

NORTH DWYER CREEK MASTER PLAN

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Prepared for:

City of Camas Planning Department
616 NE 4th Avenue
Camas, Washington 98607

Prepared by:

David Evans and Associates, Inc.
2828 SW Corbett Avenue
Portland, Oregon 97201

Introduction

The North Dwyer Creek planning area was annexed to the City of Camas in 1997, in order to provide sufficient land for the anticipated industrial employment growth in the region. The annexation agreement specifies that most of the area must be reserved for industrial development for at least 15 years. Because the annexation occurred after the City had developed its comprehensive growth management plan, the area was not planned in detail, but was shown as a part of the city dedicated to light industrial/country tech uses.

This master plan fills in the details of planning for development of the North Dwyer Creek annexation area. It addresses the infrastructure that will be needed to support the planned development in the area, and integrate it with the rest of the city. Since there are steep slopes and sensitive natural resources in the area, the master plan also addresses development standards to protect these resources.

The master plan will be adopted as a subarea plan under RCW 36.70A.080(2). As such, the master plan addresses all the requirements of the Growth Management Act as they apply to the area. The goals and policies in the *City of Camas 1994 Comprehensive Plan* also apply to the North Dwyer Creek area.

Master Plan Area

The Master Plan for North Dwyer Creek applies to property generally bounded by NW Lake Road, NW Friberg Street (but including six lots west of Friberg and south of SE 13th Street), NE Goodwin Road, and Lacamas Creek.

Figure 1 is a graphic of the North Dwyer Creek Master Plan and shows the boundary of the planning area.

Land Use Element

Background

Because Camas has sufficient residentially zoned land in other parts of the city, the annexation agreement of September 8, 1997, established Light Industrial/ Country Tech (LI/CT) zoning for most of the North Dwyer Creek area. Only a portion of the area already developed with homes was designated in low-density residential (R1-20). However, City Council recognized that the area's steep slopes, wetlands, cultural resources, and existing small-lot development made conformance with LI/CT development standards difficult and directed that a master plan for the area be prepared that would address these issues. One example of the difficulty of

compliance with the standards is that 14 lots, representing approximately 46 acres, would require a variance to the 10-acre minimum lot size standard in the LI/CT zone, or lot consolidation.

In January 1999, the City Council confirmed a continuation of the light industrial and residential zones and boundaries. More flexible development standards and a new overlay zone were authorized to encourage development while protecting sensitive resource areas.

Subarea Plan Concept

The Master Plan's central concept is to maintain maximum flexibility for future light-industrial development by protecting existing large lots zoned LI/CT. Flexibility comes from having industrial land immediately available for development by large employers, as opposed to trying to consolidate smaller lots under separate ownerships. However, large employers also create a demand for local suppliers who typically require smaller lots near the main manufacturer.

The Columbia River Economic Development Council maintains data on requests for information from companies looking for development sites throughout Clark County. Of 37 requests for information in 1996 and 1997 where the minimum acceptable lot size was stated, 40 percent were looking for lots under 10 acres and 46 percent wanted lots between 10 and 50 acres. Thus, both large and small lots are necessary for a vibrant industrial area.

This market demand for larger industrial sites forms the basis for the main assumption behind the subarea concept: For the City of Camas to be able to attract major light industrial employers, there must be an adequate supply of large industrial lots. There are few large lots of undeveloped industrial land that are without significant site constraints remaining in Camas or the region.

As a result, the LI/CT zone remains in place for most of the North Dwyer Creek Area — Area A in Figure 1 — to preserve the existing larger lots.

To accommodate potential market demand for smaller industrial lots without compromising the ability to attract larger employers, the Master Plan retains the 1998 provisions for the Planned Industrial Development (PID) overlay for Area A in Figure 1. The Plan adds more explicit industrial development standards to the PID overlay with the goal of increasing predictability for property owners and developers. The amended PID overlay also restricts commercial development because North Dwyer Creek was annexed to meet anticipated employment needs and because other commercial land is available within the city.

The Master Plan amends the existing PID regulations to apply new standards for development in the small-lot areas, known as areas “B” and “C” in Figure 1. The goal of these new standards is to allow and encourage industrial development on existing smaller lots. The Plan recommends special development standards that recognize the smaller lot sizes but are consistent with the campus-type industrial development envisioned for the remainder of the area. For example, development standards increase the intensity of buffers between different uses, especially between the small lot industrial development and residential areas. Buffers between similar uses would typically be of a lesser intensity, as fewer impacts would be anticipated.

Annexation Agreement

Over the last decade, as development proposals were submitted for portions of the North Dwyer Creek area, Clark County and the City of Camas in turn debated what type of development would be appropriate given the sensitive natural and cultural resources in the area.

In 1994, the City and County determined that the area should ultimately be a part of the City of Camas, and included it in the Urban Growth Area. The project area (then known as “Area A”) remained under the jurisdiction of Clark County. The area was designated residential for development at a density of one residence per 20 acres. In the following two years, the Camas UGB was challenged and appealed to the Western Growth Management Hearings Board because the City had included more land than needed to accommodate expected growth. Prior to the final hearing before the Board, the City of Camas was selected by Taiwan Semiconductor Manufacturing Company (now WaferTech) as the future site of its microchip plant. WaferTech absorbed much of the City’s industrial land inventory causing the City to look elsewhere for land suitable for more industrial development. As the deadline approached for the final Growth Management Hearings Board decision on the Camas UGB, the City amended its *1994 Comprehensive Plan* to designate the majority of Area A for light industrial use.

In late 1996 and early 1997, to avoid losing an opportunity for Camas and Clark County to ensure a sufficient supply of industrial land, the Board of County Commissioners held up final action on Area A to allow annexation by the City of Camas. In September 1997, the City annexed Area A, zoning over 600 acres Light Industrial/Country Tech (LI/CT). All of the annexation and zoning proceedings were subject to and a part of a public process.

Subarea Plan Land Use Goals and Policies

The purpose and objectives of the North Dwyer Creek Master Plan are expressed in the following policies:

- Provide for future employment growth by protecting industrial lots over 10 acres in size from subdivision. Retain the existing LI/CT zone in the North Dwyer Creek area.
- Encourage industrial development on existing smaller lots in the southeast area and west of Friberg Street. New provisions will be developed to permit industrial development, compatible with nearby LI/CT development.
- Provide predictability for developers and property owners by defining specific development standards for the PID overlay zone.
- Restrictions on the type of commercial uses and maximum floor area should be placed in the PID regulations to ensure that valuable industrial land is not converted to commercial uses.
- Wetlands in the North Dwyer Creek area should be managed to preserve the quality of surface water and groundwater.
- Protect and preserve sensitive cultural resources while encouraging industrial development by allowing flexibility in development standards in exchange for protecting resources.

Existing Land Uses

The North Dwyer Creek Planning Area consists of 59 parcels, most under separate ownership. Approximately half of the over 650-acre study area is owned by Vanport Manufacturing, and includes the Camas Meadows Golf Course and Corporate Center development, Phases 1, 2 and 3. Camas Meadows Corporate Center is an industrial subdivision approved with a PID overlay. Lot sizes range from two to 11 acres. Phase 1 contains 10 lots, with five lots over 10 acres and five smaller lots. Phase 2 is a 12-lot subdivision of primarily smaller lots, ranging from 2.5 to 4.5 acres. Phase 3 contains a 20-acre parcel. The Camas Meadows Corporate Center is intended to be developed with a combination of medium to large users in a business-park or corporate center style of development. The lots are planned to be developed in a way that retains the flexibility to combine or consolidate smaller lots for larger users, as needed.

The Lacamas Campground, Camas Meadows development, and Chinook Archery Club occupy close to 400 acres of the study area. Most smaller lots under individual ownership are located in the south half of the

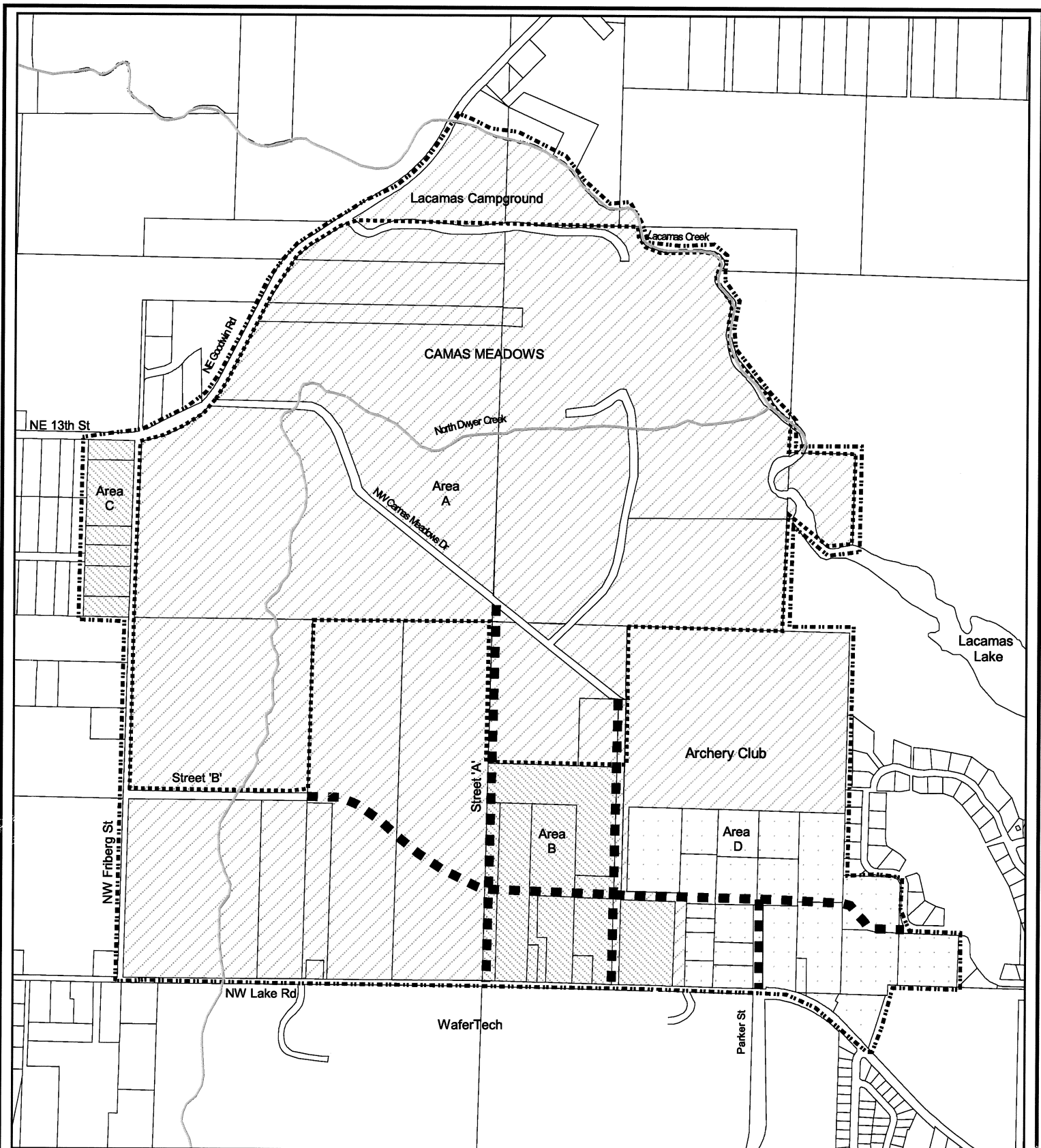








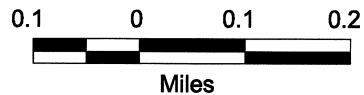
Figure 1
North Dwyer Creek Master Plan

Camas, Washington

Legend:

-  Camas Meadows Boundary
-  Master Plan Area
-  Proposed Road

-  Area A: LI/CT
-  Area B, C: New PID overlay
-  Area D: R1-10



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Source: City of Camas GIS Data; 1998

site, with the smallest sites located in the southeast corner.

Residential

Existing residences are distributed along NW Lake Road and on the private streets north of NW Lake Road. Some of these residences are on property zoned LI/CT and would be considered legal non-conforming uses. New residential development is not permitted in the LI/CT zone of the North Dwyer Creek area for fifteen years from the date of annexation (September 8, 1997). The remaining residences are on property zoned R1-20 (one dwelling unit per 20,000 square feet minimum). There are 23 parcels in the R1-20 zone totaling approximately 55 acres. The Chinook Landowners five-acre parcel (tax lot #175951-000) is used for recreation (archery). The residential density of the remaining area is approximately 2.63 acres per unit. With an average lot size of 2.27 acres.

Commercial

Primary commercial uses in the area are recreational in nature, for example, Lacamas Campground (private) and Camas Meadows Golf Course. These are identified on Figure 1, North Dwyer Creek Master Plan. A few residential properties also have businesses based on-site.

Industrial

Most of the over 650-acre Master Plan area is designated for light industrial use, but, as yet, none of the parcels has been developed for industrial use. Permitted uses in the LI/CT zone include light and high-tech industry, educational institutions, research facilities, convention centers, office complexes, and other similar uses. Secondary permitted uses include retail and service uses allowed in the C1 and C2 commercial zoning designations, except for automobile sales and garages.

