

# Behavioral Health: Community Civil 16-Bed Capacity

STATE OWNED, MIXED USE - PRE-DESIGN REPORT - MULTIPLE SITES

03.02.2020







# SW- BH Community 16-Bed Capacity Community Based Behavioral Health Facilities

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Agency: Department of Social and Health Services (DSHS)

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# 1



## Executive Summary

16-BED STATE-OWNED COMMUNITY CIVIL FACILITY

### Summarize the Problem

Governor Inslee laid out his vision to provide mental health services in local communities for people with acute mental illness in the 2019 Legislative Session. Serving people in their home communities is essential to this plan. Transformation requires development of a continuum of services that can prevent or divert people from being committed to the state hospitals and can support people in their recovery after treatment in a hospital is complete.

Governor Inslee and the Legislature are spurred by Washington's rank of 47th in the nation in capacity for appropriate mental health services. Compared to the rest of the country, Washington has a high prevalence of mental illness and low access to care. Within two years, the state will need almost 370 more civil beds than our current capacity.

The state is at the beginning of a major reform of the entire behavioral health service delivery model. The large state hospitals will evolve into a Center of Forensic Excellence through phased renovation and the construction of new hospitals designed with a new model for mental health care.

Other state agencies and the University of Washington have also been funded and charged with the responsibility to increase the number of psychiatric services such as housing.

### DSHS' Commitment to Community-Based Treatment

The Legislature supported Governor Inslee's concept and, in the 2019 Session, enacted a budget and provided direction to the Department of Social and Health Services to begin development of three small community-based/behavioral health residential treatment facilities.

These facilities would provide a range of services to people as they move through the treatment regimen: evaluation and treatment, 90-day to 180-day intensive treatment, and a step-down program to ready people for their return to home and work.

### **Current State of Civil Commitment At Western State Hospital**

Western State Hospital (WSH) was budgeted for 527 civil commitment beds through July 2019. In August 2019, 60 civil commitment beds were taken off line for conversion to forensic capacity. Now only 487 beds remain available for civil commitments.

### **Projected Need for Civil Commitment Beds in Washington**

Based on the report submitted to the Legislature in December 2018, the projected need for civil capacity beds that provide services for people who have 90-180 day commitments is 934 in 2021 and increases to 980 in 2025. Refer to Appendix G, "Report to the Legislature: Predicting Referrals for Competency, 12/1/18" for a copy of the full report.

### **Future State of Civil Commitment At Western State Hospital**

The expectation of the governor and the legislature is gradual decrease in the number of civil commitments at WSH as additional resources are introduced through community-based facilities.

Decentralization of civil commitments supports goals set by the governor and the legislature to create additional forensic psychiatric capacity on the grounds of WSH. This includes the design and building of a new forensic hospital and the establishment of a program that supports a forensic center of excellence.

### **Future State of Community-Based Civil Commitments in Washington**

This project constructs a state-operated 16-bed program for civil commitment, a privately-operated 16-bed program for civil commitment, and a privately-operated step-down transition program for those needing additional support prior to returning to the community.

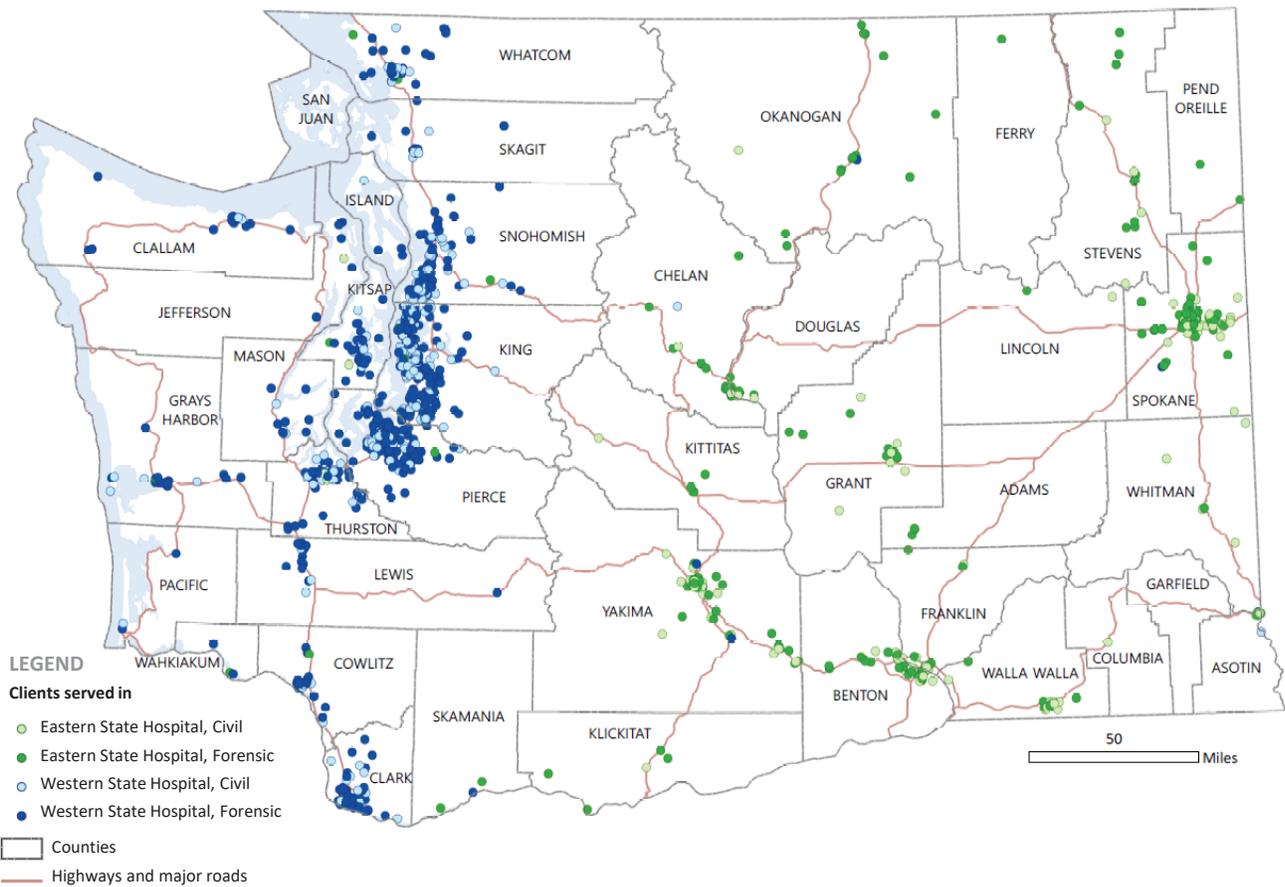
Other investments made by the legislature to create civil commitment capacity include operating funds that were provided to the Health Care Authority and a directive to contract for civil commitment beds. These legislative investments are projected to result in 275 beds for long term (90 and 180 days) commitments by 2023.

Location of new facilities will be made in part based on regional need. While all western Washington regions need capacity, the recent closure of the only residential treatment facility in Clark County has resulted in no access to civil care in the Southwest Region. This is the only Western Washington Region without any civil capacity.

# State County Map 1-1

This map shows the home community from which the civil and forensic patients are coming from and at which state facility they are receiving mental health services.

## Persons Served at State Hospitals, CY 2018

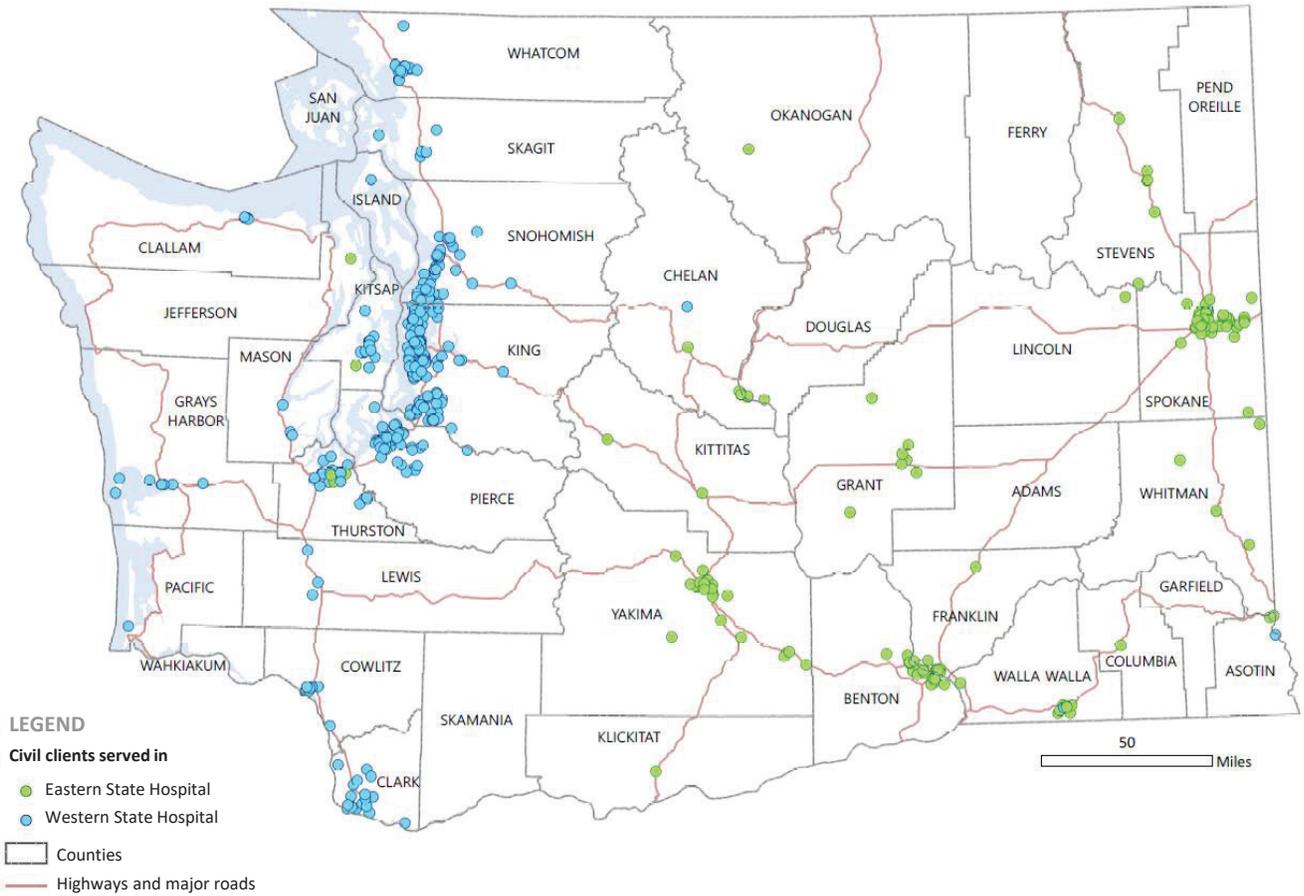


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# State County Map 1-2

This map shows the home community from which civil patients are coming from and at which state facility they are receiving mental health services. Note the high concentration in Snohomish, King, Pierce, Thurston and Clark Counties. This data was a significant contributing factor in determining the Preferred Alternate.

## Persons Served at State Hospitals, CY 2018, Civil

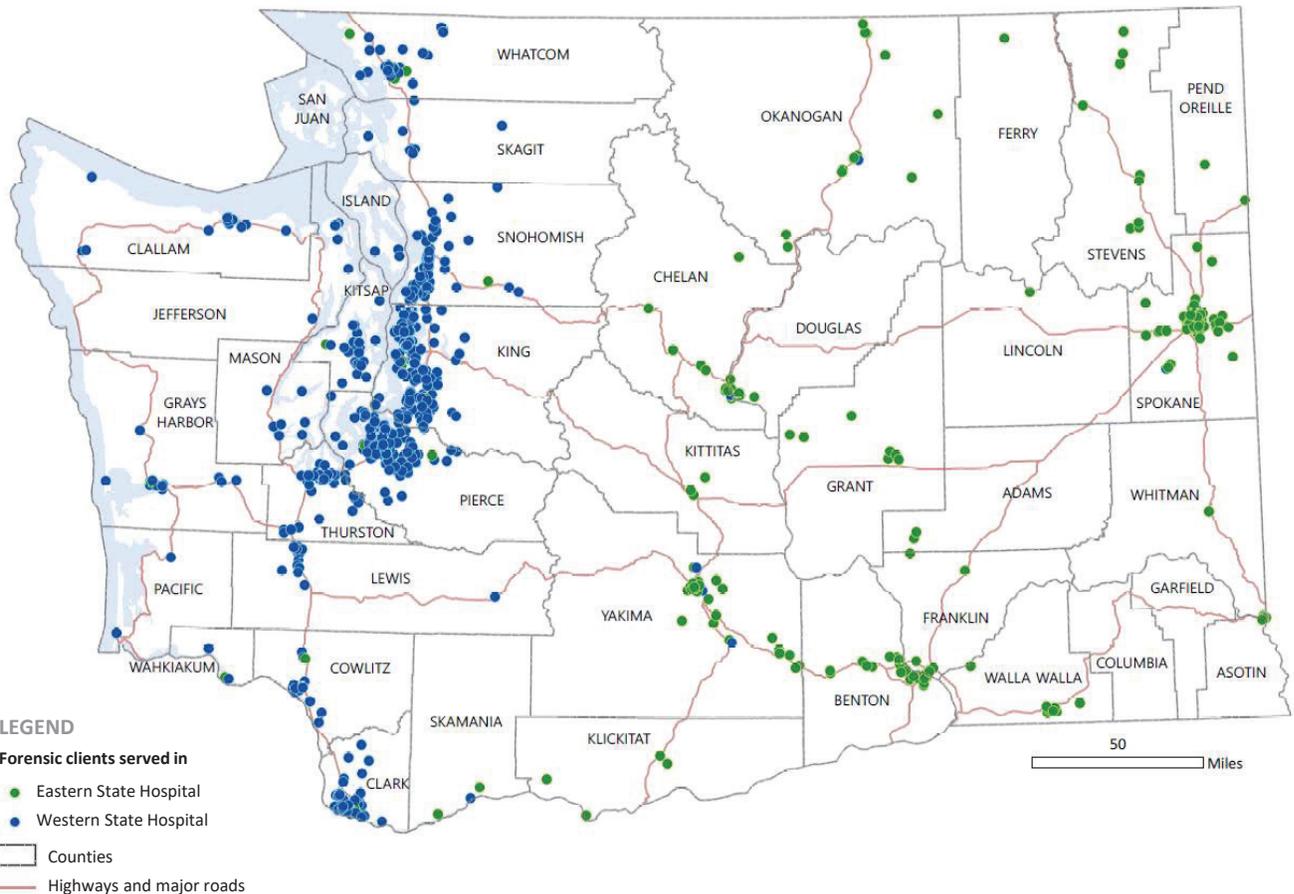


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# State County Map 1-3

This map shows the home community from which forensics patients are coming from and at which state facility they are receiving mental health services. These patients will continue to receive treatment at the state hospitals.

