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Executive Summary

The University of Washington Tacoma Infrastructure Master Plan (IMP) is an integral portion of the 2008 Campus Master Plan Update. The previous UW Tacoma Infrastructure Master Plan was completed in 2001. The driving force behind revisiting the master planning effort is the change of campus profile from a two year to a four year institution. Additionally, building technology and building systems have changed significantly in the past eight years. With the unique opportunity to guide the infrastructure development of a campus in its early years, the plan also highlights opportunities to explore sustainable building practices and define a model for an urban campus of the 21st century.

The IMP explores development possibilities for each main infrastructure system: Civil, Mechanical, Electrical, Telecommunications and Lighting. Informed recommendations are based on the most recent development strategies for the growth of the campus, focusing on application of sustainable systems and including life-cycle cost assessments.

Goals guiding this study are the desire for robust and redundant systems as well as the desire to explore energy saving alternatives, natural means of mitigating stormwater runoff and improvements that reduce the campus carbon footprint. This infrastructure master plan effort was also charged with identifying innovative opportunities that promote sustainability leadership and education within the campus community.

The University of Washington Tacoma has taken a strong position related to sustainability. Whether it’s developing the campus to LEED™ Silver and beyond, or implementing the American College of University President’s Climate Commitment, UW Tacoma is dedicated to sustainable and regenerative design, construction and operations.

This document is intended to be a planning tool to guide infrastructure development to support future growth of the student population up to and beyond 10,000 student FTEs. As with any planning document, details of specific projects have not been identified, and while “order of magnitude” opinions of system development costs have been presented in a comparative analysis, a detailed cost analysis will need to be prepared as a part of any future capital project funding requests. It is anticipated that the Infrastructure Master Plan will be revisited as necessary to ensure that UW Tacoma development proceeds in a manner that supports the mission and goals of the University and is coordinated with new and evolving technologies.
Site Context
University of Washington Tacoma is an urban campus which, along with the existing historic building fabric, establishes its unique character and sense of place.

Downtown Tacoma
The UW Tacoma campus is nestled within the varied and culturally rich fabric of Downtown Tacoma neighborhoods. To the south of campus is the Tacoma Dome District and the Brewery District which, through redevelopment of the historic brewery buildings and its direct adjacency to the Museum District, is becoming an active arts community. On its north side, the campus connects to the Upper Tacoma Business District, which is the City of Tacoma’s civic and financial center. Residential neighborhoods and St. Joseph’s Medical Center are located directly west of campus.

Figure 1.1 | UW Tacoma Vicinity Map 1
**Introduction**

**The Campus**
As stated in the Campus Master Plan, “The eight block, downtown site of the UW Tacoma Campus is unified by its orthogonal downtown street grid and steep east to west topography. Its eastern and western halves are sharply contrasted by their differing uses and character. The (eastern) lower core area is located across Pacific Avenue from the city’s restored Beaux Arts railroad station and the new State Historical Museum and is part of the Union Depot/Warehouse Special Review District. An inactive diagonal rail right-of-way, located to achieve a relatively flat rail road gradient, further accentuates the tough, industrial feel of the site. Note that this right-of-way has since been designated for a future bicycle and pedestrian path. The upper (western) site is essentially open and undeveloped. Together, the two halves afford remarkable opportunities to create a unique and exciting urban educational institution for the 21st century.”

**Topography**
Site topography for the entire campus ranges from gradual slopes in the north-south direction (typically between 0.5% and 1.0% on north-south streets) to steeper slopes in the east-west direction (ranging between 10% and 15% on east-west streets). See Figure 1.3.

The existing parcels in between the street frontages tend to follow the street grades. Some retaining structures exist on the west (uphill) side of existing parcels, where flatter slopes were constructed or where homes were abandoned and remnant foundation walls were left to retain soils. The City of Tacoma GIS maps were used to determine topography information, since a campus site survey was not available at the time of this study.

![UW Tacoma Vicinity Map 2](image-url)
Topographical Site Plan
Scale: 1"=100'-0"

Topographical Section
Horizontal Scale: 1"=100'-0"
Vertical Scale: 1" = 50'-0"

Figure 1.3 | UW Tacoma Topography Map
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Campus Facilities
Many of the buildings on the UW Tacoma campus are repurposed warehouses and industrial buildings adapted for academic use. The character of these buildings is highly valued, and as new buildings are constructed on the campus, careful attention must be paid to how the new buildings integrate with the existing campus context. Between 1993 and 2008, the campus has grown to include 15 buildings.

Phase 3
A predesign study has been completed for the next construction phase (Phase 3) at UW Tacoma, and the schematic design process has begun for the Joy Building renovation and construction of the Jefferson Building. Both buildings will be designed for academic uses and are scheduled for occupancy in 2012.

