performance levels at key intersections meet City, County and State standards, as applicable.	Quantitative
The plan provides the ability to serve truck (freight) traffic.	Identified existing truck routes are preserved and new routes are established as necessary to serve the area.	Qualitative
Infrastructure costs are taken into consideration.	Capital cost (planning level capital cost of construction of major roads, water, sewer and stormwater systems)	Quantitative
The plan encourages sound economic development.	The plan is consistent with the market study for the area and Sherwood's Economic Opportunities Analysis.	Qualitative
The plan provides opportunities for various industrial users.	The plan is responsive to multiple user types and provides opportunities for a variety of industrial/employment uses.	Qualitative
Provide appropriate level of commercial use to support needs of area's employees.	The plan identifies and provides the appropriate level and location(s) of limited commercial use.	Qualitative
Preserve significant natural resources.	The plan preserves significant natural resources where appropriate and feasible, including riparian areas and upland habitat.	Qualitative
Include Tonquin Trail elements.	The plan considers the potential Tonquin Trail alignments.	Qualitative
The plan meets the requirements of Metro Ordinance 04-1040B.	The proposed plan is consistent with the requirements of Ordinance 04-1040B and Metro Title 11.	Qualitative
Coordinate with SW Tualatin Concept Plan.	The proposed plan coordinates with the SW Tualatin Concept Plan.	Qualitative
Consider the I-5/99W Connector Project.	The proposed plan considers the I-5/99W Connector Project.	Qualitative
The plan meets the provisions of the MOU with Tualatin.	The proposed plan is consistent with the provisions of the MOU with Tualatin.	Qualitative

Goals	Evaluation Criteria	Criteria Type
Involve the broader Sherwood Community in the Planning Process.	Provide opportunities for property owners and interested parties to participate in the plan's development.	Qualitative
Consider access and response times for emergency services.	Maintain and enhance the transportation network to and through the area to provide adequate accessibility for first responders.	Qualitative

B. Phase II: Tonquin Employment Area Concept Planning

The goal of the second and final phase of the concept planning process is to recommend a Preferred Concept Plan for the development of the Tonquin Employment Area. The first step of Phase II is to explore in more detail the three Preliminary Concept Plan Alternatives developed in the spring of 2009. This Preliminary Concepts Alternatives Analysis Report will provide a description of each alternative and a qualitative and quantitative analysis that will inform the selection of a Preferred Concept Plan. The development and refinement of the Preferred Concept Plan will continue into the fall of 2009.

An important factor in determining a Preferred Concept Plan will be how well the proposed land uses and transportation system integrate with the City of Sherwood's existing, developed areas and with neighboring planned areas, as governed by the Southwest Tualatin Concept Plan. This planning process recognizes the required elements of the Southwest Tualatin Concept Plan, as well as the agreements detailed in the MOU concerning the planning for the respective new employment areas in both the City of Sherwood and the City of Tualatin. Elements of the Preliminary Concept Plan Alternatives that may appear to be inconsistent with the adopted agreements or approved plans should be considered as components of a high-level conceptual planning exercise. In this phase, project staff did not want to preclude any possible combination of land use and transportation elements for consideration. Project staff recognizes that the final Preferred Concept will need to more closely consider elements of the Southwest Tualatin Concept Plan and balance regional and local needs to achieve the best possible outcome for the Tonquin Employment Area.

One assumption underlying this next phase of planning is that the steps leading up to a Preferred Concept Plan will not be limited by existing City of Sherwood zoning. It is possible that existing zoning districts will not be suitable to implement the Preferred Concept, or that more than one zoning category will be required to implement the plan. It is possible that a hybrid of existing industrial designations may be created, or an entirely new industrial zone will be applied to the area, or be implemented through an overlay district. As the Preferred Concept Plan is developed, project staff will consider the steps that will be necessary to implement the recommendation. This could include amendments to the City's Zoning Ordinance.

While recognizing property ownership patterns, parcel lines and property ownership have not been defining factors in the development of the Preliminary Concept Alternatives. However, the Preliminary Concept Plan Alternatives were developed and will be evaluated for each alternative's ability to create opportunities for large lots. This is in response to an identified need for larger industrial parcels in the Metro area and the Urban Growth Management Functional Plan Title 4 requirements assigned to the Tonquin Employment Area, which include preserving a parcel 50 acres in size or larger for industrial uses.

The Project Goals and Evaluation Criteria developed during Phase I have guided the development and assessment of the Preliminary Concept Alternatives. They will be more specifically applied to the Preliminary Concept Alternatives following review of the alternatives with the TAC and SAC to identify the Preferred Tonquin Employment Area Concept (see "Next Steps" in this report).

C. Tonquin Employment Area Features

Three existing roadways create part of the boundary of the Tonquin Employment Area: Oregon Street, Tualatin-Sherwood Road, and SW 124th Street (future extension). The location of this site at the intersection of arterial level streets affords it good visibility. There is a unique opportunity for this area to develop in a compatible manner with existing development to the north and west and with future development to the east, which will follow the Southwest Tualatin Concept Plan. There are several man-made and natural features internal to the site that also help define the Tonquin Employment Area. These features are shown on Figure II-1. Prominent natural features on the site include the buttes in the northeast corner, wetlands associated with this topography, and steep slopes that form the western border. Utility right-of-ways and easements, most prominently one belonging to the Bonneville Power Administration, run diagonally across the site and create areas where development will be restricted. However, this constraint may also be considered an opportunity to preserve natural areas and possibly contribute to a parkway/trail-type feel along the proposed collector system or to the open space that helps define an industrial campus.[1] Consideration of these opportunities and constraints led to the development of three concept alternatives at the conclusion of Phase I of the planning process.

As discussed in the *Alternatives Comparative Analysis* section of this report, assumptions where made regarding the level of development constrained areas could support. These assumptions where held constant for all of the alternative concepts. Also constant in all three alternatives is the assumption that the existing overhead utility right-of-way and easement will be consigned to

[1] Metro Ord. 04-1040B states "Title 11 planning shall incorporate the general location of the projected right-of-way for the Tonquin Trail as shown on the 2004 Regional Transportation Plan (Exhibit F, page 3, item II.D.4)." The general location of the Tonquin Trail will be shown on the Final Preferred Concept Plan.

open space. This assumption is illustrated on the alternative concept figures as a green corridor that helps define, but is excluded from, the subareas chosen for analysis.

D. Tonquin Employment Area Alternatives Development and Assessment

What follows is a description of each Preliminary Concept Plan alternative, including land use assumptions and information on infrastructure (transportation, sewer, water and storm drainage) needs and costs. A description of each alternative with associated land use and employment assumptions is provided.

In order to make reasonable assumptions regarding the number of jobs per acre employment-type land uses will likely yield in the Tonquin Employment Area, the consultant team analyzed developed employment areas in the surrounding areas. The jobs per acre figures shown in the "Employment Assumptions" tables under each alternative are reflective of existing employment density figures for developed employment land in the vicinity. These employment densities generally do not reflect what was assumed by the City for future urban reserve areas.

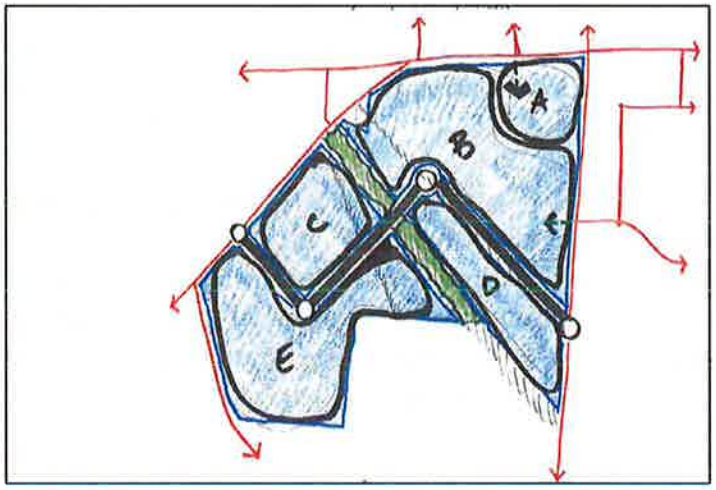
The technical analysis of the transportation and infrastructure facilities follows the description of the three Preliminary Concept Plan alternatives. Because the three Preliminary Concept Plan alternatives are fairly homogeneous in terms of the anticipated employment types (light industrial, mixed use commercial and office) and forecasted employment figures (1,941 jobs on the high end and 1,637 jobs on the lower end), the assessment for future demand of infrastructure was based on the alternative that assumed the greatest amount of possible development (Alternative #1). This "highest employment forecast" assessment was used to predict demands on each system and it was deemed not necessary to conduct a discrete analysis for each Preliminary Concept Plan alternative based on the individual employment forecasts. Since demand for transportation, sewer, water and storm drainage services are generally dictated by the number of jobs created in an area, a single technical assessment was conducted based on the highest employment forecast (1,941 jobs over the twenty year period in Alternative #1). As an illustration, the transportation travel demand analysis is based on the number of trips generated by 1,941 new jobs in the Tonquin Employment Area. Separate travel demand forecasts were not prepared for Alternatives #2 and #3. However, discrete internal circulation systems were prepared and project costs were developed for each of the three Preliminary Concept Plan alternatives and these are illustrated in the Transportation Analysis and Performance section.

Alternative #1

1. Alternative #1 Description

Alternative #1 illustrates a focus on providing a separation the Tonquin Employment Area into north and south development areas. An urban collector connection, with roadways at right angles, would provide connectivity across the site. The proposed collector roadway system in this alternative provides one access from the west, along Oregon Street, and one from the east, along SW 124th street, roughly bisecting the site and crossing the BPA right-of-way at a right angle. The proposed collector road, along with the BPA right-of-way shown in green, forms five distinct subareas (A, B, C, D, and E on Figure III-1).

Figure III-1: Alternative #1



2. Land Use and Employment Assumptions

The land use assumptions for Alternative #1 include an approximately 16 acre Mixed-use Commercial area near the intersection of SW Tualatin-Sherwood Road and SW 124th Street, shown in Figure III-1 as Subarea A. Subarea A is positioned to take advantage of the visibility afforded by the intersection of SW Tualatin-Sherwood Road and SW Oregon Street. The size of Subarea A assumes that services will primarily serve employees within the immediate area; the location of this area acknowledges that the viability of commercial services will also be dependent on visibility and accessibility from the arterial roadway system. The amount of commercial in the Final Preferred Concept Plan will be consistent with Metro's Urban Growth Management Functional Plan, which limits the amount of new commercial in areas designated as Industrial Areas.[2] Uses in this area may include retail, commercial services, limited office, and lodging. Alternative #1 assumes that the portion of the site north of the planned collector road also will allow for a mix of light industrial and office uses. This alternative provides for a transition from the commercial services in Subarea A to industrial uses in the interior of the site

[2] When Metro brought the subject area into the Urban Growth Boundary, it was given the designation of Industrial Area. This designation is described in Title 4 of the Urban Growth Management Functional Plan and its intent is to protect a supply of sites for employment uses within the metropolitan region. For Industrial Areas, new buildings for stores, branches, agencies or other outlets for retail uses and services can not occupy more that 5,000 square feet of sales or service area in a single outlet, or multiple outlets that occupy more than 20,000 square feet of sales or service area in a single building or in multiple buildings that are part of the same development project.

by designating Subarea B for Office and Light Industrial uses. Office uses will have more employees per acre than industrial, providing a customer base that may allow service-type uses to be viable, and therefore available to serve the whole employment area. Of the approximately 71.5 acres in Subarea B, 50% would be developed in Office and 50% in Light Industrial. Subarea C, approximately 41 acres with good visibility from Oregon Street and the potential for convenient access along the proposed collector road, is designated Office in this alternative. Subareas E and D have limited visibility from existing arterial roadways and development will likely be oriented internally to the site. Therefore, Subareas E and D, totaling approximately 109 acres, are designated Light Industrial in Alternative #1. For all areas designated for Light Industrial, flex space is anticipated to be one of the dominant building types to house industrial uses.

Based on these land use assumptions, an estimated 1,941 jobs could be accommodated in Alternative #1. These jobs would occur over time as infrastructure is provided to the Tonquin Employment Area.

Table III-2: Employment Assumptions for Alternative #1

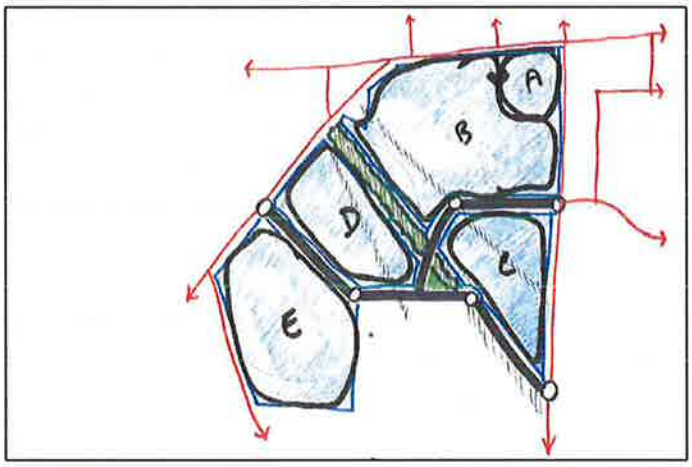
	Subarea A	Subarea B	Subarea C	Subarea D	Subarea E
Total Acres	16.0	94.8	45.6	50.4	89.3
Buildable Acres	16.0	72.5	41.1	38.3	71.1
Employment Type	Mixed-use Commercial/ limited retail, office and support commercial	Office and Light Industrial	Office	Light Industrial	Light Industrial
Building Coverage	35%	35%	40%	30%	30%
Net Acres	5.6	25.4	16.4	11.5	21.3
Jobs/ Acre	24	24	33	20	20
Total Jobs	134	609	541	230	427

E. Alternative #2

1. Alternative #2 Description

Alternative #2 was conceived as a self-contained industrial center, manifested as a more suburban style of development focused on internal circulation with less sense of connection to the surrounding street network. The proposed collector roadway system in this alternative is oriented east-west, with two access points along SW 124th Street and one on SW Oregon Street. This internal collector system, along with the utility easement shown in green, helps define five distinct subareas (A, B, C, D, and E on Figure III-2).