## Persons Served at State Hospitals, CY 2018, Forensic



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## Alternatives Considered

This predesign report studies six potential Western Washington locations as options for the 16-bed capacity community facility. The sites are distributed throughout the I-5 Corridor to address local communities' needs and partnerships with other local behavioral health facilities.

Four potential sites are on or near existing State-owned campuses: Fircrest School in Shoreline, Echo Glen in Snoqualmie, Western State Hospital in Lakewood, and Maple Lane in Centralia. The remaining two sites are in communities where property has been identified as available and would require to be purchased. The intent is to identify sites where the use is permitted outright or as necessary conditional use as a less desirable alternative.

### Alternative 1 - No Action-No New 16-bed Facility

#### Alternative 2 - Fircrest School

Two locations studied for location on Fircrest School Campus for a new 16-bed facility.

#### Alternative 3- Western State Hospital

Location south of existing Buildings 28 and 29 on Cottage Row for a new 16-bed facility.

#### Alternative 4 - Echo Glen

Location southwest of the existing Echo Glen Children's Center for a new 16-bed facility.

#### Alternative 5 - Maple Lane

Location southwest of existing Administration Building for a new 16-bed facility.

#### Alternative 6 - Clark County

Locations evaluated include four in the City of Vancouver for a new 16-bed facility.

#### Alternative 7 - Snohomish County

8 locations reviewed for a new 16-bed facility.

## Preferred Alternate

### Alternative 5 - Maple Lane

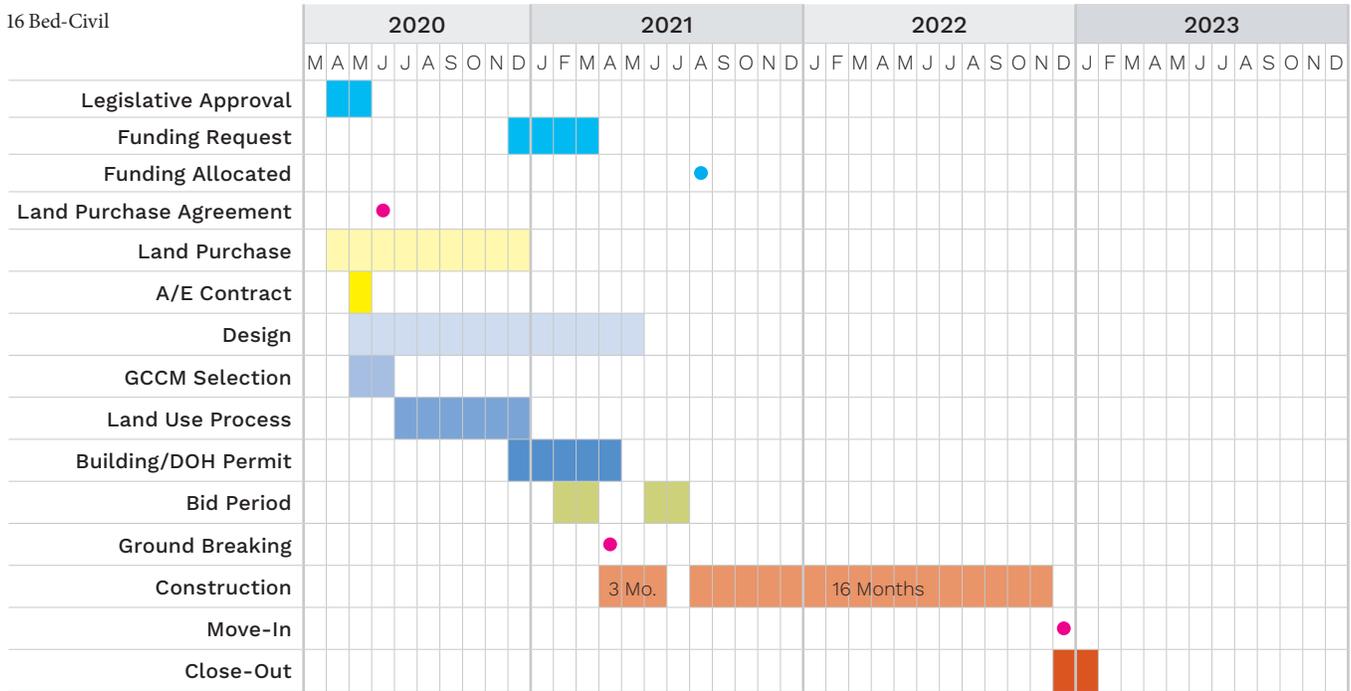
The Maple Lane site alternative was selected for the following reasons:

- The existing Maple Lane campus has space available to develop a new 16-bed facility and the site is currently under-utilized
- Space is available on site for an excellent outdoor space which could be created as part of the project
- This location provides behavioral health services south of Olympia, which is currently underserved.
- The new facility could be separated from all the correctional functions so that it could operate independently. This would make it more user friendly and enable families to visit without going through the correctional screening.
- Land-use approvals can be obtained in a reasonable time frame
- Ability to draw staff from the Olympia area
- Access to parking is nearby.
- The preferred site is flat and has access to utilities.

### Cost Estimates for Each Alternative

A single cost estimate was generated for this pre-design. Costs will be substantially the same for all alternatives. The building will be the similar for all sites. Site work such as significant grading, frontage improvements or service infrastructure as detailed in the narrative descriptions will include cost premiums that fit within the typical project allowances.

# Typical Project Schedule



## Cost Summary

The estimated construction cost for Preferred Alternate #5 Maple Lane: 16-bed, LEED Silver plus Net-Zero, in 2021 dollars, is approximately \$20 million depending on site and property purchase.



## Conclusion

The legislature has increased investment to support people who have been in the state hospitals and are in need of significant support to remain stable and transition back to their community. Investments have included facilities and programs operated by the Aging and Long Term Supports Administration, the Developmental Disabilities Administration, and the Health Care Authority. There are several goals for these investments:

- Provide quick access to mental health treatment to improve recovery outcomes.
- Decrease the number of people who become unstable in the community and need inpatient care.
- Provide discharge options for people in the hospital who have specialized needs to return to their community.

The Maple Lane site offers the best option to make an immediate impact to the shortage of 90-180 day beds. With its nearby community partners, this site offers an exciting pathway for patients to recover and return to the community.



# 2

## Problem Statement

16-BED STATE-OWNED COMMUNITY CIVIL FACILITY

### Approach Summary

In September of 2019, DSHS and the BCRA/BWBR lead design team convened a series of meetings to develop programming and concept design for 16 and 48-bed community-based facilities. These facilities will provide inpatient residential treatment for civilly-committed patients. The 48-bed campuses will be comprised of three 16-bed facilities.

The design team was asked to evaluate six locations in Western Washington as possible sites for the new facilities. Three types of program offerings were discussed:

**Evaluation and Treatment Facility (E&T)** - the E&T facility is an involuntary inpatient facility for individuals who have been civilly committed to receive mental health treatment in a secure acute environment for a period of 14 to 30 days. Patients often have significant psychiatric issues like active psychosis and suicidal ideation.

**90 to 180 Day Facility** the 90 to 180-day facility is an involuntary in-patient facility for individuals who have been civilly committed to receive mental health treatment in a secure acute care environment for a period of 90 to 180 days. These individuals may have

completed treatment in an E&T but require further treatment prior to being returned to their community.

In contrast to the E&T, the 90 to 180 day will have large spaces for activity/life skills/exercise space to keep patients engaged for the longer stay and to help teach life skills that will help transition patients back into the community. These services are not currently provided in Washington outside of the State Hospitals.

**Step Down Facility** - the Step-Down facility is an involuntary/voluntary in-patient facility for individuals who have been civilly committed to receive mental health treatment in a secure acute environment. These individuals may have completed treatment in an E&T and a 90 to 180 day but require further treatment prior to being returned to the community. These individuals can leave to go to medical appointments or leave the facility to receive additional off-site services but would return to the facility after their appointment.

The step-down facility, similar to the 90 to 180 day will have large spaces for activity/life skills /exercise space to keep patients engaged for the longer stay. This program is designed to transition the recovered civilly committed patient to the community.

## Definition of Problems and Opportunities

The State of Washington has a unique opportunity to not only improve access to behavioral health services by providing more capacity, but to reduce the stigma associated with mental illness by creating a more effective treatment model.

The design team and key DSHS stakeholders researched industry best practices. One area of focus was looking at how the built environment impacts levels of aggression and acts of violence within behavioral health facilities. In a review of 122 studies conducted in 11 countries, researchers found that up to one-third of patients admitted to a behavioral health facility will engage in some form of aggressive or violent behavior during their stay. Often, this aggression or violence results in injuries to staff or other patients. Recent research by environmental psychologists have started to reveal strong correlations between the physical environment and the aggressive or violent behaviors.

(Ulrich, Roger S., et al. "Psychiatric Ward Design Can Reduce Aggressive Behavior." *Journal of Environmental Psychology*, vol. 57, 21 May 2018, pp. 53–66., doi:10.1016/j.jenvp.2018.05.002.)

### Design Strategies proven to reduce patient aggression or violence:

#### Improved sight-lines

- Community spaces and patient room doors observable from central location
- Removal of hiding places/alcoves
- Visual connections between staff within facility

#### Positive distractions that reduce stress

- Outdoor areas accessible to patients
- Views to nature or nature-based artwork
- Access to natural daylight

#### Reduction of environmental stressors

- Elimination/reduction of environmental clutter, harsh noise and artificial lighting
- Design for control within patient rooms access areas (music, lighting color/intensity, etc.)

#### Design for low spatial/social density

- Single patient rooms with private toilets
- Minimize bottle-necks/areas of constriction

- Smaller community spaces designed for individuals in crisis
- Ample movable furniture in community spaces to allow patients to regulate relationships with others.

## Program Needs

The design team conducted an interactive workshop with key DSHS stakeholders to discuss:

- Unique patient characteristics and needs
- Staffing
- Space needs
- Key flows and adjacencies

During this workshop the design team reviewed several behavioral health archetypes and reviewed the pros/cons of each option, which became the basis for the concept plan.



Images from project team workshops held at BCRA Tacoma office

## Development of Guiding Principles

The development of the Guiding Principles was a result of Visioning Session #2. The design team presented the DSHS stakeholders with examples of what other similar facilities use as their Guiding Principles, as well as how they have utilized them in the design process and beyond. The DSHS stakeholders agreed that Guiding Principles would help them stay on course with their vision and support them in their decision making. Throughout the day, key words, phrases and ideas were collected that resonated with the stakeholders. The design team took those ideas and generated the following Guiding Principles for this design process.

### PATIENTS

**Warm, residential environment that supports patient recovery and progress** in their treatment.  
A healing environment with a goal of zero injuries, where patients and staff are integrated in partnership.

### FAMILIES

**Families are welcomed and included.** They are comfortable with the safety of their loved ones and themselves.

### STAFF

**The employer of choice** where staff are supported, empowered, high-performing, and inspired. Staff are integrated with patients, safe from harm and confident in the protection of their privacy.

### COMMUNITY

**A Community Asset** / Center of Wellness that invites community members into the facility to break down barriers and create partnerships while maintaining patient privacy.

### STEWARDSHIP

**Flexible, adaptable facilities** intentionally designed to work today and into the future. Net-Zero energy capable for environmental stewardship.

**A facility for mental wellness  
for staff, patients, family,  
and community members.**

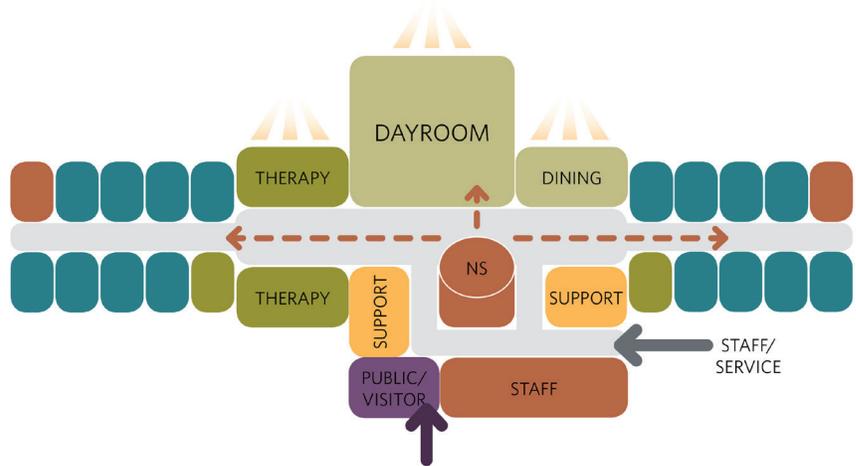


# Floor Plan Diagram Options

During the visioning sessions, the project team looked through several prototypical adjacency diagrams to discover desired layout options.

