

**Washington State University  
Tree Fruit Research and  
Extension Center  
Master Plan  
Wenatchee, WA**



**March 2008  
Washington State University  
Capital Planning and Development**

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# Washington State University Tree Fruit Research and Extension Center Master Plan

## EXECUTIVE SUMMARY

The Washington State University Tree Fruit Research & Extension Center (TFREC) Master Plan gives an overview of land use and facilities at the Center and makes recommendations that will allow the TFREC to meet its future needs for the next ten to twenty years. The Center has a rich history closely tied to the region's tree fruit industry that has directed its growth since its creation. As the industry changes and grows, the TFREC similarly needs to evolve in ways that will maintain its impact in the region.

The TFREC consists of three units: the 34-acre main campus in the city of Wenatchee, the 92-acre Columbia View site located 12 miles north in Douglas County, and the 300-acre Sunrise Orchard site located 15 miles to the south in Douglas County, purchased in 2006.

The TFREC facilities have been adequate for the past 70 years, but current research techniques require new facilities that can better support today's equipment and processes. Two new research buildings and four new residential units are recommended to meet the immediate programmatic needs on the main campus. One additional research building site has also been identified for future expansion. Finally, renovation of the Overley Lab's mechanical, electrical and life safety systems will allow this important building to provide many more years of active service to the campus.

The preferred locations for the new buildings will require the removal of eleven obsolete buildings. A phased approach is specified that will allow the

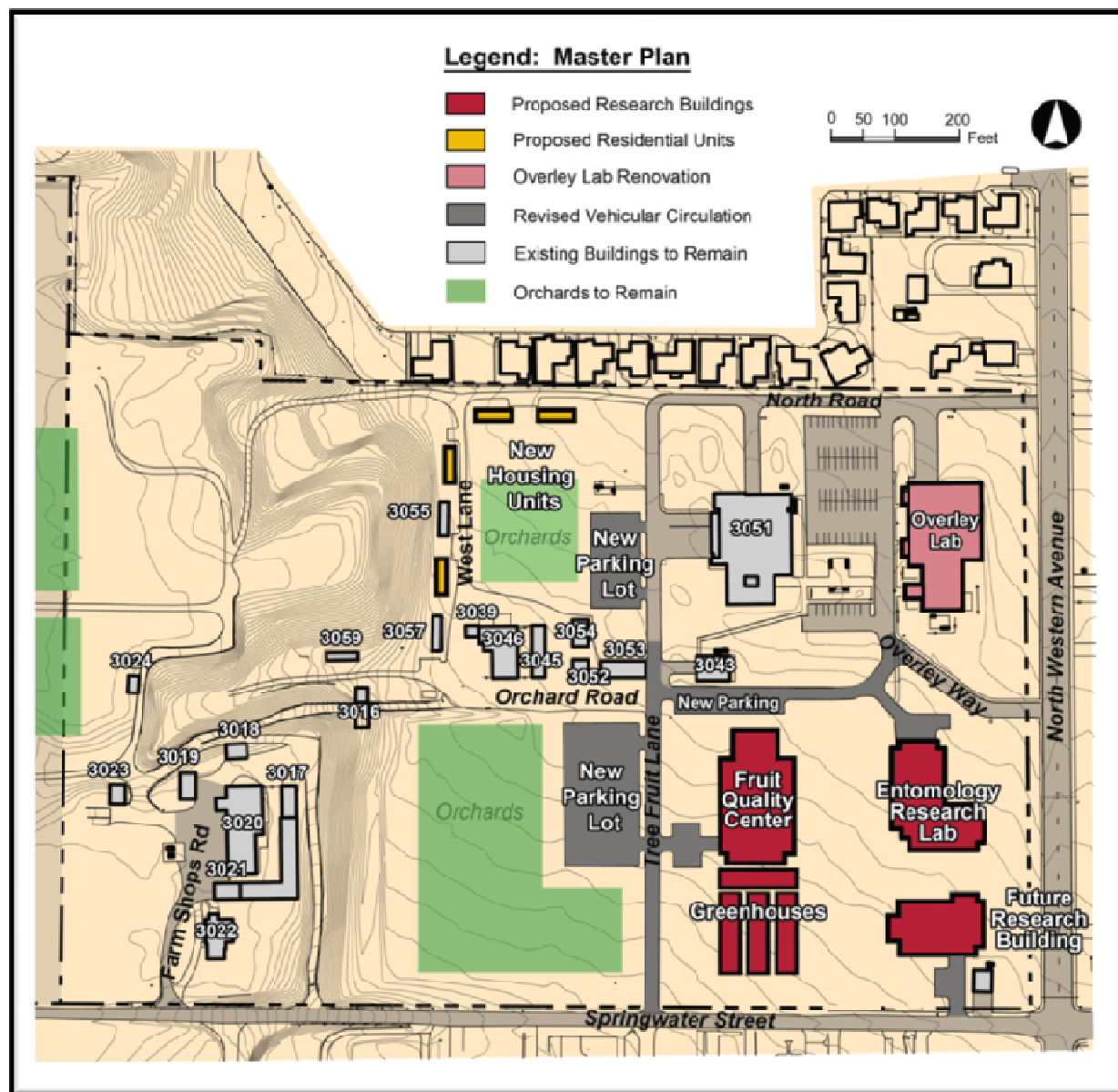
programs in these existing buildings to be moved to new locations prior to demolition.

Improvements to the vehicular circulation system will clarify wayfinding and improve safety, and strategically located barriers will improve security on the campus.

Finally, the sale of the Columbia View campus should be considered as an option to assist in the development of the Sunrise Orchard campus and to consolidate field research activities.



*Organic apple trees at Sunrise Orchard*



WSU TFREC Master Plan



## INTRODUCTION

The Washington State University Tree Fruit Research & Extension Center (TFREC) has a rich history that is closely tied to the region's tree fruit industry, directing its growth over the years. As the industry changes and grows, the TFREC similarly needs to evolve in ways that will maintain its impact in the region.

### **Master Plan Goals**

This Master Plan for the TFREC seeks to accomplish the following goals:

1. Promote a vision for the TFREC that will accommodate the demands of evolving new technologies while continuing to support current research, development and extension services for the next ten to twenty years.
2. Plan for future campus development that will support the multi-agency character of projects located on the campus.
3. Recognize the new urbanization surrounding the campus and suggest how the campus can best respond to those changes.
4. Maintain open space and pedestrian areas, and reduce conflicts with vehicular transportation in order to improve safety and the visual aesthetic of the campus.
5. Enhance security of the TFREC's main office, laboratories and greenhouse facilities.
6. Increase funding to a level sufficient to operate and maintain facilities and orchards for the long term.

### **Master Plan Assumptions**

All plans are a melding of current issues with a future vision. Attempts have been made to accommodate future needs on the campus that reflect a technologically evolving industry. In developing this Master Plan, the following assumptions were used:



*d'Anjou pear tree*

- The tree fruit industry will continue to be important to the state and region.
- The USDA will maintain their activities on the campus.
- Research done at the TFREC will continue to employ state-of-the-art technologies that will place demands on facilities.
- Residential growth in the city of Wenatchee will continue to expand.
- The rate of funding for the Center will be increased to support programmatic needs.

### **Background**

The TFREC is located in Wenatchee, the center of the primary fruit-producing region of the world. Washington supplies 69% of fresh market apples, 45% of sweet cherries, and 54% of pears in the US, with a farm gate value that exceeds \$1 billion annually and represents about 20% of the state's entire agriculture value. The tree fruit industry annually contributes over \$6 billion to the state's economy. The research and educational programs of the TFREC contribute

substantially to the growth, stability, and stature of Washington's tree fruit industry.

The TFREC's mission statement is to "advance Washington's tree fruit industry and improve the quality of life for its citizens through the discovery and dissemination of knowledge." Dedicated to the tree fruit sciences, the Center emphasizes a cooperative, multidisciplinary approach to tree fruit production.



*TFREC works closely with local growers*

## History

The TFREC has been in existence for 70 years. In February 1937 the Governor signed a bill to establish an experiment station in Wenatchee as part of Washington State College, including an appropriation of \$62,500 for land acquisition and operational funding. The tree fruit industry was already booming in the Wenatchee Valley region and an initial land purchase of 15 acres of existing orchards was made in a remote area outside of the city.

F. L. Overley, a WSU horticultural professor and fruit research pioneer, moved to the Wenatchee area in 1927 to employ his knowledge in support of the tree fruit industry. He was asked to become the first superintendent of the Station in 1940. Under his watchful eye, the research station grew substantially in size and prestige.

Subsequent purchases of surrounding orchards increased the size of the main research campus to 102 acres. In 1967 the campus constructed a modern laboratory facility and named it after F. L. Overley. In 1977 another new facility was built nearby to house USDA scientists.

As the TFREC grew, the town of Wenatchee also experienced significant growth. Soon residential development surrounded the original campus. Foreseeing possible conflicts between the research activities and the new residential growth, the Center worked with the fruit tree industry to acquire Columbia View in 1952. Located 12 miles to the north of Wenatchee, this 92-acre site housed the Center's more sensitive tree research activities. When research activities outgrew Columbia View, the western 70 acres of the main campus in Wenatchee were sold to the Wenatchee School District to finance the purchase of the 300-acre Sunrise Orchard farm. This site, purchased in 2006, is located 15 miles south of the city. The 70 acres sold to the School District were subsequently leased back to the TFREC until 2008, with a potential three year extension into 2011, allowing time for research activities to be transferred to the Sunrise Orchard site.



*Chemist in TFREC Lab*

## **Current Activities**

### **Research**

The TFREC is affiliated with WSU as part of the College of Agriculture, Human and Natural Resource Sciences. Current research includes all phases of orchard culture, pest control, fruit harvesting and handling, fruit maturity, storage, grading and packaging. Research also includes basic scientific aspects of plant physiology, entomology, plant pathology, soil science, horticulture, economics and biochemistry. The focus of the research is on apples, pears and sweet cherries, though some research is also done on apricots, peaches and plums.

Research scientists of the United States Department of Agriculture – Agriculture Research Service (USDA) have collaborative appointments at WSU and their research programs are conducted in cooperation with TFREC based programs. The TFREC also coordinates with statewide WSU research projects and with regional, national and international programs involving other universities and other federal agencies including the Environmental Protection Agency.



*Researchers downloading data*

Faculty members host a limited number of public events throughout the year that highlight their research activities and findings. In addition, occasional community events are held on site, including the “Awesome Apple Adventure” that introduces students from the local elementary schools to elements of tree fruit production including soil quality, equipment, and harvesting.

The Center enjoys tremendous support from the local business and farming community. Most of

their research findings relate directly to the issues faced daily by the tree fruit industry. The following areas of research are projected to be active in the coming years:

- **Horticulture Genomics** – the study of new varieties and genetics research, including new breeding techniques that will greatly speed up the process for varieties to be developed and evaluated.
- **Environmental Stewardship** – the reduction of chemical spraying through the use of pheromones, plus biological control through habitat management and the conservation of natural enemies of pests.
- **Efficiencies and Technologies** – greatly increasing the number of trees per acre and employing unique growing techniques that allow pickers to reach the fruit easily and efficiently. This area of research also evaluates the use of better labor-assist devices including robotics and sensory equipment.
- **Sustainability issues** – evaluating the practicality of alternative energy options. The TFREC works closely with WSU’s Irrigated Agriculture Research and Extension Center in Prosser on irrigation issues.