Figure III-2: Alternative #2



2. Land Use and Employment Assumptions

As in Alternative #1, Alternative #2 assumes an approximately 16 acre Mixed-use Commercial area at the intersection of SW Tualatin-Sherwood Road and SW 124th Street. Uses in Subarea A may include retail, commercial services, limited office, and lodging. The amount of commercial in the Final Preferred Concept Plan will be consistent with Metro's Urban Growth Management Functional Plan, which limits the amount of new commercial in areas designated as Industrial Areas (see Footnote #2 in this report). Also similar to Alternative #1, Alternative #2 assumes that the area north of a new collector roadway will be a mix of office and light industrial uses. Alternative #2 does not designate any area strictly for office use, but allows this type of use on approximately 125 buildable acres in Subarea B and Subarea D, which are each designated Office and Light Industrial. The assumption is that 60% of Subarea B will develop as light industrial and the remaining 40% of the site will develop with office uses. For Subarea D, the two use types will be evenly split, 50% office and 50% light industrial. As in Alternative #1, the assumption is that office uses in Subareas B and D support the viability of commercial services in Subarea A and provide for a transition from these services to industrial uses that lie more internal to the site. Light Industrial uses are assumed for Subareas C and E. One Project Goal is to preserve an industrial site of 50 acres or more to comply with Metro's requirements associated with the UGB amendment. This requirement could be met in either Subarea B (77 buildable acres) or Subarea E (62 buildable acres). While the proposed roadway system provides many access alternatives to Subarea C, it also somewhat isolates the approximately 36 buildable acres in that area. Flex space is anticipated to be one of the dominant building types in all areas designated for Light Industrial.

Based on these land use assumptions, an estimated 1,727 jobs could be accommodated in Alternative #2. These jobs would occur over time as infrastructure is provided to the Tonquin Employment Area.

Figure III-3: Alternative #3

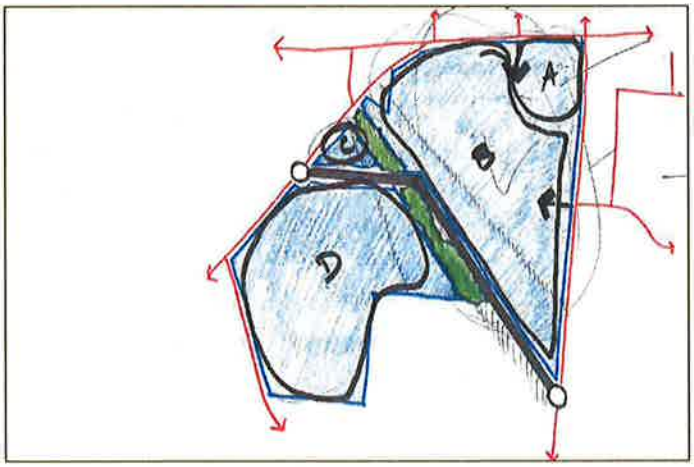
Table III-3: Employment Assumptions for Alternative #2

	Subarea A	Subarea B	Subarea C	Subarea D	Subarea E
Total Acres	16.0	96.1	55.1	53.1	75.8
Buildable Acres	16.0	77.4	35.9	48.0	61.7
Employment Type	Mixed-use Commercial/limited retail, office and support commercial	Office and Light Industrial	Light Industrial	Office and Light Industrial	Light Industrial
Building Coverage	35%	34%	30%	35%	30%
Net Acres	5.6	26.3	10.8	16.8	18.5
Jobs/ Acre	24	23	20	24	20
Total Jobs	134	605	215	403	370

F. Alternative #3

1. Alternative #3 Description

The focus of Alternative #3, as shown in Figure III-3, is on providing connectivity to the area south of the Tonquin Employment Area. This is illustrated by the proposed collector road being located along the southeast border of the employment area, providing a single east access as far south from the intersection of SW Tualatin-Sherwood Road and SW 124th Street as possible on the site. The placement of the roadway system best addresses the possibility that land to the south of the Tonquin Employment Area may be designated an urban reserve as recommended by the City of Sherwood. Placing the access point in this location on SW 124th Street also ties into the road network designed in the Southwest Tualatin Concept Plan and would create a major intersection associated with both employment areas. The proposed collector road nearly divides the site in half, with three subareas north of the roadway (Subareas A, B, and C) and one south (Subarea D).



2. Land Use and Employment Assumptions

Consistent with the other alternatives, Alternative #3 assumes Mixed-use Commercial uses in Subarea A, at the intersection of SW Tualatin-Sherwood Road and SW 124th Street. As discussed under the other alternatives, uses on the approximately 16 buildable acres in this area may include retail, commercial services, limited office, and lodging. The amount of commercial in the Final Preferred Concept Plan will be consistent with Metro's Urban Growth Management Functional Plan, which limits the amount of new commercial in areas designated as Industrial Areas (see Footnote #2 in this report). Similar to Alternative #1, Alternative #3 assumes that uses north of the proposed collector road will be a mix of light industrial and office uses. Subarea B dominates the buildable area north of the collector, with close to 111 buildable acres designated Office and Light industrial. With proximity to the commercial services envisioned for Subarea A and good visibility from both SW Tualatin-Sherwood Road and SW 124th Street, this area will have an attraction for office uses. Due to its size and location near the BPA right-of-way and de facto natural areas, there are also opportunities to develop campus-style industrial developments and creative flex space internal to Subarea B's land area. The assumption is that 20% of the buildable acreage will develop as Office and the remaining 80% will develop as Light Industrial. Subarea C completes the areas north of the proposed collector road. Oregon Street, the new collector road, and the green space/easements shown on Figure III-3 leave less than 10 acres of developable land in Subarea C. Due to its relatively small size, separation from the other industrial areas, and good visibility from SW Oregon Street, Subarea C has been designated Office in this alternative.

Besides the noted connectivity it provides to potentially urbanizable areas to the south, Alternative #3 is best distinguished as the land use alternative that provides the largest area of Light Industrial-designated land that is not bisected by the proposed transportation system. In this alternative, Subarea D contains approximately 104 buildable acres designated Light Industrial. Either Subarea B or D could accommodate a 50 acre industrial user. As in the other alternatives, flex space is anticipated to be one of the dominant building types in areas designated Light Industrial.

Based on these land use assumptions, an estimated 1,637 jobs could be accommodated in Alternative #1. These jobs would occur over time as infrastructure is provided to the Tonquin Employment Area.

Table III-4: Employment Assumptions for Alternative #3

	Subarea A	Subarea B	Subarea C	Subarea D
Total Acres	16.0	145.3	11.7	123.2
Buildable Acres	16.0	110.8	8.5	103.8
Employment Type	Mixed-use Commercial/ limited retail, office and support commercial	Office and Light Industrial	Office	Light Industrial
Building Coverage	35%	33%	40%	30%
Net Acres	5.6	36.6	3.4	31.1
Jobs/ Acre	24	21	33	20
Total Jobs	134	768	112	623

G. Transportation Analysis and Performance

The following summarizes the roadway network, transportation impacts and performance of the Tonquin Employment Area Preliminary Concept Plan alternatives. A description of the surrounding street network and transportation constraints and considerations such as the functional classification and access spacing are provided, as well as a description of the internal circulation networks for each alternative. Due to the similarities between the three alternatives in terms of job forecasts, only one alternative was selected for the operations analysis. Alternative #1 was chosen for this analysis because it is considered the "highest employment scenario," generating more trips than the other alternatives based on a higher jobs forecast. The operations analysis and mitigation for each subsequent alternative will reference the analysis done for the "highest employment" scenario. A planning level cost estimate is also provided for each alternative that includes both off-site improvements needed to mitigate site trip impacts, as well as the internal roadway system. The study area was selected for this analysis based on input from the project team and does not represent the full extent of transportation impacts that would need to be addressed to meet the Transportation Planning Rule (TPR), the Oregon Department of Transportation (ODOT), and Washington County requirements. The transportation analysis conducted during the Alternatives Analysis phase is intended to guide the selection of a Preferred Concept Plan for the Tonquin Employment Area. Because the alternatives are similar in trip generation potential, it was felt that a full TPR-based analysis would not reveal any significant differences between the alternatives. The identification of the Preferred Concept Plan will include a refined transportation assessment that evaluates the impacts of the plan on key intersections in a larger study area, including intersections on Highway 99W and I-5 interchanges, and a summary of how the plan meets state, regional and local transportation plans and policies.

1. Study Area Transportation Standards

The following sections describe the transportation standards for the street network servicing the planning area, including functional classification, access spacing, and mobility.

Functional Class

The proposed Tonquin Employment Area is bordered by SW Tualatin-Sherwood Road to the north, SW 124th Avenue to the east, SW Tonquin Road to the south, and SW Oregon Street to the west. Each of these roadways are classified as arterials. Additional key streets in the study area include SW Murdock Road (classified as an arterial) and SW Cipole Road (classified as a collector). The development of the Tonquin Employment Area will require a roadway network to be constructed through the area to facilitate connectivity. The primary east-west connection would most likely be a collector roadway which would help to facilitate east-west mobility through the area and would serve as a parallel route to SW Tualatin-Sherwood Road by connecting to SW Blake Street in the southwest Tualatin concept plan area. This parallel east-west route (regardless of specific alignment) should be considered a critical element of the future development of the Tonquin Employment Area because of the overall benefits it provides to the existing transportation system – particularly to reducing future traffic demand on SW Tualatin Sherwood Road.

Access Spacing

Access spacing helps to maintain the operating characteristics and safety of the roadway. The jurisdiction with control of the roadway sets access spacing requirements based on the functional classification of each facility. Along arterial roadways in Washington County, access spacing requires a minimum of 600 feet and a maximum of 1000 feet between intersections. The City of Sherwood requires collector roadway spacing set at a minimum of 100 feet and a maximum of 400 feet.

Mobility Standards

The performance standard for intersections controlled by the City of Sherwood is Level of Service (LOS) D.[3] The maximum v/c ratio specified by Washington County is 0.99 for signalized intersections.[4] The minimum operational standard for unsignalized intersections specified by Washington County is LOS E.

2. Site Circulation Alternatives

The following section describes the potential connections from the site to surrounding roadways and the internal roadway network of each of the preliminary alternatives. Figures III-4, III-5 and III-6 show the internal roadway network for each alternative, including major streets and intersections. Additional locations for local street connections are denoted with arrows.

Opportunities and Constraints for Roadway Connections

Access spacing requirements constrain the potential locations for the proposed east-west connector through the site. On SW Oregon Street, roughly 3,000 feet exist between the SW

[3] Page 8-25, City of Sherwood Transportation System Plan, March 15, 2005.
[4] Washington County 2020 Transportation Plan, Adopted October 29, 2002, Table 5.

Oregon Street/SW Tonquin Road intersection and SW Oregon Street/SW Dahlke Lane intersection. Due to environmental constraints (wetlands), the SW Oregon Street/SW Tonquin Road intersection may need to be shifted northeast to implement to construct a planned roundabout, which would further limit the distance available on Oregon Street for new connections. Accounting for the shift in intersection alignment, it is likely that one full-access intersection would be located along SW Oregon Street to provide access to a collector roadway through the site. In addition, there is a potential for one or two other right-in/right-out access points on SW Oregon Street to connect to local roadways. At the main east-west connector intersection along SW Oregon Street, a roundabout is one solution for traffic control. If a roundabout is ultimately selected, the slope of Oregon Street north of Tonquin Road should be considered when selecting the appropriate location along SW Oregon Street, as the roundabout would need to be situated on a level site.

The main constraint for an east-west collector connection to SW 124th Avenue is the proposed extension of SW Blake Street as indicated in the Southwest Tualatin Concept Plan[5]. The extension of SW Blake Street would connect SW 108th Avenue and SW 115th Avenue as a collector and then would become a major collector between SW 115th Avenue to SW 124th Avenue. The intersection of SW Blake Street and SW 124th Avenue is likely the only full access intersection that may be permitted along the study area and should be the connection point for an east-west collector through the site. Additional right-in/right-out connections to local streets may be possible along SW 124th Avenue. Potentially a second full access intersection may be feasible if it is located at the south edge of the site.

Access from the site to SW Tualatin-Sherwood Road can be provided via the existing traffic signal at SW 124th Avenue and SW Cipole Road. In addition, a third connection to SW Tualatin-Sherwood Road may be possible for a non-signalized right-in/right-out local street at SW Wildrose Place.

Access to SW Tonquin Road to the south is limited by topographic constraints and no connections are envisioned at this time.