Planned Industrial Development (PID) Overlay

The PID Overlay may be applied to a development in LI/CT zones after a more rigorous review by a design review committee. The overlay allows smaller lot sizes if findings can be made to satisfy specific criteria. Camas Meadows Phase 1 and 2 in the North Dwyer Creek area are being developed under the provisions of a PID overlay.

Parks and Recreation

There are no dedicated public parks in the North Dwyer Creek Master Plan area, although Lacamas Campground, Camas Meadows Golf Course and the Chinook Archery Club all provide recreation services. Along the northeast boundary of the study area is an area deeded

by the Camas Meadows development to Clark County for a regional Heritage Trail. When complete, the Heritage Trail will be deeded to the City of Camas.

On behalf of Clark County, the Columbia Land Trust recently purchased approximately 240 acres of undeveloped open space to the east of the Master Plan area, across Lacamas Creek. This area includes Camp Currie, a youth camp on Lacamas Lake.

NW Lake Road and NW Friberg Street have been designated as regional bike routes.

Natural Resources

There are several sensitive natural resource areas in the North Dwyer Creek Planning Area, as shown on Figure 2. Numbers and outlines on Figure 2 provide the general location of where the resources are, rather than a specific area of impact. The largest wetland system is on the Camas Meadows property. Other large wetland areas are on the Lacamas Campground ('6' on Figure 2) and Chinook Archery Club properties ('4' on Figure 2). Several forested and emergent wetlands are associated with the Dwyer Creek corridor (area '2' on Figure 2). Three other areas that are not connected with the larger systems include a forested wetland west of NW Friberg Street ('1' on Figure 2), an isolated hardwood/conifer forest ('3' on Figure 2), and upland forest with associated intermittent stream ('5' on Figure 2).

Permits to fill a small portion of wetlands on the Camas Meadows site and to cross North Dwyer Creek at two locations were obtained in the late 1990s, as part of the golf course development and industrial subdivision.

During the inventory of existing conditions for the Master Plan, a field investigation was conducted to identify wetland areas and wildlife habitats. Conifer/hardwood forest may provide habitat for two Federal Species of Concern, the long-legged myotis and long-eared myotis [bat species]. Suitable habitat may be found in Lacamas Creek for three other Species of Concern: the northwest pond turtle, Pacific lamprey and river lamprey. No suitable habitat for threatened or endangered wildlife species was found on the parcels investigated and no threatened or endangered wildlife species were found, other than those on Camas Meadows property.

To help protect sensitive areas from development, the Camas zoning code allows wetlands and steep slopes on a site to count as part of the open space requirement (up to half of the required 30 percent of total area required for residential development). Sensitive lands may also be used to calculate density in new developments, creating a transfer of density from wetlands or slopes to

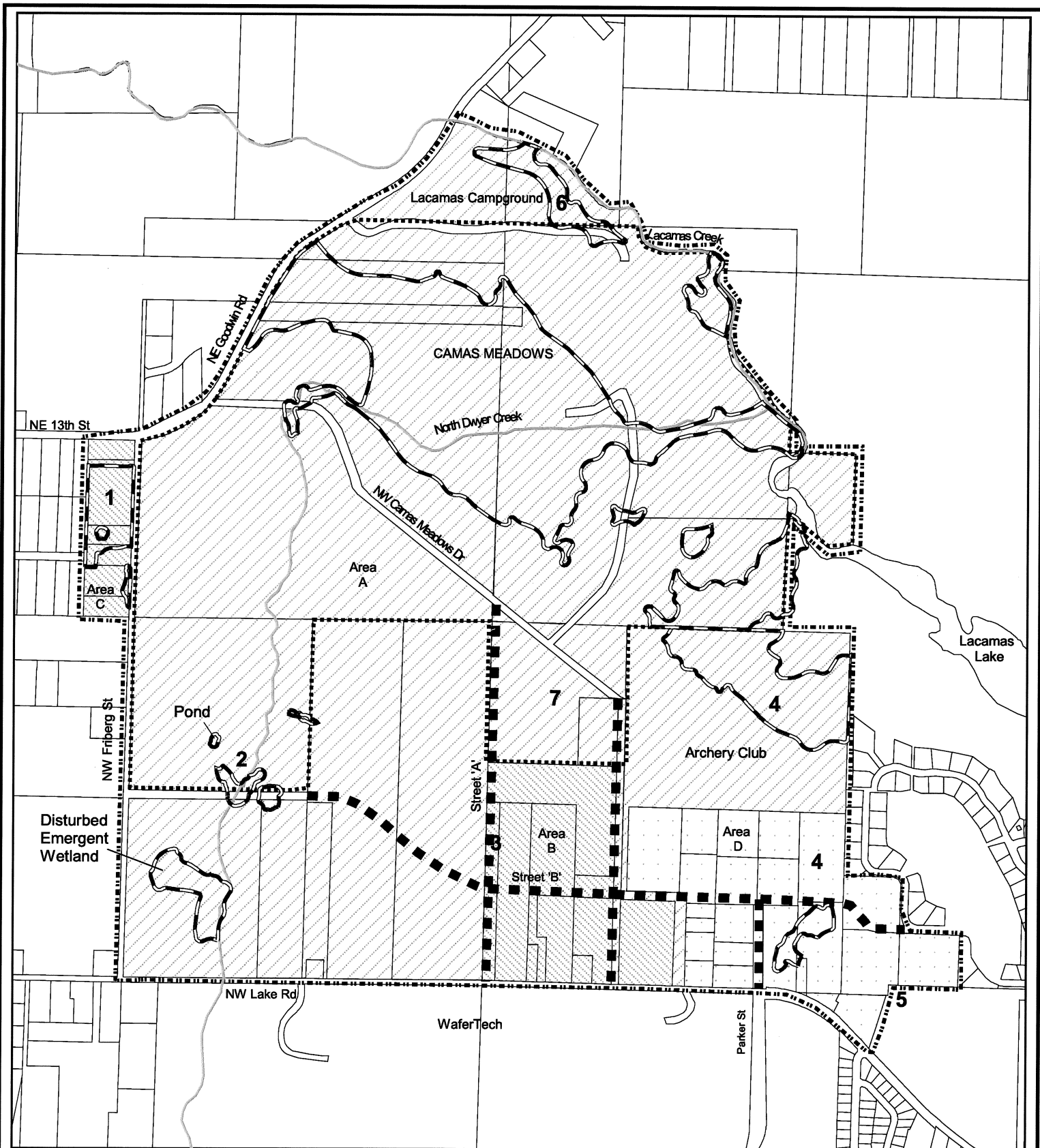









Figure 2
North Dwyer Creek Master Plan: Natural Resources

Camas, Washington

Legend:

-  Camas Meadows Boundary
-  Master Plan Area
-  Proposed Road
-  Estimated Wetland Boundary
-  Area A: LI/CT
-  Area B, C: New PID overlay
-  Area D: R1-10



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Source: City of Camas GIS Data, 1998

a more developable area. The transfer is made by reducing the minimum lot size to no less than 70 percent of the standard minimum lot size for the district.

Cultural and Historical Resources

The area around the confluence of Dwyer Creek and Lacamas Creek has been used by humans for hundreds of years because of the abundance of food (fish, camas, water) and proximity to the major Columbia River trade corridor. Prior to annexation, a review of cultural resources was conducted for the Camas Meadows development. The Army Corps of Engineers accepted the final archaeological report for Phase 1 and 2 of Camas Meadows (approved by Clark County).

A cultural resources survey was also performed for this Master Plan. A review of previous archaeological studies, historical information about the area, and an archaeological survey of land not previously surveyed for which permission from owners could be obtained, were conducted. The field work was restricted to a surface investigation, and no subsurface explorations were done. The archaeological report details the results of the survey, the general location of sites, and areas that require further investigation, "high probability areas". High probability areas are within, contiguous or nearly adjacent to known sites. Figure 3, Cultural Resources Areas with Parcels Surveyed, shows the parcels that were surveyed, and generally outlines areas of high probability. (Property owners whose parcels were surveyed may review the report at the City of Camas Planning Department.)

Planned Land Uses

Residential

The North Dwyer Creek Master Plan designates the residential portion of the planning area for single family residential-medium. The zoning is R1-10 (one dwelling unit per 10,000 square feet), consistent with the intent of the September 1997 annexation agreement. Sensitive areas such as wetlands and steep slopes will be accommodated by allowing lot sizes as small as 5,000 square feet, depending on the site constraints. Livability and character of the residential area will be preserved by retaining the overall density of one unit per 10,000 square feet.

In order to protect residential uses from the noise, odors and traffic associated with industrial use, buffering between industrial and residential uses is required of LI/CT development. Special attention will be paid to adequate buffers between small-lot industrial development in areas B and C, and the adjacent residential zones.

Commercial

The Master Plan allows commercial development that is clearly subordinate to industrial uses, and serves primarily the surrounding industrial and residential areas, not regional clientele. Consistent with the original annexation agreement, the Master Plan does not designate specific sites for commercial development. In general, the Master Plan's restrictions on commercial uses are intended to protect industrial lands from conversion to commercial uses.

During the development of the Master Plan, it became clear that some commercial uses permitted under the LI/CT and PID overlay zone regulations did not meet the intent of the zone. Some of these uses—such as drug stores, groceries, markets—are no longer the small neighborhood businesses originally envisioned for C1 and C2 zones but big-box retail uses serving a more regional residential market. To preclude these types of uses, the Master Plan imposes maximum floor area standards. Other commercial uses that are not considered supportive of industrial uses are identified and specifically prohibited.

Industrial

The primary goal of the North Dwyer Creek Master Plan is to protect the supply of large lots of industrial land that are without significant site constraints, in order to protect the ability of the City to accommodate major employers such as ULI and WaferTech.

Development standards for LI/CT

New development standards are established to create more predictability to developers.

New PID Overlay Standards

The Master Plan recognizes that a large industrial employer often requires inputs from smaller businesses and benefits from having these suppliers nearby and that previous standards precluded development. To encourage such use of smaller industrial lots in the planning area, new PID overlay standards will be developed for property with lot sizes under 10 acres in the area, between the eastern boundary of Section 28 (Township 2 North, Range 2 East) and the residential zone to the east, excluding Camas Meadows and the Archery Club property. The revised PID Overlay contains development standards geared to small-lot light industrial development, while maintaining the overall theme of campus-style development.

In short, the purpose of the revised PID Overlay is to:

- Provide incubator space for start-up industries and smaller parcels for firms supplying large employers;
- Attract development compatible with the industrial campus atmosphere of the LI/CT designation; and,
- Buffer adjacent residential areas from industrial activities, noise, and odors.

Permitted Uses

Permitted uses in LI/CT include light and high-tech industry, educational institutions, research facilities, convention centers, and office complexes. Secondary permitted uses include retail and service uses that serve the surrounding industrial and residential areas. The site area of these uses is limited. Commercial uses prohibited outright are listed in a table in Appendix A.

Parks and Recreation

Planned parks for the area include a new Neighborhood Park for the residential neighborhood and a Community Park for the North Dwyer Creek area. A more detailed discussion of parks and recreation is contained in the Parks and Recreation Element of this subarea plan.

Protection of Natural Resources

Critical areas in the Master Plan area include wetlands, frequently flooded areas (Camas Meadows development), steep slopes, and wildlife habitat.

The North Dwyer Creek Master Plan builds on existing regulations that help protect sensitive lands. Combining protection of critical areas and development is difficult on the smaller lots in the Master Plan area, so more flexible cluster development provisions are established. A special overlay for the residential portion of the Master Plan area will allow a minimum lot size of 5,000 square feet, while preserving overall density of one unit per 10,000 square feet.

Wetland classifications and associated buffers are established in order to provide more predictability and consistency for property owners. Wetland delineations based on a classification system provide applicants or property owners with advance knowledge of the buildable area. Wetland delineations are required prior to a State Environmental Policy Act (SEPA) threshold determination, with wetland impacts reports submitted separately with development applications. This results in designs that are tailored to the site and any required protection of sensitive areas. Buffer averaging combined with opportunities for wetland enhancement and more flexible density transfer standards balance the

needs of wetland preservation and protection with the goal of meeting the intended residential and industrial densities.

Natural Resources Policies

The North Dwyer Creek Master Plan establishes the following policies for natural resources:

- Protect wetlands by requiring buffers from development according to the type of wetland.
- Protect species of concern and their habitat by establishing buffers, and encouraging site plans that preserve and enhance natural features and provide for wildlife corridors.
- Balance the protection of natural resources with achievement of intended densities through density transfer provisions.

Protection of Cultural Resources

The archaeological investigation conducted for this Master Plan satisfies the requirement for an archaeological predetermination for the portions of surveyed parcels that are outside a high-probability area. For areas shown within a high-probability area, additional work, mainly subsurface exploration, is required to satisfy the requirements for a pre-determination. The remaining parcels which were not part of the Master Plan survey will require an archaeological predetermination when new development is proposed.

The archaeological study for the Master Plan meets the requirements for a planning-level project under SEPA. However, future projects that include permits or funding from federal agencies, such as the Corps of Engineers, are likely to require additional steps in order to meet requirements of the National Historic Preservation Act or National Environmental Policy Act. These federal laws and the regulations implementing them encompass cultural resources such as traditional cultural properties that are not usually protected under city or state laws.

The Master Plan incorporates by reference the policies pertaining to Archaeological resources (Chapter 16.06.15 of the Camas Municipal Code [CMC]).