*Drip irrigation system at Sunrise Orchard*



## Staff

The Center houses twelve WSU faculty, seven USDA faculty, between six and eight graduate students, four to five post doctorate associates and/or technicians, and 20 to 25 student summer employees. Center support staff includes research technologists, administrative professionals, secretaries, farm crew, and custodial and maintenance personnel. In addition, the Center enjoys regular visits by scientists from other states and foreign countries on study leaves or extended professional development. Visiting faculty often live on the campus for two to three months at a time in the existing residential spaces on the Center.

## Funding

Funding for the TFREC comes from two different sources, state allocations and research grants. The state provides about \$2 million annually to finance salaries and operations. In recent years, shortfalls in state allocations have resulted in some temporary grant funding also supporting staff salaries.

The Center receives between \$1,500,000 and \$2,000,000 per year in grants. About half of the grants are from the fruit industry via the Washington State Tree Fruit Research Commission (WSTFRC), which receives its funds through voluntary monetary assessments by growers. The WSTFRC's research grants are competitively awarded to numerous organizations, but with the majority of their research dollars going to WSU.

Operational funding for the Center has become increasingly difficult due to reductions in state funding and increasing labor, materials and equipment costs. Actual dollar amounts for operational funding provided by the state have been reduced by 60% in the past 20 years, resulting in maintenance staff cuts and reduced funding for repairs. Maintenance funds in the past were also supplemented by sales of the fruit produced by the TFREC, but recent changes in research activities and reductions in summer staffing levels have caused the Center to cease fruit sales. The current budget includes only \$22,000 to support facility maintenance, of which over half must be used for compliance costs such as fire alarm service and safety inspections. USDA

pays approximately \$200,000 per year in rent for the use of their main laboratory building, which supports the upkeep of the building and covers utility costs. The campus staff work creatively to address daily building issues, but major building repair needs are currently becoming deferred maintenance problems.



*Evaluating apple trees*

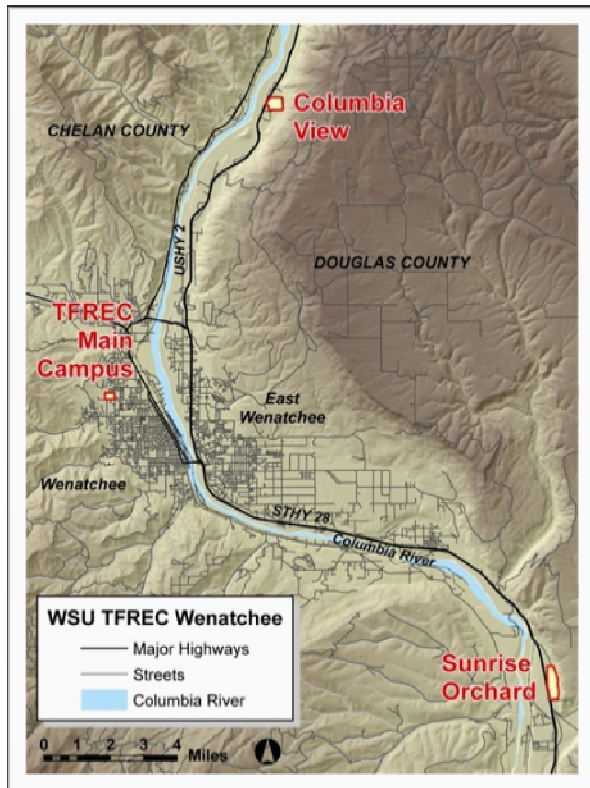
## CAMPUS PHYSICAL ASSESSMENT

The TFREC consists of three units: the main campus in Wenatchee, Columbia View in north Douglas County and Sunrise Orchard in south Douglas County. The 34-acre main campus houses the primary research laboratories and facility services. The 92-acre Columbia View and 300-acre Sunrise Orchard support the majority of the research orchards, with breeding research occurring at Columbia View and insect and disease research focused at Sunrise Orchard.

### Main Campus

#### Campus Context

The main campus is located on the northwestern edge of the city of Wenatchee. North Western Avenue, a busy 2-lane thoroughfare, lies on the eastern boundary of the property and pro-



*TFREC locations in Chelan and Douglas Counties*

vides the primary access to the TFREC. Residential development surrounds the Center on the north, east and south sides, with light industrial

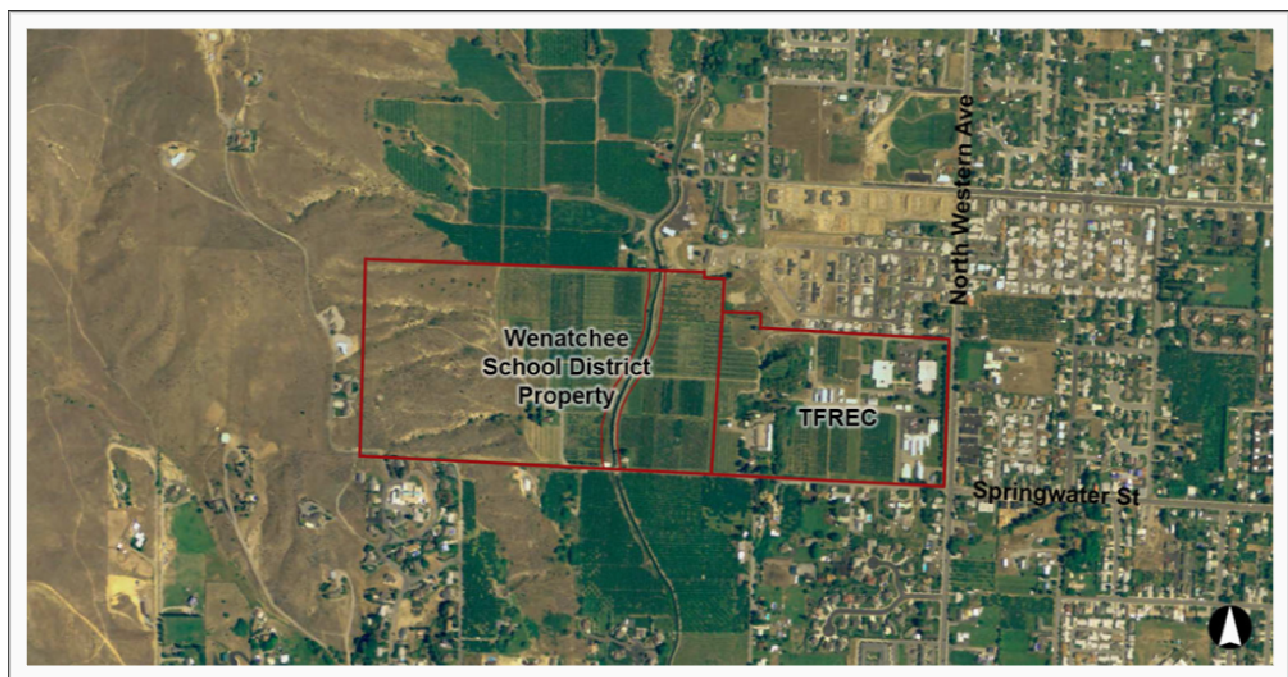
and commercial properties also nearby. Mostly undeveloped hillsides overlook the campus to the west.

### Property Boundary

The 34-acre main campus spans approximately 1,000 feet north to south and 1,500 feet east to west. The seventy acres to the west is leased from the Wenatchee School District via an agreement that is active through 2008 and has an option to extend to 2011. The leased School property is a larger rectangle that is approximately 1,300 feet across north to south and 2,350 feet east to west. A canal with an associated 100-foot right-of-way crosses through the eastern side of the School property.

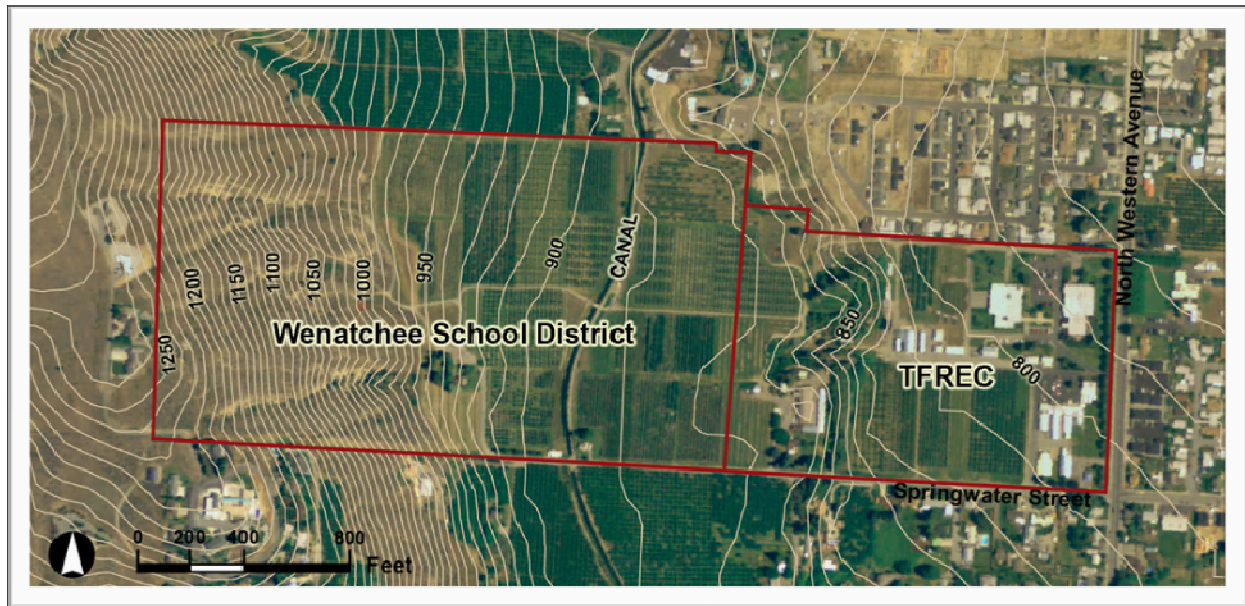
### Slopes

The majority of the TFREC property slopes gradually at about three percent from the north-east corner upward to the southwestern corner of the property. Near the western edge of the property, however, the land slopes sharply upward to a height of about sixty feet above the lower portion of the property. This extreme grade change separates the campus into two parts: a lower portion where most of the research and residences are located and an upper



*Residential development lies to the north, east, and south while undeveloped lands lie to the west*