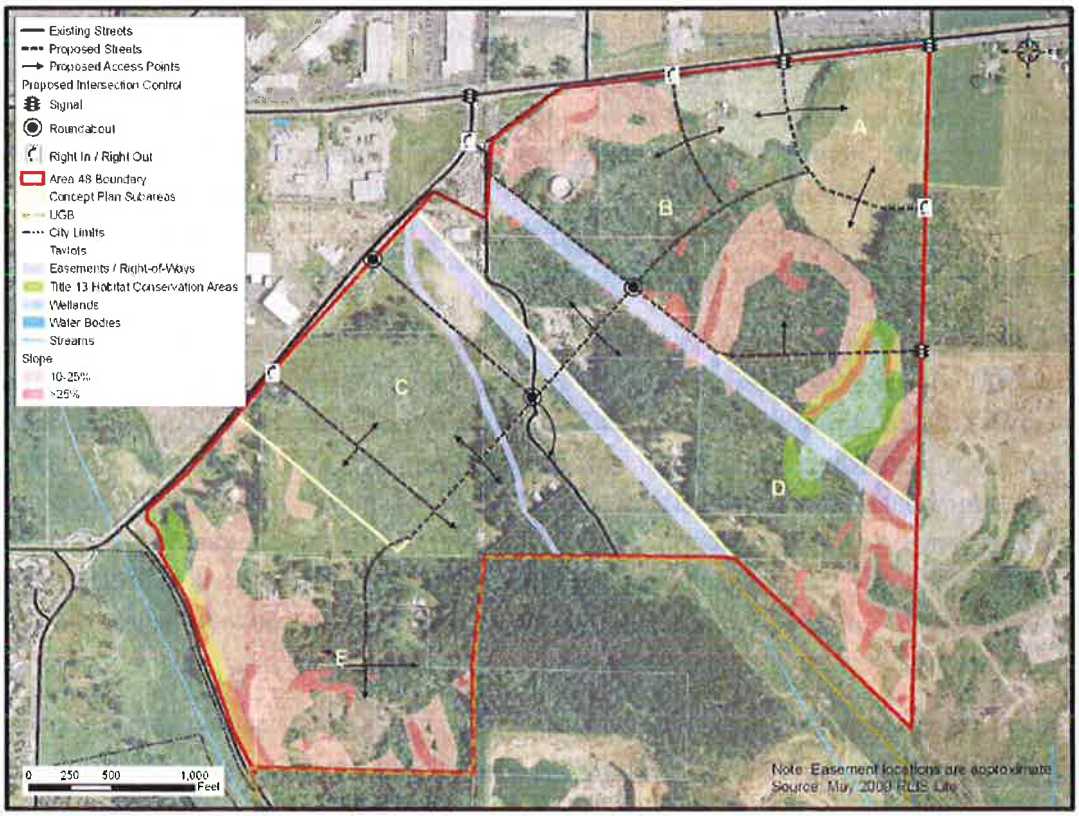
Alternative #1 Internal Site Circulation Network

The primary internal roadways for Alternative #1 consist of a collector between SW Oregon Street and SW 124th Avenue that would cross the BPA right-of-way/PGE easement twice, as well as a local street that would run south and southwest from SW Tualatin-Sherwood Road/SW Cipole Road. Additional site connections would be provided by the right-in/right-out connections on SW Oregon Street (between Tonquin Road and the collector and at SW Dahlke Lane), SW Tualatin Sherwood Road (at SW Wildrose Place), and SW 124th Avenue (between SW Tualatin-Sherwood Road and the collector). Overall, this alternative provides the most direct collector

[5] *Southwest Tualatin Concept Plan*, August 2005

roadway alignment between SW Oregon Street and SW 124th Avenue, as well as limiting crossings of the BPA right-of-way/PGE easement.

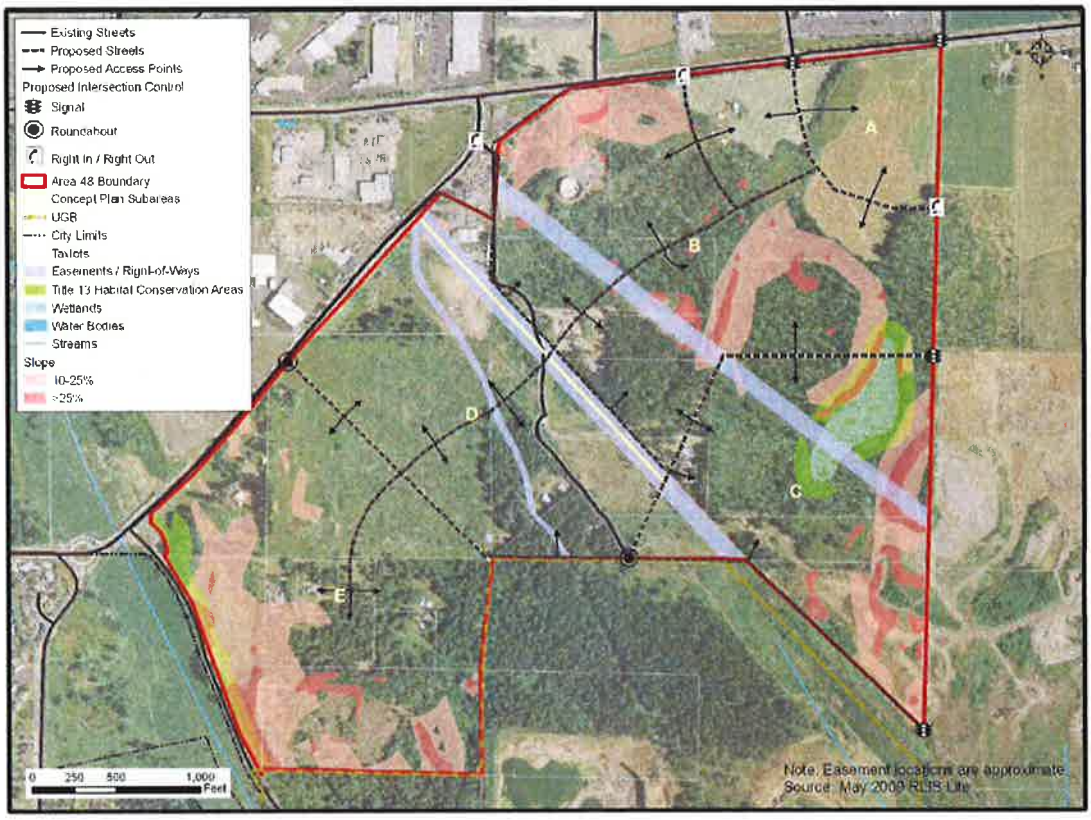
Figure III-4: Proposed Internal Roadway Network Alternative #1



Alternative #2 Internal Site Circulation Network

The primary internal roadways for Alternative #2 consist of one collector connection with SW Oregon Street that splits into two collector connections with SW 124th Avenue. This primary internal collector roadway system would cross the BPA right-of-way/PGE easement three times and other local streets would cross the utility right-of-ways three times for a total of six crossings. In addition, a local street would run south and southwest from SW Tualatin-Sherwood Road/SW Cipole Road. Additional site connections would be serviced by the right-in/right-out connections on SW Oregon Street (at SW Dahlke Lane), SW Tualatin-Sherwood Road (at SW Wildrose Place), and SW 124th Avenue (between SW Tualatin-Sherwood Road and the northern most collector). This alternative provides a greater amount of local service connections (particularly in the area between the BPA right-of-way and PGE easement), but increases the number of BPA right-of-way/PGE easement crossings.

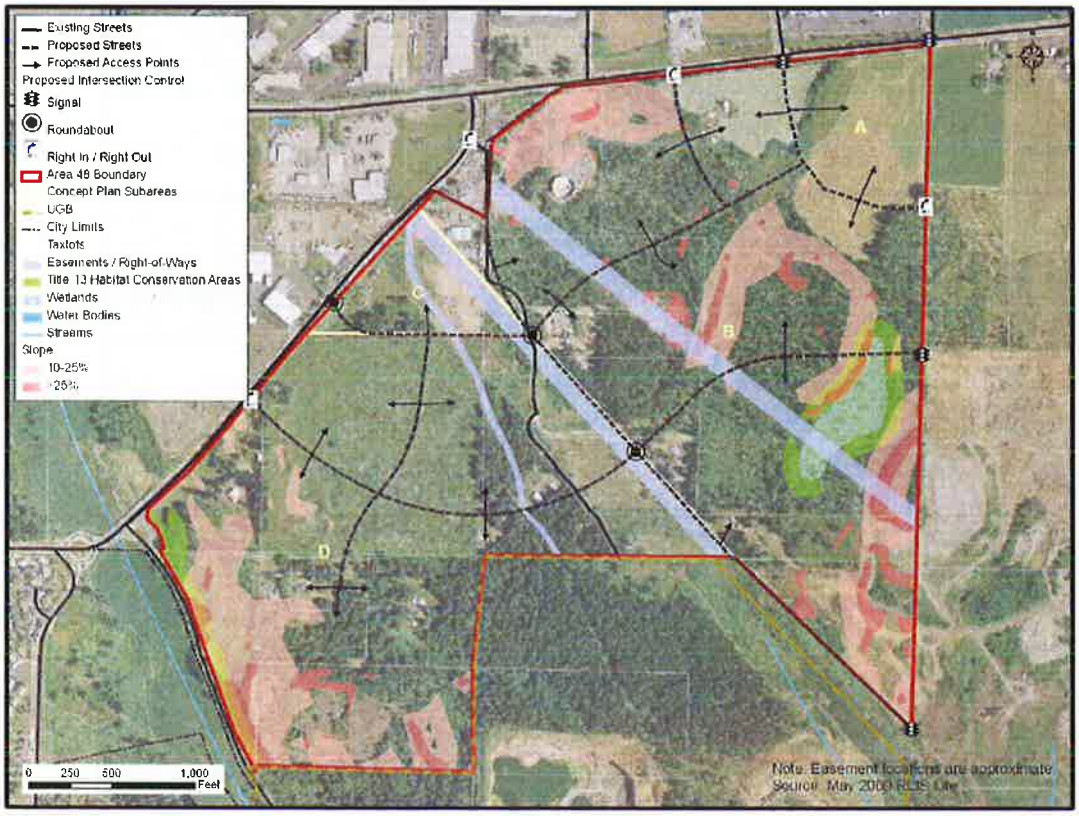
Figure III-5: Proposed Internal Roadway Network for Alternative #2



Alternative #3 Internal Site Circulation Network

The primary internal roadways for Alternative #3 consist of a collector with one connection along SW Oregon Street which splits into two connections along SW 124th Avenue. Alternative #3 crosses the BPA right-of-way /PGE easement a total of five times. As in Alternative #1 and #2, a local street would run south and southwest from SW Tualatin-Sherwood Road/SW Cipole Road. Additional site access is provided by right-in/right-out connections on SW Oregon Street (between Tonquin Road and the collector and at SW Dahlke Lane), SW Tualatin-Sherwood Road (at SW Wildrose Place), and SW 124th Avenue (between SW Tualatin-Sherwood Road and the northern most collector). Alternative #3 is unique in that the proposed internal street network in addition to the collector street network provides a total of three complete east-west roads through the site.

Figure III-6: Proposed Internal Roadway Network for Alternative #3



3. Transportation System Impacts

The transportation system impacts of the Tonquin Employment Area development are summarized in the following subsections. Due to the similarities in trip generation forecasts for the three alternatives, Alternative #1 was selected for the operations analysis because this alternative has the highest employment and trip generation forecast. The operations analysis and mitigation for each subsequent alternative will reference the analysis done for Alternative #1. Presented in the next section is the trip generation for each of the three alternatives and the intersection operations analysis of the "worst case" trip generation, as represented by Alternative #1. The future conditions evaluation includes future forecasting, planned study area roadway improvements, and motor vehicle intersection capacity analysis.

Trip Generation

To determine the transportation impacts of land use changes in the Tonquin Employment Area for each alternative, the motor vehicle traffic generated by the alternative was estimated based

on rates provided by the Institute of Transportation Engineers (ITE)[6]. Table III-5 lists the estimated PM peak hour trips for each subarea and land type for each alternative.

Due to the size and mix of land uses proposed in the development area, it is likely that some "internal trips" would occur between various uses on the site (such as office to retail trips) that would not use the external roadway network. To account for such trips, an internal trip analysis[7] was completed and those internal trips captured by the development were deducted from the total PM peak hour trip totals. In addition to internal trip capture, pass-by trips were also accounted for in the ultimate trip total. Pass-by trips are made as intermediate stops on the way from an origin to a primary destination without a route diversion[2]. The ITE methodology for pass-by trips was used to determine the amount of trips that should be subtracted from the PM peak hour trip totals to reflect the total new trips on the transportation system. The net total trips represent the additional trips to the roadway network created by the change in land use for the Tonquin Employment Area. Accounting for both internal and pass-by trips in the final trip total reduces the PM total trips by approximately 25 percent for Alternative #1 and is a better representation of the future PM trip totals for the proposed concept plan area.

As shown in Table III-5, the total new external roadway PM peak hour trips generated by each alternative range from approximately 1,190 to 1,240 trips, which does not indicate a significant difference in trip generation potential between the alternatives.

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[6] *Trip Generation Manual, 8th Edition*, Institute of Transportation Engineers, 2008.

[7] *Trip Generation Handbook, 2nd Edition*, Institute of Transportation Engineers, 2004.

Table III-5: PM Peak Hour Motor Vehicle Trip Generation for Preliminary Alternatives

Alternative #1					
Subarea	**Land Use (ITE Code)**	**Units**	**Trips In**	**Trips Out**	**Trips Total**
A	Mixed-use Commercial (820)	244 KSF	446	464	910
B	Office (710)	305 jobs	24	116	140
	Light Industrial (101)	304 jobs	27	101	128
C	Office (710)	541 jobs	42	207	249
D	Light Industrial (101)	230 jobs	20	77	97
E	Light Industrial (101)	427 jobs	38	141	179
		Alternative #1 Total Trips	**597**	**1,106**	**1,703**
		Internal Trips	*94*	*94*	*188*
		Pass-by Trips	*126*	*151*	*277*
		Alternative #1 Net Total Trips	**377**	**861**	**1,238**

Alternative #2					
Subarea	**Land Use (ITE Code)**	**Units**	**Trips In**	**Trips Out**	**Trips Total**
A	Mixed-use Commercial (820)	244 KSF	446	464	910
B	Office (710)	242 jobs	19	92	111
	Light Industrial (101)	363 jobs	32	120	152
C	Light Industrial (101)	215 jobs	19	71	90
D	Office (710)	202 jobs	16	77	93
	Light Industrial (101)	201 jobs	18	67	85
E	Light Industrial (101)	370 jobs	33	122	155
		Alternative #2 Total Trips	**583**	**1,013**	**1,596**
		Internal Trips	*50*	*50*	*100*
		Pass-by Trips	*138*	*154*	*292*
		Alternative #2 Net Total Trips	**395**	**809**	**1,204**

Alternative #3					
Subarea	**Land Use (ITE Code)**	**Units**	**Trips In**	**Trips Out**	**Trips Total**
A	Mixed-use Commercial (820)	244 KSF	446	464	910
B	Office (710)	154 jobs	12	59	71
	Light Industrial (101)	614 jobs	54	204	258
C	Office (710)	112 jobs	9	43	52
D	Light Industrial (101)	623 jobs	55	207	262
		Alternative #3 Total Trips	**576**	**977**	**1,553**
		Internal Trips	*30*	*30*	*60*
		Pass-by Trips	*144*	*155*	*299*
		Alternative #3 Net Total Trips	**402**	**792**	**1,194**

Future Forecasting

Future travel demand forecasting for the Tonquin Employment Area utilized the 2030 model developed by Metro, Washington County, and DKS Associates for the I-5 to 99W Connector Study to maintain consistency with the recent planning efforts in the area. Future 2030 PM peak hour volumes at study intersections were developed for the "highest employment" land

uses scenario (Alternative #1) by adjusting the travel demand model trip tables to reflect the trip rates listed in Table III-5. A post-processing technique following NCHRP 255 methodology[8] was used to combine the travel demand model forecasted growth with existing traffic volumes to develop year 2030 forecasts at study area intersections. These year 2030 study intersection volumes were then used to analyze and determine future impacts from the proposed concept plan area on the planned roadway network.