Housing Element

The Growth Management Act requires comprehensive plans and subarea plans to contain a housing element. Housing elements must contain an inventory and analysis of existing and projected housing, and provide for all economic segments of the community. While the North Dwyer Creek Master Plan, as a subarea plan, is required to contain the same elements as a comprehensive plan,

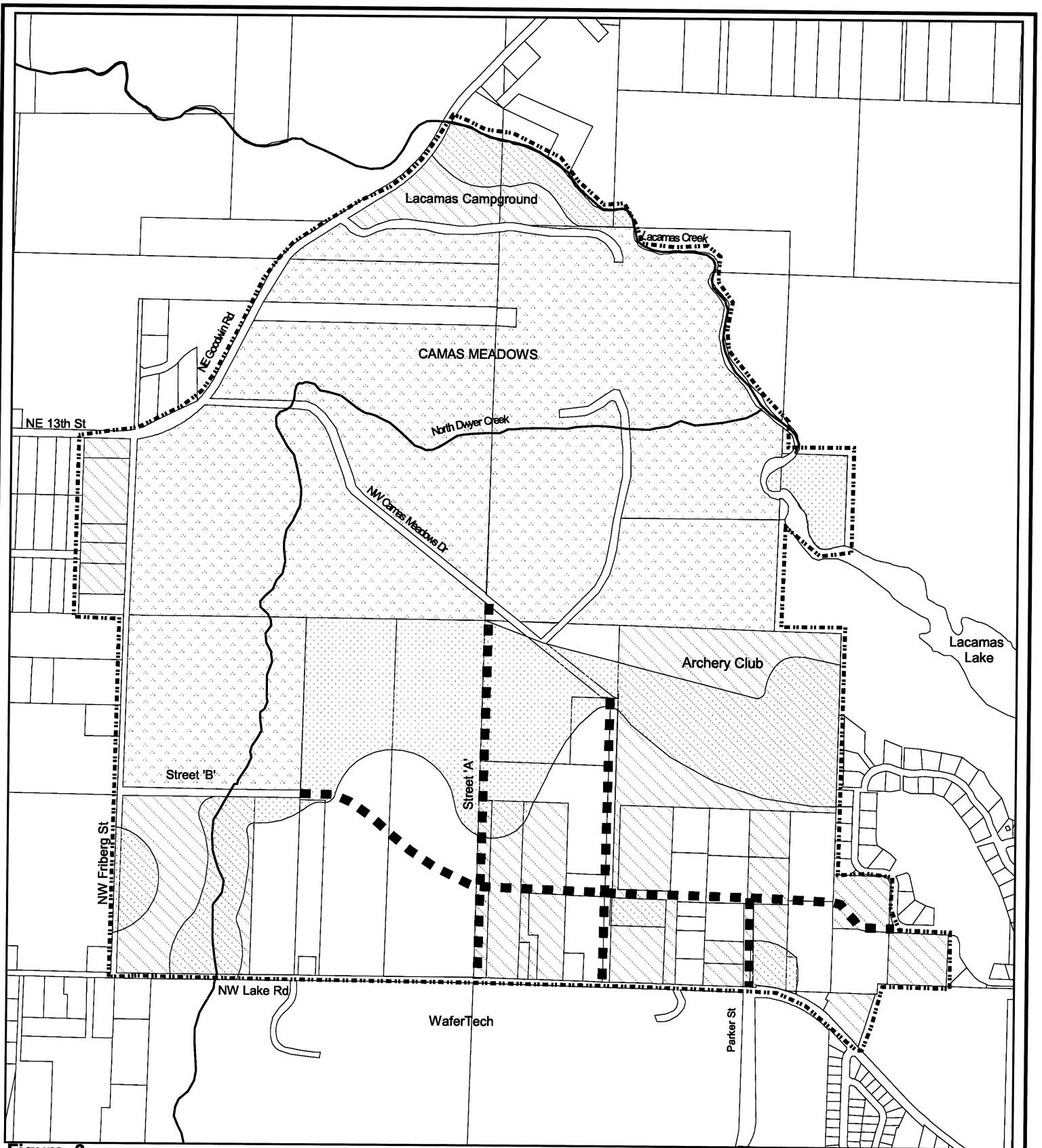


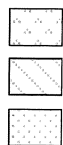
Figure 3
North Dwyer Creek Master Plan: Parcels Surveyed for Archaeological Pre-Determination
Camas, Washington

Legend:



Master Plan Area

Proposed Road



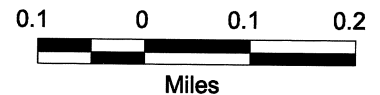
Area Previously Surveyed

Area Surveyed by AINW

High Probability Area



1:11500



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Source: City of Camas GIS Data; 1998

the limited residential area covered by this subarea plan cannot address the variety of housing needed by the City. For example, multi-family zoning would not be permitted under the annexation agreement. Instead, this Master Plan element sets flexible standards that will encourage variety in future developments in order to achieve the GMA goal of a variety of housing products.

Existing Conditions

There are currently 34 single-family residences in the Master Plan area, primarily in the southeast area, with a few west of NW Friberg Street south of NE 13th Street. These single-family residences vary in age and condition and include some manufactured homes. The area appears to have developed gradually when larger parcels were subdivided. There is no multi-family housing or institutional housing (group homes, dormitories, etc.)

Housing Policies

Camas is concerned with providing safe and sanitary housing for all residents at an appropriate cost. A variety of housing types and designs is seen as integral to meeting the diverse needs of different age groups, income levels, and family types. The North Dwyer Creek Master Plan incorporates the following policies:

- Protect existing residential areas while recognizing that the North Dwyer Creek area will remain primarily an industrial area.
- Because of site constraints, more flexible development standards will be adopted that allow small-lot single-family development while keeping an overall density in new subdivisions of one unit per 10,000 square feet.

Future Needs

The *City of Camas 1994 Comprehensive Plan* profiled the city's housing needs with respect to housing for people with low to moderate income-levels and for people with special needs. The North Dwyer Creek Master Plan incorporates this analysis by reference.

Transportation Element

Existing Plans

Most of the North Dwyer Creek study area is designated for light industrial use, but in previous analyses, the dominant land use assumed was residential. (See "Background" section.) Furthermore, the amount of residential development projected for the area varies in the two principal transportation modeling efforts. The Regional Transportation Council's (RTC) assumptions

used in the regional transportation model provide for modest residential development. More dense residential development was predicted in a study conducted for a Traffic Impact Fee update commissioned by the City of Camas. In that study, DKS Associates forecasted 2,455 residential units and 500,000 square feet of industrial development by 2015 in an analysis area that included the North Dwyer Creek study area and the area west of NW Friberg Street to 192nd Street, south of SE 13th Street. Therefore, the impact of developing the area primarily in industrial uses has not been considered.

Although it does not directly impact the North Dwyer Creek study area, it appears that earlier studies underestimated development potential on adjacent areas. There are indications that the amount of employment at WaferTech to the south of NW Lake Road may be substantially greater than assumed in the RTC's regional model.

Existing Conditions

The current roadway network serving the study area consists of state highways and local or regional roads.

State Highways

State Route (SR) 14 is the state highway linking Camas with the closest interstate highway, I-205, and then further west with I-5 near downtown Vancouver. Both of the interstate highways link Camas to Portland, Oregon to the south and Olympia and Seattle, Washington to the north. SR 14 links Camas to Vancouver to the west and to other points east in Skamania County and beyond.

Local Roadway Network

The roadways immediately adjacent to the study area are predominately narrow rural streets, and, with only minor exceptions, have no curbs, sidewalks or paved shoulders. The key roadways in the study area are NW Lake Road, NW Friberg Street, and NE Goodwin Road. These roadways are the boundaries of the study area, as well as important connections to the transportation network.

NW Lake Road is identified by the City of Camas as part of the arterial system and is projected to become a four-lane arterial on a Transportation Network map from the *1994 Comprehensive Plan*. Clark County designated this road as a two-lane collector arterial. It serves as an east/west arterial along the south section of the study area. NW Lake Road runs east/west from the west Camas city limit to NE Everett Street (SR 500). NW Lake Road runs east/west from the city limits to NW Jackson Place, then runs in a northwest/southeast direction along Lacamas Lake. There are power lines relatively close to the edge of NW Lake Road near the

intersection of NE 192nd Avenue. From the west Camas city limits to NW Jackson Place, NW Lake Road is a narrow two lane roadway. The section of roadway on the approach to NE 192nd Avenue consists of two wide lanes (both sides of the road). Beyond the intersection, the roadway consists of two narrow lanes. When the roadway turns southward, NW Lake Road becomes a three-lane arterial.

NW Friberg Street (previously NE 202nd Avenue) is identified as a two-lane collector by the City of Camas and is not designated by Clark County. NW Friberg Street serves as a north/south connection between NW Lake Road and NE 13th Street/NE Goodwin Road. It is a narrow two-lane rural roadway, lacking curbs and shoulders.

NE Goodwin Road is identified as a two-lane collector by the City of Camas maps and designated as a two-lane rural major collector by Clark County. This roadway serves as a northeast/southwest connection from NE 13th Street to NE 28th Street which provides a link to State Route (SR) 500. NE 13th Street connects NE 192nd Avenue to the intersection of NW Friberg Street and NE Goodwin Road. NE 13th Street becomes NE Goodwin Road at the intersection with NW Friberg Street.

There are several residential roads located within the Master Plan area. Most of them serve existing residential areas in the southeastern portion: NW Payne Street, NW Nightshade Street (previously NE 218th Street), NW Larkspur Street (previously NE 220th Court), and NW Jackson Place (previously NE 222nd Court). These gravel streets serve as local access from NW Lake Road to existing residences. NW Payne Street also serves as an entrance to the archery club.

Regional Roadway Network

The regional roadway network consists of the arterials that connect the study area to the Interstate highways and the other major state highways. Regional roadways near or adjacent to the study area are NE 192nd Street, NW Parker Street, SE 38th Street, and NW Pacific Rim Boulevard. These roadways connect the study area with the rest of the region and state.

NE 192nd Avenue is a proposed four lane arterial on the Transportation Network map in the *1994 Comprehensive Plan*. This road is designated by Clark County as a four-lane principal arterial with a center turn lane. The existing roadway is a two-lane north/south corridor which extends from NE 18th Street to SE 15th Street. The *City of Camas 1994 Comprehensive Plan* recommends making this roadway a four-lane arterial to a new interchange at SR 14. This would improve access for

the City of Camas industrial areas. Funding has been secured for constructing the interchange, widening SE 192nd Avenue between SE 1st and SE 15th Streets, and designing the roadway between SE 15th Street and the SR 14 interchange. Funding for the construction of the remaining connection between SR 14 and SE 15th Street is being sought.

NW Parker Street runs south from the southeast corner of the study area. NW Parker Street serves as a north/south access from NW Lake Road to NW Pacific Rim Boulevard. This roadway was constructed as a boulevard with bike lanes and a combination landscaped median and center turn lane. NW Parker Street is listed as one of the major projects in the Six-Year Transportation Improvement Program in the *City of Camas 1994 Comprehensive Plan*. There is a new traffic signal located at the intersection of NW Parker Street and SE 38th Street. South of this intersection, NW Parker Street is a four lane roadway.

SE 38th Street is identified as a two-lane collector by the Transportation Network map from the *City of Camas 1994 Comprehensive Plan*. SE 38th Street serves as an east/west corridor connecting with SE Bybee Road which turns in to NE 15th Street and connects with SE 192nd Avenue and SE 164th Avenue.

NW Pacific Rim Boulevard is a four-lane roadway designated as a four-lane arterial in the *City of Camas 1994 Comprehensive Plan*. NW Pacific Rim Boulevard is part of an east/west corridor connecting NW Parker Street with SE 34th Street which intersects with SE 164th Avenue.

Traffic Control Devices

The local street network is mostly composed of narrow rural streets. There are no traffic signals located within the study area. The northbound and southbound approaches are stop-controlled at the intersection of NW Friberg Street and NE 13th Street/Goodwin Road. NW Friberg Street is also stop-controlled at its intersection with NW Lake Road. All of the intersections in the study area appear to be operating at an acceptable level of service.

Transit

Daily transit service is provided by C-TRAN to the North Dwyer Creek Master Plan area along SE 1st Street/NW Lake Road to NW Payne Road.

Pedestrian and Bicycle Facilities

There are no pedestrian or bicycle facilities in the Master Plan area.

Existing Traffic Capacity

Existing traffic volumes were obtained from Clark County. Various traffic counts were conducted over the past years. Table 1 summarizes the traffic data available and when it was obtained. NW Lake Road experienced the most traffic within the study area.

TABLE 1: Average Daily Traffic Counts (various dates)

Location	Existing Traffic	Month/Year Collected
NW Lake Road (near NE 192 nd Avenue)	9,069	10/97
NE Goodwin Road (near NW Friberg Street)	1,897	1/92
NE 13 th Street (near NE 192 nd Avenue)	2,723	4/91
NE Friberg Street (near NW Lake Road)	303	4/90

Transportation Program Review

Six-Year Plan Projects in the Area

The *City of Camas' 1994 Comprehensive Plan* lists a series of twelve major projects in the Six-Year Transportation Improvement Program. None of the projects listed in the 1994 Plan are in or adjacent to the North Dwyer Creek study area.