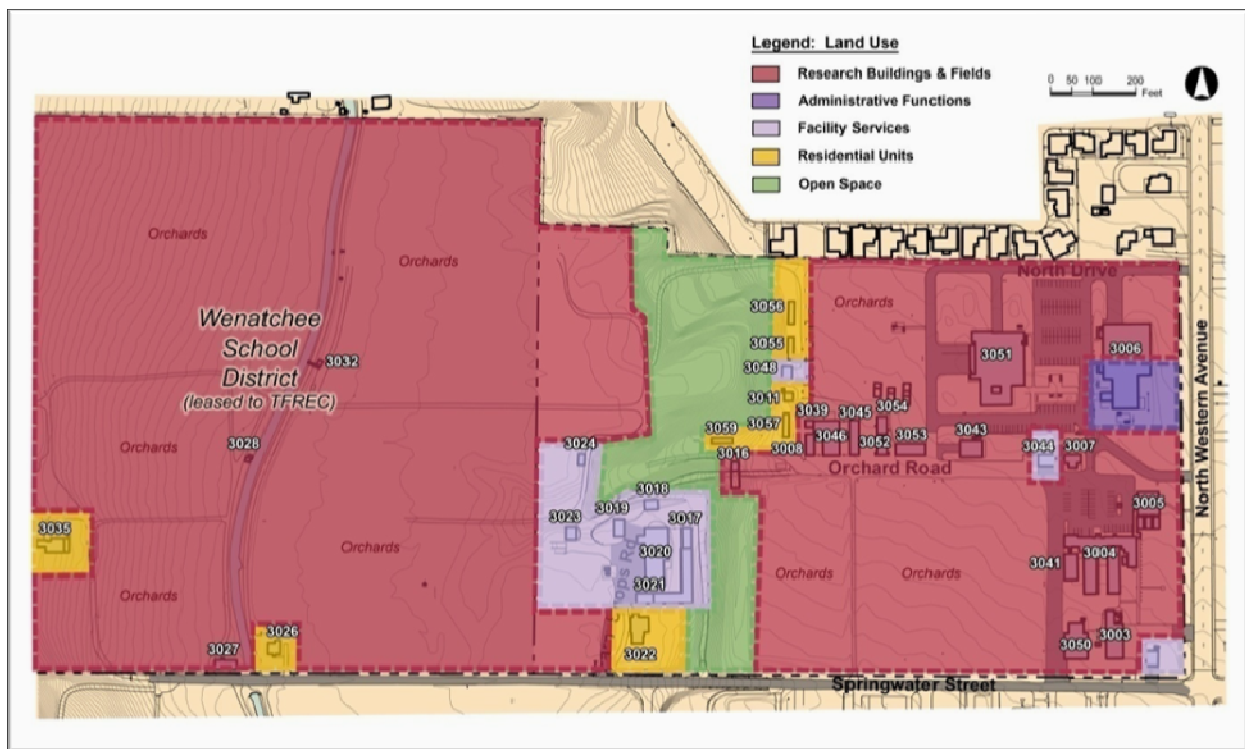


*Slopes over the TFREC and Wenatchee School District property*

portion where many of the service buildings are located. Once at the top, the land becomes nearly flat until reaching the canal on the School District property. Beyond the canal the land continues to slope upward to the west at an eight percent grade for about 700 feet, then rises steeply again into the hills beyond.

#### Land Use

The TFREC is organized with the principal research and administrative functions located in the front of the property and the service and housing functions to the rear. The main research laboratories, Overlay Lab and USDA Research Lab, are located



*Land use on TFREC and leased Wenatchee School District property*



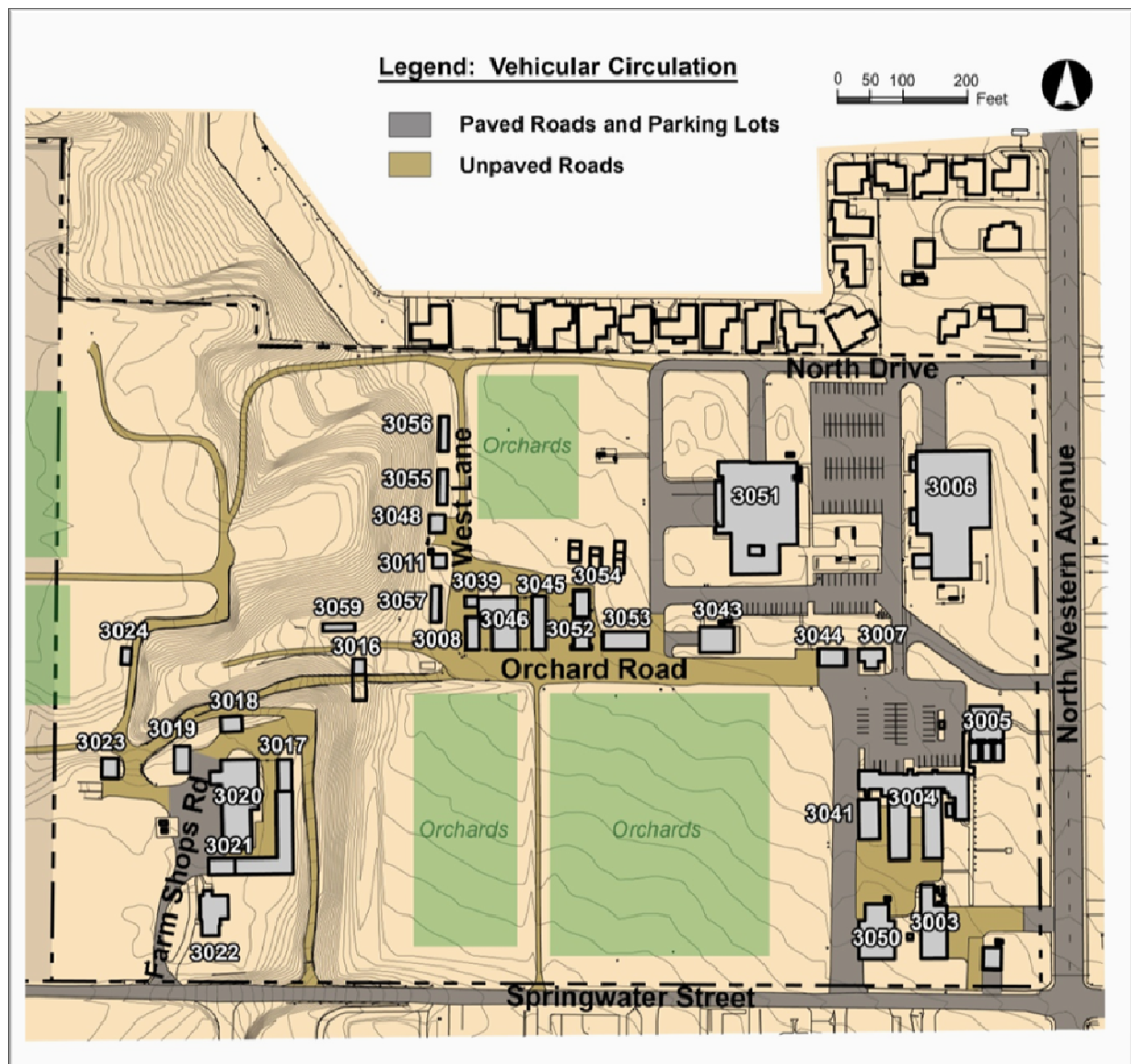
in the northeast corner of the property. Greenhouses are located primarily in the southeast corner of the property. Orchards and additional research buildings occupy the center of the TFREC, with additional orchards located to the far west on the leased Wenatchee School District property. The primary administrative functions are found in the southern portion of Overlay Lab.

Residential and service facilities are focused near the west edge of the campus, with housing to the north and services to the south. Three houses that provide additional residential capacity are located farther to the west on the upper plateau, with two being leased from the Wenatchee School District.

The City of Wenatchee annexed the TFREC property in August 2007 and changed its zoning from Residential to Office Mixed Use, similar to other large entities in the city such as the hospital and local colleges. This annexation provides increased security and better utility support from the city.

### Vehicular Circulation

North Western Avenue on the eastern boundary of the TFREC is the primary vehicular approach from the rest of Wenatchee. It is the only city-designated “principal arterial” on the western side of the city and carries a high number of vehicles. The road has one lane in each direction and wide shoulders that accommodate street-side parking.



Three roads provide access from North Western Avenue to the rest of the Center: Springwater Street, North Drive, and an unnamed entry road. Springwater Street, a paved city road, lies just to the south of the campus boundary. It provides a back entrance to staff parking and is the only paved access to the maintenance shops on the upper plateau. Several private residential homes also front Springwater Street. North Drive, a paved campus road, borders the Center's northern edge. It provides another secondary entrance to staff parking and service access to the main research buildings. It also leads to the primary housing area at the Center. The paved entry road intersects North Western Avenue at the center of the property. It leads visitors to convenient parking in front of Overlay Lab.



*TFREC and USDA signs located at entrance road*

Several internal roads provide secondary access around the campus. The majority of them are gravel. The most significant secondary road is Orchard Road, a wide gravel lane that bisects the campus east to west, linking the majority of research buildings on the lower plateau. An unnamed paved road to the west of building 3050 connects Springwater Street to Orchard Road and provides back-door access to a paved staff parking lot. Numerous other narrow gravel roads provide informal connections between the upper and lower plateaus.

Four campus parking lots provide approximately 136 paved parking spaces. Other informal parking is possible along the gravel roads throughout the Center. The numbers of spaces are adequate for most times of the year, though parking can quickly become a problem when events are hosted at the Center and visitors are often required to park on the shoulder of the busy North Western Avenue.

## Pedestrian Circulation

The limited numbers of vehicles driven beyond the paved parking areas make formal pedestrian paths through most the property unnecessary. North Western Avenue has sidewalks on both sides of the street, and sidewalks exist from the visitor parking areas to the main campus administrative areas. However, no sidewalks lead from North Western Avenue to the entrance to Overlay Lab, and visitors who park on the street must walk in the grass or in the narrow entry road to reach the building entrance.



*Entrance road has no sidewalks for pedestrians*

## Buildings

The two major research buildings dominate the property. The F.L. Overlay Laboratory is the TFREC headquarters and houses most of the WSU research laboratories for horticulture, plant physiology, soil science, entomology, and plant pathology. The administrative functions for the Center also occur here, and sponsored campus events typically take place in this building's conference rooms.

The other major research building is the USDA Tree Fruit Research Laboratory building which includes offices, laboratories, and fruit storage for USDA research in plant pathology, plant physiology and post harvest horticulture.