In order to provide a baseline comparison for the Tonquin Employment Area Concept Plan alternatives, the 2030 No Build scenario was established. The 2030 No Build scenario evaluates future traffic volumes and assumes the planned roadway geometry and limited development of Tonquin Employment Area based on existing zoning.

Planned Study Area Roadway Improvements

The future operations of the study intersections were analyzed with the assumed completion of financially constrained roadway improvements included in Metro's 2035 Regional Transportation Plan (RTP). The 2035 RTP roadway improvements were assumed, as they are the most current plan for a reasonably funded system. However, the 2030 model developed for the I-5 to 99W Connector Study is a more detailed/locally-calibrated tool for forecasting volumes in the study area. Therefore, edits were made to the 2030 travel demand model network to reflect the 2035 RTP roadway improvement projects.

The planned roadway improvements included in the 2030 travel demand model were:

- Widening of Tualatin-Sherwood Road and Roy Rogers Road to 5-lanes from Teton Avenue to Borchers Drive
- Completion of the Adams Avenue South Extension
- Completion of the Adams Avenue North Extension
- Intersection geometric, turn lane, and signal phasing improvements at Highway 99W/Tualatin-Sherwood Road
- Completion of the 124th Avenue extension from Tualatin-Sherwood Road to Tonquin Road
- Widening of Tonquin Road to 3-lanes
- Signalization of Tualatin-Sherwood Road/Gerda Lane
- Completion of 112th Extension to Myslony Street

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[8] *Highway Traffic Data for Urbanized Area Project Planning and Design – National Cooperative Highway Research Program Report 255*, Transportation Research Board, Washington DC. 1982.

- New east-west roadway through Tualatin Employment Area connecting 124th Avenue to Blake Street

Capacity Analysis

Capacity analysis at study area intersections was completed for the 2030 No-Build and the 2030 Alternative #1 scenarios. The results of the capacity analysis are listed in Table III-6, which indicates that both the intersections of SW Tualatin-Sherwood Road/SW 124th Avenue and SW Oregon Street/SW Tonquin Road fail to meet the volume to capacity (v/c) ratio standard for the 2030 No Build condition. With the added development of the Tonquin Employment Area, the intersection of SW Tualatin-Sherwood Road/SW Cipole Road is at the maximum limit for the Washington County v/c ratio standard. Although the intersection does not exceed the V/C standard, a variation in trips for the final development plan could push this intersection over the standard and mitigation would become necessary.

The added internal roadway network for the Tonquin Employment Area did improve the intersection of SW Tualatin-Sherwood Road and SW 124th Avenue. The v/c ratio was reduced from 1.10 (which fails Washington County's standard) to 0.82. The added internal roadway network provides a parallel east-west route to SW Tualatin-Sherwood Road and relieves volume from that intersection. The intersection of SW Tualatin-Sherwood Road and SW 124th Avenue is therefore improved with the development of the Tonquin Employment Area.

The intersection of SW Oregon Street and SW Tonquin Road fails to meet the v/c ratio standard in the 2030 No Build condition, as well as for the 2030 Alternative #1 scenario. However, Washington County only requires mitigation for traffic impact when the proposed project would increase traffic volumes on at least one leg of the intersection by 10-percent. The traffic volume increase generated by Alternative #1 would not meet Washington County's impact threshold. Therefore, the project would not be responsible for mitigating impacts.

Table III-6: 2030 PM Peak Hour Intersection Performance

Intersection	Agency	Intersection Performance (Delay LOS V/C) No Build	Alternative 1
Signalized Intersections			
Tualatin-Sherwood Rd / Oregon St	County	28.6 C 0.90	53.4 D 0.96
Tualatin-Sherwood Rd / Cipole Rd	County	8.9 A 0.72	34.2 C 0.99
Tualatin-Sherwood Rd / 124th Ave	County	**50.5 D 1.10**	54.6 D 0.82
124th Ave / E-W Collector	County	28.0 C 0.74	47.8 D 0.91
Unsignalized Intersections			
Oregon St / Murdock Rd	City	A 0.69	A 0.73
Oregon St / Tonquin Rd	County	**A/F 3.20**	**A/F 3.29**
Oregon St / E-W Collector	County	-	A 0.67
Roundabout A (West)	City	-	A 0.28
Roundabout B (East)	City	-	A 0.31

2-Way Stop Intersection LOS:
A/A = Major Street turn LOS/ Minor Street turn LOS

All-Way Stop/Signalized Intersection LOS:
LOS = Level of Service
Delay = Average delay per vehicle (seconds)
V/C = Volume to Capacity Ratio

4. Planning Level Cost Estimates

To evaluate the relative cost of each alternative, planning level cost estimates were completed for the key internal roadways, as connections to the surrounding roadway network. As listed in Table III-7, the costs for the alternatives range from approximately 19.5 Million to $25.6 Million. The variation in cost is primarily due to differences in the amount of internal roadway network proposed for the different alternatives.

Table III-7: Transportation Improvements and Planning Cost

Off Site Improvements			
Location	**Project**		**Cost**
124th Avenue/Proposed E-W Collector	Modify Signal to add West Leg		$150,000
Internal Roadway Network			
Alternative	**Element**		**Cost**
Alternative #1	Internal Roadway Network	12,100 ft	$17,000,000
	Intersection Control	3 roundabouts	$2,400,000
Alternative #2	Internal Roadway Network	15,900 ft	$22,340,000
	Intersection Control	2 roundabouts	$1,600,000
Alternative #3	Internal Roadway Network	16,400 ft	$23,040,000
	Intersection Control	3 roundabouts	$2,400,000
Total Alternative Cost			
Alternative #1			$19,550,000
Alternative #2			$24,090,000
Alternative #3			$25,590,000

H. Infrastructure Analysis

The following summarizes the sewer, water and storm drainage network associated with the Tonquin Employment Area Preliminary Concept Plan alternatives. A description of existing infrastructure considerations is provided, as well as a description of the internal infrastructure systems for each alternative. As with the transportation analysis the similarities in employment forecasts and types for the three alternatives lead to the use of one scenario for the operations analysis. Alternative #1 is used for this analysis because it has the highest employment forecasts and greatest infrastructure needs when compared to the other two alternatives with lower employment forecasts. The other two alternatives were consequently deemed to have less of an impact on the systems analyzed here. The operations analysis and mitigation for each alternative will reference the analysis done for the worst case scenario. A planning level cost estimate is also provided for each alternative that includes both on- and off-site improvements needed to provide the necessary infrastructure network.

1. Sanitary Sewer System Analysis and Performance

Sanitary sewer service can be provided to the Tonquin Employment Area by the City of Sherwood and Clean Water Services (CWS). The sanitary sewer system was evaluated for its ability to accept the wastewater from the planning area using information provided in the

Sanitary System Master Plan for City of Sherwood, July 2007, prepared by Murray, Smith, and Associates. Based on that evaluation, improvements needed to serve the area were identified.

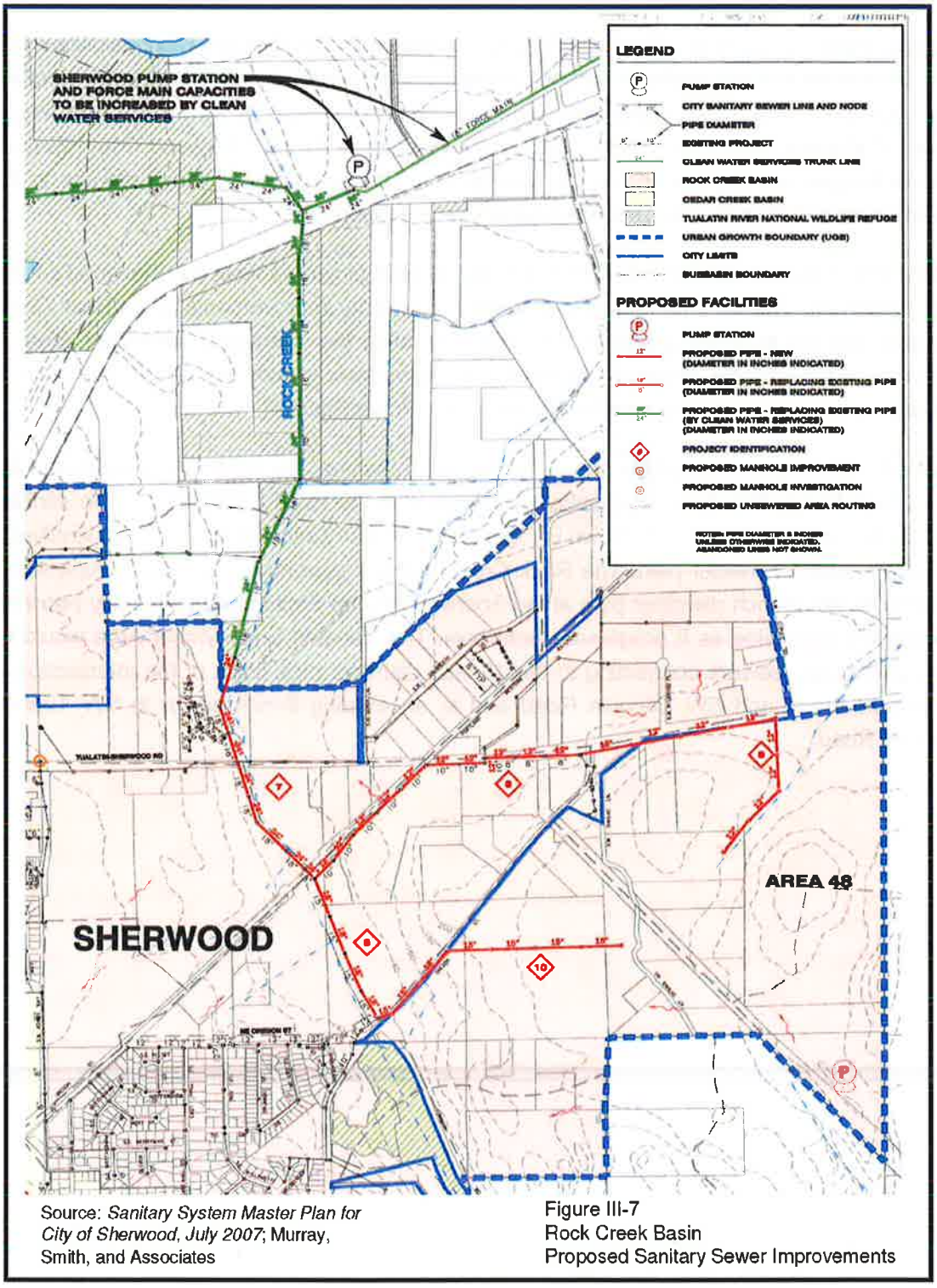
For areas within its city limits, Sherwood shares wastewater management responsibilities with CWS. Sherwood is responsible for sanitary sewers smaller than 24 inches in diameter located within City limits, and CWS owns and maintains interceptor sewers 24 inches and larger, sewage lift stations, and force mains. CWS conveys sewage to the Sherwood Pump Station, which discharges into the Upper Tualatin Interceptor. The interceptor conveys sewage to the Durham Advanced Wastewater Treatment Facility for treatment.

Sanitary sewer service can be provided to the Tonquin Employment Area by Sherwood's Rock Creek interceptor. The sanitary master plan identifies capacity improvements to the Rock Creek interceptor needed to serve growth in the basin, including the Tonquin Employment Area. In addition to improvements made by Sherwood to serve new customers, CWS will need to construct a new interceptor and expand the Sherwood Pump Station.[9]

Sherwood's sanitary sewer system serves two drainage basins, the Rock Creek basin and the Cedar Creek basin. The Tonquin Employment Area is in the Rock Creek basin. The sanitary sewer system serving the area is shown in Figure III-7, as well as the improvements identified in Sherwood's sanitary master plan. The Rock Creek basin is currently served by a trunk sewer that starts as an 18-inch diameter pipe at the Sherwood Pump Station and eventually becomes a 15-inch diameter pipe as it progresses upstream. The Tonquin Employment Area would be served by sanitary sewers connecting to the 15-inch diameter pipe north of the intersection of SW Oregon Street and SW Tonquin Road and to an existing 8-inch sewer in SW Tualatin Sherwood Road.

[9] The *Sanitary System Master Plan for City of Sherwood* reports that CWS plans to upgrade the Sherwood Pump Station and force main to serve saturation development.