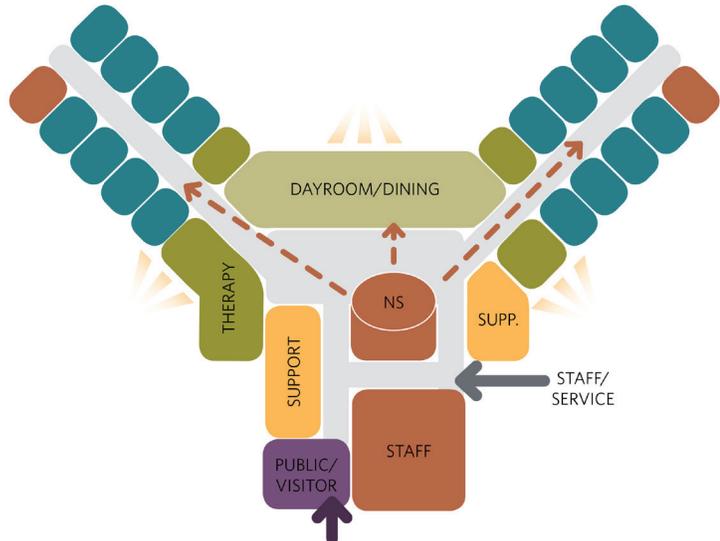
## Option A

- (+) Good sightlines from nurse station
- (+) Access to daylight
- (-) Long straight corridor
- (+) Offices on the unit



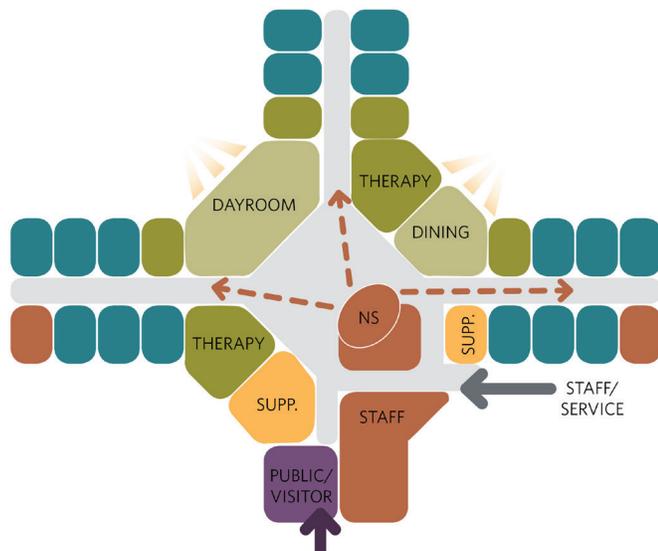
## Option B

- (+) Sightlines from nurse station
- (-) Not able to see whole unit
- (+) Offices on the unit



## Option C

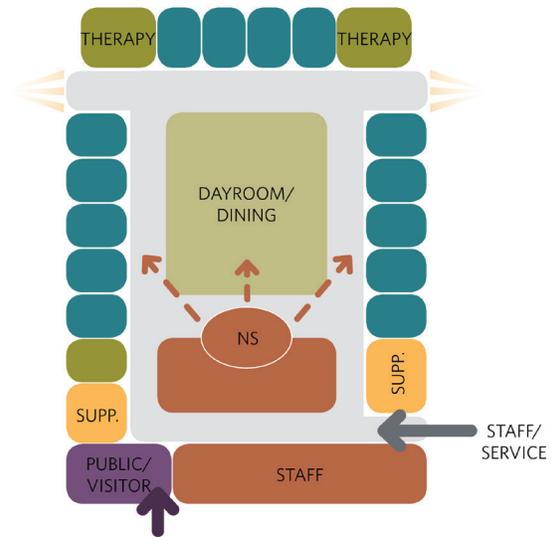
- (-) Not able to see whole unit
- (+) Offices on the unit
- (+) Multiple therapy areas



## Floor Plan Diagram Options

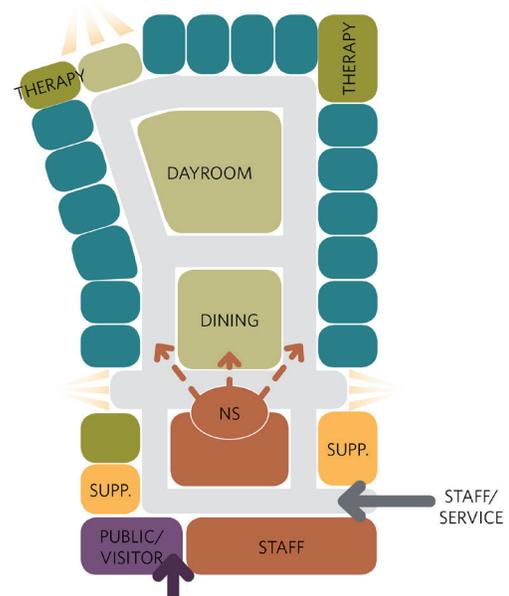
### Option D

- (+) Able to always see whole unit
- (-) Limited access to daylight
- (-) Nurse station not as integrated
- (-) Large open floor plan
- (-) Offices located off the unit



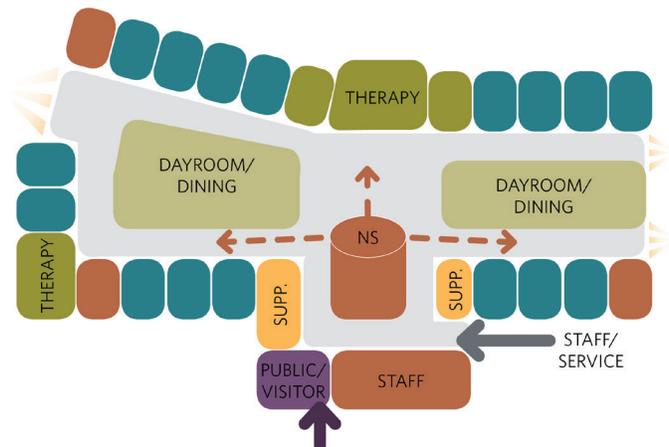
### Option E

- (-) Nurse station not as integrated
- (+) Able to always see whole unit
- (-) Offices located off the unit



### Option F (Preferred Option)

- (+) Good sightlines from nurse station
- (+) Able to always see whole unit
- (+) Multiple dayroom/dining spaces which can allow for different group sizes
- (-) Rooms that open directly onto the community spaces
- (+) Offices on the unit
- (+) Geometry that breaks up long corridors



# Prototypical Space Plan

## Concept Plan

The goal is to create a prototypical plan that would work well for each of the three treatment facilities: Evaluation and Treatment, 90/180, and Step-Down. Facilities will be highly flexible, allowing them to be easily adaptable to any other of these programs in the future. The proposed concept plan breaks the 16-bed facility down into two areas that allow staff to manage the patient milieu.

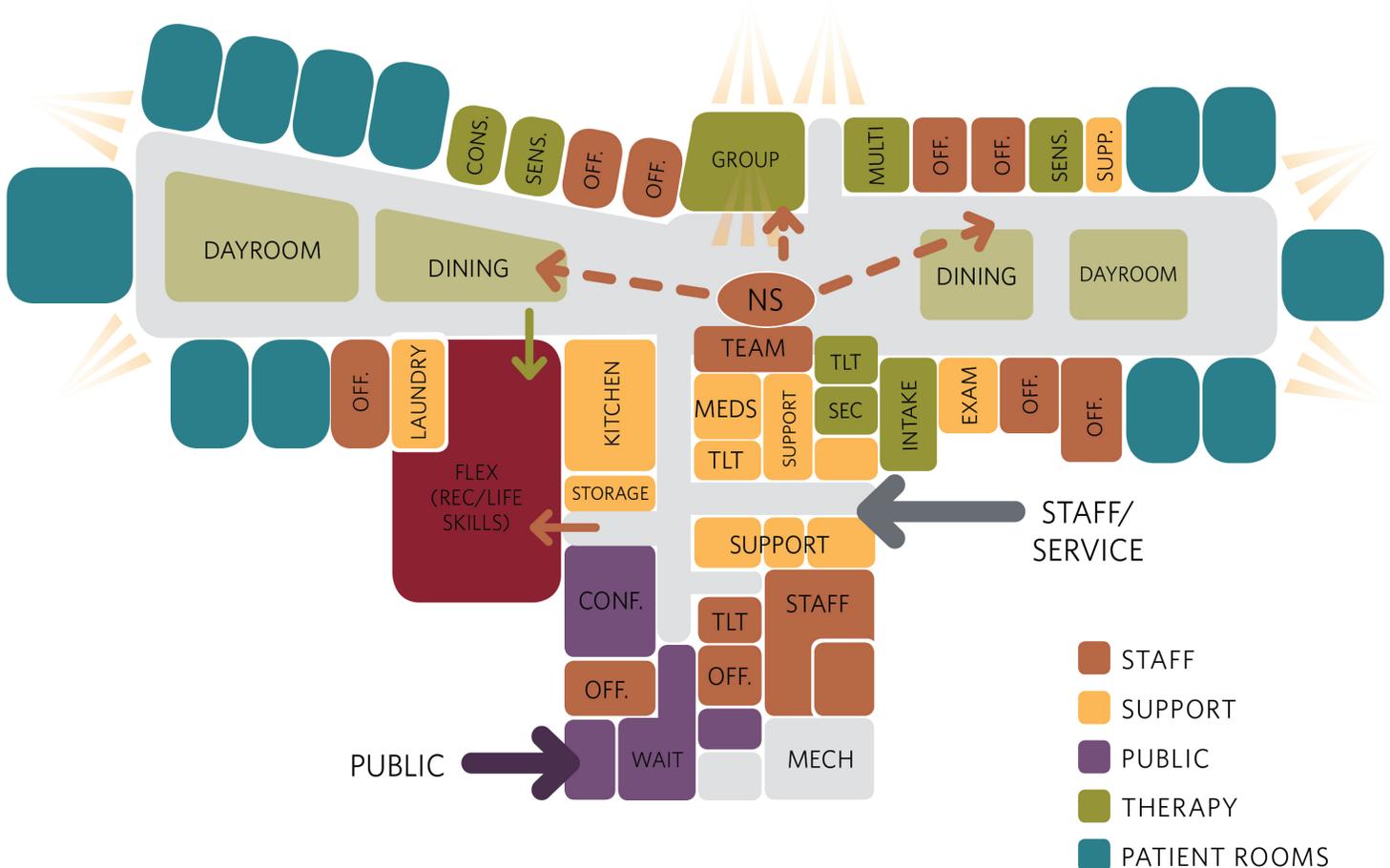
## Other planning strategies include:

- Clear sight-lines to community spaces and patient room doors from central staff team area
- Creating multiple opportunities to bring natural light and views to the outdoors into the central community spaces
- Locating provider/therapist offices and private consult rooms centrally for improved staff efficiency
- Off-stage entry/circulation for staff and support functions (laundry, food service, etc.)

Pros
<ul style="list-style-type: none"> <li>• Provides the most flexibility for future expansion or growth</li> <li>• Less concern with vertical security</li> <li>• More appealing to private operators</li> <li>• Less operational infrastructure to support and maintain</li> <li>• More roof surface area for solar panel system</li> </ul>

Cons
<ul style="list-style-type: none"> <li>• More land required which adds restrictions to potential site locations</li> </ul>

## Adjacency Diagram - single story



# Two-Story Building Analysis

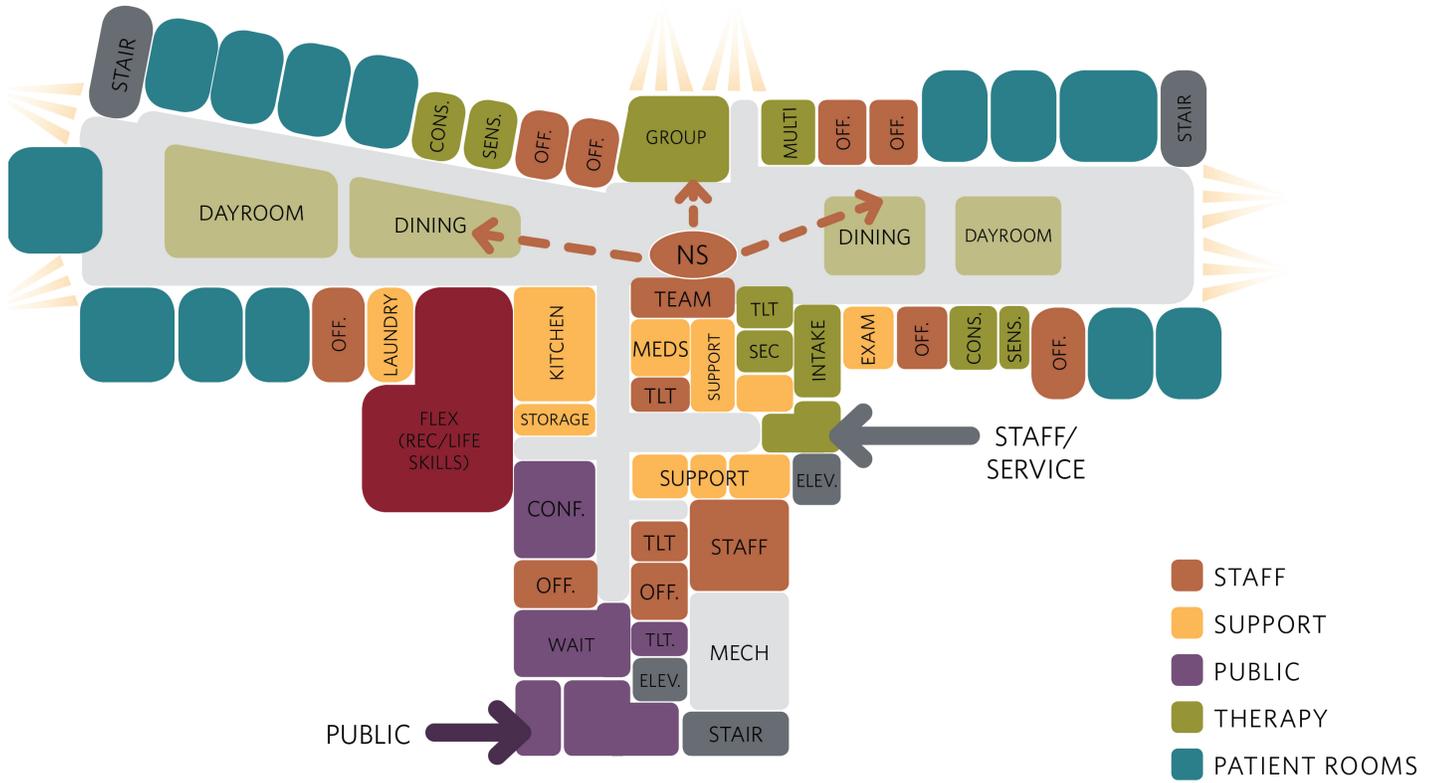
## Concept Plan – 2 Story Option

As some of the potential building sites have a smaller footprint, a two-story building option was also developed. Currently federal requirements limit reimbursements for facilities with more than 16 licensed beds. The 90-180 day and Step-down facilities are licensed differently so these facilities could potentially be stacked rather than be separate, one-story buildings.