USDA owns several buildings on the campus: a fruit packing facility (3046), an equipment storage building (3045), a flammable storage building (3052), a greenhouse (3041) and an agriculture engineering building (3003). USDA also holds a long-term lease for the land underneath the flam-

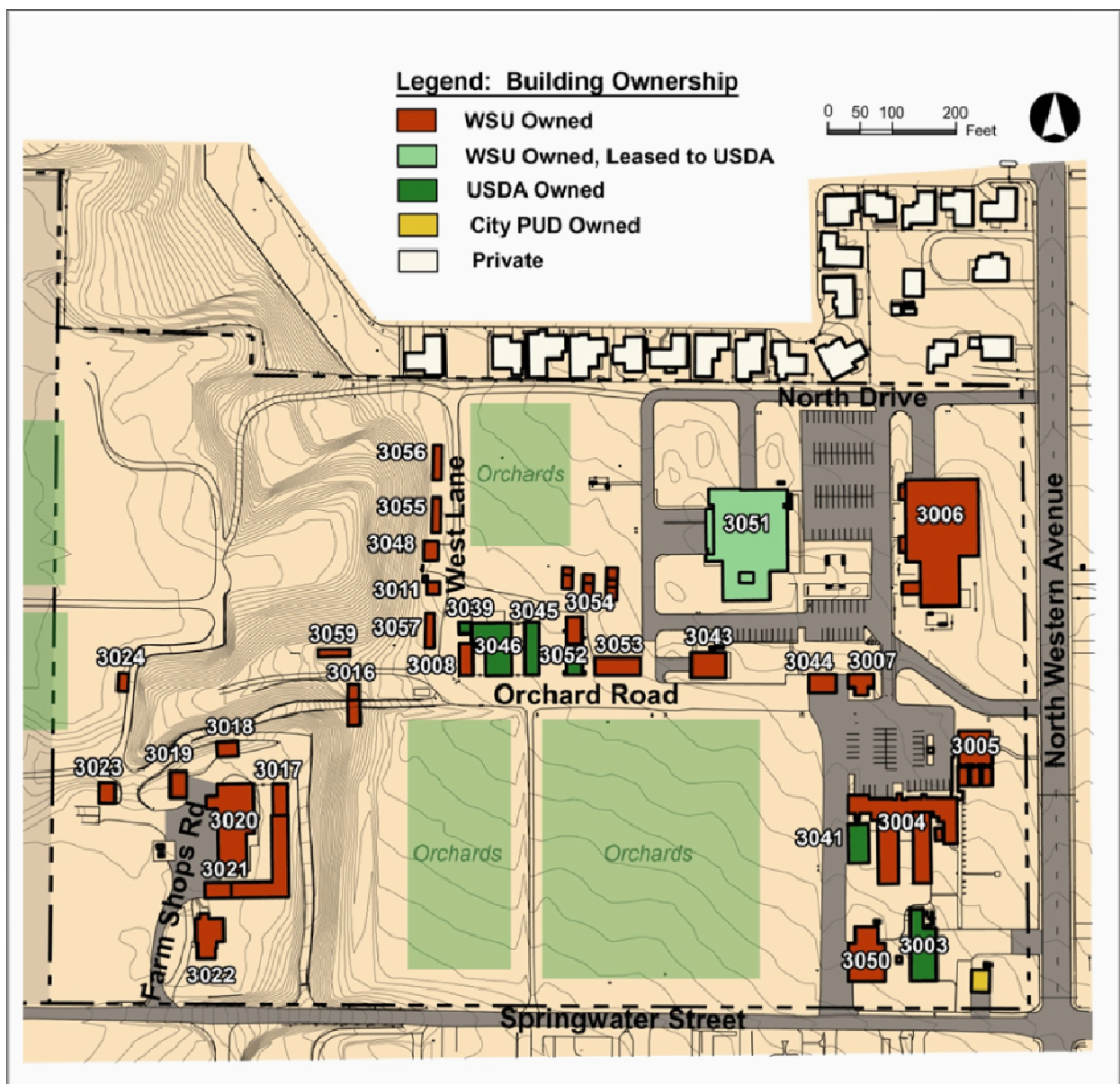
mable storage building. The WSU faculty and USDA researchers have developed a collaborative working relationship over the years, and building spaces are shared regularly by the two entities.

The Chelan County Public Utilities Department (PUD) owns a pump house on WSU property near the intersection of Springwater Street and North Western Avenue. This pump house supplies domestic water to the campus as well as to the surrounding neighborhoods.

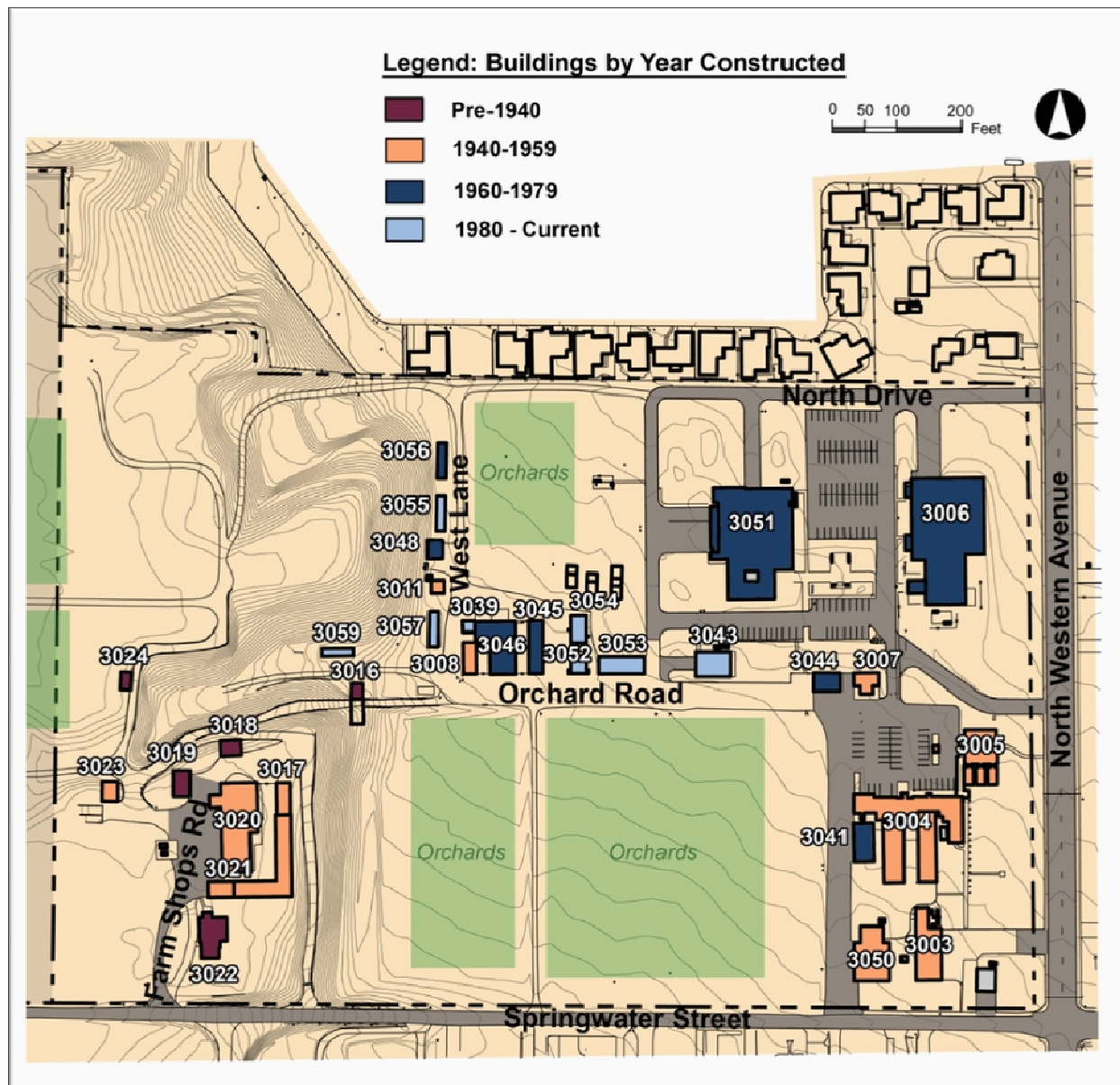
Like many other campuses across the country, the TFREC had a building boom in the two decades of



*F. L. Overlay Laboratory (Building 3006)*



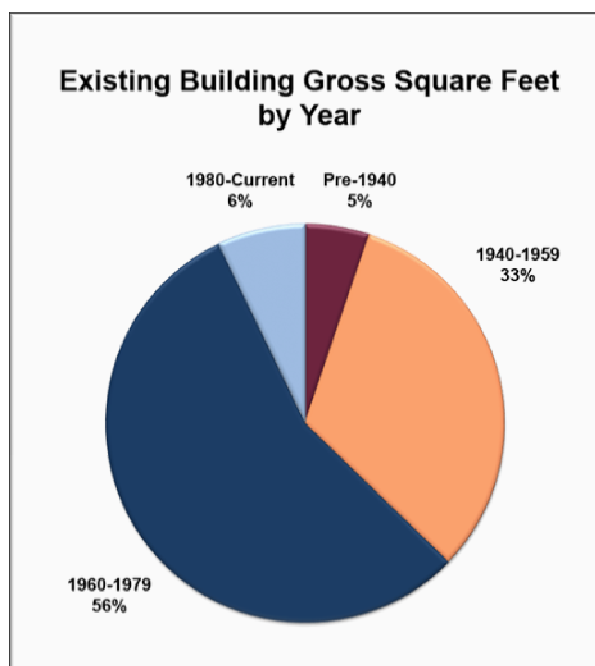




the 1960's and 1970's. Over half of the existing campus square footage was constructed during this period. The two large research buildings represent the majority of this square footage at over 56,000 gross square feet (GSF) total. These two buildings successfully support research functions at the current time, though their age suggests that significant upgrades will soon be needed for outdated electrical, mechanical and plumbing systems. The buildings also need safety improvements including a fire system upgrade and building sprinklers.



USDA Laboratory (Building 3051)



Many of the older minor research and maintenance buildings were constructed in the 1940's and 1950's. Although these buildings are still in use, many are reaching the end of their useful life. About 10% of the building square footage constructed in this era is owned by USDA.



*Entomology head house (Building 3005) built in 1949*

Few buildings remain from the earliest years of the Center before 1940, and these are located on the upper plateau. Several transferred their ownership to the Wenatchee School District as part of the property sale. The remaining pre-1940 buildings still owned by the TFREC include some of the smaller shop buildings and the adjacent house (3022).

Approximately eight percent of the Center's building space has been constructed in the years since 1980, and no new major research buildings have been constructed since the 1978 USDA Research Laboratory. The most recently constructed buildings include minor research buildings and the manufactured homes used for graduate student housing. USDA owns approximately 9% of the building square footage built in this era. A new hazardous waste storage building built in 2002 is used regularly by both WSU and USDA.



