Existing Conditions

Overview
The University of Washington Tacoma Campus Master Plan Update establishes the vision and direction for the development of the UW Tacoma campus over the next twenty-plus years. The master plan focuses on the future need to accommodate 10,000 or more student FTEs by 2030, up from the nearly 3,000 of today.

In this analysis, The Evaluation of Transportation Needs focuses on the impacts of the planned growth on the surrounding transportation system. The analysis looks at the campus plan within its surrounding environment—examining not only the effect of the campus on the surrounding transportation system, but also how the development of the surrounding land uses will affect the operation of the campus. The analysis of existing and future transportation needs is an important part of the Campus Master Plan Update process, establishing the existing challenges for the transportation system and identifying the strategies and actions that will be needed to provide a transportation system that supports travel by auto, bicycle, pedestrian and transit.

This report addresses the need for vehicle parking and circulation, as well as the needs of bicyclists, pedestrians and transit users. A major change from the 2003 Campus Master Plan is to keep Market Street open to vehicle traffic. This change will keep vehicle access through the campus and allow transit to use Market Street as a primary corridor.

The following section describes the existing transportation environment of the UW Tacoma campus and surrounding area. The study area is bounded by S 13th Street on the north, Pacific Avenue on the east, S 25th Street on the south, and Tacoma Avenue on the west. The transportation system is examined in the context of the campus as it relates to the City of Tacoma street system, traffic and intersection operation, parking, transit and non-motorized travel.
City streets provide the primary travel corridors for all modes of transportation. Streets are used by everyone in the community from commuters and residents getting to work or school to delivery trucks, fire fighters and police. The UW Tacoma campus is well served by the regional transportation facilities, with strong connections to Interstate 5 (I-5), Interstate 705 (I-705), SR 16, SR 509 and SR 7. Figure 1 shows the major elements of the street system including the street classification, speed limits and traffic controls.

**Street Classification**

The existing street network provides facilities for vehicles, pedestrians, bicyclists and transit users. For vehicles, it is a network whose efficiency depends upon how well the streets move traffic through the system. The City classifies streets using a hierarchy of function, from most intensive use to least intensive, grouping streets according to the character of service they are intended to provide. Classification helps ensure that the needed vehicle capacity will be available and that street improvements will balance the differing needs of vehicles, pedestrians and bicyclists. Figure 1 shows how the arterial streets are classified by the City of Tacoma within the study area.

Examples of arterial streets in the study area are used to illustrate the characteristics of each type of arterial street.

**Principal**

S. 21st Street is four lanes wide and connects the City street system to I-705. As a Principal Arterial it emphasizes the movement of vehicle traffic, by restricting on-street parking and minimizing direct access to adjacent properties. It's major intersections have signals with multiple phases to allow protected turning movements.

**Minor**

Market Street is a minor arterial, characterized by fairly high traffic volumes but with only one travel lane in each direction. Parking occurs along the street. The major intersections have traffic signals, but may not include protected left turn phases.

**Collector**

Jefferson Avenue is a collector arterial. Traffic volumes are moderate and access to driveways and on-street parking are common along the street.
Figure 1. Characteristics of the Street Network

Legend
- Arterial Principal
- Arterial Minor
- Arterial Collector
- Other
- Speed Limit for Roadway
- Signalized intersection

NOT TO SCALE
Existing Conditions

**Speed Limits**
The City designates speed limits as a means of managing traffic at safe and appropriate travel speeds for a particular corridor segment. Most arterial streets within the study area have posted speed limits of 25 mph or higher with the highest speed limits (30 mph) found on Pacific Avenue and Tacoma Avenue and portions of South C Street and Jefferson Avenue. The remaining streets within the campus are generally posted at 25 mph.

**Traffic Controls and Lane Configurations**
To move traffic more efficiently and safely, the City uses traffic signals, signs, and pavement markings to direct drivers, pedestrians, and bicyclists. Stop signs serve the critical function of establishing which approach has the right-of-way. Traffic signals are typically found at the junction of two major streets, where traffic volumes necessitate a signal to control the safe movement of the traffic flows.

For vehicles, the separation of movements and control by a traffic signal can facilitate traffic movements. However, streets with greater numbers of lanes can result in longer crossing distances. For multi-lane streets, traffic signals give pedestrians and bicycles opportunities to cross busy intersections providing a margin of safety.