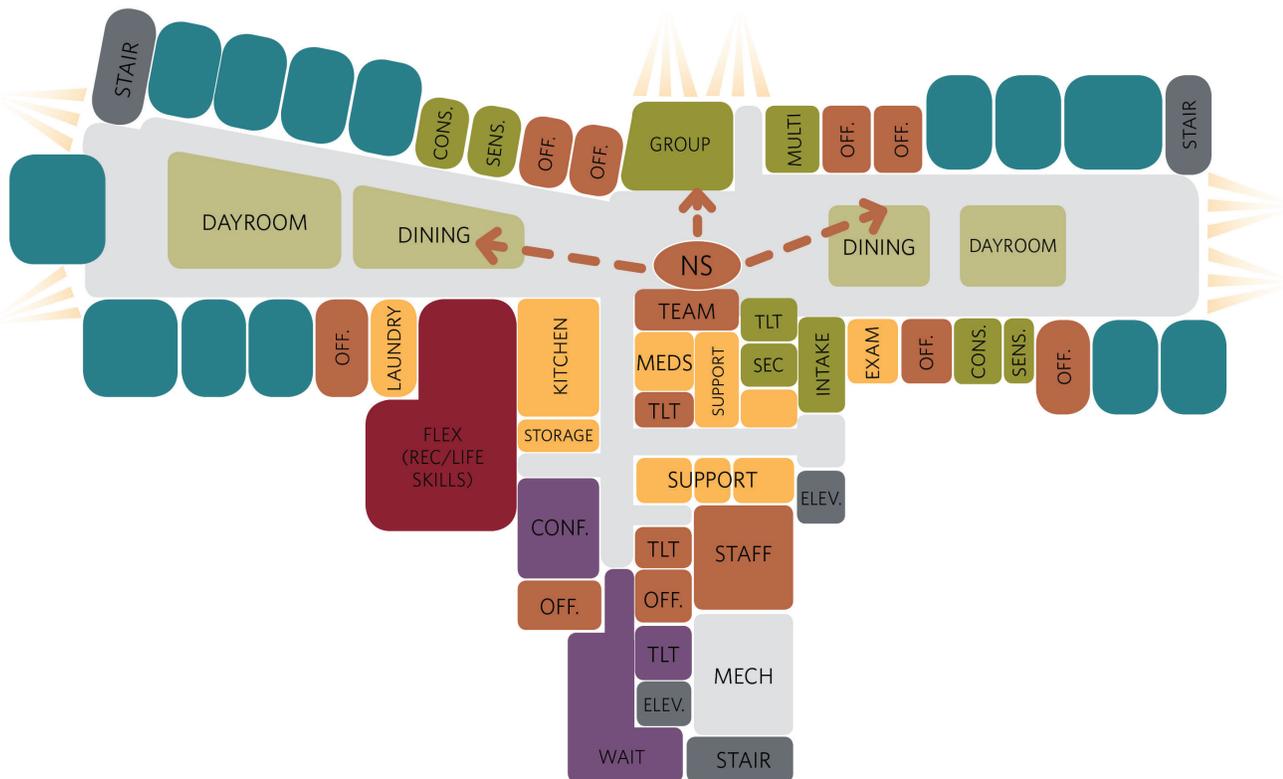
Pros
<ul style="list-style-type: none"><li>• Reduced building footprint accommodates smaller sites</li><li>• Potential to share Mechanical/Electrical systems</li><li>• Smaller roof surface reduces heating/cooling loss</li><li>• Properties greater than 1 acre are difficult to locate in urban areas.</li><li>• Communities are interested in efficient design to maximize available land.</li><li>• Staff familiarity between floors. If each floor is operated by the same organization, then staff can float between floors seamlessly.</li></ul>

Cons
<ul style="list-style-type: none"><li>• The addition of stairs, elevators and shafts increase the overall building area – 38,000sf, 1350sf add per program</li><li>• Assume 2 elevators (one for visitors &amp; one for service)</li><li>• Increased cost for elevators</li><li>• Increased construction costs</li><li>• Increased maintenance cost</li><li>• Potential staffing challenges escorting upper level patients to outdoor activity area</li><li>• Potential sightline/privacy concerns of upper patient outdoor area from ground level patient spaces</li><li>• Need to verify that the combined facility doesn't create an IMD</li><li>• Potential triggering more restrictive building code requirements – IBC construction type due to larger area</li><li>• Reduced roof area will impact solar array sizing</li></ul>

Adjacency Diagram Two Story option - Level One



Adjacency Diagram Two Story option - Level Two



# Evaluation & Treatment (E & T)

State of Washington DSHS Community 48/16

## Summary Information

### SPACE PROGRAM

Room/Area	FGI Guidelines Reference	Safety Risk Level	Requested		Comments	
			Unit	NSF		
<b>Reception/Public Areas</b>			<b>430</b>			
Vestibule			1	120	120	Seating for 6-8. Includes space for family lockers. ADA accessible.
Greeting Area/			1	180	180	
Family Toilet			2	65	130	
<b>Patient Intake Area</b>			<b>695</b>			
Patient Intake		5	1	140	140	Admission area for incoming patients. Assumes shelving for patient gowns & extra clothing.
Patient Belongings		1	1	200	200	
Laundry		5	1	80	80	Locker/cabinet for each patient & area for luggage/oversized items. Alcove located between Intake area & Patient Belongings.
Seclusion Room	2.1-2.4.3	5	1	100	100	Space to store restraint chair/bed Accessible for intake without going through Seclusion room. Also used for urine collection - need water shut-off.
Ante Room		5	1	100	100	
Seclusion Toilet/Shower		5	1	75	75	
<b>Patient Lodging/Care Area</b>			<b>3,975</b>			
Patient Room, Private	2.5-2.2.2.2	4	10	160	1,600	Includes platform bed, desk w/ chair, wardrobe and patient storage.
Patient Room, Semi-Private	2.5-2.2.2.2	4	3	240	720	
Toilet/Shower Room		4	13	75	975	1 phone + 2 video/app-based alcoves - observable from NS Includes space for medication dispensing units, medication cart, computer, small refrigerator, cabinet storage and countertop w/sink. Large laundry sink, 2 washers & dryers & folding counter. Exam/treatment table, sink, lockable storage cabinets, provider desk & Assume 1 room located in each wing.
Phone Alcove		3	3	10	30	
Medications		1	1	120	120	
Patient Laundry		3	1	150	150	Exam/treatment table, sink, lockable storage cabinets, provider desk & Assume 1 room located in each wing.
Exam Room	2.1.3.2.2.1	2	1	140	140	
Quiet/Sensory Room	2.5-2.2.4.3	3	2	120	240	
<b>Community/Program Areas</b>			<b>2,470</b>			
Family Visitation	2.5-2.2.8.1				0	Assume using Multi- purpose & Group room for visitation. Multi-purpose room used as 2nd Consult room.
Consultation	2.5-2.2.6.13	3	1	120	120	
Multi Purpose		3	1	120	120	Used for visitation & consults
Group Room, Large		2 or 3	1	300	300	Multi-purpose space used for group/rec therapy, noisy activities & visitation. Assume counter w/ sink & cabinets for storage.
Dayroom - Large		2 or 3	1	600	600	Assume 2 separate spaces to reduce number of patients within a single space.
Dayroom - Small		2 or 3	1	300	300	
Dining Area	2.5-2.2.8.2(b)	2 or 3	2	250	500	Assume Dining areas are co-located with Dayrooms.
Re-heat Kitchen		1	1	320	320	ADA accessible.
Kitchen Storage		1	1	80	80	
Toilet Room		4	2	65	130	
<b>Tele-Court</b>			<b>700</b>			
Courtroom		2	1	320	320	Primarily used by E&T. Other programs would use less frequency. 90-180 day patients would be transported over to E&T. Adjacent to tele-court space. Includes space for Judge & Clerk King County needs dedicated spaces for defense & prosecutors
Judge's Chamber		1	1	140	140	
Office, Attorney		1	2	120	240	
<b>Support Areas</b>			<b>480</b>			
Clean Supply/Linen		1	1	100	100	Shelving for clean linen & personal hygiene supplies. No hopper sink required.
Soiled Holding		1	1	100	100	
Red Bag Waste		1	1	50	50	Mobility equipment, recreational equipment & etc.
Housekeeping Closet		1	1	80	80	
Equipment Storage		1	2	75	150	
<b>Staff Areas</b>			<b>2,380</b>			
Nursing/Staff Desk		2 or 3	1	140	140	All offices to be on unit except Business office Space for 2-3 4 charting workstations, right sized to encourage staff to be on unit
Team Workroom		1	1	200	200	
Office, Administrator		1	1	140	140	Program director, Nursing director, Clinical director, Business office MD or NP Tech workstation + shelving for records
Office, Private		1	4	120	480	
Office, Provider		2	1	120	120	
Medical Records		1	1	150	150	2-3 desks for Rehab/Recreation & Social Services
Office, Flex		1	1	100	100	
Office, Shared		1	1	150	150	Used for Treatment Planning & Staff Meetings. Sized for 12 people. Small space w/ comfortable chair, dimmable light, small counter w/ sink & undercounter refig Assumes space for table/chairs, full size refig, microwave, coffee 8-10 staff during day. 6 evening. 4 overnight. Half sized lockers, not
Staff Toilet & Shower		1	2	80	160	
Conference Room		1	1	300	300	
Respite/Lactation		1	1	120	120	
Staff Break		1	1	240	240	
Staff Lockers		1	1	80	80	
<b>Mechanical</b>			<b>350</b>			
<b>Subtotal</b>			<b>11,480</b>			
<b>Total</b>			<b>16,646</b>		1.45 Multiplier ranges from 1.40 - 1.50 DGSF	

END OF SPACE PROGRAM

Evaluation & Treatment (E & T)

# Engineering Summary

## Prototype Building

### Introduction

There are a series of design elements that will be consistent regardless of knowing which final site is to be chosen for these facilities. The following are brief descriptions of the design approaches as they relate to the site, sustainability, mechanical, electrical, and plumbing designs.

### Electrical Service

Each 16 Bed facility will be treated as an independent facility. Each 16 Bed will have its own utility service entrances for utility power, emergency power, telecommunications, cable television, internet, etc.

Normal power will be distributed to electric rooms in each facility and branch circuits will supply power to all electrical fixtures and devices from these electric rooms.

### Essential Power

An optional power generator will be provided to pick up select building loads. The generator will be locally positioned to serve power directly and exclusively to this building. This generator will have a 96 hour fuel supply local to the generator.

Emergency Power (NEC Article 700) for egress and communications will be provided by a central battery inverter.

An Optional Power branch will be provided by the local generator through an automatic transfer switch and will serve total redundant power to the building.

### Lighting

Lighting will be accomplished using LED lighting fixtures with features that allow dimming and in specific locations will be tunable for light color.

Ligature resistant lighting fixtures will be provided in all Patient accessible areas.

Tunable lighting will be provided in Sensory and Seclusion Rooms. Amber night lights will be provided in patient bedrooms.

Exterior lighting will be LED fixtures.

Lighting controls will vary from fully automatic lighting in public spaces using occupancy sensors and daylighting controls to (manual dimming) lighting control in patient rooms. All controls will be localized to the area of use. Patient rooms will have Staff override switching for lighting, whether it is to be global or local per room will be determined during building design.

### Power Distribution

Individual building power panels will be provided.

Patient rooms and Seclusion rooms will not have receptacles installed.

### Telecommunications

Each building will have a main distribution facility (MDF). Intermediate Distribution Facilities may be needed in the facility if the MDF is more than 200' from any location in the building. Multi-story facilities will have an IDF room on each floor. Cable will be based on CAT-6A cabling.

Wireless connectivity may be available to Patients, Staff, External Providers (Doctors) and Visitors over multiple wireless networks.

### Television

- Television (TV) outlets will be provided in common areas, not in patient rooms in the 90-180 facilities.