*Hazardous Waste Building (3043) built in 2002*

The Center's available housing stock for students and visiting faculty is barely adequate. Four of the eight residential units are modular houses located in the northwest corner of the campus. Two of these were installed in 2007. Two other modular houses (3059, 3056) and an adjacent cabin (3011) are in poor shape and need to be replaced. Two additional housing units are located on the School District property and will need to be replaced before the lease ends in 2011. The house near the maintenance



*New Residential unit (Building 3057) installed in 2007*

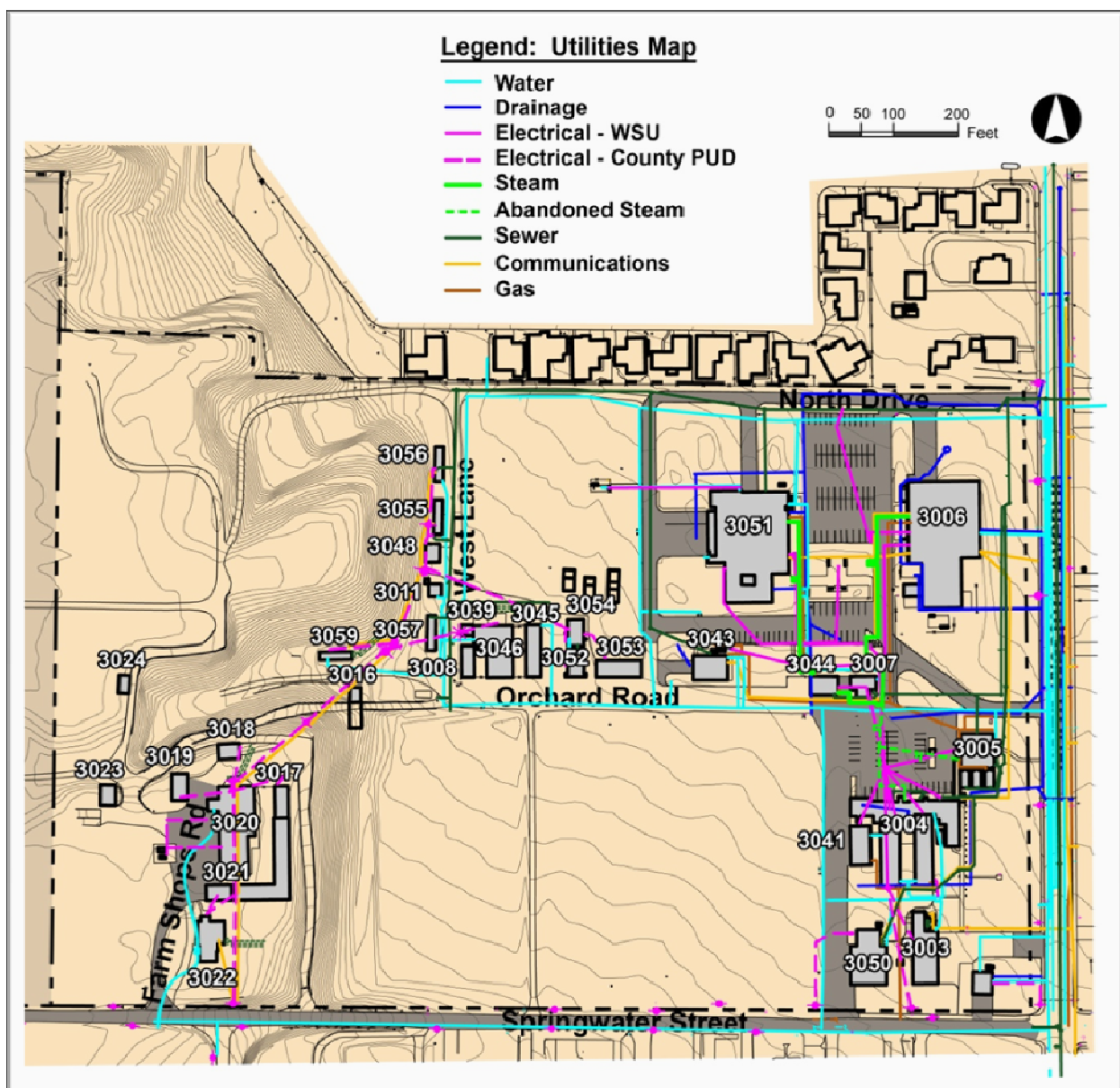
shops (3022) is rented to a Center maintenance employee and is unavailable for temporary housing. The housing goal for the TFREC is to have six total available units that would support eight to fourteen graduate and post doctoral students and visiting faculty.

### Utilities

The utility infrastructure on the campus is in good condition. WSU Facilities Operations replaced most of the eight-inch ductile iron water lines in 2004, and fire hydrants are adequate. The electric lines have also been upgraded.

WSU owns roughly half of the electric lines from the poles to the building meters while Chelan County owns the rest. WSU owns all the lines from the meters to the buildings. Electrical primary lines are 24 KWH. City-owned sewer extends to all buildings except the Farm Manager's Residence (3022) and the large shop building (3020) at the top of the plateau, one of the residential trailers (3059) and the USDA packing line building (3046), which are all on septic systems.

The steam boiler plant (3044) provides steam heat to the two main research buildings. The boilers are fueled by natural gas. At one time





the steam boilers also heated the greenhouses 3004 and 3005, and the now abandoned steam lines potentially contain asbestos. As the boilers are aging and will soon require major upgrades, a more cost effective solution could include the replacement of the boiler plant with individual heating units for the two research buildings. This solution requires a detailed evaluation by a mechanical engineer prior to implementation.

The canal on the upper plateau provides irrigation water to the orchards on both the upper and lower plateau. This canal existed prior to the establishment of the TFREC and supports farming activities throughout the County. Two pump houses pull water from the canal for irrigation, one (3032) having a single pump supplying irrigation water to the upper plateau and the other (3028) having two pumps, one supplying the upper plateau and the other the lower plateau. These pumps are owned by the County PUD, and the TFREC maintains the water rights to irrigate their land.

### **Landscaping**

The campus landscape at the Center appears abundant and attractive. Numerous densely-planted shrub beds frame the campus entrance, and stately mature birch trees line North Western Avenue. Additional shrub beds are scattered around the Overlay Lab and USDA Research Lab. Numerous ornamental deciduous and evergreen trees also contribute to the appearance of the campus. The age of the landscaping materials is a future challenge as there are not sufficient resources for their removal or replacement. The steep slopes on the west side of the property have been left with naturally-growing tree cover, providing a pleasant backdrop to the campus buildings.

The main entrances of the Overlay Lab and USDA Research Lab are enhanced by small gardens and seating areas. A small memorial planting is located between the two buildings. A secluded patio with several benches and a picnic table is located to the south of Overlay Lab, which supports both informal gatherings and more formal receptions.

The TFREC grounds staff have been able to maintain the landscape with very few people. Most of the plant varieties are low-



*Landscaping along North Western Avenue*

maintenance, allowing the staff to focus their efforts on just a few areas.

### **Security**

The TFREC campus is an active research station and security is vital to human safety and the success of research efforts. Buildings throughout the campus are locked when not in use. However, no fencing exists to limit public access to the property except for a wooden residential privacy fence along the north property boundary. The presence of a significant number of staff at the Center provide a level of informal oversight that discourages unauthorized access, but those numbers decline substantially in the evenings. Trespassers might go unnoticed after hours.

The ongoing public events, while aiding in the exchange of information and supporting community outreach, also increase the risk of unauthorized access to the areas of sensitive research at the Center. The TFREC prefers to host only a limited number of community events and conferences to keep this risk low.

### **Columbia View**

The Columbia View property is located 12 miles north of Wenatchee in Douglas County. The 92-acre site is on Highway 2 on a high plateau overlooking the Columbia River. It is used by both WSU and USDA researchers. The property has water rights, and about half of the acreage is currently planted in orchards. The property is owned by WSU, but USDA has a memorandum of understanding that grants their use of an assigned portion of the property. Currently WSU has 30 acres in use, while USDA has about 15 acres in production.

The TFREC also leases a nearby 38-acre property from the Chelan County PUD called the “Smith Tract”. This property is planted with additional orchards and is located adjacent to the banks of the Columbia River. The lease is active through 2011 with annual renewals.

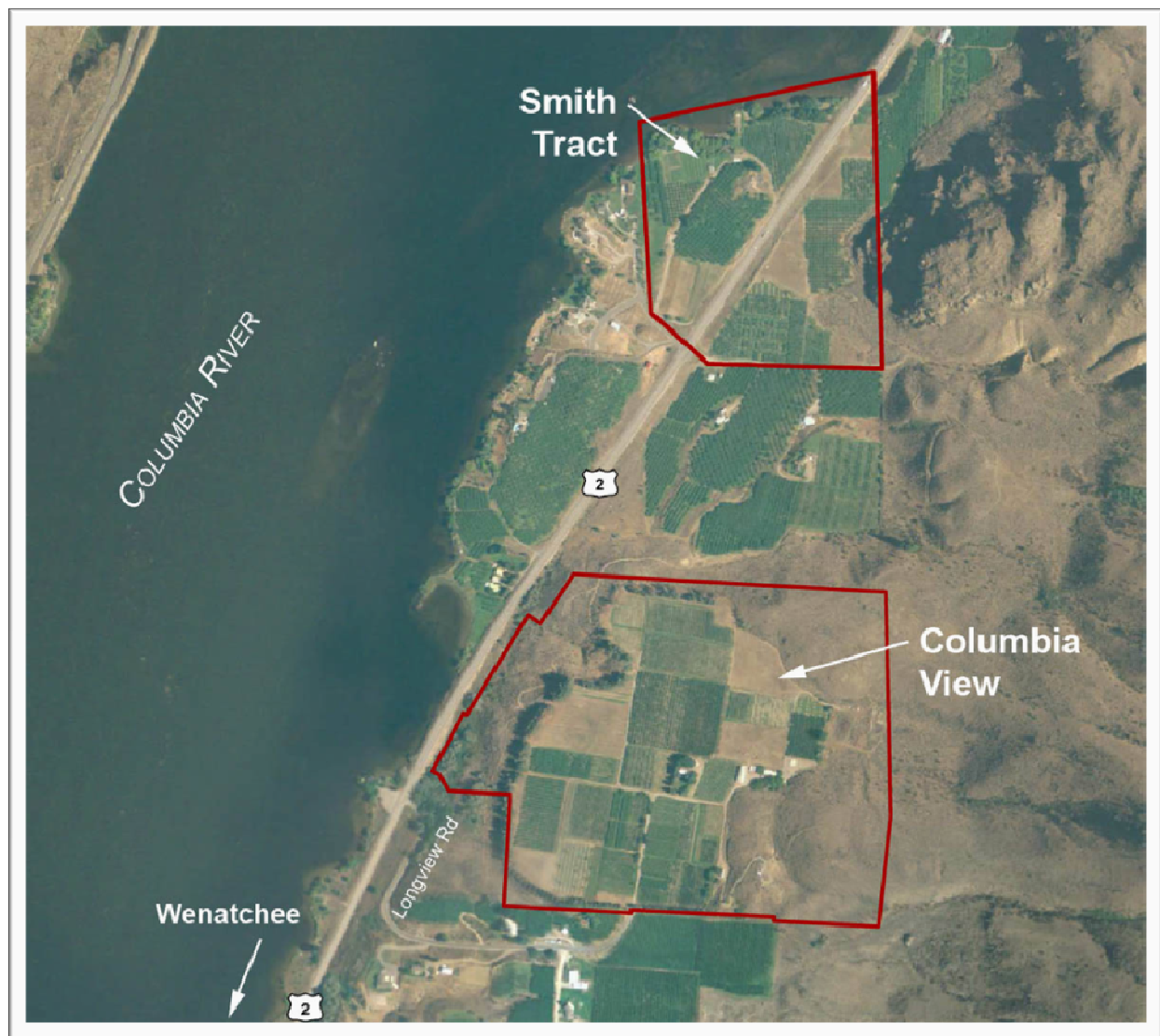
Workers and researchers come to the site daily. TFREC’s research at Columbia View focuses primarily on breeding and increased-density growing techniques, using unique branching methods and tight spacing between plants.

The Columbia View and Smith Tract contain approximately 15 buildings with a total square footage of nearly 11,000. Half of the buildings are small utility structures with less than 500 square



*Two buildings on Columbia View property*

feet. The larger buildings include storage buildings, some with small offices, plus a house that is occupied by an on-site graduate student. This 24-



hour oversight improves security, which is especially important at Columbia View due to its remote location. A metal prefabricated building that has been used in the past as housing for pickers during the harvest season is in poor condition and is scheduled for demolition. The farm equipment used at Columbia View is about 30 years old on average.