Figure III-7: Proposed Sanitary Sewer Improvements



Source: *Sanitary System Master Plan for City of Sherwood, July 2007*; Murray, Smith, and Associates

Figure III-7
Rock Creek Basin
Proposed Sanitary Sewer Improvements

The 300 acres in the Tonquin Employment Area will be developed in mixed-use commercial, office, and light industrial land uses employing 1,637 to 1,941 people, depending on the alternative implemented. The design wastewater flows reported in the Sherwood sanitary master plan for commercial, office, and light industrial land uses are 3,660 gallons per acre per day plus 1,760 gallons per acre per day for peak infiltration and inflow, for a total contribution of 5,420 gallons per acre per day. The 300 acres in planning area would contribute 1,626,000 gallons of wastewater per day to the Sherwood sanitary sewer system during wet weather. The sanitary master plan reports that peak flows were evaluated using a hydrograph approach combining loading from sanitary flows, steady wet-weather infiltration, and storm induced inflows rather than applying peaking factors.

Needed Improvements

Sewer improvements with a total estimated cost of $6,890,000 (rounded) will be needed to serve the Tonquin Employment Area at saturation development. In addition, CWS plans to upgrade the Sherwood Pump Station and force main to serve saturation development. System development charges will also be assessed as the area develops. The sewer improvements include:

- Approximately $4,357,813 in trunk sewer improvements to serve the Rock Creek Basin and the Tonquin Employment Area
- Approximately $2,532,000 for local sewer improvements within the development to extend sewer service from the trunk sewers to individual lots

The cost estimates are based on unit prices in the sanitary master plan, which are based on construction pricing in 2007. Current construction pricing is similar to that in 2007, so no pricing adjustments have been made.

The sanitary master plan identified the following trunk sewer improvements with a total estimated project cost of $4,357,813 in 2007 as being needed to extend service to the Tonquin Employment Area at saturation development:

- Capacity Upgrade - Rock Creek Trunk - 1,436 linear feet of 15-inch diameter Rock Creek Trunk would be replaced with new 18-inch diameter pipe from Manhole 414NSan to Manhole 402NSan. This is shown as Project 6 on Figure III-7. The sanitary master plan estimated the project cost of this sewer at $356,128.
- Capacity Upgrade - Rock Creek Trunk - Approximately 1,349 linear feet of 18-inch diameter Rock Creek Trunk would be replaced with new 24-inch diameter pipe from Manhole 402NSan to Manhole 396NSan. This is shown as Project 7 on Figure III-7. The sanitary master plan estimated the project cost of this sewer at $366,928.

- Capacity Upgrade – Tonquin Employment Area North - Approximately 3,011 linear feet of 8-inch and 10-inch diameter collection pipe would be replaced with new 12-inch diameter pipe from Manhole 402NSan to Manhole 440NSan. This is shown as Project 8 on Figure III-7. The sanitary master plan estimated the project cost of this sewer at $683,497.

- Collection System Extension – Tonquin Employment Area North – The collection system would be extended from Manhole 402NSan, with approximately 3,280 linear feet of new 12-inch diameter pipe to serve Area 48. This is shown as Project 9 on Figure III-7. The sanitary master plan estimated the project cost of this sewer at $744,560.

- Collection System Extension – Tonquin Employment Area South – The collection system would be extended from Manhole 414NSan, with approximately 2,650 linear feet of new 15-inch diameter pipe to serve the south side of Area 48. This is shown as Project 10 on Figure III-7 . The sanitary master plan estimated the project cost of this sewer at $630,700.

- CWS Rock Creek Trunk - Approximately 5,200 linear feet of 18-inch diameter trunk will need to be upsized to 24-inch diameter pipe from the City limits to the existing 24-inch diameter Sherwood. Using the unit estimating price of $272 per linear foot in the sanitary master plan, the estimated project cost of this sewer was $1,576,000.

The sanitary master plan reports that CWS plans to upgrade the Sherwood Pump Station and force main to serve saturation development.

In addition to the improvements identified in the sanitary master plan, approximately 12,000 linear feet of local sewers will be needed within the Tonquin Employment Area to extend sewer service to the lots. Using the unit estimating price in the sanitary master plan for 8-inch diameter sewer of $211 per linear foot, the estimated cost of 12,000 feet of local sewers is estimated to cost $2,532,000.

The differences in sanitary sewer improvements needed to serve the three development alternatives were evaluated. Sanitary sewer improvements are expected to be located within road right-of-way. However, the differences in roadway layouts between the three alternatives were found to not substantially impact sanitary sewer costs.

2. Water System Analysis and Performance

Water service can be provided to the Tonquin Employment Area from the City of Sherwood's water system. The water system was evaluated for its ability to provide adequate pressure and supply peak hour and fire demands based on information provided in *Water System Master*

Plan for City of Sherwood, August 2005, prepared by Murray, Smith, and Associates. Based on that evaluation, improvements needed to serve the planning area were identified.

Water service can be provided to the Tonquin Employment Area from the City of Sherwood's 380-ft pressure zone. According to the water master plan, the 380-ft pressure zone is designed to provide a minimum pressure of 50 psi at elevations of approximately 250-feet. Approximately 270 (90%) of the 296 acres in the planning area are below an elevation of 250 ft, except for approximately 12 acres along the extreme northeast edge of the property which has elevations of 250 to 305 feet, and a second area of approximately 15 acres in the northeastern portion of the property that has elevations of approximately 250 to 270 feet. If system pressure was 52 psi at an elevation of 250 feet, it would be approximately 47 psi at an elevation of 270-feet and approximately 27 psi at an elevation of 305 feet. Given the small amount of area above an elevation of 250-feet, water system pressures should generally be adequate for typical office, commercial, and light industrial development.

The 380-ft pressure zone is the lowest and largest pressure zone in the City of Sherwood system and serves 2,513 of the 2,994 acres in the water service area. The pressure zone is developed in residential, commercial and industrial land uses. The zone is served by gravity from a 2 million gallon reservoir.[10] All four of the City's groundwater wells and the City's Tualatin Supply Connection supply the 300-foot pressure zone directly. The City has a capital improvement plan identifying water mains, additional storage reservoirs and new water source development needed to meet demands at saturation development.

The Tonquin Employment Area will be developed in mixed-use commercial, office, and light industrial land uses employing 1,637 to 1,941 people, depending on the alternative implemented. The Sherwood water master plan does not separately estimate water demand for these land uses, so water demand in the planning area was estimated assuming that there will be no process water uses and applying an average day demand of 45 gallons per employee per day, making total average day demand 74,000 to 87,500 gallons per day in the Tonquin Employment Area when it is fully developed. This is equivalent to a peak demand of 360 gpm if all use occurs over an 8-hour work day with a peaking factor of 2. The water master plan recommends a fire flow demand of 3,500 gpm with duration of 3 hours for office, commercial, and light industrial land uses. Since the fire flow requirement is higher, it will govern design of the water distribution system.

[10] Note: the City has a 4 million gallon water reservoir in the 380 zone (Snyder Park) that will be operational in time to serve future development in the Tonquin Employment Area.

Needed Improvements

Based on the results of hydraulic modeling reported by MSA, Inc. in the water master plan, the 380-ft pressure zone should have adequate capacity to serve the Tonquin Employment Area. The water distribution system can be served from two existing water mains:

- An existing 12-inch diameter water main in SW Oregon Street along the west side of the Tonquin Employment Area. The main in SW Oregon Street is connected to existing water mains in the 380-ft pressure zone on its north and south ends and appears to have a good source of supply from both directions. With a supply from each end, the existing 12-inch water main in SW Oregon Street can supply a fire flow of 3,500 gpm at a velocity of approximately 5 feet per second, which is well within acceptable design limits. The water master plan indicates that the existing 12-inch main should be able to deliver the required fire flow for existing light commercial development along SW Oregon Street, which has the same required fire flow as the planning area.

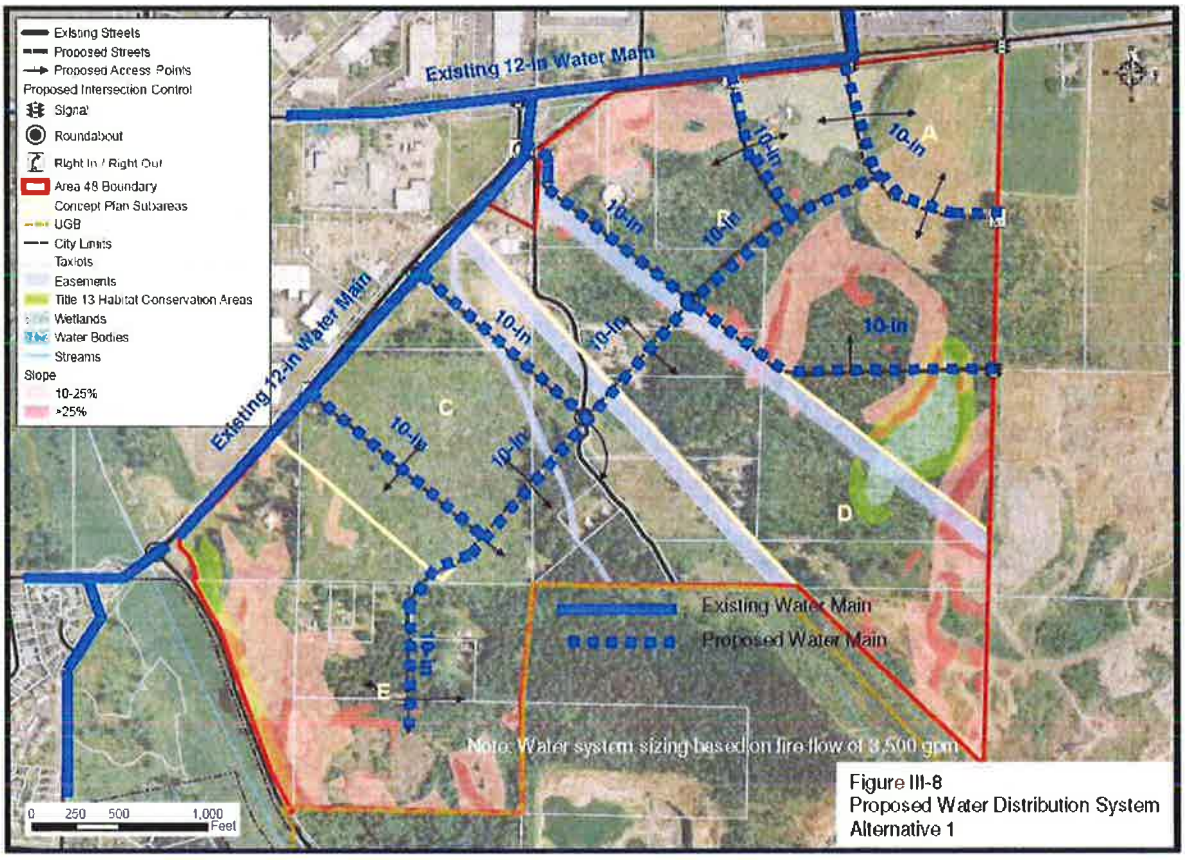
- An existing 12-inch diameter water main in the Tualatin-Sherwood Highway along the north side of Area 48. The main in the Tualatin-Sherwood Highway is connected to the 380-ft pressure zone at SW Oregon Street and appears to have a good source of supply from its west end. With a supply from one end, the existing 12-inch water main should be able to supply a fire flow of 3,500 gpm at a velocity of 9.93 feet per second, which is within acceptable design limits.

The internal water system concept was developed using the street plans for the three employment area alternatives. The three alternatives were found to be functionally identical from a water service perspective. Water main velocities were limited to a maximum of 15 feet per second under fire flow conditions. Approximately 12,000 feet of 10-inch diameter pipe would be needed to provide water service to the concept plans, as shown in Figure III-8. All three concept plans have approximately the same length of water main. The differences in roadway layouts between the three alternatives were found to not substantially impact water system costs. The estimated construction cost of the water system is $2,600,000, as shown in Table III-8. In addition to the costs of constructing the water mains within the Tonquin Employment Area, system development charges would be assessed as the area develops.

Table III-8: Estimated Water Distribution System Project Costs

Item	Quantity	Unit	Unit price	Item price
10-inch water main in new development	12,000	Linear feet	$112	$1,344,000
Fire hydrant assemblies	20	Each	$4,500	$90,000
10-inch gate valves	16	Each	$2,400	$38,400
Tap existing water main	5	Each	$5,000	$25,000
Subtotal				$1,497,400
Overhead and profit at 20%				$299,480
Subtotal				$1,796,880
Contingencies, engineering, legal, and management at 45%				$808,596
Total estimated project cost				$2,605,476
Rounded to				$2,600,000

Figure III-8: Proposed Water Distribution System



3. Storm Drainage System Analysis and Performance

This section describes the conceptualized stormwater infrastructure needed to serve the Tonquin Employment Area. The 296.1 acre planning area drains to three different receiving waters: Hedges Creek, Upper Coffee Lake Creek, and Rock Creek. An analysis of stormwater system improvements needed as a result of the development of the Tonquin Employment Area has been completed for each of these drainage basins and is consistent with the concepts presented in the Stormwater Master Plan for the City of Sherwood (June 2007) and Clean Water Services' (CWS) Design and Construction Standards (June 2007). With mixed-commercial and light industrial development expected in the planning area, regional stormwater facilities were sized for each drainage basin and planning level cost estimates have been included. This analysis addresses the major publicly owned stormwater management facilities.

Topography, soil type, the amount of impervious area, and storm intensity and duration are important parameters for determining stormwater runoff volume and peak flow rates. To be consistent with CWS Standards, the Santa Barbra Urban Hydrograph Method (SBUH) was used

to estimate runoff volume and peak flow rates for the 25-year, 24-hour and 100-year, 24-hour storms. CWS provides an equation for use in calculating the water quality peak flow rate and total water quality volume in Section 4.05.6 of the 2007 Design and Construction Standards.

Land use classifications were provided for the three alternatives. All three of the Preliminary Concept Plan alternatives provided similar impervious area results, making it necessary to only generate one set of peak flows and volumes for this analysis. The Soil Conservation Service (SCS) Technical Release 55 (TR-55) associates land use type with a percentage of impervious area and a Curve Number (CN), based on hydrologic soil type. Hydrologic soil types of B, C, and D are present in the Tonquin Employment Area. See Table III-9 below for a summary of the land-use classifications, associated impervious area percentage and CNs that were used for the analysis.