### Audio/Visual

- Patient rooms will be provided with music and ambient sound generators.
- The Multi-Purpose room will be provided with an Audio Visual (A/V) system including music and ambient sound generators.

### Telecourt

- 90-180 facilities will have a Telecourt including cameras, televisions, data/voice and A/V systems.

### Solar Power - Net-Zero Alternate

Solar photovoltaic (PV) power that would allow for 100% offset of the building's annual energy consumption will be planned as an alternate for the facilities. Lighting will be made 20% more efficient than the base. Connection to the building electrical system for distribution back to the electric utility will be provided. the electric utility will be provided.

# Engineering Summary

## Prototype Building

### Fire Alarm

The Fire Alarm system will consist of a local main fire alarm panel in each building reporting back to the central campus fire alarm monitoring location over fiber for all DSHS campus facilities. Other locations will have full fire alarm systems with requirements determined for the specific facility during the building design.

Initiation devices will consist of smoke detectors located in strategic areas.

Notification appliances will consist of voice alarm speakers and visual alerting devices (Speaker/strobes).

The fire alarm system will need to be closely coordinated with the local Fire Marshal's office to provide a system that provides for a safe environment and is the least disruptive to the residents and staff.

90-180 facility exterior doors will not unlock on Fire Alarm but will unlock on Fire Sprinkler Flow. Step-down facility exterior doors will not be locked.

### Security

Security will include intrusion detection, access control, security video, panic alarms, and wander control. Security features for lockdown may also be anticipated. Panic Alarms will be provided in Nurse Station areas. Portable, worn on Staff, alerting and alarming systems will be provided as part of the Nurse Call system.

### Nurse Call

Nurse Call will be provided to allow for two way voice communications between each Patient bed and the Nurse Station serving the bed. Each Patient bed will have a ligature resistant nurse call station including a staff assist pushbutton. Bath, Shower and Toilet rooms will have ligature resistant assistance call cords.

The nurse call system will provide portable Staff devices that will allow the staff to receive nurse calls while away from the Nurse Stations.

Wearable Staff duress alarms will be provided as part of the nurse call system.

### Heating, Ventilation and Air Conditioning

The mechanical system will be comprised of a Variable Refrigerant Flow (VRF) system with a Dedicated Outdoor Air System (DOAS) for ventilation air. There will be three DOAS units serving the building delivering tempered ventilation air to individual Variable Air Volume (VAV) dampers at each space. This system provides for individual control in patient rooms and staff control in staff offices and common spaces. Ligature resistant supply and return grilles will be provided in all patient rooms.

### Plumbing

Behavioral healthcare ligature resistant plumbing fixtures and floor drains are to be utilized for all areas throughout the building including Staff/ Service areas. Lavatories and water closets will be provided with low flow fixtures. Shower heads will utilize limited flow cartridges.

### Sustainability

The facility will strive to provide an environmentally sensitive impact in keeping with the mission of this project to provide a safe, restorative and healing environment for those in need.

LEED V4 Silver minimum will be achieved for this project. The LEED items targeted are strategically selected to be minimal cost and highest benefit to the environment and building occupants.

Accountability to the executive order 18-01 will be achieved.

- Site selection to reduce carbon impacts – accounted for in this document
- Have a strategic technical consultant on the project
- Durable envelope design, efficient HVAC system with submetering and graphic dashboards is incorporated into 18-01 cost premiums
- Target low Embodied Carbon through project design and construction strategies
- Design for renewables and energy storage using solar photovoltaics (PV) to offset annual operational energy use, achieving net zero energy.

### Site Design

The area around each building' will be designed to provide adequate storm water treatment and/or retention. The topography will be modified as minimally as required to provide proper drainage and natural landscaping elements.

# Criteria to Evaluate Site for Project Implementation

## Site Development/Permitting

### Permitting

- Land Use Requirements - It is ideal if the site allows the 90-180 use outright. Second choice would be if a use permit process is required. Public Processes can be risky.
- Timeline to Achieve Building Permit
- Ability/Timeline for Jurisdiction to approve plans
- Master Plan Status - on site where it applies

### Land Size and Configuration

- Evaluate if property shape and topography support desired building configuration and site circulation

### Off Site Development Requirements

- Work with Authority Having Jurisdiction (AHJ) to determine extent of off-site improvements. This includes Jurisdiction-required right-of-way (ROW) improvements for items such as sidewalks, landscaping, curb, and gutter. Understand preliminary cost implications.

### Utility Availability / Stormwater

- Study available utilities, electricity, water, sewer, gas, and communications. Determine preliminary connections, routing, and possible obstructions. Understand preliminary cost implications.
- Stormwater strategy - creating preliminary strategy for dealing with stormwater.

## Site Amenities

### Shared Facilities

- Is there an on-site kitchen or laundry that would provide services?

### Transportation / Location

- How close is the site to I-5 or other major highways?
- Is the site accessible for families?
- Is public transportation available to the site?
- What is the distance from the site to Western State Hospital?

### Vocation / Recreation space

- Are there existing vocational programs nearby?
- Is there adequate space for recreation activities?

### Healing Environment

- Does the environment have access to nature?
- What is the feel of the adjoining neighborhood?

### Purchased Services

- Are contracted food services available?
- Are contracted laundry services available?

## Community Assets

### Regional Need

- Does this location fit into the State's larger plan to provide community-based facilities located along the I-5 corridor?
- Would the location be near where there is a noted, significant need?

### Access to Healthcare

- Can patients obtain dental, optical, and other healthcare services nearby?

### Access to other Mental Health services

- What is the distance to the nearest E&T Facility?

### Staff Availability

- Does the area around the chosen site have an adequate supply of potential employees?
- Would that availability serve the anticipated capacity?

### Community Receptiveness

- Has the surrounding community communicated desire for this type of facility?
- Is the local leadership supportive of the project?

## Decision Matrix

In order to solidify the preferred site, the Site Criteria has been utilized to rank each location based on a scale of 1-5 from lowest to highest where:

- 1 describes a poor, or potentially problematic site, condition, or process (such as land-use or permitting)
- 5 describes a highly-desired site based on the potential layout or utility solutions, adjacency to supportive entities, or the receptiveness of the surrounding community.

	Fircrest School	Western State	Echo Glen	Maple Lane	Clark County	Snohomish County
<b>Site Development / Permitting</b>						
Permit (Complexity and Duration)	2	2	3	3	3	3
Off-Site Development Requirements	3	3	4	3	3	3
Utilities Available	2	2	2	3	4	3
Land Size and Configuration	4	2	3	4	4	3

The preferred option for Maple Lane is supported by the fact that the site has functioned in the past as a behavioral health facility so permitting is readily achievable but will require a master plan update. Some off-site frontage work will be required by the county. Utilities are available and will have to be negotiated with corrections to determine what will be made available to this project. Adequate land size is available.

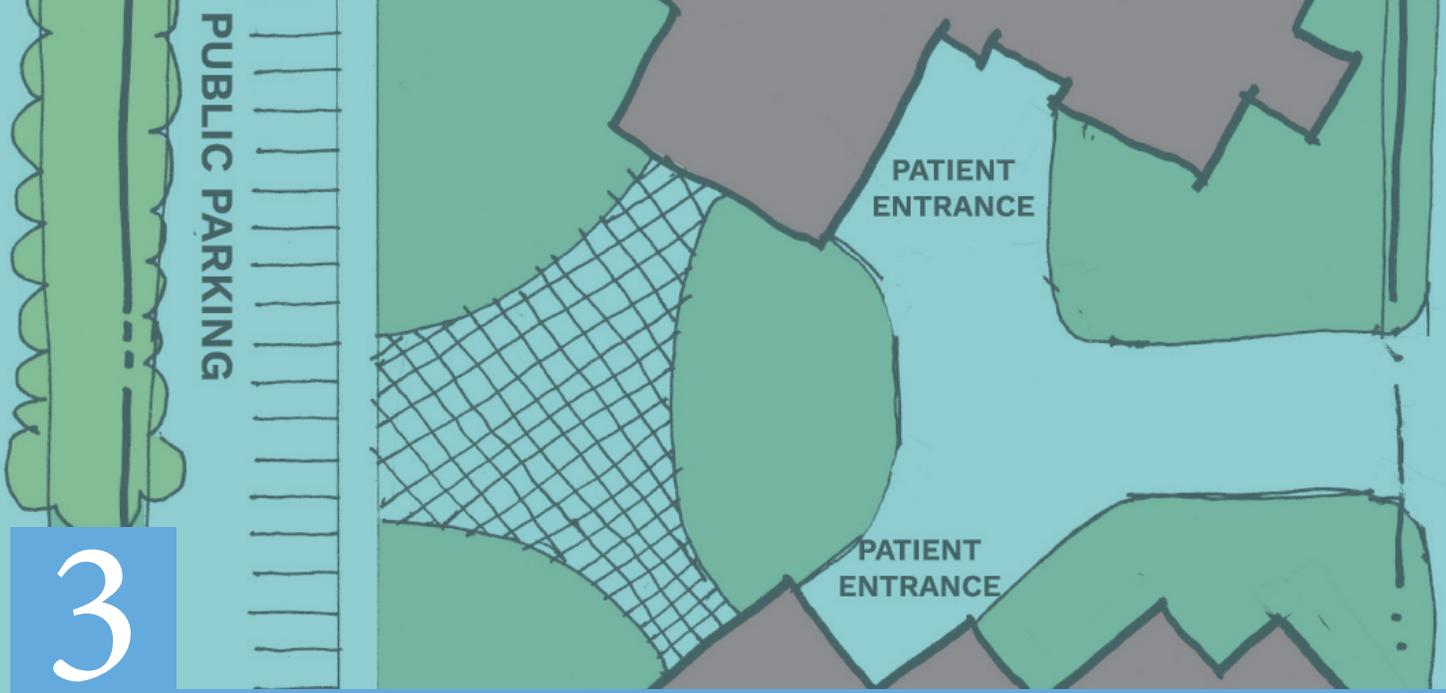
<b>Site Amenities</b>						
Shared Facilities	3	3	1	3	3	3
Transportation	4	4	3	3	3	3
Vocation / Recreation Space	3	3	3	3	3	3
Healing Environment	5	2	5	3	3	3

Shared amenities are not likely between corrections and mental health at Maple Lane as the programs need to be kept separate. Fircrest and Echo Glen have the best environments to support mental health treatment.

<b>Community Assets</b>						
Regional Need	1	1	3	5	1	1
Healthcare facilities nearby	5	4	5	3	2	3
Access to other Mental Health	3	5	4	4	4	3
Staff Availability	5	5	2	4	4	3
Community Receptiveness	3	2	3	4	4	3

Southwest Washington has a significant need and desire for behavioral health services, both 90 to 180-day civil commitment and evaluation and treatment. A high score in staff availability indicates the availability of psychiatric staff nearby.

<b>TOTAL SCORE:</b>	43	38	41	45	41	37
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# Analysis of Alternatives

16-BED STATE-OWNED COMMUNITY CIVIL FACILITY

## Considered Alternates

- NA** **Alternative 1 - No Action-No New 16-bed Facility**
- FS** **Alternative 2 - Fircrest School**  
Two locations studied for location on Fircrest School Campus for a new 16-bed facility.
- WS** **Alternative 3- Western State Hospital**  
Location south of existing Buildings 28 and 29 on Cottage Row for a new 16-bed facility.
- EG** **Alternative 4 - Echo Glen**  
Location southwest of existing Administration Building for a new 16-bed facility.
- ML** **Alternative 5 - Maple Lane**  
Location east of existing support buildings for a new 16-bed facility.
- CC** **Alternative 6 - Clark County**  
Locations evaluated include four in the City of Vancouver for a new 16-bed facility.
- SC** **Alternative 7 - Snohomish County**  
8 locations reviewed for a new 16-bed facility.



# No Action Alternative #1

## **Alternate 1 - No Action-No new 16-bed Facility**

The state will continue to provide treatment with the current number of beds that remains well below the need, while the need continues to increase. This current configuration does not serve the current model of care.

Additional costs on the current number of beds will be incurred due to housing a low acuity population in a hospital facility rather than a residential setting. For the population that does not have access to these or the existing civil beds, costs will be incurred in other settings around the state.



# Fircrest School Campus

## Alternative #2

### Site Overview:

Fircrest School Campus is a 88-acre State-owned property in Shoreline, WA just north of Seattle. The Fircrest School provides support to approximately 200 individuals with intellectual disabilities in a residential setting. The school programs include (i) long term nursing care for individuals with intellectual disabilities, (ii) intermediate care for individuals with an intellectual disability, and (iii) an on-campus adult training program (ATP) for individuals with intellectual disabilities. The campus includes several program and accessory operational buildings to support facility functions. Several other buildings, such as the port laboratories and ATP building, are also located on the property. The campus has a large number of mature trees and several forested areas.



Aerial Photo

Map Data: Copyright 2019 Google

# Preliminary Site Layout - Fircrest School Campus

## Building Area 1: North

Building Area 1 has three existing nursing buildings that would need to be demolished in order to make room for the new program. The area's topography is the biggest challenge with a variety of large slopes and existing underground utilities.