*New plantings at Columbia View*

### **Sunrise Orchard**

WSU purchased the 300-acre Sunrise Orchard site in November 2006 using the proceeds of the property sale on the main campus to the Wenatchee School District. Sunrise Orchard is located 15 miles south of Wenatchee along Highway 28. Water rights exist on the property to support the 150 acres currently being farmed.

Research at Sunrise Orchard focuses on insect and disease mitigation. The distance of the new orchard from other commercial orchards provides valuable isolation for these kinds of research activities. The site was additionally beneficial to the TFREC because it already contained 100 acres of certified organic apple production. A significant portion of this organic production will remain for research purposes and could possibly expand to pear and cherries as well as other fruit crops.

The privately-financed Washington State Tree Fruit Research Commission has donated \$500,000 for development of the new research orchard. In addition, nurseries donated the 40,000 new apple, pear, and cherry tree stock planted on site in May

2007. Local industry donated the equipment needed for the planting. Other improvements include a new irrigation main line with a state-of-the-art filter, and a dual drip and micro sprinkler irrigation system. Electric power was installed to support the irrigation system and research equipment.

Due to its remote location and proximity to Highway 28, this area has numerous problems with trespassing and vandalism. A county road that connects a nearby DOT-owned gravel pit to the highway bisects the property and reduces the Center's ability to properly secure the site. While the County Sheriff intermittently patrols the site, additional security measures like an on-site caretaker would benefit the Center.



*Compound at Sunrise Orchard*

Fencing is being used to increase security as much as possible. A compound area has been surrounded by a six-foot chain link fence with

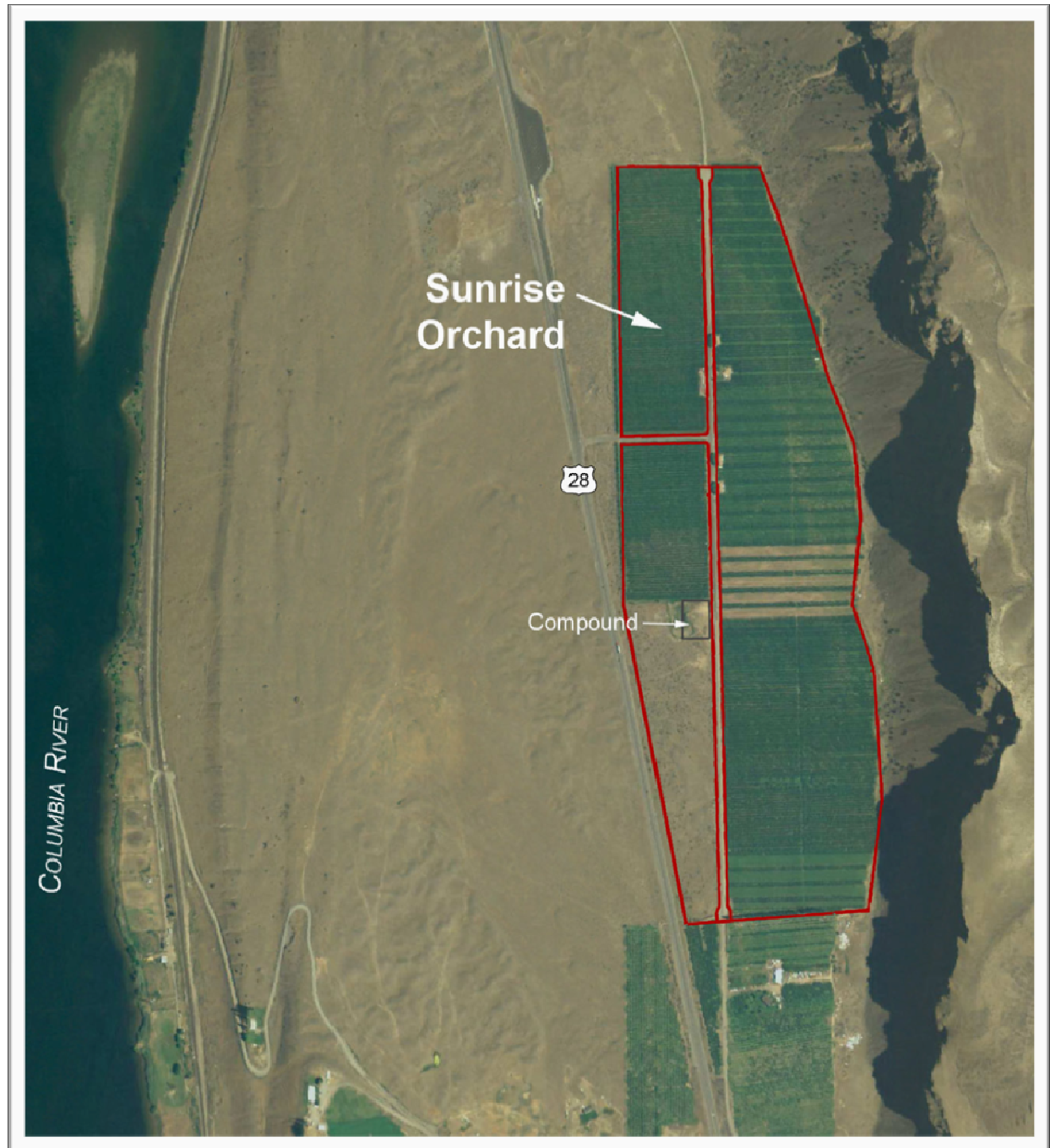


*New deer fence, funded by local companies*



razor wire on top. Most of the equipment and fuel used on site is stored safely within this compound, though occasionally vandals will get inside to steal fuel and metals. An electrified deer fence has been recently installed around

approximately 60 acres of new apple, pear and cherry tree plantings to deter human trespassers as well as opportunistic deer that enjoyed nibbling on the young leaves in the orchard.



*Aerial photo of Sunrise Orchard property*

## MASTER PLAN RECOMMENDATIONS

The existing facilities on the TFREC have been adequate for the past 70 years, but current research techniques require new facilities that can better support today's equipment and processes.

### Main Campus

The staff at TFREC developed a prioritized list of future space needs in 2006 based on current research efforts and the ability of existing facilities to support those efforts. Although these priorities are described as individual units, a new building project could contain more than one program to take advantage of synergies that exist between programs.

- **Priority 1: New fruit quality and handling facility with packing lines, labs, cold storage and offices.** The existing packing line is located in building 3046, which is in poor condition. The packing line and equipment are outdated and do not reflect current packing processes. A new packing line with related labs and offices is needed to better represent current technology.
- **Priority 2: New greenhouses with a head house and growth rooms.** The existing greenhouses have reached the end of their service life. They currently support research in entomology, soils, and insect-rearing.
- **Priority 3: Research Lab and offices.** Additional modern research space is needed, particularly to support insect behavior research. This research currently occurs in building 3050 which dates from 1949.
- **Priority 4: Housing for graduate students and visiting faculty.** Temporary housing can be difficult to find in the active Wenatchee housing market. The TFREC would like to increase their housing units through the installation of additional single- and double-wide manufactured housing.

## Demolition

Several buildings have reached the end of their useful life, and need to be removed to make way for new facilities that are better able to meet the future needs of the TFREC. Demolition will also reduce the deferred maintenance needs of the TFREC. The buildings proposed for removal are:

<u>Bldg #</u>	<u>Building Name</u>	<u>Date Const.</u>	<u>Gross Square Ft.</u>
3003	USDA Agriculture Engineering Bldg	1955	3,800 (approx)
3004	Entomology Annex Head House & Greenhouses	1951	15,314
3005	Entomology Head House & Greenhouse	1949	7,256
3007	Control Atmosphere Store (used for breeding)	1958	1,068
3008	Experimental Chemical & Spray Storage	1989	1,000
3011	Cabin 3	1947	464
3041	USDA Entomology Annex Greenhouse	1963	1,885
3044	Central Heating Plant	1967	1,178
3048	Trailer Storage and Carport	1965	620
3050	Annex Lab	1949	4,253
3056	House trailer	1989	728

TOTAL GROSS SQUARE FEET: 37,566

The total removed capacity would be slightly over 37,500 gross square feet (GSF). The removal of building 3008 will require hazardous material clean up as the building and the surrounding soils are heavily contaminated.

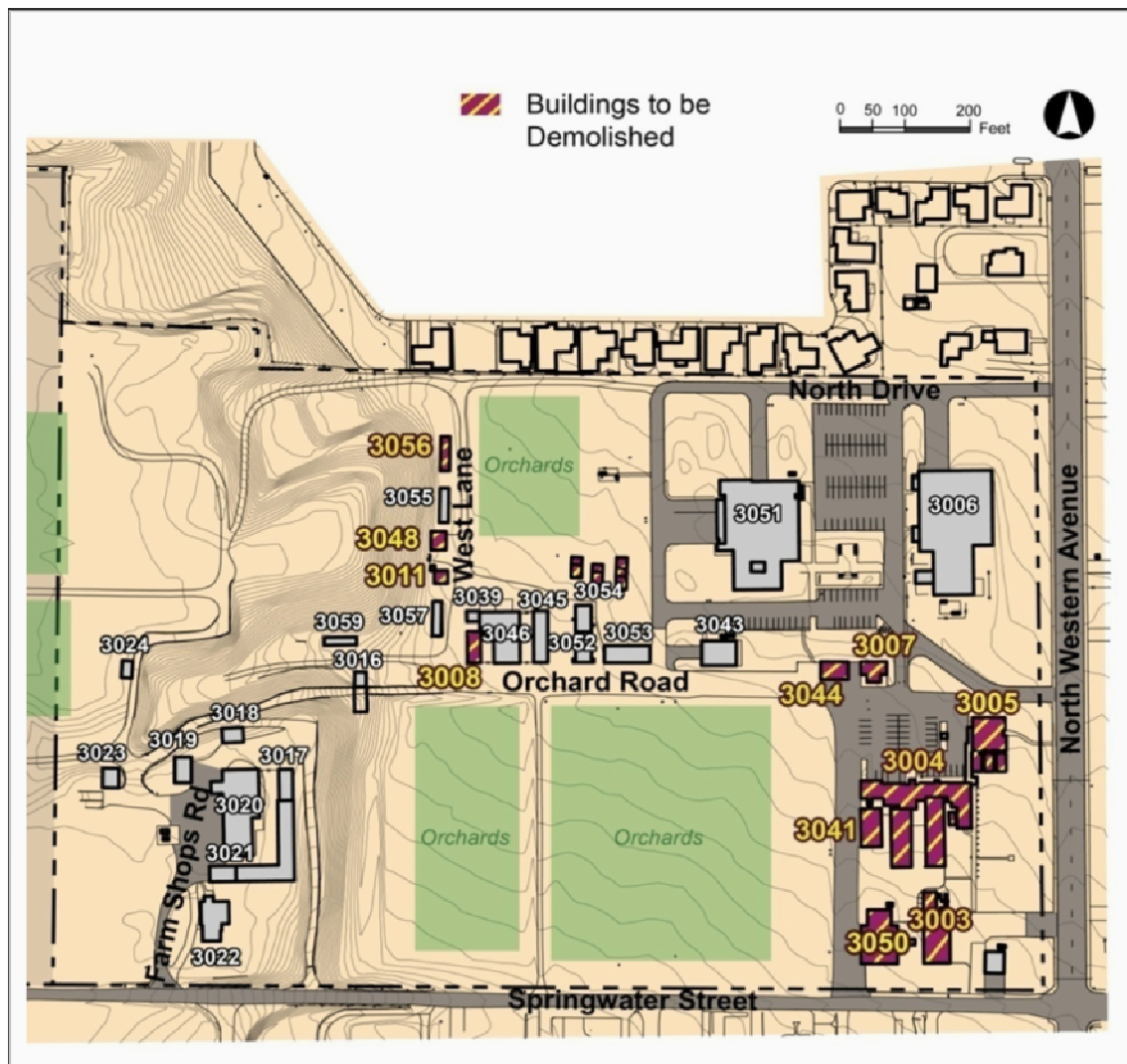
Since most of the buildings proposed for demolition are currently in use, research activities will need to be moved to new locations prior to their removal. USDA owns buildings 3003 and 3041 that together contain approximately 5,700 GSF. The demolition of those buildings would require prior approval by the federal government and accommodation of those USDA research projects elsewhere.