Table III-9: Percent Imperviousness and CN based on Land Use Type

Land Use	Percent Imperviousness	Curve Number for Hydrologic Soil Groups			
		A	B	C	D
Mixed Commercial	85%	89	92	94	95
Industrial	72%	81	88	91	93
Open Space (grass cover >75%)	10%	39	61	74	80

The regional stormwater facility for each basin is sized for water quality purposes only. This is based on the assumption that the developer will provide on-site detention. Therefore, the facilities were designed to convey the water quality storm (dry weather storm event totaling 0.36 inches of precipitation falling in 4 hours with an average annual storm return period of 96 hours), in accordance with CWS requirements.

The Santa Barbara Urban Hydrograph (SBUH) method was used to produce stormwater runoff volumes and peak flow rates for the 25-year, 24-hour and 100-yr, 24-hour storms. Rainfall volumes for the 25 and 100-year events were consistent with CWS standards and the adopted master plan; 3.9-inches in 24 hours for the 25-year event and 4.5-inches in 24 hours for the 100-year event. See Table III-10 for the results.

Table III-10: SBUH Results Summary

Drainage Basin	Impervious Area in Drainage Basin (acres)	WQ Storm Peak Design Flow Rate (cfs)	WQ Storm Total Runoff Volume (ft3)	25-Year, 24-Hour Storm Peak Design Flow Rate (cfs)	25-Year, 24-Hour Storm Total Runoff Volume (ft3)	100-Year, 24-Hour Storm Peak Design Flow Rate (cfs)	100-Year, 24-Hour Storm Total Runoff Volume (ft3)
Coffee Lake Creek	28.1	2.55	36,740	13.91	574,107	16.58	681,420
Hedge Creek	69.5	6.30	90,790	28.91	1,311,633	34.19	1,549,206
Rock Creek	28.1	7.48	107,661	34.42	1,539,929	40.76	1,820478

Needed Improvements

Three regional stormwater facilities were sized based on the peak flows and runoff volumes provided by the previously described analysis. Each facility is an extended dry basin, designed to CWS standards. The facilities have been designed to provide water quality treatment, and it is assumed that detention will be provided on-site, by the developer. The area required for each extended dry basin footprint is shown by basin in Table III-11. The facility identifiers in Table III-11 are consistent with the projects listed in the 2007 Stormwater Master Plan for the City of Sherwood.

Table III-11: Area of Regional Stormwater Facility by Basin

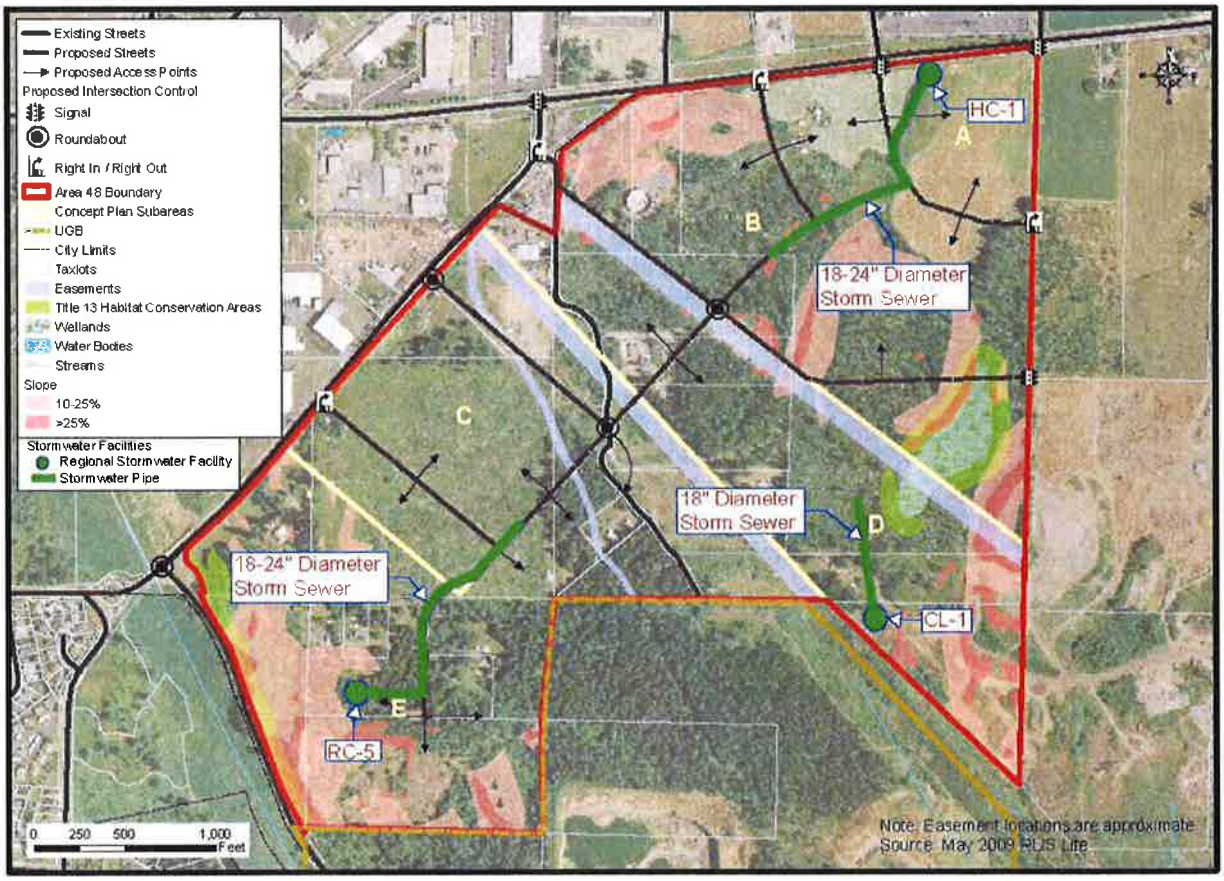
Drainage Basin	Facility Identifier	Required Area for Regional Stormwater Facility (acres)
Coffee Lake Creek	CL-1	0.57
Hedge Creek	HC-1	1.04
Rock Creek	RC-5	1.17

For locations of the facilities, see Figure III-9.

For the purpose of this study we have assumed that regional water quality facilities will be constructed; however, alternative development opportunities are possible. Regional detention facilities or combination regional detention/water quality facilities are possible. Alternatively, developers could be required to construct all of their stormwater management facilities on-site; with no regional detention or water quality facilities.

It is recommended that developers be made conscious of the advantages of implementing low impact development approaches (LIDA) for stormwater quality and detention purposes. The appropriate LIDA will minimize stormwater runoff generated by the development and is considered the most appropriate method of stormwater management where possible. LIDA shall be designed and constructed in accordance with CWS's 2007 Design and Construction Standards Section 4.07.

Figure III-9: Proposed Stormwater System



Cost estimates for the stormwater infrastructure projects in each basin are summarized in Table III-12.

Table III-12: Conceptual Level Cost Estimates for Stormwater Projects by Basin

Item No.	Description	Total
	Coffee Lake Creek Regional Stormwater Facility	
1	2500 CY of Excavation and Grading	$50,000
2	0.57 AC Landscaping and Temporary Irrigation	$17,100
3	200 LF Access Road	$10,000
4	700 LF Access Control Fencing	$17,500
5	Pre-Treatment (Sedimentation MH)	$10,000
6	Inlet and Outlet Structures	$17,500
7	Plant Maintenance	$3,075
8	5% Erosion Control	$6,350
	Total Estimated Construction Cost	$131,525
	45% Contingency, Administration, and Engineering	$59,186
	Total Estimated Project Cost	$190,711
	Rounded to	**$191,000**
	Hedges Creek Regional Stormwater Facility	
1	5100 CY of Excavation and Grading	$102,000
2	1.04 AC Landscaping and Temporary Irrigation	$31,200
3	450 LF Access Road	$22,500
4	1000 LF Access Control Fencing	$25,000
5	Pre-Treatment (Sedimentation MH)	$10,000
6	Inlet and Outlet Structures	$17,500
7	Plant Maintenance	$8,850
8	5% Erosion Control	$10,853
	Total Estimated Construction Cost	$227,903
	45% Contingency, Administration, and Engineering	$102,556
	Total Estimated Project Cost	$330,459
	Rounded to	**$331,000**
	Rock Creek Regional Stormwater Facility	
1	6000 CY of Excavation and Grading	$120,000
2	1.17 AC Landscaping and Temporary Irrigation	$35,100
3	475 LF Access Road	$23,750
4	1100 LF Access Control Fencing	$27,500
5	Pre-Treatment (Sedimentation MH)	$10,000
6	Inlet and Outlet Structures	$17,500
7	Plant Maintenance	$8,850
8	5% Erosion Control	$12,135
	Total Estimated Construction Cost	$254,835
	45% Contingency, Administration, and Engineering	$114,676
	Total Estimated Project Cost	$369,511
	Rounded to	**$370,000**
	Conveyance Infrastructure	
1	1800 LF 18-inch Diameter Storm Sewer Trunk Piping	$270,000
2	1800 LF 24-inch Diameter Storm Sewer Trunk Piping	$315,000
3	(9) 48-inch Diameter Manholes	$47,835
	Total Estimated Construction Cost	$632,835
	45% Contingency, Administration, and Engineering	$284,776
	Total Estimated Project Cost	$917,611
	Rounded to	**$918,000**

IV. Analysis Summary and Preliminary Conclusions

All three of the Preliminary Concept Alternatives appear to meet the Goals and Evaluation Criteria developed to steer the project towards a suitable land use and transportation system that will support future employment in the Tonquin Employment Area. For example, all of the alternatives show a land use pattern and supportive infrastructure to meet the goals of encouraging sound economic development and providing opportunities for various industrial users. Each of the three alternatives includes an internal circulation system that is reasonable given the topography and other existing site constraints and ensures connectivity and suitable access points onto the surrounding arterial system.

At this level of design, there are few differences between the Preliminary Concept Alternatives that can be used for significant comparative analysis. The notable exception is the internal circulation systems for each alternative and the differences in amount of roadway and number of intersections. As shown in the Transportation Analysis and Performance section of this report and Table III-7, the costs for the internal roadway network and intersection control for each alternative do allow for some comparative analysis, with Alternative #1 clearly generating the least costs.

A critical point illustrated in the transportation analysis is that development in the Tonquin Employment Area will require an east-west connection from SW 124th Avenue to SW Oregon Street through the site. This collector-level roadway is a vital component of all three alternatives. This proposed roadway would help to facilitate east-west mobility through the area and would serve as a parallel route to SW Tualatin-Sherwood Road by connecting to SW Blake Street in the Southwest Tualatin concept plan area. Beyond the internal circulation function it provides, this collector is shown to provide an overall benefit to the existing transportation system, in particular by reducing future traffic demand on SW Tualatin Sherwood Road.

The sanitary sewer and water systems are sized based on demand, in this case future employees, and for purposes of this report the need analysis was based on the alternative that would generate the greatest employment numbers, Alternative #1. The storm water system will be developed along with the roadway system and its capacity largely determined by drainage off the impervious surfaces of the roads.

The land use and infrastructure variables explored in this report do not definitively point to one Preliminary Concept Alternative being the clear choice for further refinement. Rather, it is expected that the elements analyzed in this report, and will provide the tools to further discussion that will lead to refinements of one alternative (or a hybrid alternative) and an ultimate selection of a Preferred Concept Plan.

V. Summary of Next Steps

The Preliminary Concept Alternatives and the information in this report will be reviewed and refined by the project's TAC and SAC. The final Preliminary Concept Alternatives Analysis Report and the transportation implications of each alternative will be presented to the community at a public Open House. The goal of the Open House will be to solicit public comment and suggested further refinements to the proposed land use and transportation system. This public feedback will help inform the City's selection of a Preferred Concept for the Tonquin Employment Area. The TAC and SAC will then meet to review the Open House summary and public feedback and provide input regarding a Preferred Concept. With this information, the consultant team will prepare a draft Preferred Concept Plan, including a Draft Technical Transportation and Traffic memorandum and an Infrastructure Plan detailing cost and possible funding mechanisms, for review by the City, TAC, and SAC. Necessary refinements to elements of the Preferred Concept, including the transportation system, infrastructure, and land use patterns, will be made and a final Preferred Concept Plan prepared for the City, TAC, and SAC consideration in early 2010. The Adoption of the Preferred Concept Plan, which will entail amendments to the City of Sherwood's Comprehensive Plan Text and Map and may include associated code amendments, is anticipated to occur by March 2010.

City of Sherwood Oregon

Home of the Tualatin River National Wildlife Refuge

RESOLUTION 2007-083

A RESOLUTION AUTHORIZING THE CITY MANGER TO ENTER INTO A MEMORANDUM OF UNDERSTANDING (MOU) WITH THE CITY OF TUALATIN REGARDING THE FUTURE BOUNDARY BETWEEN THE TWO CITIES SOUTH OF TUALATIN SHERWOOD ROAD IN THE AREA COMMONLY REFERRED TO AS "AREA 48" OR THE "QUARRY AREA".

WHEREAS, in 2002 Metro added approximately 300 acres of land to the Urban Growth Boundary located between the City of Sherwood and the City of Tualatin for industrial purposes located generally south of SW Tualatin-Sherwood Road; and

WHEREAS, the City staff of Tualatin and Sherwood held a series of discussions concerning future industrial development and transportation issues surrounding the Quarry area and a series of principles have been reached in a proposed MOU (Exhibit 1); and

WHEREAS, The MOU is a precursor to concept planning work and authorization of the MOU will establish the initial framework and understandings for concept planning for the area and identify that the Cities intend to enter into an Intergovernmental Agreement under the authority of ORS 190.110(1) and ORS 195.020 to 195.085 that will reflect and contain provisions representing the intent and understandings set forth in this Memorandum; and

WHEREAS, the Tualatin City Council conducted a work session on the draft MOU on September 10, 2007 and authorized signature on October 22, 2007 and the Sherwood City Council conducted a work session on the draft MOU on October 2, 2007.