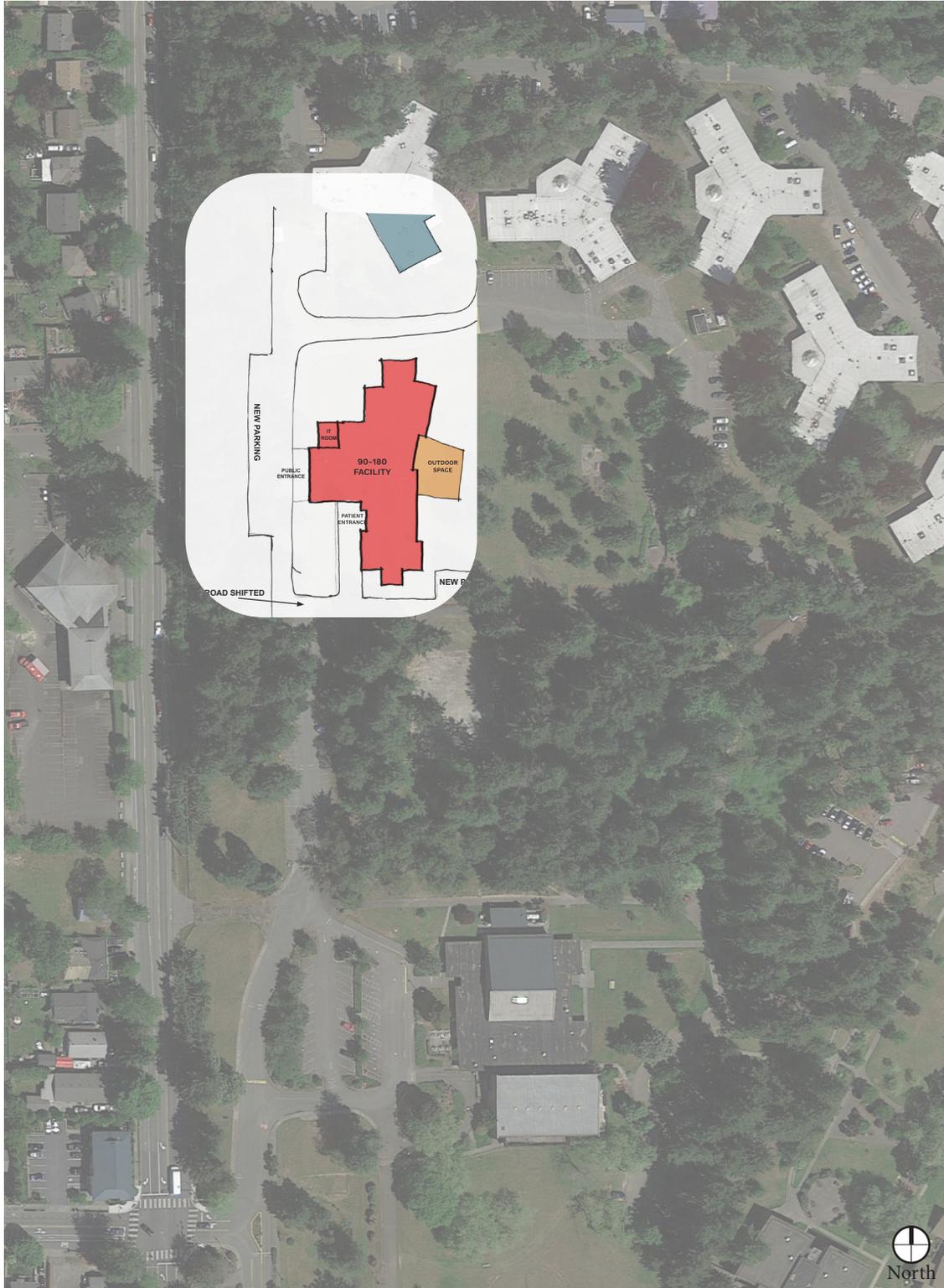
Enlarged Site Plan with prototype building layout

Map Data: Copyright 2019 Google

# Preliminary Site Layout - Fircrest School Campus

## Building Area 2: Northwest

Buildings can be constructed without the demolition of the Y buildings. The department would prefer the buildings to be constructed as close to the northern property line and to demolish the Y buildings after a nursing building is constructed. The land in Building Area 2 has been cleared from the previous building and has a slight topography change that would be adjusted to provide an additional access road. This is the current preferred option to construct a 120 bed nursing facility to serve those at Fircrest.



Enlarged Site Plan with prototype building layout

Map Data: Copyright 2019 Google



### Site Topography

The site is located on the Fircrest Residential Habilitation Center campus in Shoreline, Washington. The site is flat with approximate elevations ranging between 345 and 349, sloping to the south.

### Storm Drainage

The site does not currently have any water quality or flow control facilities. Per the National Resources Conservation Service (NRCS), the site soils are very gravelly sandy loam and are moderately well drained. The City of Shoreline currently uses the 2012 Stormwater Manual for Western Washington, as Amended in December 2014 for storm drainage design. This site will trigger requirements for a redevelopment, including stormwater flow control and water quality treatment. This manual requires that stormwater discharges match pre-developed discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow to meet flow control requirements. The pre-developed condition is defined as forested land cover. An open detention pond or underground detention pipes meet flow control requirements. Enhanced treatment will likely be required for the pollution generating impervious surfaces. We anticipate that the treatment facility will be an above ground bioretention or a mechanical system such as a Filterra.

### Water Systems

Existing water lines onsite are all demolished, capped, in poor condition, and not available for reuse. The project cannot tap into the campus water system for this site. Existing water lines onsite for the campus are undersized and do not provide adequate fire flow. Public water lines are located along 15th Avenue NE and NE 150th Street. New fire service and domestic water could be provided from the public right-of-way. A fire main loop around the building is anticipated to meet fire hydrant spacing requirements. The campus water system will need to be studied to determine which water mains must be repaired or replaced to serve new buildings. Providing fire storage tanks may be an option to provide sufficient fire protection, but an estimated cost of this has not been included in this study. Fire tanks will need to be included within the study of the campus water system.

### Sanitary Sewer

Sewer lines along the east side of the site are new and are available for connection.

### Power and Gas Availability

Campus normal power is available near the site. The gas line to the west of the site is capped. According records obtained by AHBL, a gas line runs along the west side of 15th Ave NE.

### Offsite Improvements

Public transit is located on 15th Avenue NE. The site has easy access for the residents and the public from 15th Avenue NE or NE 150th Street. Because of its proximity to the street, the City would likely require frontage improvements along NE 150th Street, 15th Avenue NE, and their intersection. We anticipate these improvements will consist of concrete sidewalk, landscape strip, and intersection ADA ramp improvements at a minimum..

### Electrical Systems

Normal power electric service to each building will be served from a new 500 kVA outdoor pad mounted transformer. This transformer will be connected to the campus power system. If feasible, the three buildings will be combined and served from a single transformer.

New underground feeders will provide service to a new indoor switchboard located in each facility.

The existing site electrical infrastructure will be extended to serve these new facilities. A new exterior pad mount switch will be provided to allow for the extension of new power to each facility

Campus-supplied standby power will not be provided to these facilities.

Standby Power will be provided by a local generator for the building and will not be provided by the campus standby power system.

The campus telecommunication fiber network will be extended to these facilities from Building 66 main site distribution facility.

# Review of Laws, Regulations, and Permitting - Fircrest School Campus

## WAC State Requirements

The project will be required to be licensed as a Residential Treatment Facility by the Washington State Department of Health. The project will be secure and locked complying with WAC 246-337 Residential Treatment Facility code section.

Other codes the project will comply with include:

- 2018 International Building Code
- 2018 International Mechanical Code
- 2020 National Electric Code (NFPA 70)
- 2018 FGI Guidelines for Design and Construction of Residential Health Care, and Support Facilities.
- 2018 Washington State Energy Code
- 2015 Health Care Facilities Code (NFPA 99)
- 2012 Life Safety Code (NFPA 101)
- Behavioral Health Design Guide – Edition 9.0

## Energy Requirements

The Governor’s Office Executive order 18-01 states that “...all newly constructed state-owned buildings shall be designed to be zero energy or zero energy-capable, and include consideration of net- embodied carbon. In unique situations where a cost effective zero-energy building is not yet technically feasible, buildings shall be designed to exceed the current state building code for energy efficiency to the greatest extent possible.”

## Accessibility

Americans with Disabilities Act (ADA) accessibility for all spaces is critical not only for Behavioral Health patients, but for any staff, volunteers and visitors who require accessibility and all who are deaf, hard-of-hearing, blind, wheelchair users, people with mobility challenges, etc.

## Centers for Medicare and Medicaid Services

The Joint Commission’s Environment of Care Standard EC.02.06.05 states the Joint Commission expects organizations to assess building design and construction requirements based on local, state, and federal regulations and codes.

Typically, the state health department licensing entity is the authority having jurisdiction (AHJ), and health care organizations must comply with the AHJ’s licensing rules to obtain approvals to operate. When state regulations are silent on a specific design criterion, the Joint Commission recognizes the 2014 Facility Guidelines Institute (FGI) Guidelines for Design and Construction of Hospitals and Outpatient Facilities for new construction and renovation.

Participation in the Centers for Medicare and Medicaid (CMS) programs requires that the facility also be designed to comply with the requirements of the National Fire Protection Associations’ Life Safety Code 101 (2012 Edition) and all referenced codes. When a conflict exists between the Federal requirement and the State building code, the most restrictive provision of code shall be implemented. The design team will work with the various AHJ’s (planning, building, and fire) to proactively resolve code related conflicts in advance of completing the design.

## Permitting

The Fircrest School is subject to the City of Shoreline’s Municipal Code. A MDP and a special use permit will be required. Currently the city is re-writing its Master Development Plan requirements and there is a moratorium on MDP submittals. It is our understanding that the moratorium will be lifted by mid-2020, at which time a master development permit and a special use permit can be applied for concurrently. The review process for the MDP and Special Use permit could take between six to nine months.



Building Area 1: North



Area 2: Northwest

## Pros and Cons

### Pros

- Availability of professional staff
- Access to I-5 and other main arterial roads
- Relationship with UW Medical School
- Campus support from Fircrest (maintenance, food services, etc)
- Healing environment

### Cons

- Small parcels of land
- Premium pay for professional staff
- Close to park and high school
- Would require master plan update

## Scorecard - Fircrest School Campus

### Site Development / Permitting

Permit (Complexity and Duration)	2
Off-Site Development Requirements	3
Utilities Available	2
Land Size and Configuration	4

- Fircrest was scored low on permitting due to the additional step fo getting the master development plan approved in additional to a Conditional Use Permit
- Off-site development was rated neutral as the project did not appear to trigger any off-site improvements.
- Utilities are available on site but likely will trigger expensive upgrades or extensions
- Sites evaluated appear to be of adequate size

### Site Amenities

Shared Facilities	3
Transportation	4
Vocation / Recreation Space	3
Healing Environment	5

- Scores high with possible shared facilities like food or laundry services
- Located with ample public transportation nearby
- There are currently no outdoor recreation spaces on site
- The environment is open with trees and access to the natural environment.
- Maintenance staff exists on campus and can be added to support a new facility.

### Community Assets

Regional Need	1
Healthcare facilities nearby	5
Access to other Mental Health	3
Staff Availability	5
Community Receptiveness	3
<b>TOTAL SCORE:</b>	<b>43</b>

- Fircrest is supported by health care services, including hospitals and private practices, nearby
- Access to I-5 is good if transport is required to or from Western State
- The community seems receptive although there is some resistance from the city currently
- Psychiatrists are available from the University of Washington
- Large population base from which to attract staff



# Western State Hospital Alternative #3

## Site Overview:

Western State Hospital (WSH) in Lakewood, WA is a 288 acre, State-owned campus. The Governor's 2019-21 Biennial Budget proposed evolving the state psychiatric hospitals into Forensic Center of Excellence and closing the hospitals to civil commitment admissions by the end of 2023. The 2019-21 Enacted Budget supported his vision and provided funding for predesign of a 250-350 bed new forensic hospital, and the study of community based civilly committed beds.

The Department of Social and Health Services is also studying the addition of a new 48-bed civil commitment facility on the WSH campus as part of Governor Inslee's 5-year plan. The WSH campus offers advantages of existing staff, services and infrastructure to keep operational costs of that facility low.