The *1994 Comprehensive Plan* recognized the need to substantially increase the capacity for east-west traffic. The Plan specifically identifies the need for a minimum of four lanes on 1st Street, SR 14, and Pacific Rim Boulevard.

Several projects in the North Dwyer Creek Planning area have been identified as needed projects. Some are significant enough to be included in the list of major projects at such time as they are sufficiently advanced in the planning process that they should be included in the Six-Year Transportation Improvement Program. Further discussion of the needed projects is contained in a subsequent section.

The project list in the *1994 Comprehensive Plan* is not modified by The Master Plan.

Transportation Policies

The following transportation policies apply to The North Dwyer Creek Master Plan area:

- Separate industrial traffic from residential areas to avoid negative impacts on livability.

- Provide pedestrian and bicycle access from employment centers to the rest of the city.
- Encourage transportation demand management techniques such as carpooling and transit service to the North Dwyer Creek industrial area from residential areas outside the Planning Area.
- Protect the function of the streets in the Planning Area by assigning appropriate access management standards.
- Level of service standards shall be applied to streets in the North Dwyer Creek Planning Area to maintain adequate capacity.

Traffic Impact Evaluation Criteria and Standards

The *1994 Comprehensive Plan* describes the use of three components to measure the adequacy of the transportation system. The three components are 1) traffic service, 2) compatibility, and 3) benefit-cost. An evaluation matrix that takes each of these into account was used in The *1994 Comprehensive Plan* to compare the system alternatives.

The sub-area analysis for the North Dwyer Creek study area uses these criteria from the *1994 Comprehensive Plan* to ensure that transportation needs are satisfied.

Future Roadway Network

The regional roadway network serving Camas consists of existing roads and some new roadways proposed in the *City of Camas 1994 Comprehensive Plan*. Many of the collector and arterial streets that comprise the existing regional network will need to be upgraded to accommodate increased traffic.

To accommodate the planned development in the North Dwyer Creek area, two regional facilities will need to be substantially improved to increase capacity: SE 1st Street/NW Lake Road and SE 192nd Avenue (a corridor that includes a new section of road).

In addition, two other roads will become increasingly important, though less so than the regional facilities: NW Friberg Street and NE Goodwin Road. NW Friberg Street is the west boundary of the North Dwyer Creek study area and NE Goodwin Road is the north boundary of the area. Both are classified as collectors or arterial streets by Camas and by Clark County. Improvements to both NW Friberg Street and NE Goodwin Road will be needed to accommodate planned development. Discussion of the roadway standards recommended for these roads are contained in a subsequent section.

Finally, collector roadways contained entirely within the North Dwyer Creek study area will need to be developed. They are not expected to function as part of the regional road network, but will play a very important role in providing access to any industrial and office developments in the study area.

Roadway standards recommended for these roads are also contained in a subsequent section.

Projected Traffic Volume

A traffic study was conducted to analyze the impact of development of the North Dwyer Creek area and to identify the transportation improvements needed to accommodate the planned development. The majority of this area is zoned Light Industrial/Country Tech (LI/CT) with some residential zoning in the southeast portion and west of NW Friberg Street. Without substantial improvements, the current transportation network is not capable of accommodating full development of the area. The key steps in evaluating the transportation system consisted of verifying the development assumptions; estimating traffic generated by the proposed development; assigning traffic to the road system; and identifying roadway standards and projects to accommodate the planned development.

Land Use Assumptions

The primary uses permitted in LI/CT include light and high-tech industry, educational institutions, research facilities, convention centers, office complexes, and other similar uses. Retail and service uses directly associated with the industrial and office uses are permitted as secondary uses.

For the purposes of this analysis, full development of the LI/CT zone was assumed using a combination of uses. The 18-hole golf course is planned to account for about 160 acres and residential uses will account for about 50 acres. Wetlands and other non-developable portions of the site further restrict the amount of land that can be developed for high-traffic generators such as industrial facilities, offices, and research parks.

The land available for development in the LI/CT zone consists of 20 parcels ranging from approximately 2.5 acres to 40 acres. In keeping with the concept for development of the North Dwyer Creek Planning area, a combination of uses permitted under the LI/CT zone was assumed. Most of the larger lots (more than 10 acres in size) were assumed to be for manufacturing or light industrial use. The smaller parcels were assumed to be research centers or general office uses. The twenty parcels were assumed to be developed as follows: three manufacturing, four light industrial, three research cen-

ters, and 10 general office parcels. In total, the development could consist of approximately 3.4 million square feet of light manufacturing and/or office space.

Each parcel was assumed to have 20 percent of land reserved for landscaping and buffers. The 20 percent assumed a maximum build out condition and generated a worst-case scenario from a traffic standpoint. The remainder of each parcel would be used for the buildings and parking. The amount of building space and the number of employees is balanced with the amount of parking. Two story buildings were assumed for office and research center land uses and one-story buildings for light industrial and manufacturing.

According to the Camas Municipal Code the minimum parking space requirements for office and research centers are one space per employee at peak hour, plus 15 percent and for light industrial and manufacturing is one space per employee at peak hour plus 10 percent. The building size, parking area, and number of employees were estimated from the remaining land, assuming there would be 300 square feet of workspace and 400 square feet of parking lot space per employee. The parking lot space includes both the parking space itself and the driveways and aisles within the lots.

The southeast portion of the North Dwyer Creek study area includes approximately 50 acres designated for residential use. Much of this land is already developed on lots substantially larger than the typical urban lot. There is potential for in-fill development, but the density that will be achieved is less than a typical subdivision. The residential development potential of the area was to fall in the range of 100 to 150 single-family dwellings.

Trip Generation Rates and Calculation of Trip Generation

Trip generation rates for the uses described in the preceding section were obtained from the Institute of Transportation Engineers (ITE) reference, *Trip Generation – 6th Edition*. This is the standard reference for trip rates for a wide variety of land uses. Table 2 summarizes the average trip generation rates for the categories of land uses anticipated in the North Dwyer Creek area. The table lists daily, AM peak hour, and PM peak hour trip rates by employee for industrial and office developments. The table also lists the trip generation rates for the golf course for the same time periods. In addition, for golf courses, the table shows the trip rate for Saturdays and Sundays and their respective peak hours.

As illustrated in Table 2, the trip behavior for the golf course is different than the trip rates used under the LI/CT uses. Light industrial and manufacturing pro-

TABLE 2: Average Trip Generation Rates Per Employee

Land Use	Weekday Trip Rate	AM Peak Hour Trip Rate	PM Peak Hour Trip Rate	Saturday Peak Hour Trip Rates	Sunday Peak Hour Trip Rates
General Office	3.32	0.48	0.46	--	--
Research Centers	2.77	0.43	0.41	--	--
Light Industrial	3.02	0.48	0.51	--	--
Manufacturing	2.10	0.39	0.40	--	--
Golf Course	5.04	0.21	0.30	0.64 (5.82*)	0.58 (5.88*)

Source: *Trip Generation, 6th Edition*, Institute of Transportation Engineers

*These figures are the trip rates for the entire day on Saturdays and Sundays, as opposed to the peak hour rate.

duced similar trip generation numbers and the same for office and research centers. Using trip generation rates from the ITE manual, weekday, AM, and PM peak period trips were calculated by multiplying the average trip generation rate by the number of employees.

Using the information about the type and quantity of development proposed in the study area and the trip rates summarized in Table 2, the total traffic from the LI/CT portion of the North Dwyer Creek area was calculated.

Table 3 illustrates the additional traffic generated by maximum development of the industrial uses, research centers, offices, as well as by the golf course. On an average weekday, approximately 40,200 trips would be generated from these employment and recreation sites. Table 3 summarizes the total traffic for the three time periods and differentiates between entering and exiting traffic.

TABLE 3: Average Weekday Trips For The North Dwyer Creek Study Area

Time-Period	Trips Generated	Entering Vehicles	Exiting Vehicles
Weekday	40,200	20,100	20,100
AM Peak	6,100	5,250	850
PM Peak	5,000	1,100	3,900

The traffic from industrial and office areas are intended to be separated from the residential areas to minimize incompatibility problems. For these reasons, the traffic from the residential portions of the North Dwyer Creek study area were not added to that from the LI/CT area.

To calculate the projected traffic from the residential areas, the weekday AM peak hour, and PM peak-hour trip rates per household for single family dwellings were obtained, and are shown below in Table 4.

TABLE 4: Average Trip Generation Rates Per Dwelling

Land Use	Trip Rates		
	Weekday	AM Peak Hour	PM Peak Hour
Single Family Dwelling	9.57	0.75	1.01

Source: *Trip Generation, 6th Edition*, Institute of Transportation Engineers

The trip rates from Table 3 multiplied by an expected 100 to 150 dwelling units, indicates that residents would make approximately 1,000 to 1,500 daily trips. The number of projected residential trips is very small compared to the projected traffic from the industrial areas.

Regional Traffic Distribution Assumptions and Traffic Assignment

The regional distribution of traffic for the North Dwyer Creek study area was determined by examining the relative population and development potential in the region. The vast majority of the employees, visitors, and customers of the LI/CT development in the North Dwyer Creek study area can be expected to come from Vancouver and other areas to the west. A few may come from the north. An increasing proportion can be expected to come from Camas to the east and to the south.

The assumptions for the regional distribution of traffic are: 60 percent to and from the west; 20 percent to and from the east; 15 percent to and from the south; and 5 percent to and from the north. The principal roads serving the traffic to and from the west include SE 1st Street and NE 13th Street. NW Lake Road would serve as the principal route for traffic to and from the east; NW Parker Street would serve most traffic to and from the south; and NE Goodwin Road would serve traffic to and from the north.

Based on the amount of traffic generated by each commercial parcel within the North Dwyer Creek Planning area and the assumptions about the regional distribution of traffic, a traffic assignment was performed. The re-

gional traffic patterns were translated into specific turn volumes at key intersections. Figure 4 illustrates the PM peak hour traffic generated by the parcels designed for LI/CT development.

Traffic from the development area was added to existing traffic on the nearby street network, thereby representing a short-term condition that simulates what traffic conditions would be if the area develops very rapidly. The second scenario accounts for increases in background traffic and is based on a 50 percent increase in existing traffic to simulate a two-percent annual growth rate for 20 years. The forecast traffic volumes at key locations for both scenarios are summarized in Table 5.

As illustrated in Table 5, none of the streets in the LI/CT area exists, so there are no counts and no change between the traffic volumes where background traffic growth is included or not included. Note that the largest component of the future traffic for all streets is that generated by the development in the LI/CT area. Neither existing traffic nor through traffic is as large as that generated by the planned development.

TRANSPORTATION IMPROVEMENTS

Intersection Improvements

There are no signalized intersections within the study area. With the full development, many of the intersections in the study area will require signalization to maintain a safe and efficient roadway network. Each of

the key intersections in the study area was evaluated based upon the traffic volumes forecast. Signal warrants were evaluated using the methods described in *The Manual on Uniform Traffic Control Devices (MUTCD)*. Using the traffic volumes that provide for no increase in through-traffic, nine of the twelve intersections within the study area will meet at least one signal warrant, Warrant 11, Peak Hour Volume.

The Peak Hour Volume warrant is met when the combination of traffic on the major street and the traffic on the side street reach certain threshold levels. The threshold level depends upon the number of lanes of both streets. The Peak Hour Volume warrant is generally considered to be the easiest of the warrants to meet, but it does provide a good indication of the need for further study and monitoring as development occurs. It should be noted that increases in through traffic would make it more likely that an intersection meets warrants at an earlier date.

The three major intersections of streets that are parts of the regional street network have the highest forecast traffic volumes and will be among the first likely to meet traffic signal warrants.