NOW, THEREFORE, THE CITY RESOLVES AS FOLLOWS:

Section 1. The City of Sherwood City Council hereby authorizes the City Manager to sign the MOU attached as Exhibit 1, establishing the initial framework for the Area 48 concept planning process.

Section 2: This Resolution shall be effective upon its approval and adoption.

Duly passed by the City Council this 6th day of November 2007.

Keith S. Mays, Mayor

ATTEST:

Sylvia Murphy, City Recorder

Exhibit 1

MEMORANDUM OF UNDERSTANDING BETWEEN THE CITIES OF TUALATIN AND SHERWOOD FOR URBAN GROWTH BOUNDARY QUARRY EXPANSION AREA LOCATED BETWEEN THE TWO CITIES

Whereas, in 2004 the Metro Council added an area located between the Cities of Tualatin and Sherwood (the Cities), referred to as the Quarry Area (see attached map), to the Urban Growth Boundary for industrial uses; and

Whereas, the Cities share a boundary along Cipole Road to the north, but are separated by an area of unincorporated Washington County south of SW Tualatin-Sherwood Road and east of SW Oregon Street (the "Quarry Area"), and wish to enter into this agreement, in part, to establish the boundary between the Cities; and

Whereas, Title 11 of Metro's Urban Growth Management Functional Plan requires that local governments complete a "concept plan" prior to urbanization; and

Whereas, the Cities wish to work together to do the Title 11 concept planning for this area to assure carefully planned development in the Quarry Area that will be of benefit to the Cities and their residents and to minimize negative traffic impacts on SW Tualatin-Sherwood Road; and

Whereas, once the concept planning for the area is complete, the Cities intend to enter into an Intergovernmental Agreement under the authority of ORS 190.110(1) and ORS 195.020 to 195.085 that will reflect and contain provisions representing the intent and understandings set forth in this Memorandum.

Now, therefore, the Cities set forth their understanding as follows:

1. The boundary between Tualatin and Sherwood shall be the future SW 124th Avenue extension south of SW Tualatin-Sherwood Road, with the entirety of SW 124th Avenue located in the City of Tualatin.

2. Tualatin shall generally control access onto the future SW 124th Avenue, keeping driveway and street accesses to a minimum, to assure better flow of traffic from Pacific Highway 99W to SW Tonquin Road or the I-5/99W Connector consistent with existing street improvement and spacing standards or adopted as part of the concept planning process.

3. The concept planning for the Quarry Area shall include transportation concepts that provide access restrictions onto SW Tualatin-Sherwood Road and the future extension of SW 124th Avenue south of SW Tualatin-Sherwood Road

while ensuring all properties can develop in accordance with the law and the zoning adopted with the concept plan implementation.

4. In exchange for being allowed to control access onto SW 124th, Tualatin agrees to allow the area south of SW Tualatin-Sherwood Road between the future SW 124th extension and SW Oregon Street to be added to the City of Sherwood so that Sherwood may acquire needed industrial land to improve its long-term economic sustainability.

5. The Cities agree the newly added area will generally be considered for industrial type zoning consistent with the UGB expansion ordinance (Ord 02-969B); the specific details and allocation of which will be determined through the concept planning process. The Cities further agree that the scope of the concept plan shall consider the traffic impacts, whether restrictions are needed to limit access or uses (for example warehouse/distribution and commercial) further based on the outcomes of the concept planning process and funding mechanisms for SW 124th as well as other infrastructure needs identified through the process so that traffic impacts on the area will be minimized.

6. The Cities agree to participate in funding improvements to SW 124th Avenue, the details of which will be specified in an Intergovernmental Agreement upon completion of the concept plan.

7. The Cities acknowledge that they have already submitted a joint grant application to Metro for grant funds to concept plan the area. Once the concept planning is complete, the Cities agree to enter into an Intergovernmental Agreement to memorialize these understandings and the outcomes of the concept planning.

ENTERED into this ____ day of _____, 2007.

CITY OF SHERWOOD, Oregon

By_____

ATTEST:

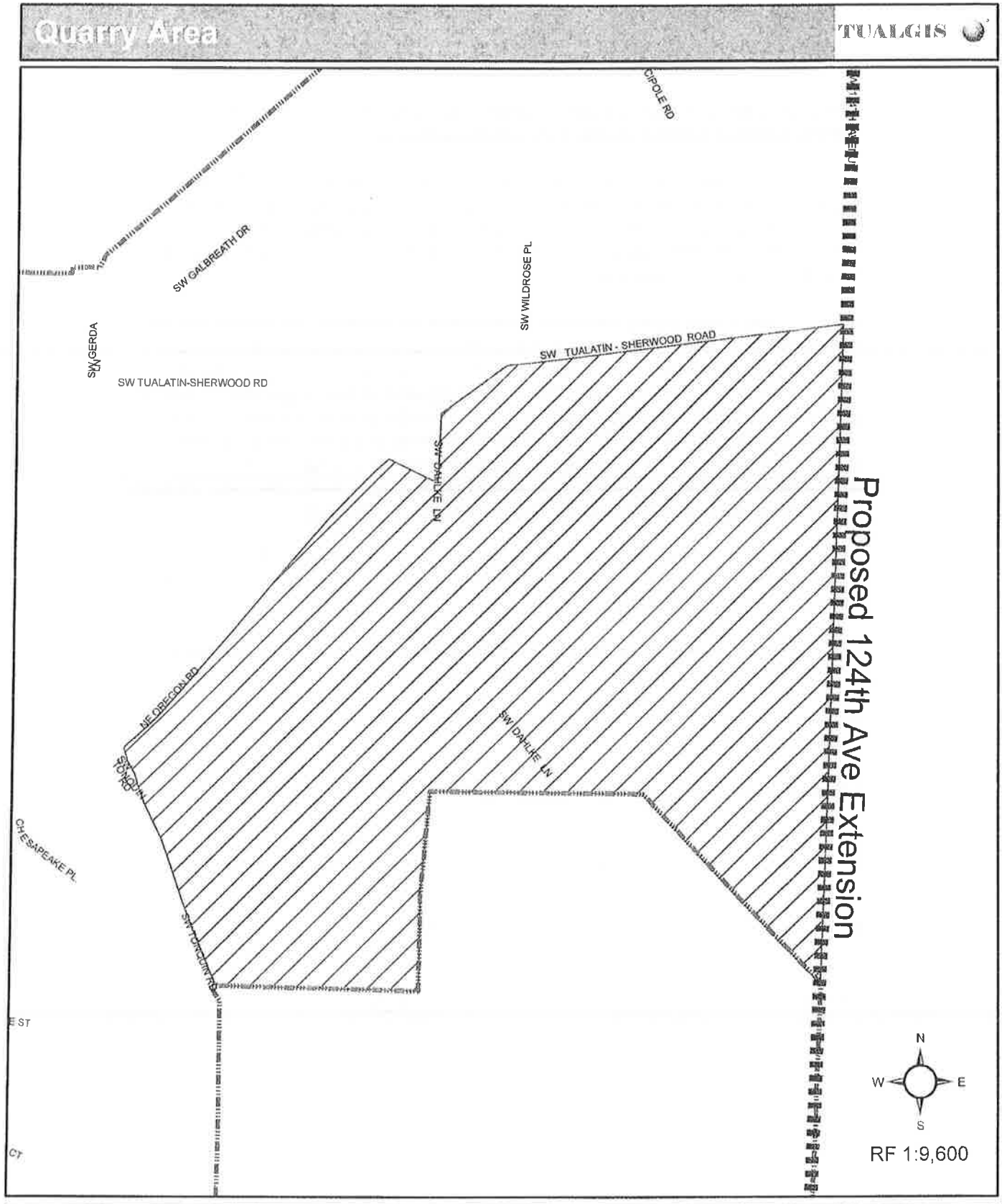
By_____

CITY OF TUALATIN, Oregon

By_____

ATTEST:

By_____


Quarry Area
TUALGIS
CIPOLE RD
SW GALBREATH DR
SW WILDROSE PL
SW GERDA LN
SW TUALATIN-SHERWOOD RD
SW TUALATIN - SHERWOOD ROAD
SW OAKLEE LN
Proposed 124th Ave Extension
NE OREGON RD
SW DAHLKE LN
SW TONQUIN RD
CHESAPEAKE PL
E ST
CT
N
W
E
S
RF 1:9,600
Urban Growth Boundary
Proposed 124th Ave Extension
Quarry Area
Tualatin
Sherwood
This map is derived from various digital database sources. While an attempt has been made to provide an accurate map, the City of Tualatin, OR assumes no responsibility or liability for any errors or ommissions in the information. This map is provided "as is". -Engineering and Building Dept
Plotted 8/21/2007

ORR PARCEL

D. Cities and counties may allow division of lots or parcels into smaller lots or parcels as follows:

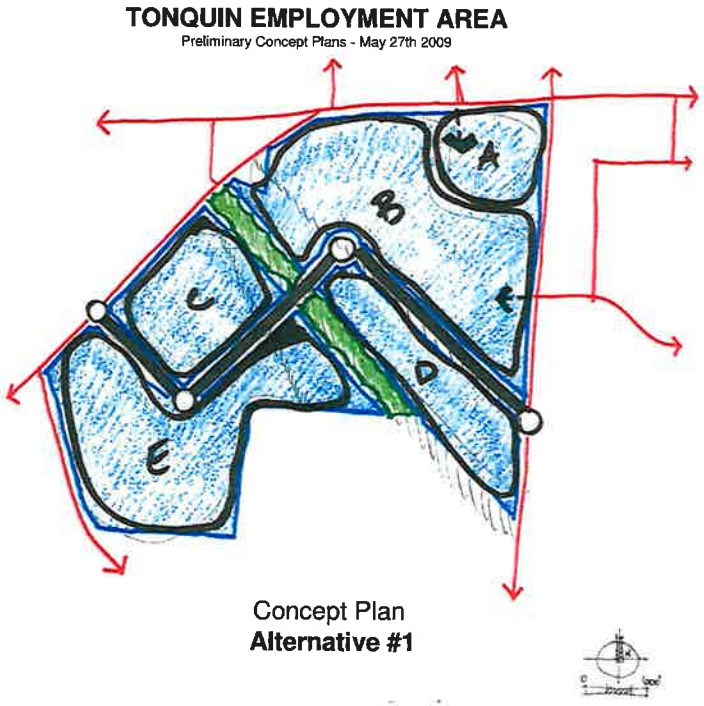
1. Lots or parcels smaller than 50 acres may be divided into any number of smaller lots or parcels.

2. Lots or parcels larger than 50 acres may be divided into smaller lots and parcels pursuant to a master plan approved by the city or county so long as the resulting division yields at least one lot or parcel of at least 50 acres in size.

3. Lots or parcels 50 acres or larger, including those created pursuant to paragraph (2) of this subsection,
may be divided into any number of smaller lots or parcels pursuant to a master plan approved by the city or county so long as at least 40 percent of the area of the lot or parcel has been developed with industrial uses or uses accessory to industrial use, and no portion has been developed, or is proposed to be developed with uses described in subsection A of this section.

Subsection A lists:
retail commercial uses—such as stores and restaurants—and retail and professional services that cater to daily customers—such as financial, insurance, real estate, legal, medical and dental offices