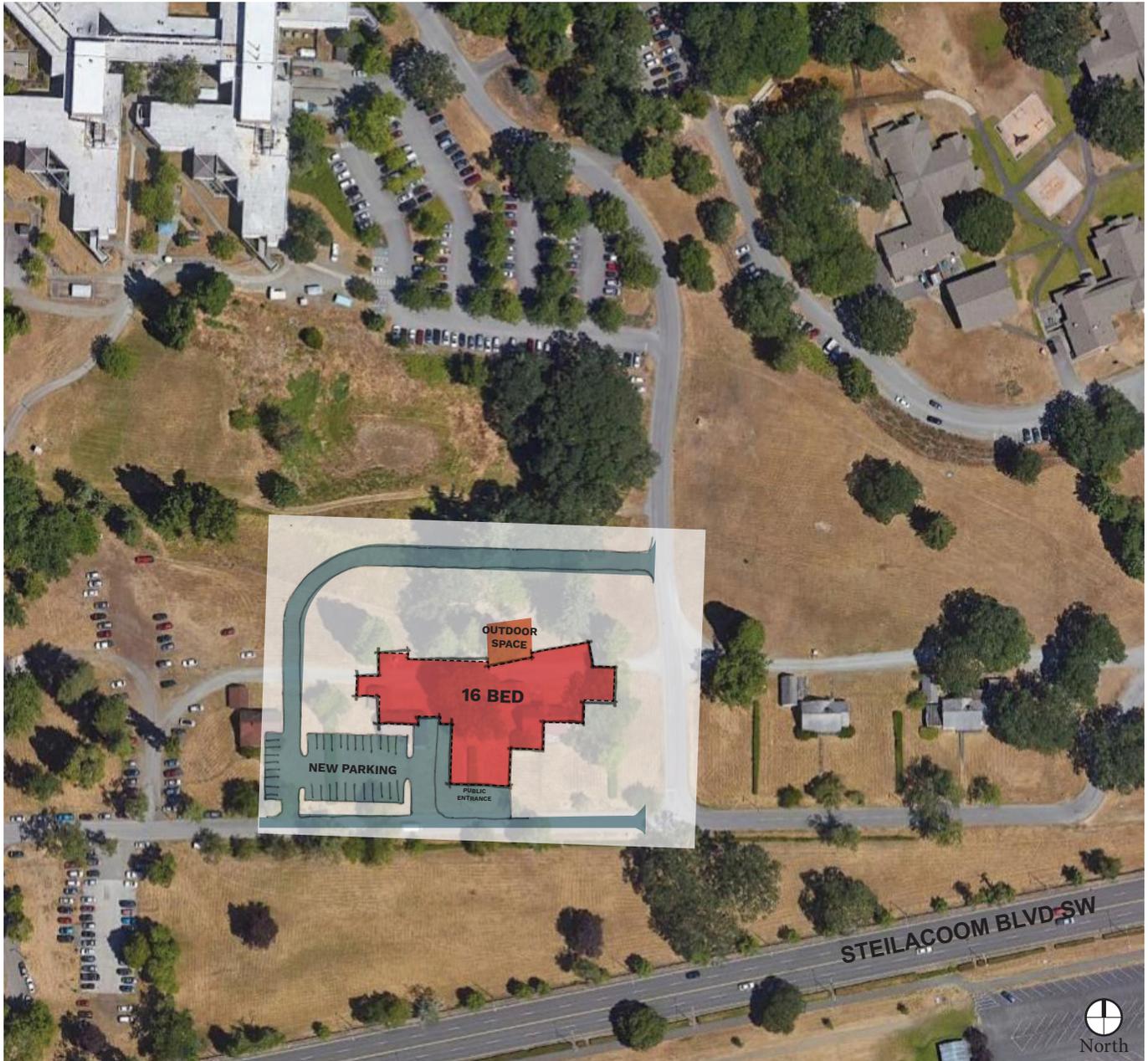
Aerial Photo

Map Data: Copyright 2019 Google

# Preliminary Site Layout - Western State Hospital

## Layout Description:

Siting of the 16-bed facility is in coordination with the development of the updated Western State Hospital Campus master plan and forensic building design. The targeted location directly abuts Child Study and Treatment Center and the historic Fort Steilacoom along Steilacoom Boulevard. The site currently has officers' quarters and a storm pond. The officers' quarters will be removed prior to development. The storm pond will also need to be relocated as part of the work.



Enlarged Site Plan with prototype building layout

Map Data: Copyright 2019 Google



## Engineering Narratives - Western State Hospital

### Topography

The project site is within the DSHS campus containing Western State Hospital and is currently developed with several buildings and supporting infrastructure. The proposed site is near the center of the general campus. Specifically, the site is bordered by the existing Forensic Hospital to the north, the access drive serving the existing Forensic Hospital to the east, Fort Street to the south and the Historic Fort Steilacoom area to the west.

The site has a local low spot in the northern portion of the subject area which appears to be an infiltration pond that serves the existing Forensic Hospital. There is roughly a 30-foot elevation change based on Pierce County GIS data. The site is generally flatter in the southern half. It is anticipated that there will be some grading necessary to develop the building pad and parking lot.

### Storm Drainage

The existing storm drainage system consists of a network of pipes and catch basins. There appears to be some above ground infiltration facilities to dispose of stormwater.

The project will comply with the applicable edition of the Department of Ecology Stormwater Management Manual for Western Washington as amended by the City of Lakewood. The National Resources Conservation Service (NRCS) classifies the onsite soils as Spanaway gravelly sandy loam (0-3% slopes) which are generally favorable to infiltration. Given this information as well past experience, it is assumed that the project will provide flow control through onsite infiltration. Water quality facilities to treat stormwater runoff from areas subject to vehicular traffic will be designed in accordance with the Stormwater Management Manual.

There appears to be an infiltration pond that serves the existing Forensic Hospital located on the subject site. At least the majority, but more likely all of the pond will need to be filled and replaced with commensurate underground storage and infiltration system. This will be in addition to the stormwater infiltration facility needed for the project.

### Water Systems

The Western State Hospital makes its own water with its wells and reservoirs. There are existing mains within the subject site. The project will connect to the existing mains. Depending on the exact siting of the building and associated improvements, relocating a portion of the existing mains might be required. Further coordination to determine exact requirements will be needed during the final design of the project.

### Sanitary Sewer

The existing site is served by sewer. The Town of Steilacoom is the sewer purveyor for the site. There is an existing main within the subject site. The project will connect to the existing main. Depending on the exact siting of the building and associated improvements, relocating a portion of the existing main might be required. Further coordination to determine exact requirements will be needed during the final design of the project.

### Power and Gas Availability

Tacoma Power is the purveyor for power and Puget Sound Energy (PSE) is the purveyor for gas. The site currently has both power and gas service. Further coordination will be needed to determine if the current infrastructure has capacity to serve the proposed project.

### Offsite Improvements

The City of Lakewood classifies Steilacoom Blvd SW as a principal arterial. The 2018 City of Lakewood standard street section for a principal arterial street shows an 80-foot right-of-way with five vehicle lanes and a planter and sidewalk. Currently, Steilacoom Blvd SW has a 60-foot right of way with four vehicle lanes and no sidewalk on the project side of the street. Improvements may not be needed with this project since it is within the greater DSHS campus. Coordination with City of Lakewood will be required to determine if any frontage improvements will be required.

**Electrical Systems**

Normal power electric service to each building will be served from a new 500 kVA outdoor pad mounted transformer. This transformer will be connected to the campus power system. If feasible, the three buildings will be combined and served from a single transformer.

New underground feeders will provide service to a new indoor switchboard located in each facility.

The existing site electrical infrastructure will be extended to serve these new facilities. A new electrical cut-out switch will be provided on site that will monitor the power company utility power and will disconnect the new facilities from the campus power source in the event of a power outage as it is assumed the site generator is not large enough to pick up the new facilities. A new exterior pad mount switch will be provided to allow for the extension of new power to each facility. Refer to General Electrical Conditions for distribution inside each building.

Site supplied standby power will not be supplied to these facilities at this time as the existing site generator is assumed to not be large enough to accept the new loads. Refer to General Electrical Conditions for essential power distribution throughout each building.

The campus telecommunication fiber network will be extended to these facilities from the main site distribution facility. Refer to General Electrical Conditions for telecommunications distribution inside each building.

Refer to General Electrical Conditions for lighting, power, equipment connections, fire alarm, security, nurse call, and solar power for each building.

## Review of Laws, Regulations, and Permitting - Western State Hospital

### WAC State Requirements

The project will be required to be licensed as a Residential Treatment Facility by the Washington State Department of Health. The project will be secure and locked complying with WAC 246-337 Residential Treatment Facility code section.

Other codes the project will comply with include:

- 2018 International Building Code
- 2018 International Mechanical Code
- 2020 National Electric Code (NFPA 70)
- 2018 FGI Guidelines for Design and Construction of Residential Health Care and Support Facilities.
- 2018 Washington State Energy Code
- 2015 Health Care Facilities Code (NFPA 99)
- 2012 Life Safety Code (NFPA 101)
- Behavioral Health Design Guide – Edition 9.0

### Energy Requirements

The Governor’s Office Executive order 18-01 states that “...all newly constructed state-owned buildings shall be designed to be zero energy or zero energy-capable, and include consideration of net- embodied carbon. In unique situations where a cost effective zero-energy building is not yet technically feasible, buildings shall be designed to exceed the current state building code for energy efficiency to the greatest extent possible.”

### Accessibility

Americans with Disabilities Act (ADA) accessibility for all spaces is critical not only for Behavioral Health patients, but for any staff, volunteers and visitors who require accessibility and all who are deaf, hard-of-hearing, blind, wheelchair users, people with mobility challenges, etc.

### Centers for Medicare and Medicaid Services

The Joint Commission’s Environment of Care Standard EC.02.06.05 states the Joint Commission expects organizations to assess building design and construction requirements based on local, state, and federal regulations and codes.

Typically, the state health department licensing entity is the authority having jurisdiction (AHJ), and health care organizations must comply with the AHJ’s licensing rules to obtain approvals to operate. When state regulations are silent on a specific design criterion, the Joint Commission recognizes the 2014 Facility Guidelines Institute (FGI) Guidelines for Design and Construction of Hospitals and Outpatient Facilities for new construction and renovation.

Participation in the Centers for Medicare and Medicaid (CMS) programs requires that the facility also be designed to comply with the requirements of the National Fire Protection Associations’ Life Safety Code 101 (2012 Edition) and all referenced codes. When a conflict exists between the Federal requirement and the State building code, the most restrictive provision of code shall be implemented. The design team will work with the various AHJ’s (planning, building, and fire) to proactively resolve code related conflicts in advance of completing the design.

### Permitting

Western State Hospital is located in the city of Lakewood. DSHS is in the process of updating the master plan for the campus. The city will not allow DSHS to develop a new program facility, such as a 16-bed or 48-bed civil commitment facility without approving the updated master plan. This requirement makes the timeline of implementation of this project uncertain. Land use approvals for a project as complex as the Hospital Master Plan update could take as long as twelve months after submittal.



View looking North

Map Data: Copyright 2019 Google



View looking Northwest

Map Data: Copyright 2019 Google

## Pros and Cons

### Pros

- Site already owned by the State
- Centrally-located in Western WA along I-5 corridor
- New kitchen that can be used for new facilities
- Concentration of expertise
- Longtime community presence

### Cons

- Building demolition required
- A concentrated collection of existing utilities would need to be addressed
- Unforeseen underground challenges (dumps, foundations, archaeological significance)
- Civil patient programs may be more successful if located off of Western State Campus
- Community resistance to expansion of programs at WSH

## Scorecard - Western State Hospital

### Site Development / Permitting

Permit (Complexity and Duration)	2
Off-Site Development Requirements	3
Utilities Available	2
Land Size and Configuration	2

- Complex permitting due to the Western State Master Plan
- Project will not move ahead without master plan approved by the City of Lakewood
- Off-site improvements do not appear to be of significant cost
- Utilities are available, but the campus infrastructure is old and this project will likely trigger downstream campus upgrades
- There is adequate space for this project

### Site Amenities

Shared Facilities	3
Transportation	4
Vocation / Recreation Space	3
Healing Environment	2

- Food service and laundry could be shared with Western State Hospital. However, this may not be a benefit as private operators would likely obtain services off site.
- While it is a pleasant environment, due to the stigma of the state hospital, it is not the preferred location for these new services

### Community Assets

Regional Need	1
Healthcare facilities nearby	4
Access to other Mental Health	5
Staff Availability	5
Community Receptiveness	2
<b>TOTAL SCORE:</b>	<b>38</b>

- Pierce County is currently providing the State Hospital
- A new mental health hospital will be available soon in Tacoma
- There are similar services available in the county
- There is good access to healthcare and other mental health services
- Staff appear to be available due to the nearby population
- The community feels like they have their fair share of mental health facilities and therefore may not be receptive to a new one

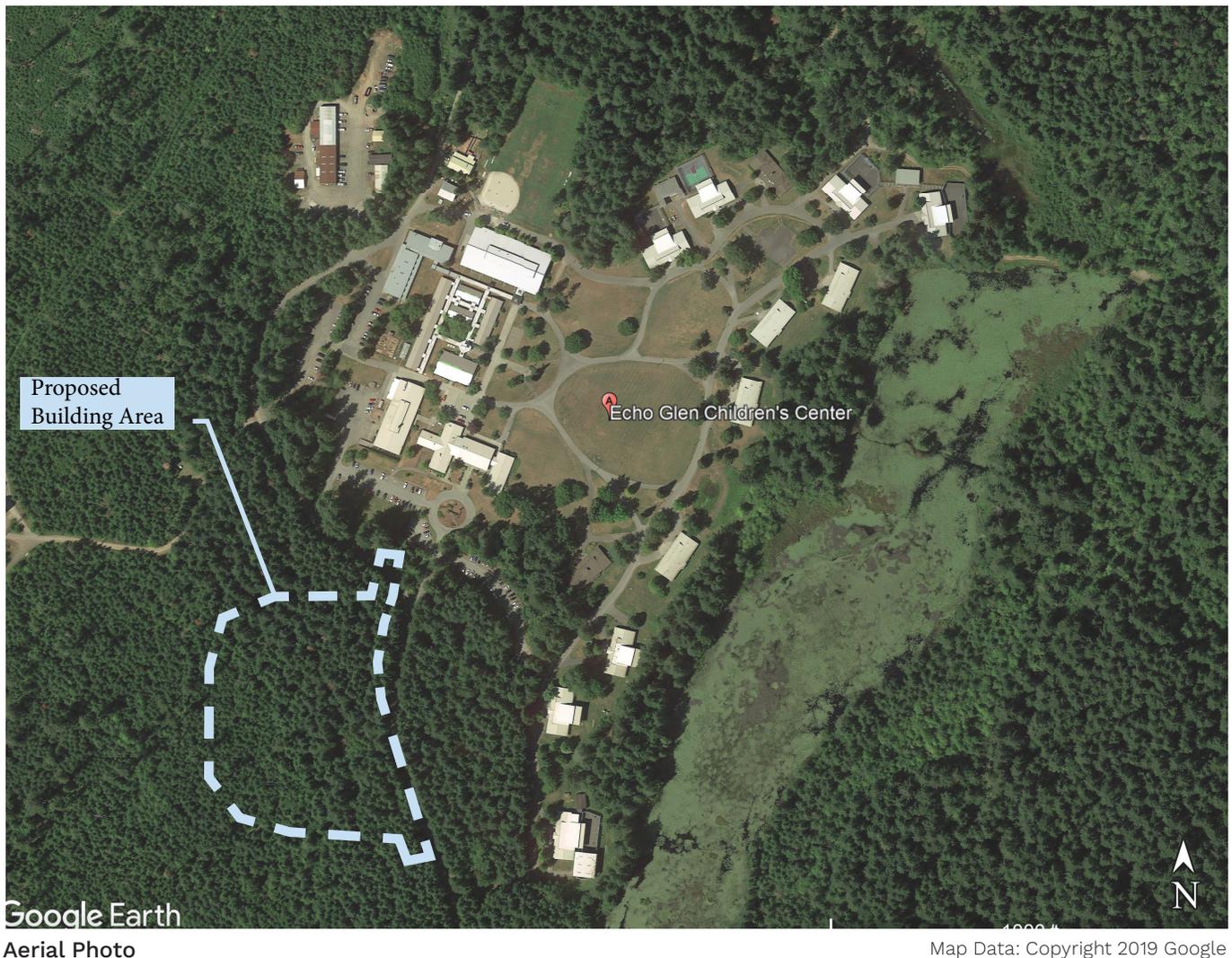


# Echo Glen Alternative #4

## Site Overview:

Echo Glen Children's Center near Snoqualmie is a medium/maximum security facility that is bordered by natural wetlands. It provides treatment services for younger male offenders and is the only institution for female offenders. Echo Glen provides educational services for a wide range of youth with varying needs. The proposed site evaluated for a new 16-bed adult civilly-committed facility is located southwest of the existing campus.