The Central Heating Plant (3044) could only be demolished if an engineering assessment of the Overlay Lab and the USDA Research Laboratory confirms that they would be more efficiently heated by other methods.

Several field wind tunnels lie north of building 3054. Research using these tunnels continues but they should be moved elsewhere.



*Building 3008, proposed for demolition*

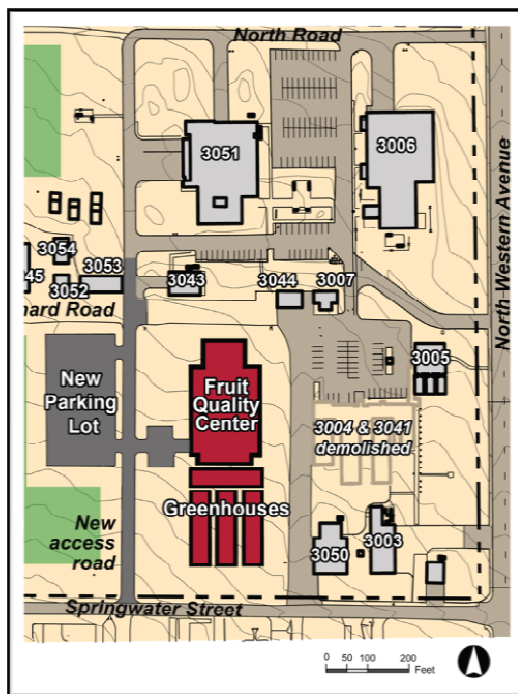




## New Buildings and Building Renovations

Two new research buildings and a renovation of Overlay Lab's mechanical, electrical, and life safety systems will provide the necessary facilities to support future research. An additional building site for additional future research needs has also been identified. The preferred locations for new buildings will require a phased approach to allow programs in existing buildings to be moved prior to their demolition.

- **Phase 1: Fruit Quality Center and Greenhouses.** A new Fruit Quality Center (FQC) and Greenhouses are recommended as the first new buildings on the campus. The FQC fills a critical need to replace the outdated USDA handling lab (3046) currently used by TFREC researchers. The new greenhouses will incorporate research in the Entomology Annex and Greenhouses (3004), the USDA Greenhouse (3041), the breeding program in 3007 and provide added capacity for future programs.



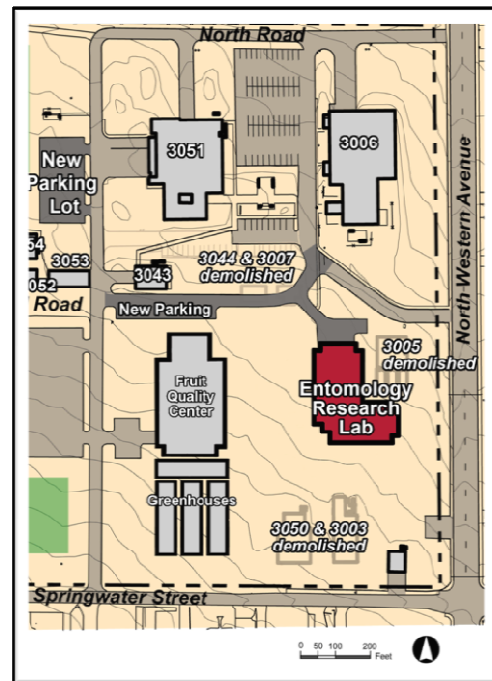
*TFREC Master Plan—Phase One*

These buildings will be located to the west of building 3004 and will match the

scale of the other buildings on the campus. A new access road and parking lot will also be built to service these buildings. This construction will require the removal of some existing orchards.

Once the FQC and Greenhouses are completed, then buildings 3004 and 3041 (a USDA building) can be removed.

- **Phase 2: Entomology Research Laboratory.** A new Entomology Research Laboratory will accommodate the growing research in this field and replace the facilities in outdated buildings 3005, 3050 and 3003 (a USDA building). This building will be located on the site now cleared by the removal of Buildings 3004 and 3041. Building 3005 will remain in place until the new Lab is completed unless temporary accommodations can be found.

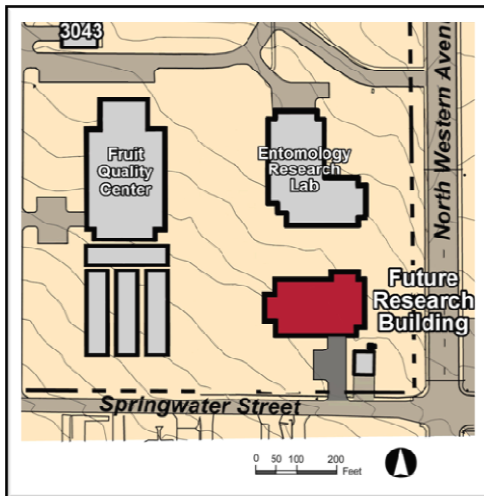


*TFREC Master Plan—Phase Two*

The demolition of buildings 3044 (the central heating plant) and 3007 will allow the east half of Orchard Road to be improved and new employee and visitor parking added.

The Entomology Research Lab's location will create a quadrangle with the USDA Research Lab, the Overlay Lab and the new FQC and Greenhouses. This will also keep all research activities in close proximity. The east face of the new building will maintain a 100-foot buffer from North Western Avenue and be no higher than two stories, consistent with the appearance of Overlay Lab.

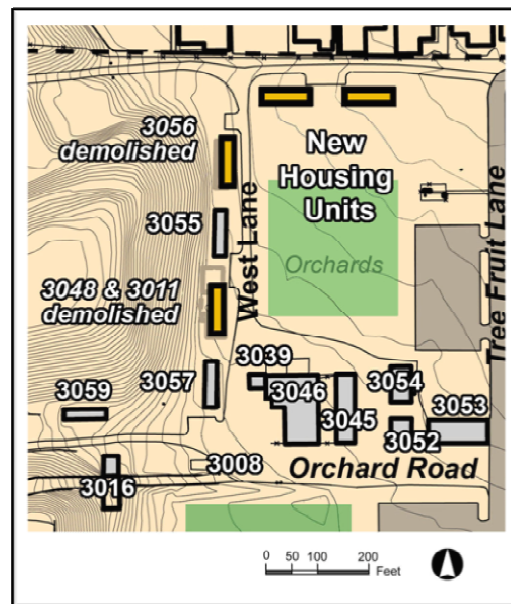
- **Phase 3: Future Research Building.** The demolition of buildings 3050 and 3003 will improve the campus appearance and open a site for a future research building to fill upcoming campus needs. Its location will complete the "quad" begun by the previous buildings. It will match the appearance of the other buildings in material and size, and will maintain a 100-foot set-back from both Springwater Street and North Western Avenue.



TFREC Master Plan—Phase Three

- **Renovation of Overlay Laboratory.** Overlay Lab will soon require a complete renovation of its mechanical, electrical, and life safety systems, rejuvenating this important building for many more years of active service. This project can occur independently of Phases 1-3. Due to the importance of this building to the research activities, it should begin as soon as funding becomes available.

- **Housing for Graduate Students & Visiting Faculty:** Two duplex or four single modular housing units will be added to the available housing stock for graduate, post doctorate and visiting faculty, bringing the total number of available units to six. The first modular units will be located along West Lane on the sites of the demolished buildings 3011, 3048 and 3056. Additional units will be located along the North Road extension. The removal of a portion of the small adjacent orchard will create an open grassy area that could accommodate informal recreation for the residents.



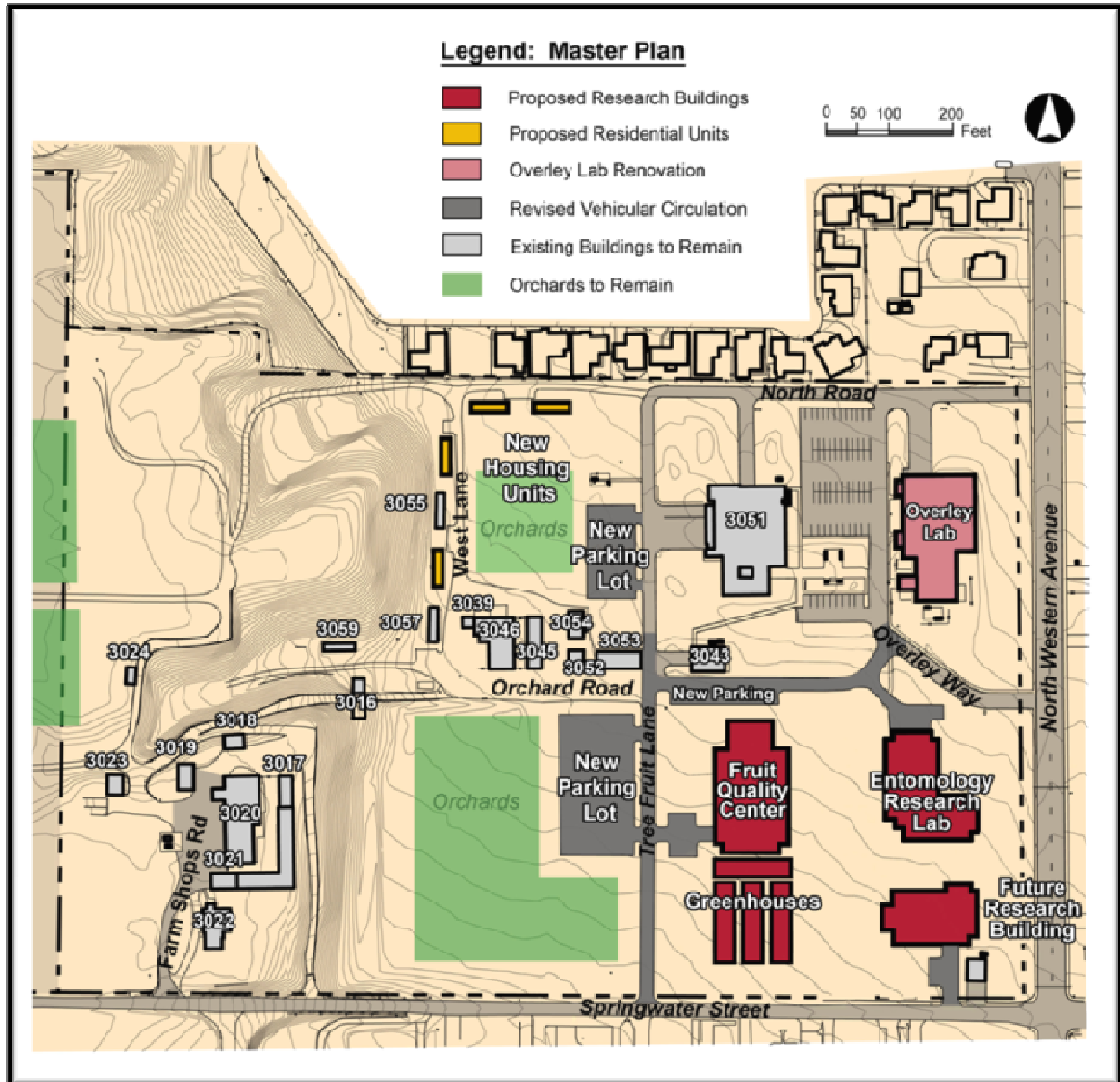
TFREC Master Plan—Housing

## Circulation

Several modifications to the existing vehicular system will clarify circulation routes and reduce conflicts between pedestrians and vehicles.