Joy Building Renovation
The Joy Building is located on Pacific Avenue directly adjacent to UW Tacoma’s West Coast Grocery Building (WCG). Constructed in 1892, it is a three-story building with approximately 47,700 square feet. This building renovation will provide UW Tacoma with a mix of classroom, office, and retail space.

Jefferson Avenue Building
The Jefferson Avenue Building will be located south of the Tioga Building and across the railroad right-of-way from the existing Library. It will provide 37,000 square feet of classroom, office, and library expansion space.

Figure 1.4 | UW Tacoma Existing Campus Map
**Ground Cover**

Typical ground cover on the campus consists of unmowed lawns at undeveloped parcels (predominantly west of Market Street) and gravel or asphalt where surface parking lots have been created. Manicured landscape areas and concrete paths also exist in the improved areas of the campus (predominantly located east of Market Street).

**Campus Utility Providers**

**Natural Gas: Puget Sound Energy**

Natural gas is provided to the campus by Puget Sound Energy (PSE), a subsidiary of Puget Energy. PSE is Washington state’s largest and oldest energy utility, serving over 6,000 square miles and approximately 725,000 natural gas customers in the Puget Sound region of Western Washington. Approximately 47% of the natural gas supplied by PSE comes from the Western United States and the remainder originates in Canada.

There are three existing gas services (meters) on the UW Tacoma campus, two of which are located to support the two boiler plants. The meter at the Academic Building supports its boiler plant, and the meter at the Science Building supports the Science Building plant and minor laboratory equipment. The third meter is located at the Longshoremen’s Hall and supports heating and other functions in that building. (The Longshoremen’s Hall is not expected to remain in the long term Campus Master Plan). It has recently been announced that natural gas utility costs in the Pacific Northwest are scheduled to increase by approximately 25% in the near term.

**Electrical: Tacoma Power**

Utility electrical power is provided to the campus by Tacoma Power, a division of Tacoma Public Utilities. Tacoma Power is publicly owned and was created in 1893 when Tacoma citizens voted to buy the privately owned Tacoma Light & Water Company. Today, Tacoma Power has a service area of approximately 180 square miles and provides electrical service to over 160,000 customers.

Tacoma Power generates approximately 42% of its customer energy requirements and purchases the remainder from various sources including Bonneville Power Administration (BPA), Priest Rapids Dam and Grand Coulee Project Hydro Authority.

Figure 1.5 depicts the resource mix of the electricity provided to customers of Tacoma Power. Evident by the significant percentage of hydroelectric energy, Tacoma Power currently provides primarily renewable power to its customers and expects to improve on this percentage in the coming years.
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**Water: Tacoma Water**
Water service is provided to the campus by Tacoma Water, a division of Tacoma Public Utilities. Tacoma Water is publicly owned and was created in 1893 when Tacoma citizens voted to buy the privately owned Tacoma Light & Water Company.

Today, Tacoma Water produces approximately 21.5 billion gallons annually and provides water service to over 97,000 customers. Their transmission and distribution system consists of over 1,300 miles of main piping, and their water supply comes from various sources including the Green River, seven North Fork wells, and local wells. Tacoma Water is able to store a total of approximately 300 million gallons of water in the McMillin Reservoir (which can hold 108 million gallons) and in 21 other reservoirs and standpipes.

**Telecommunications: Qwest Communications**

Telephone and data service is provided to the campus by Qwest Communications International. Headquartered in Denver, CO, Qwest was founded in 1996 and provides telecommunications services to 14 western US states.

The minimum point of presence (MPOP) for Qwest at the UW Tacoma Campus occurs at the Walsh Gardner Building main router room (MRR).

**Cable TV: Comcast & Click! Network**

Cable television service is provided to the campus by both Comcast and Click! Network.

Comcast was founded in 1963 as a single-system cable operation and today is the nation’s leading provider of cable and communications services.

Click! Network is a division of Tacoma Power. Utilizing a fiber-optic network originally created to control the Tacoma Power substations, Click! Network is one of many telecommunications services offered by Tacoma Power including high-speed internet and broadband services.

The minimum point of presence (MPOP) for Comcast and Click! Network at the UW Tacoma Campus occurs at the Walsh Gardner Building main router room (MRR).
2008 Campus Master Plan Update

In 1993, the University of Washington Tacoma’s first Campus Master Plan was completed and set the initial vision for a new higher education campus located in the Warehouse District of downtown Tacoma. This location positioned UW Tacoma to be an active participant in the redevelopment of a vital urban district.

Two subsequent major construction phases created the campus’ current learning spaces, faculty and staff offices, university library, and open space to support the University’s mission to provide upper level degree programs to a population of 2,000 student FTEs. Anticipating steady growth of the campus, the University then completed a 2003 Master Plan that further developed the framework of the future campus and corresponding architectural and landscape guidelines.