**Traffic Volumes and Intersection Operations**
When traffic flows smoothly, trips can be predictable and efficient and congestion is minimal. However, when the roads are crowded and congested, travelers get frustrated as the travel time increases. The following section examines the traffic volumes within the study area for an average day, as well as the morning and evening peak commute hours.

**Figures 2, 3, and 4** show the average daily weekday, AM peak hour (morning commute) and PM peak hour (evening commute) traffic volumes, respectively and identifies intersections with long-to-extreme delays during the peak hours. **Appendix A** summarizes the results of the analysis of intersection operations for the existing conditions.

**Daily Weekday Traffic**
For east-west streets, the highest weekday traffic volumes occur on S 21st Street between Market Street and the I-705 freeway ramps, with 17,700 daily trips. The primary north-south corridors, Tacoma Avenue, Pacific Avenue and Market Street carry between 8,000 and 14,000 daily trips. These streets are typically affected by higher levels of traffic congestion during AM and PM peak periods but much of that traffic is “pass-through” traffic, not related to the operation of the UW Tacoma Campus.

**AM Peak Hour Traffic (morning commute)**
The AM peak hour represents the traffic volumes during the morning commute. The AM volumes are generally lower than the evening commute volumes. The AM has higher volumes in the northbound and westbound direction, with S 21st Street and segments of Pacific Avenue exceeding 750 hourly trips during the AM peak hour. Still most intersections in the study area are uncongested. Only the unsignalized intersection of C Street/S 21st Street shows long delays for traffic traveling northbound.
Figure 2. Daily Weekday Volumes
Figure 3. AM Peak Hour Traffic
Figure 4. PM Peak Hour Traffic
Existing Conditions

PM Peak Hour Traffic (afternoon commute)
The PM peak hour represents the highest traffic volumes during the day and corresponds with the evening commute hour. The predominant direction of travel during the PM Peak hour is southbound and eastbound; opposite from the morning commute.

During the PM peak hour, S 21st Street (east of Market Street), S 19th Street between Market Street and Tacoma Avenue, Tacoma Avenue and Pacific Avenue all exceed 750 hourly trips. Five intersections have long delays due to extreme congestion. The signalized intersection of the S 21st Street/Pacific Avenue has extreme delays averaging more than 113 seconds per vehicle.

Vehicle Circulation
How well traffic circulates is dependent on the street network’s regional and local connections. Campus traffic uses the primary circulation routes of the City’s arterial network. Traffic from the campus connects to the major regional highway system via the I-705 freeway, which connects downtown Tacoma with I-5, at either the S 21st Street interchange or the Pacific Avenue interchange at S 13th Street and S 15th Street.

Local access through the study area is concentrated on principal and minor arterials such as Tacoma Avenue, Pacific Avenue and S 21st Street.

The existing buildings are centered in the eastern portion of the UW Tacoma campus, primarily between Market Street and Pacific Avenue. Access to the main student parking lot area is off of Dolly Roberson Lane/C Street near the Mattress Factory and Jefferson Avenue. An ADA-accessible lot is located off of Commerce Street on the north end of campus. Other streets important to campus circulation include S 17th Avenue, S 21st Avenue, S 19th Avenue and Pacific Avenue.

Access to the campus for trucks and deliveries primarily follows similar access routes. Trucks can enter campus on Dolly Roberson Lane, Jefferson Avenue, Market Street, and Fawcett Avenue. Acting as alleyways, Court C, Court D and Court E streets provide half-block access to specific campus buildings. Access via Commerce Street needs to be coordinated with the UW Tacoma Administration.
Existing Conditions

Figure 5. Parking Supply
Existing Conditions

Parking

Parking in the UW Tacoma area is a mix of on-campus pay parking, private parking lots and garages, striped on-street parking spaces, and areas of unmarked parking. The UW provides 350 parking spaces in its three main lots and requires either a permit or an hourly pay parking fee. In addition, a large number of on-street parking spaces are located throughout the UW Tacoma campus area, with no controls or restrictions. Vehicles have a 1-hour limit on parking along Jefferson Avenue, Pacific Avenue and portions of Broadway Street, Market Street, S 17th Street and S 19th Street. A small section of Court E is also signed with a 2-hour limit. It is anticipated that on-street parking will require fees in the future. Many students and staff also utilize the free parking at the Tacoma Dome and ride Sound Transit’s Link Light Rail to campus. Pierce Transit may ultimately charge for Tacoma Dome parking, which could influence the number of UW Tacoma commuters who choose this option.