The three intersections most likely to meet warrants are:

- NW Lake Road and NW Friberg Street
- NW Lake Road and NW Parker Street
- NW Friberg Street and NE Goodwin Road/NE 13th Street

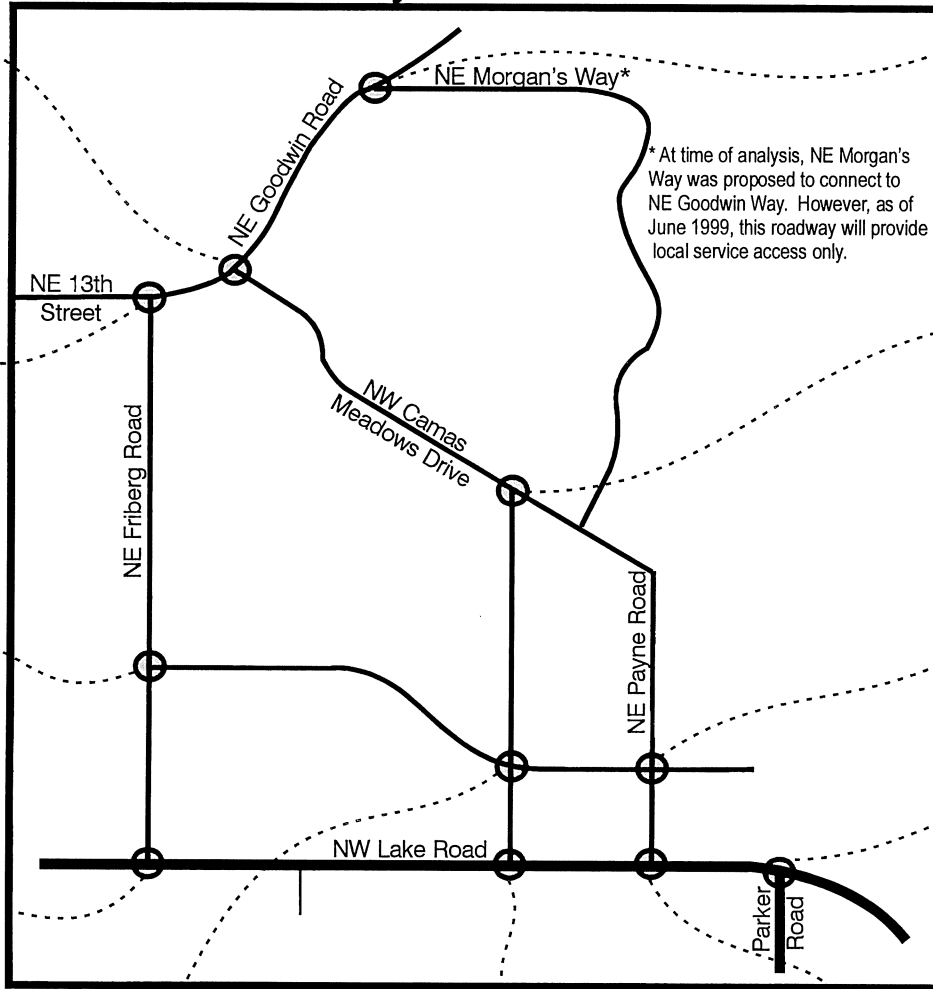
Several other intersections in the study area are also

TABLE 5: Forecast Traffic At Key Locations

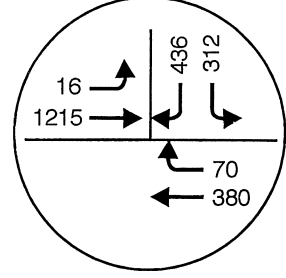
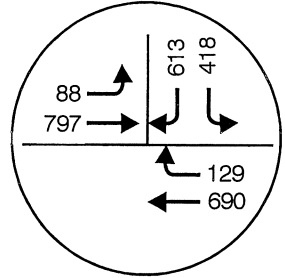
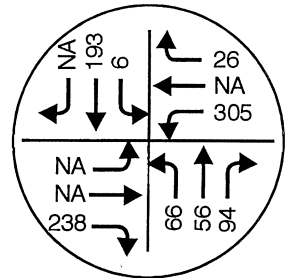
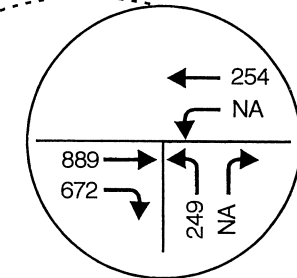
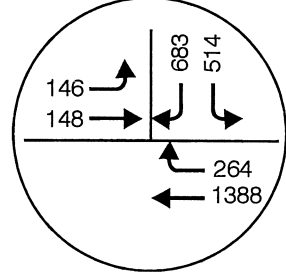
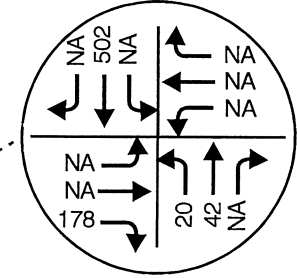
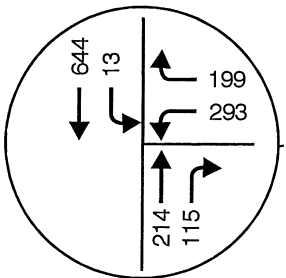
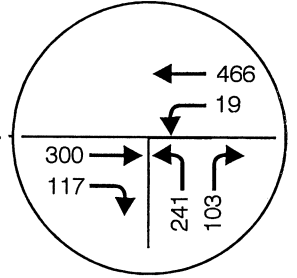
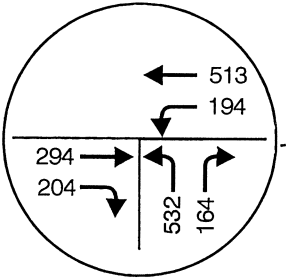
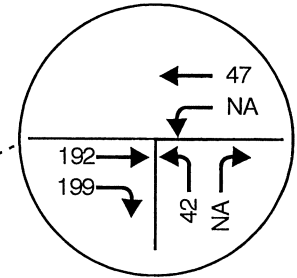
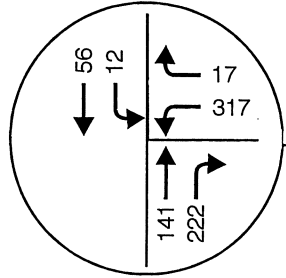
Roadway	Existing Weekday Traffic	Traffic from Development of Study Area	Total Traffic with No Increase in Background Traffic	Total Traffic with 50% Increase in Background Traffic
NW Lake Road (near NW Friberg Street)	9,100	19,800	28,900	33,400
NW Lake Road (near NW Parker Street)	8,000*	15,000	23,000	27,000
NW Friberg Street (near NW Lake Road)	300	14,000	14,300	14,500
NE Goodwin Road (northeast portion of study area)	1,900	2,000	3,900	4,900
NE 13 th Street (between NW Friberg and NE 192 nd Avenue)	2,700	10,200	12,900	14,300
NW Parker Street (near NW Lake Road)	4,000*	6,400	10,400	12,400
NW Morgan's Way (near NE Goodwin Road)	N/A	3,100	3,100	3,100
NW Camas Meadows Drive	N/A	8,900	8,900	8,900
NW Payne Road	N/A	7,100	7,100	7,100
Industrial Road (near NW Lake Road)	N/A	7,500	7,500	7,500
Industrial Road (near NW Friberg Street)	N/A	9,000	9,000	9,000

* Estimated traffic from old counts or from counts at nearby locations. N/A Traffic Counts were Not Available

North Dwyer Creek Master Plan



*At time of analysis, NE Morgan's Way was proposed to connect to NE Goodwin Way. However, as of June 1999, this roadway will provide local service access only.



N
Not to Scale

Figure 4
PM Peak Hour
Volumes

likely to meet the Peak Hour Volume warrant when development reaches a certain level. These intersections will allow access from the LI/CT developments to the principal roadways that bound it. Forecast traffic volumes on the regional roads (1st Street/Lake Road, Friberg Road, and Goodwin Road) make it very likely that the intersections with the industrial collector roads that penetrate the study area will meet the Peak Hour Volume warrant. The date at which warrants are met will depend upon the rate of development. These intersections should be reevaluated as development occurs. Intersections likely to meet traffic signal warrants include:

- NW Lake Road and Industrial Road #2
- NW Lake Road and NW Payne Road
- NW Friberg Street and Industrial Road #1
- NE Goodwin Road and NW Camas Meadows Drive
- NE Goodwin Road and NW Morgan's Way

One other location in the study area that may meet traffic signal warrants is a location on NW Friberg Street between NW Lake Road and NE Goodwin Road. If each of the large industrial parcels that abuts NW Friberg Street develops individually with its own driveway, none of them is likely to have enough traffic to meet traffic signal warrants. If, however, several parcels have joint access and use a collector or frontage road to concentrate traffic, the traffic volumes might be enough to cause the Peak Hour Volume warrant to be met.

Each of the more important intersections within the LI/CT area was also evaluated to determine whether traffic signals would likely be needed. If the development occurs as planned, it is likely that none of the internal intersections in the LI/CT area will meet signal warrants.

Regional Road Network

SE 1st Street/NW Lake Road

As noted above, the SE 1st Street/NW Lake Road corridor is part of the City of Camas' regional road network and is the only arterial within the study area. The analysis conducted for this project verifies that the basic cross-section of the SE 1st Street/NW Lake Road corridor should consist of two travel lanes in each direction and a center turn lane. The road should also include sidewalks, curb and gutter, and bike lanes. As noted in the previous section, several key intersections will need to be signalized.

NW Friberg Street

NW Friberg Street will provide access to abutting parcels in the west portion of the study area, and, based on forecasted trips, the existing, narrow, two-lane rural road will not be adequate for future levels of traffic. Therefore, the North Dwyer Creek Master Plan calls for widening NE Friberg Road to include one travel lane in each direction with a continuous center turn lane, curb and gutter, and sidewalks and bike lanes. The center turn lane will be especially important if each of the industrial parcels adjacent to it has individual driveways.

Five large, industrial parcels of approximately 10 acres each abut NW Friberg Street between SE 1st Street and NE Goodwin Road. There are two options for access for these parcels. One is to allow each of the parcels to have individual driveway access on NW Friberg Street. The second option would involve a frontage road that will allow access for all five parcels. This concept would concentrate traffic and provide for a single access to NW Friberg Street. The intersection of this frontage road with NW Friberg Street would likely require installation of a traffic signal. If Camas Meadows Corporate Center Phase 1 develops as approved, there may be individual access points.

NE Goodwin Road

Anticipated volumes from the full build-out of the study area will increase traffic along NE Goodwin Road. This will require widening NE 13th Street and a portion of NE Goodwin Road adjacent to the northeast portion of the study. The existing, narrow, two-lane rural road will not be adequate to accommodate forecasted traffic. The widening should include one travel lane in each direction with a continuous center turn lane, curbs and gutters, sidewalks, and bike lanes.

Local Road Network

Industrial Roads

The internal road network in the North Dwyer Creek Master Plan consists of three roads approved for the Camas Meadows Golf Course and the Camas Meadows Corporate Center (Phases 1 and 2). Another major east-west connection will be built as development occurs.

The internal industrial roads will be classified as primary or secondary industrial roads. NW Camas Meadows Drive, a primary road, travels diagonally through the development from NE Goodwin Road to the golf course clubhouse and southward to NW Lake Road. A second secondary industrial road will be a north-south connection between Camas Meadows Drive and NW Lake Road, and form the main entrance to the LI/CT area, approximately 2,600 feet east of NW Friberg

Street. This is identified as Street "A" on Figure 1. A third major road would connect to NW Friberg Street at the south boundary of the Camas Meadows Corporate Center, cross North Dwyer Creek and continue eastward to the residential area east of the Planning Area (Street "B" on Figure 1). A fourth road is a service road that travels north from Camas Meadows Drive to a maintenance building.

The standards for primary and secondary industrial roads call for two travel lanes and a center turn lane in most locations. In some locations, the center turn lane will be eliminated. Both the primary and secondary roads have design volumes of 8,000 to 12,000 average daily traffic (ADT) and design speed is 35 mph for the primary road and 30 mph for the secondary road. Based upon the traffic analysis, the street cross-sections will accommodate the traffic volumes forecasted.

The North Dwyer Creek Master Plan implements a standard for pedestrian ways and bikeways that differs from those proposed and adopted for the Camas Meadows Corporate Center. The Camas Meadows development proposed a 10-foot wide, combination sidewalk and bike path on one side of internal industrial roads. Cyclists may be discouraged from using a separated bike path where intersecting driveways are common. Yet, bicycling could be an important component of a transportation demand management strategy for industrial and office developments, and should be expected on roadways throughout the LI/CT zone.

Consequently, the Master Plan intends that cyclists be accommodated on the roadway itself by amending the design proposed for Camas Meadows Corporate Center. While the standard pavement width of 40 feet approved for NW Camas Meadows Drive and NW Morgan's Way provides for 14-foot wide travel lanes, and a 14-foot travel lane is generally accepted as the minimum width for shared use by bicyclists and motorists, this width is not recommended for roadways with high volumes of bicyclists. Therefore, new industrial roads in the North Dwyer Creek area will have a pavement width of 44 feet. This will provide sufficient width for two 5-foot bike lanes, two 11-foot travel lanes, and a 12-foot wide center turn lane, creating greater separation between bicycles and motor vehicles and increasing safety for the cyclists.

Because traffic volumes on the industrial roadways will range up to 9,000 vehicles per day, pedestrian facilities on both sides of the roads will be required, with a minimum width of five feet. If the 8-foot-wide pedestrian path approved for the Camas Meadows Corporate Center is retained on one side, the extra width would be

an advantage for users and may encourage its use for jogging and walking as part of an exercise program.

Residential Streets

For the residential street network, the North Dwyer Creek Master Plan extends Parker Street northward from NW Lake Road to Street "B". Other future internal residential streets will be determined as new residential development occurs. Residential road standards consist of curbs, gutters and sidewalks. Providing access to the abutting properties is an intended use of the residential streets, so narrow streets with slower design speeds are appropriate. A pavement width of as little as 28 feet can provide for traffic generated in the residential area and still provide space for on-street parking. Bicyclists can mix safely and readily with motorists on the street.

Because NW Parker Street carries industrial truck traffic south of NW Lake Road, it will be necessary to actively discourage trucks and other industrial traffic from continuing northward through the residential neighborhood, as this would have negative impacts on livability. Traffic-calming techniques can be implemented to deter other industrial traffic from cutting through the residential area. Such traffic calming techniques include narrow streets, traffic circles, and sidewalk bulb-outs at intersections with the industrial roadways and with NW Lake Road. In addition, signs will indicate the approved truck route between NW Parker Street and the main entrance to the industrial area.

Access Management

Access management consists of rules about the number and placement of access points, such as private driveways or side roads. Access management is used to control traffic conflict points and provide access to abutting properties while maintaining the safety and function of the roadway. For arterial streets, priority is given to carrying higher volumes of through-traffic, and typically, access points are restricted.