UW Tacoma continues to expand its programs and services. In the Fall of 2006, UW Tacoma began to enroll freshmen and sophomores and receive requests from the student body to provide housing. With UW Tacoma’s transition from a two-year, upper division and graduate commuter campus to a full, four-year institution with student housing and associated support such as recreation and a student center, an update to the 2003 Master Plan is required. This includes an update to the long term plan as well as articulation of the next phases of development specific to meeting the new mission.

The major goals of the 2008 Campus Master Plan Update are to enhance the urban character of the existing campus and provide opportunities to strengthen a sense of community as a four-year, residential institution by providing:

- A central open space (the ‘heart’ of campus) and various smaller green spaces throughout the campus;
- Pedestrian connections up the hill and improvements on north/south streets;
- An integration of uses (between residential, student life, and academics) that will accommodate at least 10,000 FTEs;
- Housing facilities accommodating approximately 12% of the student population;
- A pathway and open spaces aligned with a view of Mt. Rainier leading into the campus from the corner of 17th Street and Tacoma Avenue;
- Safer routing of vehicular traffic as Market Street remains open through the campus, and 19th Street between Market and Fawcett is closed to vehicular traffic. The plan could respond to closing Market Street in the future, if appropriate;
- Careful consideration of accessibility on north-south walkways and east-west access through buildings by elevator; and
- Opportunities for retail and private development.
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Figure 1.6 | Long-term Campus Development Plan

Legend

Academics & Services
- Existing UW Tacoma
- Future UW Tacoma
- Facilities - Warehouse/CP
- Facilities - Grounds Storage
- Japanese Language School Memorial Garden
- Retail

Transportation
- Existing Public Transit
- Potential Public Transit
- Potential Parking (underground)
As indicated in Figure 1.7, the total campus building square footage is currently slightly below 500,000 and is expected to approach 1.3 million as the enrollment surpasses 5,000 FTEs. At full build-out with a projected FTE count of 10,000 student, the campus is anticipated to include approximately 2.4 million square feet of total building space (not including structured parking).

The phasing plan shown in Figure 1.8 summarizes potential program elements as the campus approaches full build-out.
Soil and Groundwater Contamination

Abandoned oil and fuel tanks were common in this once residential and industrial area of Tacoma. As UW Tacoma properties have been purchased and developed, some of these abandoned tanks have been found and were later determined to have leaked, resulting in soil and groundwater contamination. Seven contaminated plumes were identified east of Market Street in studies performed by the University of Washington. See Appendix A for relevant location and groundwater depth information on these plumes from the Draft Feasibility Study (April 14, 2003) and Draft Supplemental Remedial Investigation Work Plan (March 5, 2006), currently under review by the UW Department of Ecology.

As shown in Figure 1.9, the largest contaminated area extends from Market Street to Pacific Avenue and from South 19th Street to South 21st Street. Numerous monitoring wells have been placed and are monitored by the University. The depths to groundwater in these locations have been found to vary from approximately 4.5 to 53.5 feet depending on the monitoring well location.

Further studies should be implemented to examine the soil and groundwater conditions west of Market Street. A recent study found TCE contamination between Court E and Fawcett Avenue. It is also recommended that a detailed geotechnical report including contaminated soil and construction water handling recommendations be obtained prior to construction in all areas of campus.

These studies indicate that the seven plumes contain the following contaminants:

- Trichloroethene (TCE)
- Benzene (B)
- Total Petroleum Hydrocarbons (TPH)
- Vinyl Chloride (VC)
- Tetrachloroethene (PCE)
Figure 1.9 | Approximate Groundwater Contamination Limits (with Campus Development Plan underlay)
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Planning Process
The Infrastructure Master Plan was developed in conjunction with the Campus Master Plan Update to focus on identifying strategies for centralized or decentralized service, infrastructure upgrades as the campus grows, and sustainable strategies for energy, carbon, and water.

The Infrastructure Master Plan is the result of a large team effort. The Architecture, Mechanical, Electrical, Lighting, and Civil engineering consultants worked closely with UW Tacoma and UW Seattle Campus Engineering to establish Infrastructure Master Plan Goals, evaluate the existing campus infrastructure, and explore a wide variety of strategies for meeting the campus infrastructure and sustainability goals.

UW Facilities Services Design Guide
UW Facilities Services has developed extensive guidelines for the design and implementation of the campus utilities infrastructure, as described in the Facility Services Design Guide (FSDG). The FSDG represents years of the University’s experience and standards development which should be applied to the Tacoma campus throughout the design and implementation of the campus utility infrastructure.

Infrastructure Master Plan Goals
- Robust, reliable, redundant systems
- Inform strategies for energy distribution (central or distributed) and how these systems should be sized and located
- Understand interim servicing of existing buildings to inform construction phasing
- Reduce carbon footprint
- Develop a carbon-neutral (or carbon-negative) master plan option with innovative and informative sustainable strategies
- Consider campus security (exterior lighting)
- Explore alternative fuel options
- Use natural systems to mitigate run-off
- Demonstrate innovations of systems to promote leadership and education within the campus community