The addition of sidewalks along the entrance road will help visitors safely reach Overlay Lab from North Western Avenue. Visitors will also benefit if the entrance road is named Overlay Way, reflecting the importance of F. L. Overlay to the Center and identifying the road's ultimate destination.

A continuously paved route linking service and parking areas will be completed with a new ac-



cess road called Fruit Tree Lane that connects Springwater Street with the service drive behind the USDA Research Lab (3051). It will be built as part of the FQC project. Removing the drive adjacent to building 3050 will reinforce the pedestrian-only quadrangle.

Improved visibility and vehicular access will be accomplished with a realignment of the intersection of Orchard Road and Overlay Way. This realignment will be completed after the removal of buildings 3007 and 3044.

An increase in parking spaces and a reduction in pedestrian-vehicular conflicts are accomplished with several parking lot changes. The removal of spaces in the lot to the south of the USDA Research Lab, keeping only visitor parking spaces, will improve pedestrian safety and increase the open space. New lots will be created to the west of the USDA Research Lab and to the west and to the north of the new FQC to increase the overall number of available parking. The existing parking lot between the Overlay Lab and the USDA Research Lab will remain as the primary employee parking.



## Landscaping

Landscaping around the new buildings will consist of a low maintenance but attractive planting scheme aimed to minimize additional staff resources. Little pruning or irrigation will be required with the use of drought-resistant lawn with low-growing plantings around the buildings. Low maintenance shrubs and trees will screen service and parking lots visible from the primary visitor areas and neighborhoods.

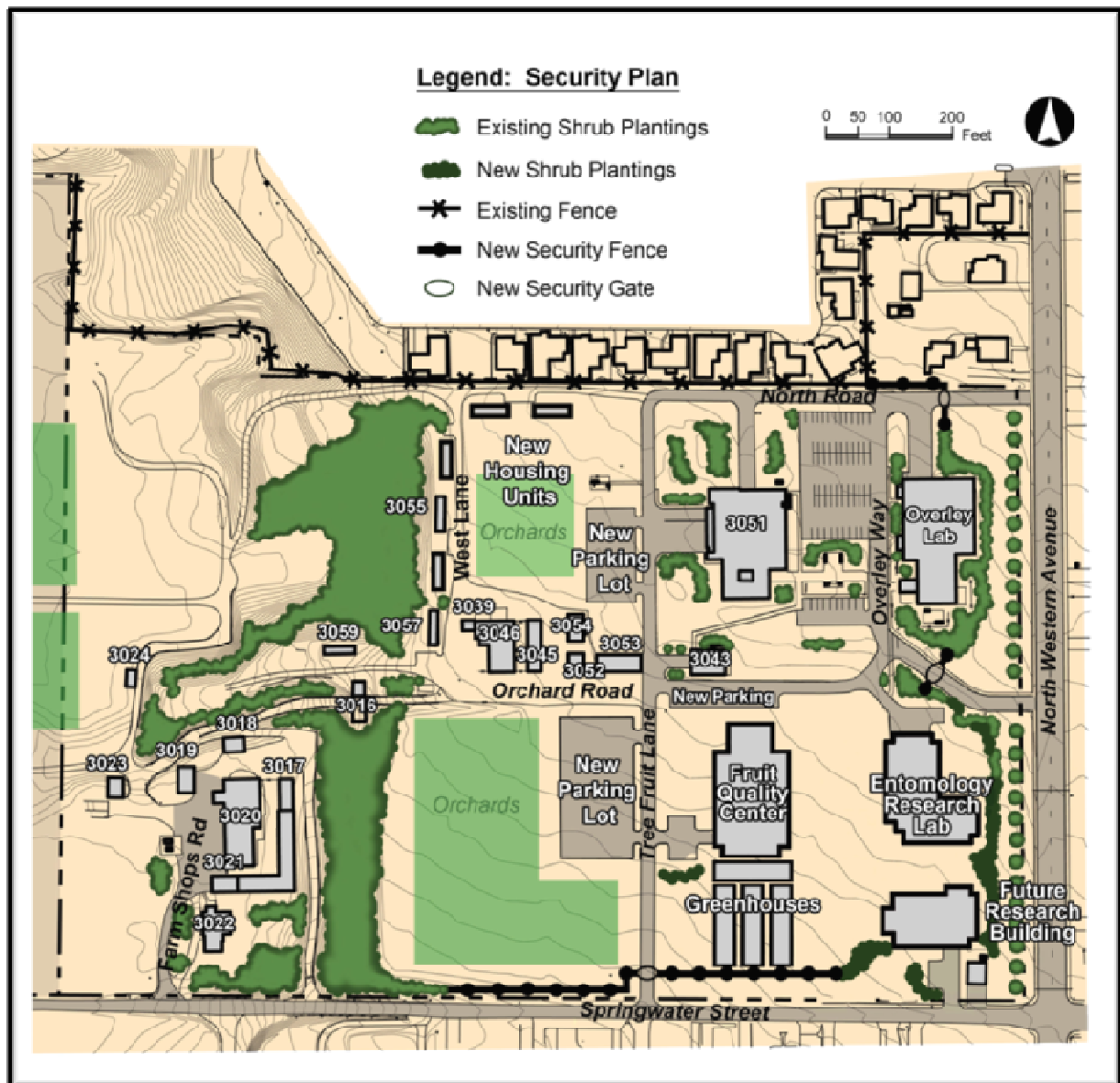
## Security

Adding barriers on the campus will discourage unauthorized access to research and housing

areas. Dense shrubbery will be integrated with attractive fences to deter intentional or unintentional trespassers. Gates on the main drives will allow access to buildings during business hours.

## Sustainability

The TFREC already incorporates sustainable initiatives in its research and land use. Efficient irrigation practices, dense orchard plantings, and the reduction of pesticide use all contribute greatly to sustainable practices. The campus landscape includes native and drought tolerant species needing little maintenance and irrigation. All new buildings constructed on the campus will meet sustainable building standards.



Likewise, the new building systems installed in Overlay Lab will include highly energy efficient features and equipment.

### **Columbia View**

The ability of the Columbia View site to adequately support the TFREC's long term research needs is restricted by the aging buildings and limited acreage. The beautiful views from the property increase its value as prime residential development property, and its sale should be considered to support new equipment or real estate purchases that will consolidate activities at Sunrise Orchard.

### **Sunrise Orchard**

Additional facilities are needed for Sunrise Orchard to meet its full research potential. The first priority is a new storage building with an office and restroom. Other essential buildings include a small combination pesticide/fill station, two manufactured homes working as on-site labs, and additional covered storage for equipment. All of these buildings could be funded by industry or minor capital funds.

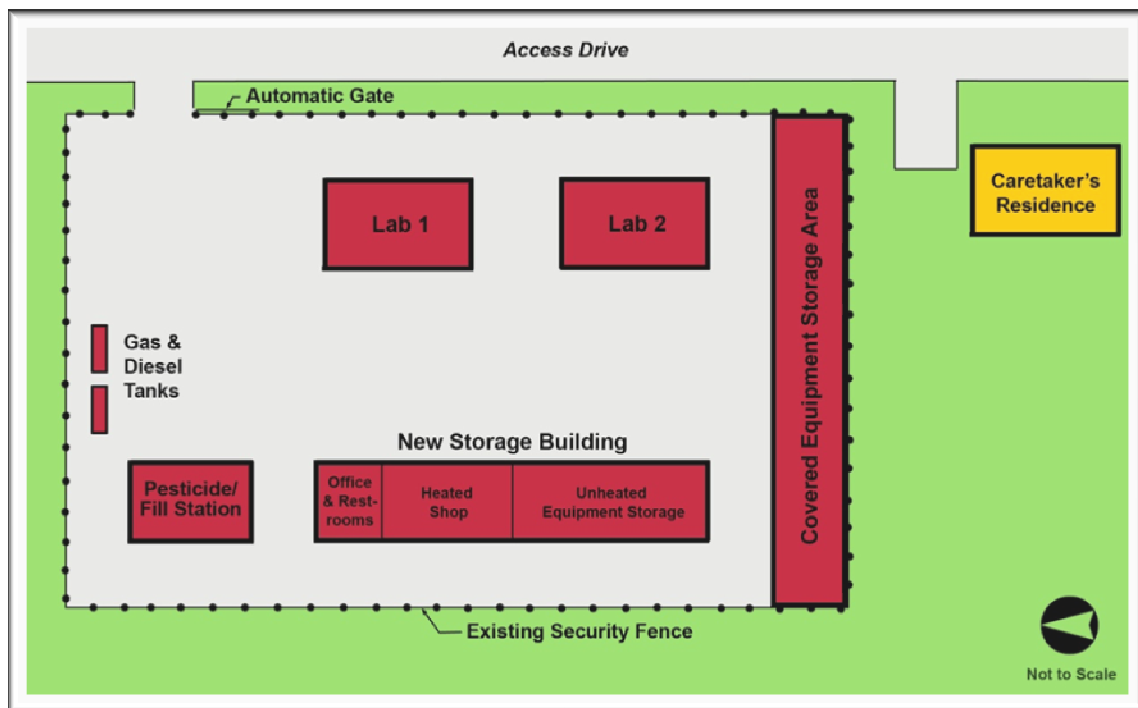
Due to security concerns, all new facilities will be constructed within the existing compound. A

manufactured house constructed on the site for a live-in caretaker will provide 24-hour oversight of the facilities.

The sale of the Columbia View property could provide funds for either building construction or the purchase of additional orchards adjacent to Sunrise Orchard. The fifty acres of orchard that are available immediately to the south of Sunrise would provide enough land to support the consolidation of activities from Columbia View and also provide additional water rights for back-up irrigation in cases of drought or equipment malfunction.

### **CONCLUSION**

The recommendations described in this Master Plan are necessary for the TFREC to stay abreast of current technologies and research procedures. Increased operational funding will also be critical for the long term maintenance of the campus. The TFREC's research provides crucial assistance to Washington's valuable tree fruit industry, but these research activities cannot continue without adequate financial support. A combination of increased funding and state-of-the-art research laboratories will allow the Center to effectively support the tree fruit industry for years to come.



*Proposed buildings for Sunrise Orchard*

## Acknowledgements

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