Figure 5 shows the on-street and campus parking supply in the study area.

Transit

Transit currently plays a major role in Tacoma’s transportation system, and service to the UW Tacoma Campus is expected to expand as the student population increases. Transit solutions are an increasingly important element in the movement of students to and from campus. Students and staff from all around the region use transit as shown in Figure 6. Pierce Transit, Sound Transit and Intercity Transit offer service to the study area. Figure 7 shows the transit routes that operate within the study area and Figure 8 shows the transit passenger activity (boardings and alightings) at each stop.

Pierce Transit Routes

Pierce Transit is the local transit provider in the area serving all of Pierce County. Transit services to UW Tacoma Campus are provided from local service within the City of Tacoma and surrounding areas including University Place (Route 53/53A), Gig Harbor (Route 102), Milton/Federal Way (Route 501) and South Hill (Route 490).

Sound Transit Routes

Sound Transit is a regional provider with express buses, Link light rail service, and commuter rail known as Sounder Trains. Sound Transit express bus routes provide regional connections to destinations outside of Tacoma including Bonney Lake (Route 582), Seattle’s U-District (Route 586) and three routes serving downtown Seattle (Route 590, and Routes 591 and 594 leaving from the Tacoma Dome Station).

Sound Transit operates the Link light rail system that connects downtown Tacoma and the Tacoma Dome Station, providing a strong link to the campus on Pacific Street and allowing access from campus to a variety of residential, employment and retail areas.

Sound Transit also operates Sounder commuter rail from the Tacoma Dome Station. The heavy rail trains operate between Seattle and Tacoma serving stops in, Tukwila, Kent, Auburn, Sumner, and Puyallup. While this service is primarily oriented towards serving commuters traveling to Seattle (4 morning and afternoon routes), 2 morning and evening runs serve the reverse commuters traveling to Tacoma from downtown Seattle. An additional Sounder route that travels to South Tacoma and Lakewood is scheduled to begin in 2011.
Existing Conditions

Figure 6. Transit Destinations

Legend
- Pierce Transit
- Olympia Express
- Pierce Transit
- Sounder Commuter Rail
- County Boundaries

Miles

N

0 5

Legend
- Pierce Transit
- Olympia Express
- Pierce Transit
- Sounder Commuter Rail
- County Boundaries

Miles

N

0 5
Figure 7. Transit Routes Serving UW Tacoma
Figure 8. Transit Stops and Activity
**Existing Conditions**

**Intercity Transit**

Intercity Transit is the Olympia area transit provider. Routes 603 and 603A run between downtown Olympia and downtown Tacoma, with stops in Lacey, Lakewood and on Pacific Street near the UW Tacoma Campus.

**Transit Passenger Activity**

High levels of passenger boardings and alightings occur where frequent transit service is provided to a variety of destinations. High levels of ridership also occur at locations where convenient transfers are possible between routes and at locations that provide service to regional park-and-ride facilities. Excluding the Link light rail and Intercity Transit riders, the highest transit activity in the study area is at the northbound and southbound stops on Pacific Avenue at S 19th Street, where more than the 600 persons per day get on or off transit. Other locations with high transit activity along Pacific Avenue include the stops near S 13th Street, S 14th Street, Hood Avenue, S 21st Street, S Puyallup Street/S 24th Street and S 25th Street. Other locations are Tacoma Street near S 13th Street, S 14th Street, Market Street near S 13th Avenue.

**Pedestrian and Bicycle Travel**

Pedestrian facilities are needed within the campus to move students and staff between buildings, but they also connect the campus to transit and vehicle parking, as well as adjacent housing and neighboring business districts. Bicycle facilities that connect to regional trails allow cyclists to travel for greater distances providing an attractive option for students and staff to get to the campus.

**Pedestrian Corridors**

Sidewalks are an important part of the transportation network, providing safe corridors for walking commute trips and recreation. Sidewalks are also important for individuals with disabilities and the proper accommodation and design of walkway facilities, including pedestrian curb ramps and crosswalks, are important. Pedestrian-friendly street design makes the walking environment safer, fosters trips made on foot, and facilitates better access to transit.