There are at least two locations in the study area that deserve discussion relative to access management. Because it is the principal roadway serving the North Dwyer Creek study area and all of north Camas, the SE 1st Street/NW Lake Road corridor should be protected by tailored access management standards that will preserve the carrying capacity. Between its intersections with NW Friberg Street and Parker Street, no individual driveways and only three intervening intersections are planned. Two of the three intersections may meet warrants for traffic signals.

The second concern is the section of NW Friberg Street between 1st Street/Lake Road and NE Goodwin Road.

TABLE 6: Design Features of Roads in the North Dwyer Creek Study Area

Feature	NW Lake Road/1st Street	NE Friberg Road, NE Goodwin/13 th Street	Industrial Road Option 1	Industrial Road Option 2	Residential Roads
Design Volume	32,000 & up	8,000 to 12,000	8,000 to 12,000	8,000 to 12,000	Up to 1,200
Number of Lanes	5	3	3	3	2
Total Pavement Width	72 feet	48 feet	40 feet	44 feet	28 feet
Travel Lane Width	12 feet	12 feet	14 feet	11 feet	10 feet
Turn Lane Width	14 feet	14 feet	14 feet	14 feet	NA
Bike Lane Width	5 feet	5 feet	None	5 feet	none
Sidewalks	Both sides	Both sides	Both sides	Both sides	Both sides
Curb & Gutter	Yes	Yes	Yes	Yes	Yes
Parking	No	No	No	No	Yes

As a three-lane road, it will have substantially less capacity than will NW Lake Road, so access management will also be important. Signalized intersections are planned at both ends (i.e., SE 1st Street/NW Lake Road and at NE 13th Street/NE Goodwin Road). High volumes of traffic will cause lengthy queues during the peak hours. As a result, access to the streets will be especially difficult from driveways within 300 to 600 feet of these signalized intersections. If residential lots are located close to the intersection, driveways are best located as far from the signalized intersections as possible. One option is to construct a residential frontage road to eliminate multiple access points along the roadway that cause conflict. This may be appropriate for the residentially designated parcels near the intersection of Goodwin Road and Friberg Road.

Summary of Recommended Street Design Standards

Table 6 summarizes the recommended design standards for the roadways serving the North Dwyer Creek study area.

Transit Plan

The 1994 *Comprehensive Plan* proposes improved C-TRAN service on NW Lake Road/SE 1st Street to serve the adjacent industrial development. The amount of service may need to be periodically reevaluated as development intensifies in the North Dwyer Creek area.

Concurrency Management

The 1994 *Comprehensive Plan* already specifies the components of the Concurrency Management System

(CMS) adopted by the City of Camas. This Master Plan incorporates these components by reference.

Project Prioritization

The 1994 *Comprehensive Plan* provides a mechanism for establishing priorities for improvements and for preparing improvement cost estimates. A comprehensive update of cost estimates for not-yet-completed projects should probably be conducted to ensure that costs for all projects are comparable.

Table 7 summarizes how planning-level unit costs can be applied to the projects recommended to serve the North Dwyer Creek area.

TABLE 7: Planning Level Unit Costs for Improvement Projects (1999)

Improvement	Unit	Cost
Traffic Signal	Per signal	\$ 150,000
5-Lane, 82-foot Urban Street	Per mile	\$3,600,000
3-Lane, 44-foot Urban Street	Per mile	\$1,800,000
3-Lane, 40-foot Urban Street	Per mile	\$1,700,000
2-Lane, 28-foot Urban Street	Per mile	\$1,300,000

Table 8 summarizes the approximate roadway construction costs for the projects needed to provide adequate capacity for full development of the North Dwyer Creek area.

TABLE 8: Summary of Roadway Project Costs (1999)

Facility	Length	Total Construction Cost
SE 1 st Street/Lake Road	0.9 mi.	\$3,200,000

NE Goodwin Road	0.7 mi.	\$1,300,000
NE Friberg Road	0.8 mi.	\$1,400,000
Industrial streets (all)	3.4 mi.	\$6,100,000
Residential streets (all)	1.2 mi.	\$1,500,000
Traffic Signals (8)	NA	\$1,200,000
Total		\$14,700,000

Mitigation Payment System

The *1994 Comprehensive Plan* establishes a basic system for allocating costs and transportation impact fees (TIF) for development. The *1994 Comprehensive Plan* listed \$21,282,000 for roadway costs to be covered under the impact fee calculations.

The *City of Camas Traffic Impact Fee Report* (June 1997) provides an updated list of TIF projects and a refined methodology. Among the projects listed in the 1997 report is the improvement of SE 1st Street/NW Lake Road. In that report, however, it is listed as a three-lane facility with an estimated cost of approximately \$2.5 million. Subsequent adjustments have been made to reflect its planned improvement to a four- or five-lane road.

An update of TIF projects is needed and should include additional facility improvements required for the North Dwyer Creek Master Plan area. Several factors should be considered in this update. Abutting property owners may directly and completely fund some projects. In these cases, no portion of the project need be accounted for in the TIF program. The industrial streets in the LI/CT area and the local streets in the adjacent residential area may fall into this category.

For other projects, such as improvements in the SE 1st Street/NW Lake Road corridor, the property owners may fund a portion of the project cost while the excess capacity of the roadway will be funded under the TIF program.

For another category of projects, the TIF program may be the appropriate funding mechanism for the entire project cost. The installation of traffic signals at the intersection of NW Friberg Street and SE 1st Street/NW Lake Road or the intersection of NW Lake Road and Parker Street may fall under this category.

It might also be appropriate to consider a local improvement district or a separate TIF program to cover the cost of projects that are of specific benefit to developers in the North Dwyer Creek LI/CT area. Examples of these improvements could include the installation of traffic signals at where the industrial roads intersect with NW Friberg Street or with NW Lake Road. Such

signals have significant benefit to the developers in the district, but no benefit to others in the area.

A comprehensive update of the TIF and other cost allocation programs could account for these changes and provide for a funding mechanism to account for development of the North Dwyer Creek area.

Parks, Open Space and Recreation Element

Existing Conditions

Parks

Because North Dwyer Creek is an urbanizing rural area there has not been the need to provide park facilities. There are no dedicated public parks in the North Dwyer Creek Master Plan area. There are three private recreation facilities encompassing approximately 250 acres:

- Lacamas Campground
- Camas Meadows Golf Course
- Chinook Archery Club

Vancouver-Clark County Parks and Recreation provides regional type facilities. Regional Parks are typically located in areas with outstanding natural features or qualities. Serving the study area are LaCamas Park and the undeveloped Camp Currie. These facilities range in size from 100 to more than 325 acres. Facilities include (or will include) group picnic sites, hiking trails, fishing piers, barbecues, and potentially overnight camping areas. Figure 5 shows existing and proposed parks and trails.

Greenway and Open Space Network

The Camas Meadows development plan included a dedication of property for the Heritage Trail along the southwest side of LaCamas Creek (see next section). The Camas Meadows development also includes time and other, potentially public, open spaces encompassing sensitive wetland areas.

Trails and Bikeways

Heritage Trail is the only regional trail in the study area and is being constructed by the Camas Meadows development and completed by Clark County along the south shore of LaCamas Creek. When completed, the trail is to be deeded to the City of Camas and will be available to residents of the North Dwyer Creek area.

There are existing regional bike routes on NW Lake Road and NW Friberg Street.

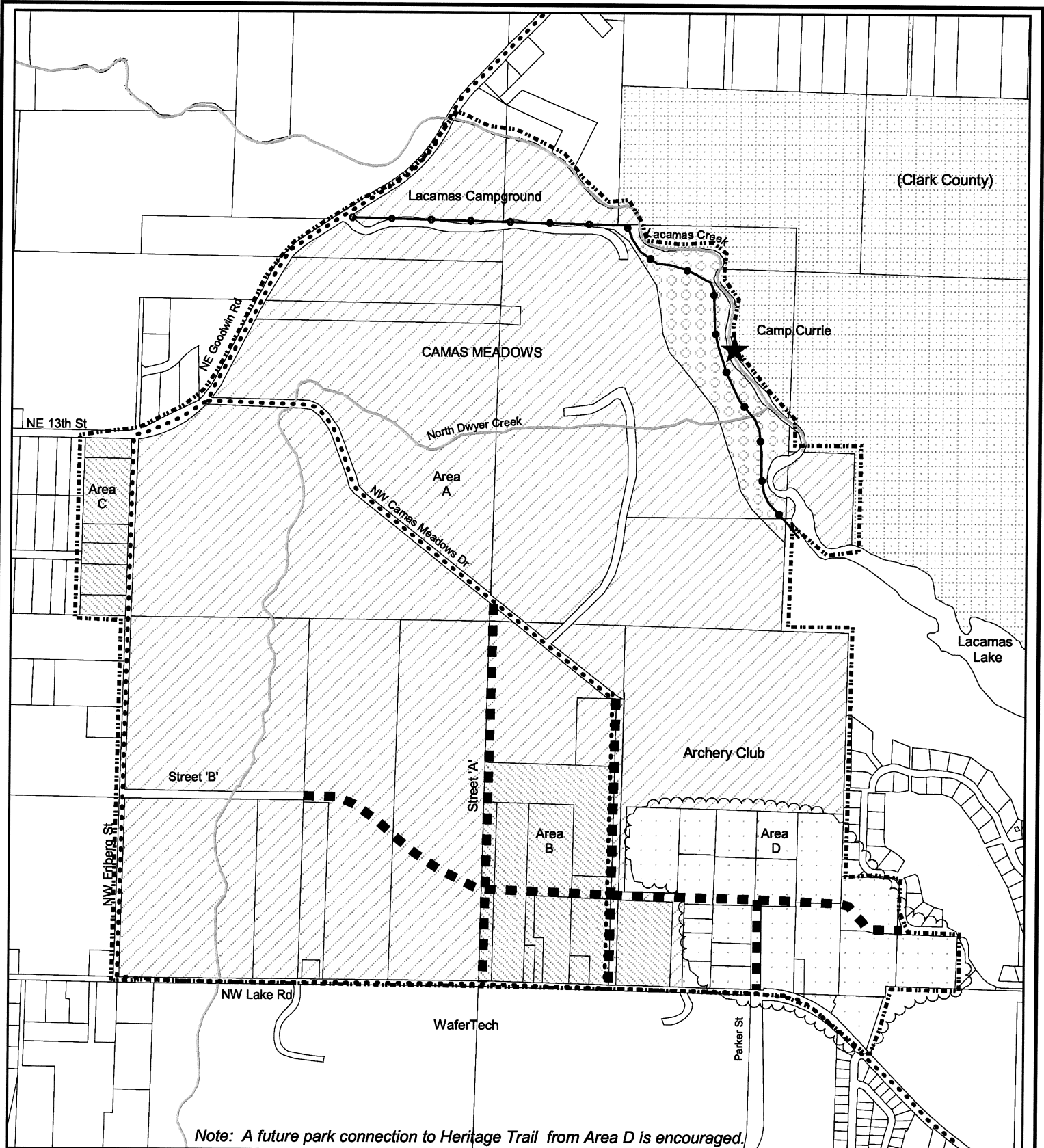


Figure 5 **Camas, Washington**

North Dwyer Creek Master Plan: Parks and Recreation Features

Legend:		Bike Route Area Recommended to be Served by a Neighborhood Park Future Trail Connection to Camp Currie	Area A: LI/CT Area B, C: New PID overlay Area D: R1-10 Heritage Trail Dedication Camp Currie, Undeveloped County Regional Park	<div style="text-align: center;"> <p>0.1 0 0.1 0.2 Miles</p> </div> <div style="text-align: center;"> <p>N</p> <p>1:11500</p> </div>
Proposed Road Master Plan Area Heritage Trail			<p>CMSX0004 6/99</p> <p>Source: City of Camas GIS Data; 1998</p>	

The other park categories Special Facilities, Greenways, and Permanent Open Space are not a part of the study area.

Parks and Recreation Policies

The following policies on parks and recreation facilities apply to the North Dwyer Creek Master Plan area:

- Provide a Neighborhood Park within a half-mile of residential development.
- Encourage new developments to provide opportunities to access regional trails.
- Establish signs for bike routes on local streets that connect with regional bike lanes.
- Encourage new developments to provide pedestrian and bicycle connections to schools, parks, permanent open space and other trails.
- Create secondary networks of paths and trails by making mid-block, perpendicular links with roads (rather than paralleling existing roads).

Needs Analysis

As of January 200, new park standards have been adopted for the City of Camas. The new park standards are more descriptive and flexible than previously, with the emphasis on locating parks near people. For example, the standard for a Community Park would change from 2.5 acres per 1,000 people to Neighborhood Park (Community Park Function) seven to 10 acres in size and serving people within one half-mile. In this case, the Neighborhood Park (Community Park Function) contains all elements of a typical neighborhood park, plus specialized facilities such as sport fields or other features.

Neighborhood Parks

Within the study area a Neighborhood Park needs to be provided. The Neighborhood Park is typically a combination playground designed for non-organized activities. It is generally small in size serving people within one half-mile walking distance. Minimum size requirements are three to seven acres. Appropriate facilities include: open play areas, children's playground, paved game courts, tennis courts, picnic areas with tables and benches, interior pathways, and trails.

In the North Dwyer Creek residential area one neighborhood park is recommended.