Alternative 1 Summary



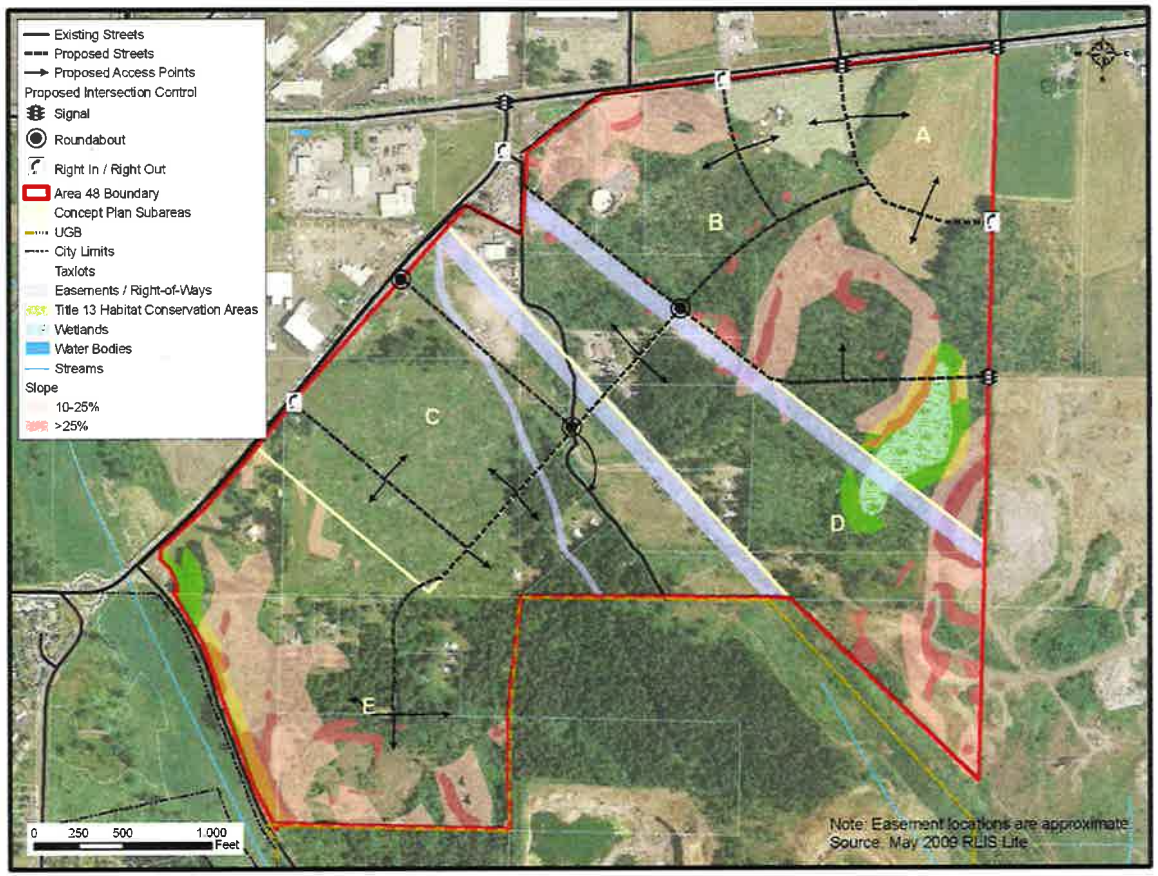
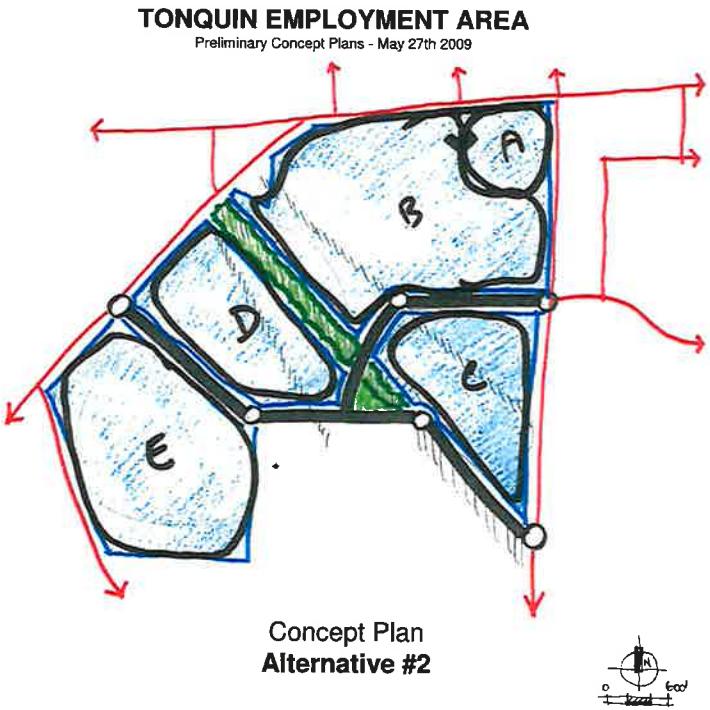


Table III-2: Employment Assumptions for Alternative #1

	Subarea A	Subarea B	Subarea C	Subarea D	Subarea E
Total Acres	16.0	94.8	45.6	50.4	89.3
Buildable Acres	16.0	72.5	41.1	38.3	71.1
Employment Type	Mixed-use Commercial/ limited retail, office and support commercial	Office and Light Industrial	Office	Light Industrial	Light Industrial
Building Coverage	35%	35%	40%	30%	30%
Net Acres	5.6	25.4	16.4	11.5	21.3
Jobs/ Acre	24	24	33	20	20
Total Jobs	134	609	541	230	427

Alternative 2 Summary



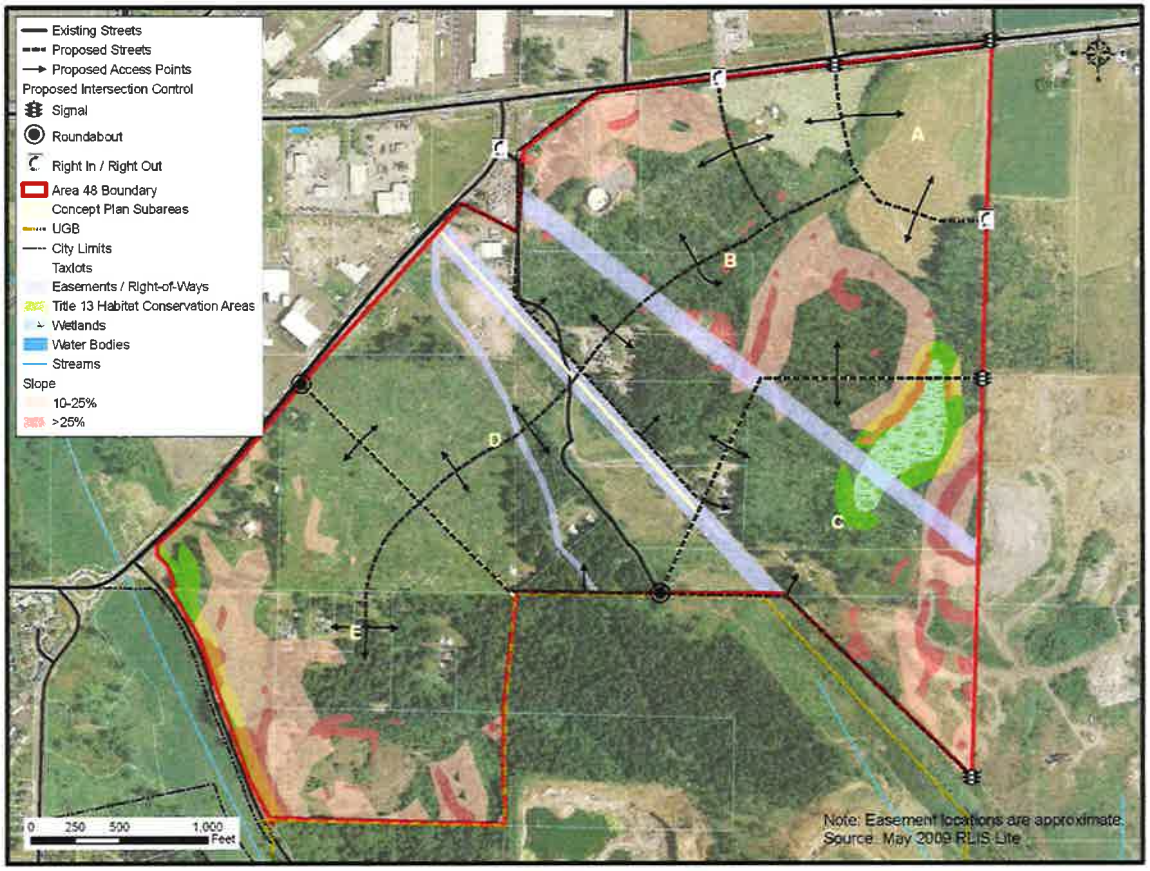
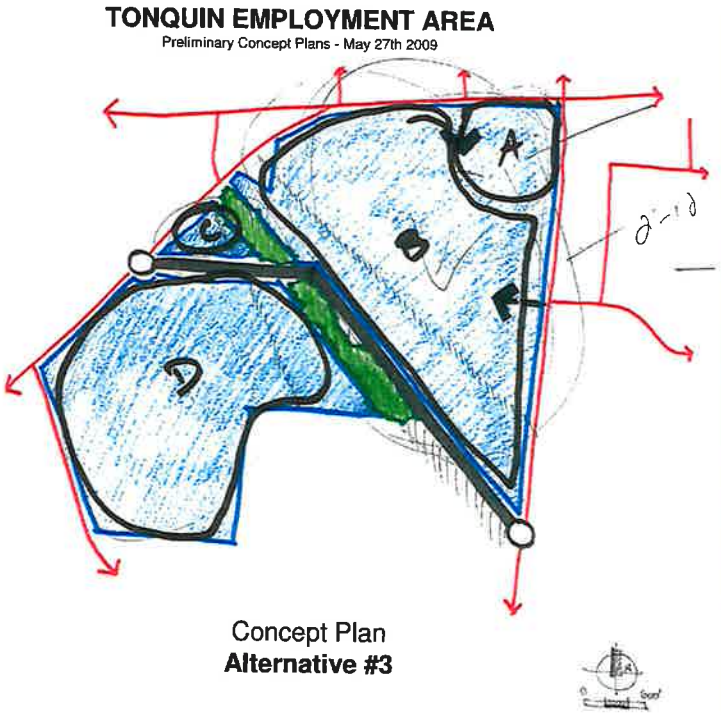


Table III-3: Employment Assumptions for Alternative #2

	Subarea A	Subarea B	Subarea C	Subarea D	Subarea E
Total Acres	16.0	96.1	55.1	53.1	75.8
Buildable Acres	16.0	77.4	35.9	48.0	61.7
Employment Type	Mixed-use Commercial/ limited retail, office and support commercial	Office and Light Industrial	Light Industrial	Office and Light Industrial	Light Industrial
Building Coverage	35%	34%	30%	35%	30%
Net Acres	5.6	26.3	10.8	16.8	18.5
Jobs/ Acre	24	23	20	24	20
Total Jobs	134	605	215	403	370

Alternative 3 Summary



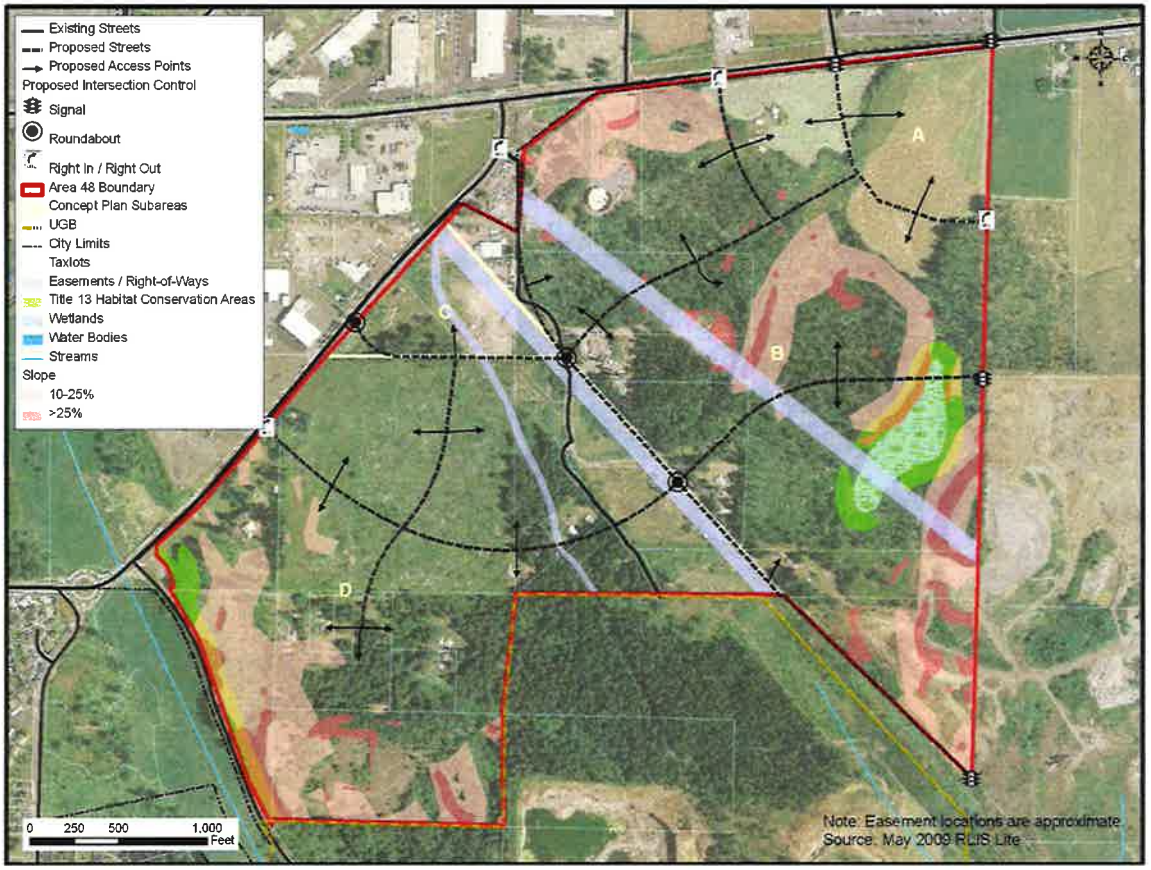


Table III-4: Employment Assumptions for Alternative #3

	Subarea A	Subarea B	Subarea C	Subarea D
Total Acres	16.0	145.3	11.7	123.2
Buildable Acres	16.0	110.8	8.5	103.8
Employment Type	Mixed-use Commercial/ limited retail, office and support commercial	Office and Light Industrial	Office	Light Industrial
Building Coverage	35%	33%	40%	30%
Net Acres	5.6	36.6	3.4	31.1
Jobs/ Acre	24	21	33	20
Total Jobs	134	768	112	623

City of Sherwood Planning Commission Work Session

Industrial Design Standards

Review of Planning Process To-Date:

- February 2008: Staff provides Planning Commission (PC) with a map of all industrially-zoned property in the City classified into two categories. Tier I property is adjacent to arterial or collector streets and Tier II property is not. Staff proposes added design requirements of Tier I developments.

- March 2008: PC decides to bifurcate review of design standards into two separate plan amendments- commercial and industrial. Focus is placed on commercial design standards.

- September 2008: PC directs staff to review industrial design standards from codes from other jurisdictions.

- October 2008: Staff presents findings from other jurisdictions. PC directs staff to propose industrial design code language.

- February 2009: Staff proposes industrial design code language. PC directs staff to propose goals and objectives.

- May 2009: Staff proposes goals and objectives. PC refines goals and objectives. PC directs staff to solicit input from industrial developers and property owners regarding experiences developing in jurisdictions with design standards and thoughts on industrial design standards in Sherwood.

- October 2009: Staff solicits input from industrial developers and property owners. Information to be presented at this work session (October 13, 2009).

Next Steps:

- Staff will prepare code language for PC to review prior to work session on November 10, 2009.

- Staff will refine proposed code language based on PC discussion at work session on November 10th. Staff will submit notification to DLCD and prepare plan amendment staff report.