The City of Tacoma has built a nearly complete sidewalk network throughout the study area. Pedestrian corridors attract larger volumes of pedestrian activity. These corridors from and to the UW Tacoma Campus are often key crossing locations, such as connections to transit and locations where students may live or park vehicles off-campus. Pedestrian corridors include S 19th Street between the campus and transit on Pacific Avenue, S 19th Street to the west that connects to the Hillside Neighborhood, Pacific Street for its transit connections and the connection to the Brewery District. Figure 9 shows the primary pedestrian corridors to the UW Tacoma Campus.

**Bicycle Corridors**

There are no existing bicycle facilities within the UW Tacoma study area. Bicyclists share the streets with vehicle traffic or use area sidewalks. Review of the area found few streets with wide curb lanes or low volume to function for bicycle commutes. Most intersections lack bicycle loop detectors at signalized intersections and there is limited secure bicycle storage and lockers/showers at campus. The nearest bicycle facilities are along S 15th Street, which has bicycle lanes that run between Cedar Street and Yakima Avenue.
Figure 9. Primary Pedestrian Corridors
**Accessibility**

Accessibility in the east-west direction is a challenge because of the steep topography of the site. At some locations, barrier-free access is provided by elevator and bridging corridors between buildings and will continue to be incorporated into future development on the campus.

The topography of the UW Tacoma area is a particular constraint to bicycle travel. The grade on S 21st Street increases from 48 to 208 feet in just over a quarter mile or an overall grade of 10 to 11 percent. For bicycles, a steep uphill grade often discourages travel or may require out-of-direction travel on alternate routes. Figure 9 shows the locations where steep slopes exceed a 10 percent grade in the study area.

**Safety**

One of the City of Tacoma’s priorities is the provision a safe transportation system for travelers of all modes. The City promotes road safety for the ongoing management of the street network and emergency services. The City continuously constructs and retrofits streets to improve safety and decrease the likelihood of collisions making the streets safer for pedestrians, transit, and bicyclists.

**Collision Analysis**

The City collects and monitors collision data to identify roadway hazards, and seeks to correct hazardous locations by implementing appropriate safety measures. Many vehicle crashes occur at or near intersections. Using the three years of collision data (2005, 2006, and 2007) provided by the City of Tacoma, the collision analysis reviewed the crash history of intersections and roadways within the study area. Vehicle collisions usually occur as a result of the one or more factors, including:

- Driver skills and behavior (driver age and aggressiveness)
- Roadway controls (stop signs, warning signs)
- Roadway configuration (turn lanes, lane widths, shoulders, sidewalks)
- Roadway geometrics (sight distance, corner radii)
- Weather conditions (rain, glare)
- Vehicle condition and maintenance (brakes, tires)
- Roadway condition (potholes, loose gravel on road)

Often combinations of these factors cause a vehicle to crash, and many crashes are related to factors beyond the design and maintenance of the street system. Figure 10 shows the location and frequency of vehicle collisions and the location where pedestrian or bicycle crashes occurred — vehicle-vehicle, vehicle-pedestrian and vehicle-bicycle collisions.
Figure 10. 2005-2007 Vehicle, Bicycle and Pedestrian Collisions
Existing Conditions

Most locations in the study area have fewer than 5 collisions per year, which is low for urban intersections. The most frequent types of collisions and contributing factors for intersections with 5 or more collisions include:

- **S 21st Street/Pacific Avenue** – 17 out of the 25 collisions at this location were rear end collisions. Driver impatience and traffic congestion were likely contributing factors.
- **S 21st Street/S Tacoma Avenue** – 17 out of the 22 collisions at this location were related to vehicles attempting to cross Tacoma Avenue from S 21st Street. The lack of a signal and the high side street crossing volumes at this intersection may be contributing factors.
- **S 25th Street/Pacific Avenue** – No one type of collision stands out at this location. Turning collisions could be affected by the lack of protected left turn signal phases at this intersection.

**Pedestrian and Bicycle Collisions**

Within the study area there were 13 vehicle-pedestrian and 3 vehicle-bicycle collisions over the 3 year period. Most collisions occurred at mid-block locations indicating a need to create strong pedestrian connections that encourage crossings at appropriate locations. The lack of protected left turn movements at S 19th Street/S Tacoma Avenue may be a contributing factor in the two pedestrian-vehicle collisions recorded at this location.