Trails

There are four classifications of trails. These are generally located off paved roads within their own rights-of-

way or easements. Designations are regional, local, rustic and semi-primitive. Within the study area only regional and local trails apply.

Regional Connections

In the study area a new connection from the Heritage Trail to Camp Currie is proposed. Additional connections can also be made to the Heritage Trail along the golf course access road from NE Goodwin Road to the Heritage Trail dedication area.

Local Trails

A Local Trail designed to serve the local community and to provide access to the regional trail systems is proposed. The trail width is to be from 6 feet to 10 feet in width depending on the use proposed and the terrain involved. Surfacing may be paved or crushed aggregate. The right of way will vary from 24 feet to 40 feet and can be located on or off roads.

At this time no local trails are identified for the study area. However, new developments should be encouraged to provide linkages to schools, parks and other destination points.

Bikeways

Bicycle lanes are typically located along existing street and road rights-of-way or can be incorporated into the overall width required for new construction. There are two classifications for bike lanes: regional and local. The regional bike lane is intended to connect users to other jurisdiction or destinations adjoining Camas. Local bike lanes are to move the residents of Camas from one area of the city to another

Regional Bike Lane

Additional regional bike lanes are not needed in the study area.

Local Bike Lane

A new local bike route is proposed along NW Payne Street north to the Camas Meadows Golf Course and the interior circulation road in the proposed industrial area from the Camas Meadows Golf Course west to NE Goodwin Road. In addition, street standards allow sufficient width for road sharing between bicycles and other vehicles.

Costs For Required Facilities

At this time costs are not estimated.

Funding For Future Parks

Acquisition costs will be gathered from the City of Camas open space impact fees, Real Estate Excise Tax

(REET), the State of Washington IAC funds, and other appropriate resources.

Public Facilities, Services, and Utilities Element

This element of the Master Plan comprises the services provided by the City, such as schools, emergency, fire, and police services, as well as the physical infrastructure for sanitary and storm sewers, and water supply. The Growth Management Act requires cities and counties to ensure their services and facilities can accommodate growth.

Public Facilities, Services, and Utilities Policies

The following policies apply to the North Dwyer Creek Master Plan area:

- All new development in the Master Plan area must be served by the sewer and water systems as described in the Master Plan and shown on Figures 6a and 6b.
- The costs of extending public facilities to the North Dwyer Creek Master Plan area will be shared or borne by property owners seeking development or redevelopment, as determined by the City of Camas.

Public Facilities

Schools

Existing

The North Dwyer Creek study area includes portions of both Camas and Evergreen School Districts. However, since the Evergreen School District includes only industrial areas and no potential residential development, the following discussion pertains only to the Camas School District.

Schools in Camas include: Camas High School, Skyridge Mid-level School, JD Zellerbach Elementary School, Hellen Baller Elementary School, Dorothy Fox Elementary School, and Lacamas Heights Elementary School.

In 1994, the Camas School District *Comprehensive Plan* identified the capital facilities projects to meet current needs, all of which have been completed.

Future Needs and Assumptions

Camas School District uses a formula of an average of 0.94 students per household and an optimum capacity ratio of 25 students for each teacher. The school district demographer makes projections for enrollment based on

historic trends, new housing starts, and interest rates. For every 25 students, an additional 900 square feet is needed. The school district typically does not plan more than five years ahead because a change in interest rates of 2 percent or more can dramatically affect demand. Usually elementary schools can be constructed within two years and middle schools within three years.

The optimum capacity in the Camas School District is 3,650 students for all grades (K-12). As of September 1998, enrollment for the school year was just over 3,500. The school district projects that capacity will be exceeded by 2000 or 2001.

In May 1999, voters approved a bond measure to provide financing for new school facilities. The bond will provide approximately \$57 million for the following: a new high school and a new elementary school, relocation of the bus dispatch office and maintenance facility and bus parking area, modernization projects, a 6-classroom expansion at Dorothy Fox school, and property acquisitions.

At R1-10 zoning, approximately 195 new lots could be created in the North Dwyer Creek residential area, adding approximately 183 additional students to the system. Since in 1998 school facilities were nearly full, the school district may have reached capacity before new residential development in North Dwyer Creek generates these additional students. Given the approval of future bond funding, now is an appropriate time to ensure that future facilities will be able to accommodate the build-out of the residential area of North Dwyer Creek.

City Services

Fire Protection and Emergency Medical Services

Existing

The North Dwyer Creek annexation area is serviced by the City of Camas Fire Department. The Camas Fire Department operates from the Camas Municipal Building complex at 616 NE Fourth Avenue in the downtown core area. The fire station portion of the building is 8,500 square feet. Services include fire suppression, public education, inspection, prevention and code enforcement within the city.

The ambulance service area encompasses urban densities along the 164th Avenue corridor, as well as Camas and Washougal. Paramedic personnel cross-trained as firefighters provide a ratio of 2.4 fire-capable personnel per 1,000 people when the ambulance is not in use and 1.3 when in use.

The Fire Department recently opened a modular station at 4010 NW Astor Street, formerly the Fire District #9 Volunteer Station, and has added staff. The purchase of property on NW Parker Street north of 38th Avenue for a new fire station is being completed, with construction of a new station expected by the end of 2000.

Future Needs and Assumptions

Based on population growth on the west side of Camas, and growth of the Light Industrial/County Tech area at an average rate of \$20 million in assessed valuation annually to 2004, current facilities and staff levels cannot accommodate build-out. According to the *City of Camas 1994 Comprehensive Plan*, the main fire station was already often at capacity in 1994. Since the police moved to new facilities to alleviate some of the current burden, a staffed modular facility in the Grass Valley station was opened in 1997 to improve response times for the west side of Camas. A new west side station began construction in June 2000 and will be open by Spring 2001. This second station is located on NW Parker Street just north of NW 38th Avenue.

With the new fire station, the Fire Department will be able to meet the 6-minute response-time standard, a standard not currently met. The second (west) fire station, coupled with space vacated by the police at the Camas Municipal Building, was anticipated to provide sufficient capacity for 20 years, to 2014.

With respect to fire flow requirements, the water lines were constructed to accommodate industrial development, and no problems with accommodating build-out are expected.

Standards

- The Camas Fire Department uses standards to set minimum levels of service, which are listed in the *City of Camas 1994 Comprehensive Plan*. The North Dwyer Creek Master Plan incorporates these standards by reference.

Police Protection

Existing Conditions

In October 1997, the Camas Police Department moved from the Camas Municipal Building at 616 NE 4th Avenue in downtown Camas to a new facility on NE 3rd Avenue.

Future Needs and Assumptions

A new fire station planned for the west side, near NW Parker Street, will have an office for the Police Department to use and for the public to contact police. The NE 3rd Avenue facility, combined with the west side fire

station office, will meet police department needs to 2014.

No unanticipated impacts are expected with build-out of the North Dwyer Creek Master Plan area, and the department will be able to accommodate future needs of the residents and industrial businesses. If necessary or requested by new businesses locating in the North Dwyer Creek industrial area, the police department may be willing (contingent on available funding) to have an officer or officers undergo special training to deal with crimes commonly associated with high technology industry.

Standards

The North Dwyer Creek Master Plan incorporates by reference the *City of Camas 1994 Comprehensive Plan's* level of service standard.

Library

Existing Conditions

The Camas Public Library serves the city and surrounding area. The Camas Library occupies 8,750 square feet in downtown Camas at 421 NE Franklin Street, across from City Hall.

Future Needs and Assumptions

In 1994, the library was at capacity for patron seating, storage, and staff work space. A study of the library's needs and the potential cost for remodeling and expanding the existing building was conducted through the fall of 1998. Funding in the amount of \$7.96 million was secured through voter approval in early 2000. Construction is scheduled for Spring to Summer 2001. The *1994 Comprehensive Plan* notes that as the city expands westward, a smaller secondary facility in a commercial district would be considered.

The library will accommodate some future needs by expanding its links with participating libraries, including access to full text periodical databases and an Internet connection. Most demand outside of Camas comes from areas to the north of the city limits. Build-out of the North Dwyer Creek area with primarily industrial uses is not expected to affect the level of services provided by the Camas Public Library.

City Utilities

Water

Existing System

The existing water system for the City of Camas is described in the Water System Master Plan, dated February 1996. Since that plan was completed, additions have been made to the system that affect the North Dwyer Creek area. A 12-inch line was constructed from the existing system west along NW Lake Road to NW Friberg Street. This line then extends north on NW Friberg Street to the bridge at NE Goodwin Road, and is looped back into the Camas Meadows development through a 12-inch line in NW Camas Meadows Drive. An 8-inch line also extends along NE Goodwin Road to the Green Mountain Golf Course. Figure 6A shows the existing and planned water system at the time the North Dwyer Creek Master Plan was drafted.

Surface Water

The discussion of surface water in the *City of Camas 1994 Comprehensive Plan* applies to the North Dwyer Creek Master Plan area and is not changed by the North Dwyer Creek Master Plan.

Ground Water Wells

The Camas Meadows Golf Course currently operates a 10-inch well for irrigation purposes. Three proposed wells, located in the North Dwyer Creek area, were discussed in the Water System Master Plan. At the time the research was done for the North Dwyer Creek Master Plan, no wells had been constructed, nor were there plans to construct any in the future, though wells remain a possible water source for the City of Camas.

Level of Service Criteria

The level of service criteria for the North Dwyer Creek Master Plan adheres to the *City of Camas 1994 Comprehensive Plan* except for the following additions:

Design Consideration. The minimum mainline size shall be 8-inches. A hydraulic analysis must be performed to determine the mainline size using the appropriate land use designation for both domestic and fire flow requirements.

Flow Requirements. Fire flow requirements for the North Dwyer Creek Area are as stated in the *City of Camas 1994 Comprehensive Plan*. Systems are to be designed to provide a maximum pressure range of 30 to 100 pounds per square inch (psi) with the ideal range varying from 40 to 90 psi. The addition of pressure reducing valves in the North Dwyer Creek Master Plan

area may be necessary to maintain pressures within the acceptable range.

Construction Criteria. Construction criteria in the *City of Camas 1994 Comprehensive Plan* apply to the North Dwyer Creek Master Plan area and are adopted by reference.

Current Deficiencies/Excess Capacity

The existing North Dwyer Creek Master Plan area has excess capacity.

Water System Model and Evaluation

The North Dwyer Creek Master Plan area was added to the existing City of Camas EPANET water system model. The criteria used for the additional modeling came from the City of Camas Water System Master Plan.

Capital Improvement Plan

A Capital Improvement Plan (CIP) of recommended projects and their associated costs has been prepared and is included as Table 9.

Finance

The finance section of the *City of Camas 1994 Comprehensive Plan* is applicable to the North Dwyer Creek Master Plan area and is not amended by the North Dwyer Creek Master Plan.

Wastewater

Existing System

The existing wastewater system for the City of Camas is described in the Wastewater Facilities Plan, dated October, 1994. The North Dwyer Creek study area was included in this Plan and identified as service area 2. The Study Area is currently unsewered with the exception of a small number of rural, private septic systems with drain fields for wastewater disposal. Since this plan was completed, few additions have been made to the system that impact the North Dwyer Creek Area. The logical connection point to the existing system remains the existing 21 inch diameter pressure main located at the intersection of NW Lake Road and Parker Street. Figure 6B shows the existing and planned sanitary sewer system at the time the North Dwyer Creek Master Plan was drafted.

Level of Service Criteria

The level of service criteria for the North Dwyer Creek Area are the same as those in the *City of Camas 1994 Comprehensive Plan*.

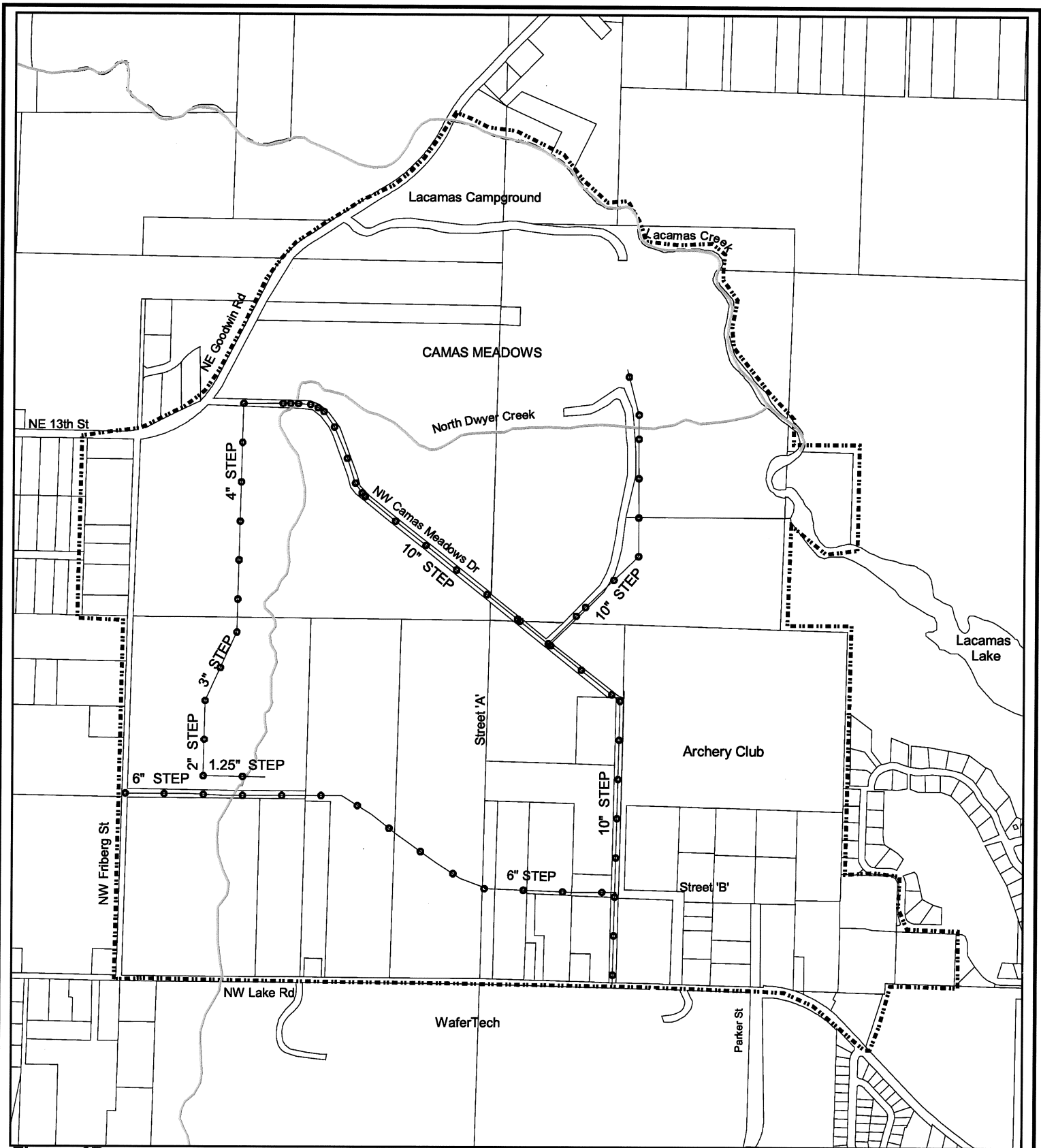



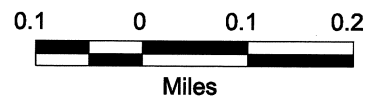


Figure 6B
North Dwyer Creek Master Plan: Sanitary Sewer Lines

Camas, Washington

Legend:

-  Sewer Lines, Existing
-  Septic Tank Effluent Pressure, Proposed
-  Master Plan Area



CMSX0004
9/99

Source: City of Camas GIS Data; 1998

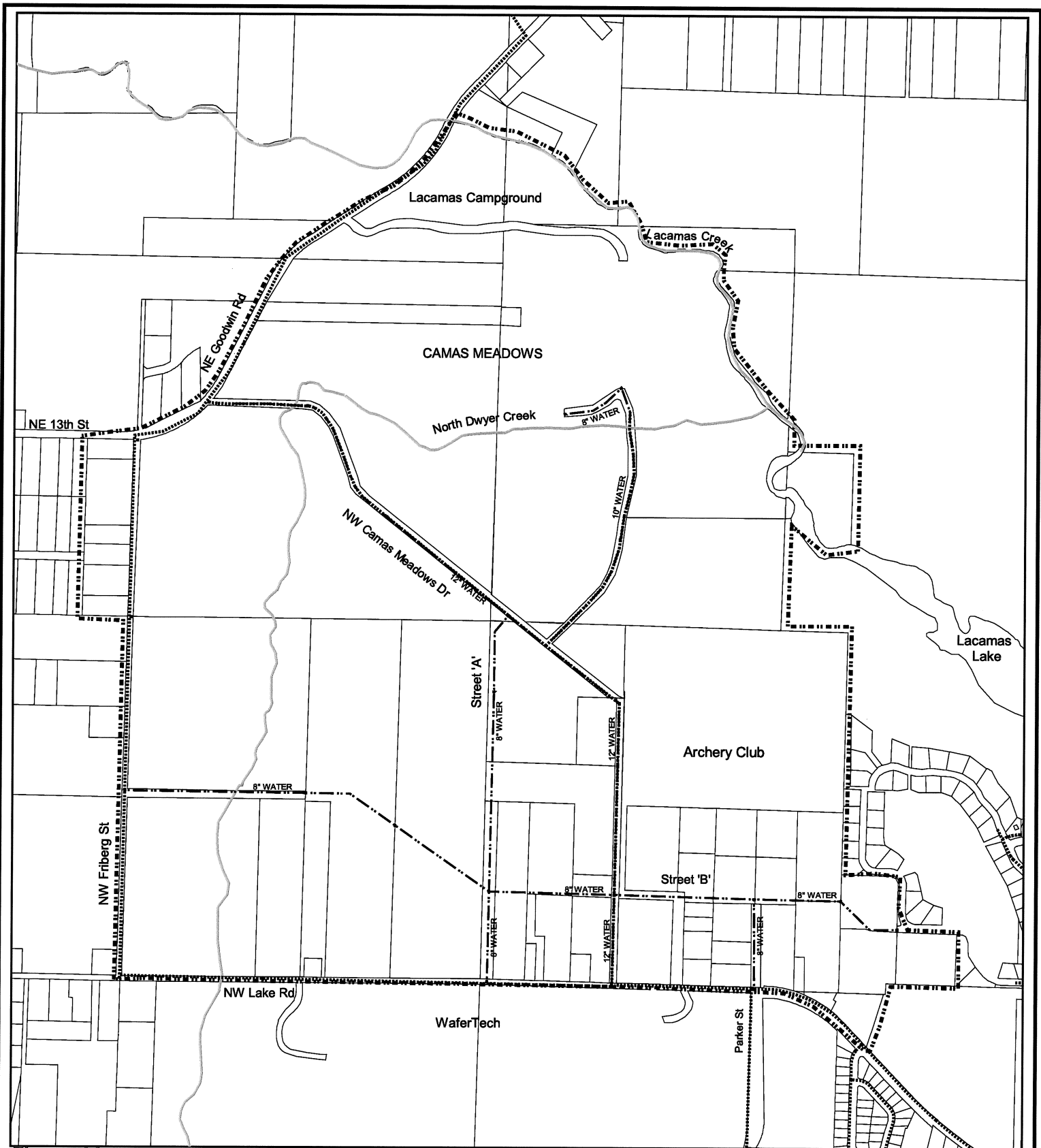





Figure 6A
North Dwyer Creek Master Plan: Water Lines

Camas, Washington

Legend:

-  Water Line, Proposed
-  Water Lines, Existing
-  Master Plan Area



1:11500



CMSX0004
 5/99

Source: City of Camas GIS Data, 1998

TABLE 9: Water Capital Improvement Plan

Priority	Proposed Improvement	Purpose	Funded By	Estimated Cost
1	Install 6,000 feet of 12-inch pipeline on NW Payne Street, along NW Camas Meadows Drive from NW Lake Road to NE Goodwin Road	Future Growth	Developer to install line (completion date: 1999)	\$600,000
2	Install 5,900 feet of 8-inch pipeline on future road from NW Michaelbrook Lane to NW Friberg Street	Future Growth	Developer to install line	\$501,500
3	Install 2,700 feet of 8-inch pipeline on Street 'A' from NW Lake Road to NW Camas Meadows Drive	Future Growth	Developer to install line	\$229,500
4	Install 650 feet of 8-inch pipeline on future road from the intersection of NW Lake Road and Parker Road north to the future road through the residential zoned area	Future Growth	Developer to install line	\$55,250

Current Deficiencies/Excess Capacity

The North Dwyer Creek Study Area is included in the *City of Camas 1994 Comprehensive Plan*. This plan provides for adequate future capacity including the proposed collection system as outlined in this plan.

Major Elements of the Plan

Population, Flow and Loading Projections

With the introduction of the LI/CT with the PID Overlay, smaller lots may be developed but the projected loading and flow differences are negligible (smaller lots, lower projected flows/lot; larger lots, higher projected flows/lot). The Population, flow and loading projections for the Study Area remain the same as the *City of Camas 1994 Comprehensive Plan*.

Collection System Improvements

Design Considerations

The *1994 Comprehensive Plan* recommends the use of three predominate wastewater collection systems: septic tank effluent systems, conventional gravity sewers, and a combination to be used to provide service within the City. The *Wastewater Facilities Plan, 1994*, calls for a single 500 gallon per minute, City maintained, septic tank effluent (STE) pump station. The proposed location of this station is indicated on North Dwyer Creek near the center of the Study Area. Approximately 4,500 feet of 8-inch diameter forcemain is also included in the 1994 Facilities Plan.

A current, more detailed, study entitled "Camas Meadows Corporate Center and Golf Course Sanitary Basin Study" by MacKay and Sposito, Inc., January, 1999 (revised March 1, 1999) indicates that a single pump station is not feasible due to topography and proposes two (City maintained) STE pump stations.

Upon considering the MacKay and Sposito, Inc. proposal and the future maintenance responsibilities generated by the proposed system, City staff elected to change the collection system in this area to a septic tank effluent pump (S.T.E.P.) system for the entire master plan area. This decision is consistent with the recommendations of the 1994 Comprehensive Plan and has the following advantages:

- The City of Camas would not be responsible for the operating and relatively high maintenance costs of the electro-mechanical pump station. (Costs would be distributed proportionately among individual users who would be responsible for the operation and maintenance costs generated by their own usage).
- Inflow and infiltration (I and I) are eliminated from the system, thus reducing an unnecessary load on the Water Pollution Control Plant.
- There are generally lower maintenance costs with effluent collection system pressure pipe systems.

The main disadvantages for the City would be increased truck traffic from hauling septic solids and additional receiving system requirements at the pollution control plant.

There are advantages for developers, in that the initial cost of system design and construction is lower. Likewise, users would have the advantage of control over their own system, including responsibility for design, construction and maintenance. The disadvantages are the costs associated with this responsibility, such as for maintenance and periodically removing the septic solids (usually every 7 to 10 years).

User Pump Design Criteria

The user pump design criteria, below, provide the individual property owner some basis for design of their individual pumping system as related to pumping into a

common force main. The reason for the conservative approach is that the head conditions in the common force main fluctuate and it is very difficult to determine just what criteria to use for design.

The suggested individual user pump design criteria are:

- Friction factor: "C"=100
- Head condition operation range: TDH +/- 50 feet (TDH = Total Dynamic Head)
- Design velocity: 2 feet per second to 6 feet per second

Sludge Disposal Options

The Sludge Disposal Options as discussed in the *City of Camas 1994 Comprehensive Plan* apply to the North Dwyer Creek Master Plan area.

Finance

The finance section of the *City of Camas 1994 Comprehensive Plan* applies to the North Dwyer Creek Master Plan area.

Stormwater System

Existing Conditions

There are several residential subdivisions situated east of the North Dwyer Creek Master Plan area that are serviced by a regional stormwater detention pond. The Camas Meadows East subdivision has provided stormwater sewer stub-outs to the adjacent residential property. These pipes were sized to convey the undeveloped 10-year, 24-hour storm. Any development will have to provide its own water quantity and quality control facilities prior to connection to this existing system.

Management of Stormwater

Management of stormwater generated by any development in the North Dwyer Creek study area will adhere to the *Stormwater Management Manual for the Puget Sound Basin*. The *Fisher Basin Sub-Area Plan* will be used in conjunction with the *Stormwater Management Manual for the Puget Sound Basin* and, in the event of discrepancies between the two, the *Fisher Basin Sub-Area Plan* will be used. Each development will be required to provide a water quantity and quality control facility as described in the *Stormwater Management Manual for the Puget Sound Basin*. No underground facilities will be accepted.

Regional water quantity and quality control facilities are not encouraged by the City except in residential subdivisions. A regional facility would be considered by the City for the LI/CT areas with a signed maintenance agreement between the interested parties.

The area zoned residential, located in the southeast corner of the North Dwyer Creek Annexation Area, has an existing wetland within its confines. This wetland would be an ideal area for water quality/wetland mitigation.

Maintenance

The maintenance of the water quantity and quality control facilities will be performed by the property owner or homeowner's association. The property owner or homeowner association, prior to the acceptance of the water quantity and quality control facilities by the City, must sign a maintenance contract with the City stating that the property owner or homeowner's association will properly maintain the facilities. The City will perform periodical maintenance checks of the facilities and notify the property owner or homeowner's association of any violations of the maintenance contract.

The location of the water quantity and quality control facilities should be accessible to city personnel either by proximity to a public access road or with an access road and easement.

Future Changes

On March 16, 1999, nine population groups of salmon were listed for protection under the Endangered Species Act (ESA). The effect of this on the Lacamas Lake Basin are unknown at this time but changes may need to be made to the water quality requirements in the *Stormwater Management Manual for the Puget Sound Basin* and the *Fisher Basin Sub-Area Plan*. These possible changes and their effect on the North Dwyer Creek study area will need to be addressed and incorporated into the North Dwyer Creek Master Plan as they become available.

Other Utilities

The GMA requires every comprehensive plan to discuss existing and proposed utilities, including electrical lines, natural gas pipelines, and telecommunication lines. The providers of these utilities to Camas are: Clark Public Utilities (electricity), Northwest Natural (natural gas), and General Telephone of the Northwest (GTE). Since the *City of Camas 1994 Comprehensive Plan* evaluated existing conditions and future needs based on the development of the North Dwyer Creek area with light industrial uses, that analysis is hereby incorporated by reference. No additional impacts are anticipated that could not be accommodated by the providers.