After some dicussion, it has been decided that it is not desired to bring an adult population to this campus. Echo Glen functions well as a facility that serves minors only.



# Preliminary Site Layout - Echo Glen

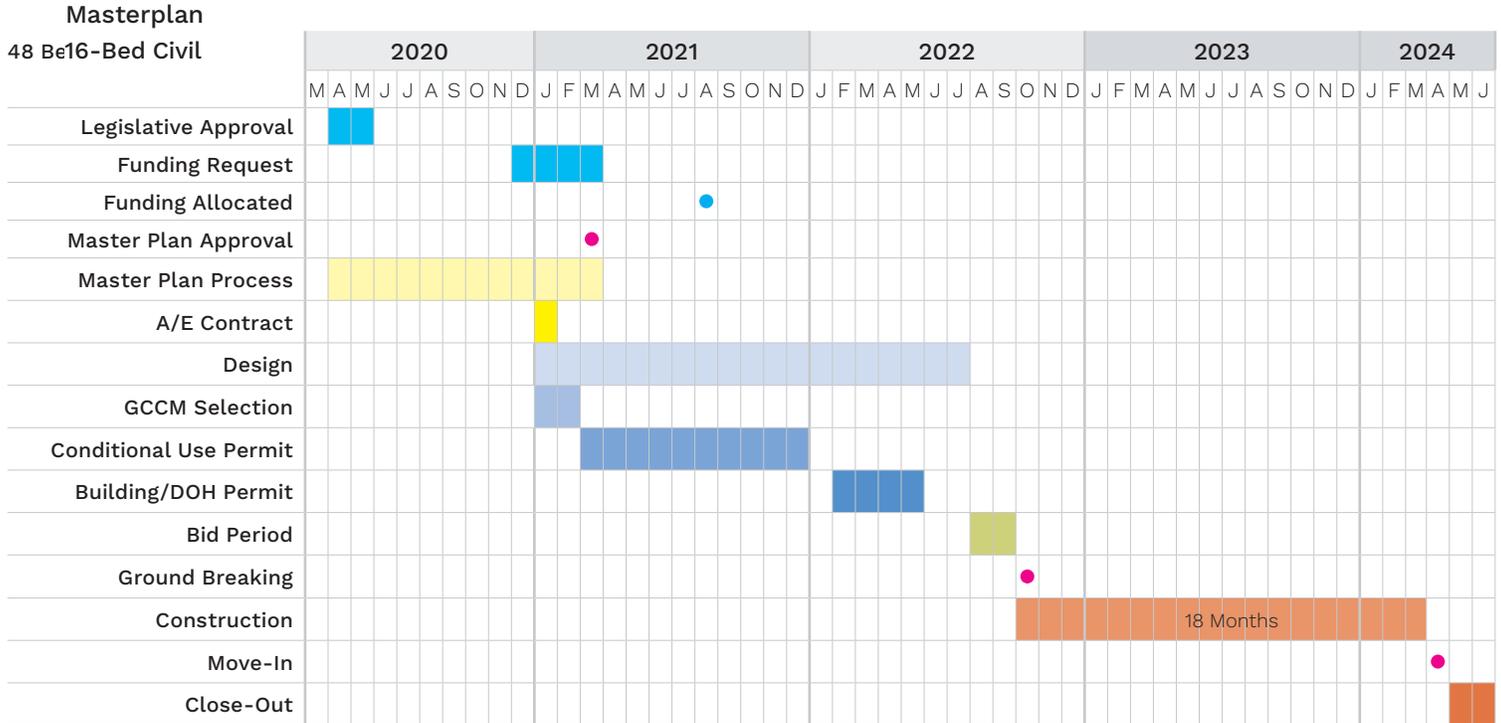
## Layout Description:

The location of the layout is southwest of the existing administration building. The plan groups the three new buildings around a central parking area. The goal is to minimize the development footprint and maintain the wooded perimeter. The area of the development is relatively flat. The site would be fenced to prevent access from youths who have eloped from the unfenced or unsecured facility.



Enlarged Site Plan with prototype building layout

Map Data: Copyright 2019 Google



### Cost Summary

The estimated construction cost for Preferred Alternate #4 Echo Glen: 16-bed, LEED Silver plus Net-Zero, in 2021 dollars, is approximately \$20 million depending on sit.

### Ownership

The property at Echo Glen is owned by the Department of Natural Resources (DNR) and leased by the Department of Children, Youth and Families (DCYF). Next steps will include a discussion with DNR and DCYF to determine additional steps to modify the lease to incorporate the new buildings.

## Engineering Narratives - Echo Glen

### Topography

The project site is located on the same parcel as a juvenile rehabilitation center, Echo Glen Children's Center, near Snoqualmie, Washington. Specifically, it is located in the southwest corner of the campus, bounded by Echo Glen's maintenance access road to the east and north, and wooded area to the south and west. The parcel is owned by the Department of Natural Resources, and leased to the Department of Children, Youth, and Families. The site is currently completely wooded. The site has extensive grade change, with an approximate elevation change from 985-feet to 950-feet sloping from northwest to southeast, according to King County GIS.

### Storm Drainage

There are no existing storm drainage facilities or structures within the project site. The existing Echo Glen buildings utilize a detention pond for flow control before discharging into Lake Kittyprince to the east. It is anticipated that this site will have a similar storm management system by utilizing a storm water quality and detention system before discharging to Lake Kittyprince. This site will trigger requirements for stormwater flow control and water quality treatment. The City of Snoqualmie currently uses the 2016 King County Surface Water Design Manual for storm drainage design, along with the 2016 City of Snoqualmie Addendum to the SWDM. According to the National Resources Conservation Service (NRCS), the onsite soils are classified as Tokul gravelly medial loam (8-15% slopes), which are moderately well drained.

### Water Systems

There are two existing wells on the parcel; both are located just north of the project site. The Well 1 pump outfalls to a 72,000 gallon fire protection storage tank. The Well 2 pump outfalls to a 72,000 gallon tank and a 375,000 gallon tank. The wells and storage tanks provide domestic water and fire water to the site. We understand the existing water system does not have adequate capacity for the proposed project. It is anticipated that another well and additional storage tanks will need to

be constructed to serve a new building. Alternatively, a connection can be made to the City of Snoqualmie water system at the Snoqualmie Valley Hospital located to the east of the project site. This requires approximately a half-mile of water main extension along Echo Glen's access road to the project site. Water main installation can be done concurrently with the trenching required to provide power to the project site. A fire main loop around the building is anticipated to meet fire hydrant spacing requirements.

### Sanitary Sewer

All sanitary sewage from The Echo Glen Center buildings currently outfalls to a pump station located to the northwest of Echo Glen. Then it is pumped to the north and to the east along a sanitary sewer easement before leaving the parcel, and outfalling to the City of Snoqualmie's sanitary sewer system. Due to anticipated future growth of the Echo Glen Children's Center, this pump station may have to be increased to serve a new building. Alternatively, a sewer connection can be made to the Snoqualmie Valley Hospital's sewer lift station located to the east of the project site. Trenching for the sewer main extension could be done concurrently with the water main and electricity trenching, as previously mentioned.

### Offsite Improvements

No offsite improvements are anticipated other than repairs to the access road as needed to install the power lines and other possible trenching.

**Electrical Systems**

Normal power electric service to the building will be served from a new 500 kVA indoor dry type transformer substation to match other installations on the campus. This transformer will be connected to the campus power system.

The Main Switch for the building will be contained in the substation.

The existing site electrical infrastructure will be extended to serve these new facilities, likely to come from an existing spare switch located in the campus main electric room. Refer to General Electrical Conditions for distribution inside each building.

Site supplied standby power will be supplied to this facility as the existing site generator appears large enough to accept the new loads. Refer to General Electrical Conditions for essential power distribution throughout each building

Telecommunication fiber network and cable TV will be extended to this facility along the entry road, will originate off campus and be brought on to the site.

## Review of Laws, Regulations, and Permitting - Echo Glen Campus

### WAC State Requirements

The project will be required to be licensed as a Residential Treatment Facility by the Washington State Department of Health. The project will be secure and locked complying with WAC 246-337 Residential Treatment Facility code section.

Other codes the project will comply with include:

- 2018 International Building Code
- 2018 International Mechanical Code
- 2020 National Electric Code (NFPA 70)
- 2018 FGI Guidelines for Design and Construction of Residential Health Care, and Support Facilities.
- 2018 Washington State Energy Code
- 2015 Health Care Facilities Code (NFPA 99)
- 2012 Life Safety Code (NFPA 101)
- Behavioral Health Design Guide – Edition 9.0

### Energy Requirements

The Governor’s Office Executive order 18-01 states that “...all newly constructed state-owned buildings shall be designed to be zero energy or zero energy-capable, and include consideration of net- embodied carbon. In unique situations where a cost effective zero-energy building is not yet technically feasible, buildings shall be designed to exceed the current state building code for energy efficiency to the greatest extent possible.”

### Accessibility

Americans with Disabilities Act (ADA) accessibility for all spaces is critical not only for Behavioral Health patients, but for any staff, volunteers and visitors who require accessibility and all who are deaf, hard-of-hearing, blind, wheelchair users, people with mobility challenges, etc.

### Centers for Medicare and Medicaid Services

The Joint Commission’s Environment of Care Standard EC.02.06.05 states the Joint Commission expects organizations to assess building design and construction requirements based on local, state, and federal regulations and codes.

Typically, the state health department licensing entity is the authority having jurisdiction (AHJ), and health care organizations must comply with the AHJ’s licensing rules to obtain approvals to operate. When state regulations are silent on a specific design criterion, the Joint Commission recognizes the 2014 Facility Guidelines Institute (FGI) Guidelines for Design and Construction of Hospitals and Outpatient Facilities for new construction and renovation.

Participation in the Centers for Medicare and Medicaid (CMS) programs requires that the facility also be designed to comply with the requirements of the National Fire Protection Associations’ Life Safety Code 101 (2012 Edition) and all referenced codes. When a conflict exists between the Federal requirement and the State building code, the most restrictive provision of code shall be implemented. The design team will work with the various AHJ’s (planning, building, and fire) to proactively resolve code related conflicts in advance of completing the design.

### Permitting

The Echo Glen Campus is currently leased to the Department of Children, Youth and Families. In order to place a Behavioral Health facility at the site, a Conditional Use permit through King County is likely required. We recommend allowing six to nine months for this use permit. It will likely require a hearing examiner decision.

The project will likely require expanding the area that is covered by the existing master plan. The property is zoned RA-5 and has limits to the size of behavioral health facilities it allows (10 adults or less). This information will need to be confirmed with King county prior to proceeding with design on this project.



Existing buildings



Main entry

## Pros and Cons

### Pros

- Lots of undeveloped land around Echo Glen
- Close to Seattle and Bellevue
- Convenient access to I-90 and I-5
- Relationship with UW Medical School
- Close to 25-bed community hospital
- Close to medical services in Issaquah

### Cons

- Access to site is one way in and out along long drive
- Lack of utilities
- Topography contains hills and swamps along with required clear-cutting
- Requires a master plan update
- More inclement weather likely due to mountain range

## Scorecard - Echo Glen Campus

### Site Development / Permitting

Permit (Complexity and Duration)	3
Off-Site Development Requirements	4
Utilities Available	2
Land Size and Configuration	3

- Conditional-use Permit appears to be attainable but will require a master plan update
- Off-site requirements are minimal in terms of frontage
- Utilities would have to be extended from existing
- We reviewed other properties near Echo Glen and found that zoning restrictions prevent a RTF at this time
- Rezoning a property can take several years.
- When contacted, the County was not initially receptive to rezone for a RTF in this area.

### Site Amenities

Shared Facilities	1
Transportation	3
Vocation / Recreation Space	3
Healing Environment	5

- Unlikely that facilities could be shared
- There is public transportation nearby
- It is a great environment for healing

### Community Assets

Regional Need	3
Healthcare facilities nearby	5
Access to other Mental Health	4
Staff Availability	2
Community Receptiveness	3
<b>TOTAL SCORE:</b>	<b>41</b>

- Hospital is nearby along with other mental health facilities available in King County
- Large population is in the vicinity so staff should be available
- No known community opposition



# Maple Lane Campus

## Preferred Option - Alternative #5

### Site Overview:

Located within minutes of the I-5 Corridor, Maple Lane Campus is approximately 20 miles south of Olympia, WA and 100 miles north of Portland, OR. The campus is owned by the Department of Corrections, the DOC also has some operations on site with plans for additional/future inmate housing currently used as a DSHS Competency Restoration facility in partnership with Wellpath.



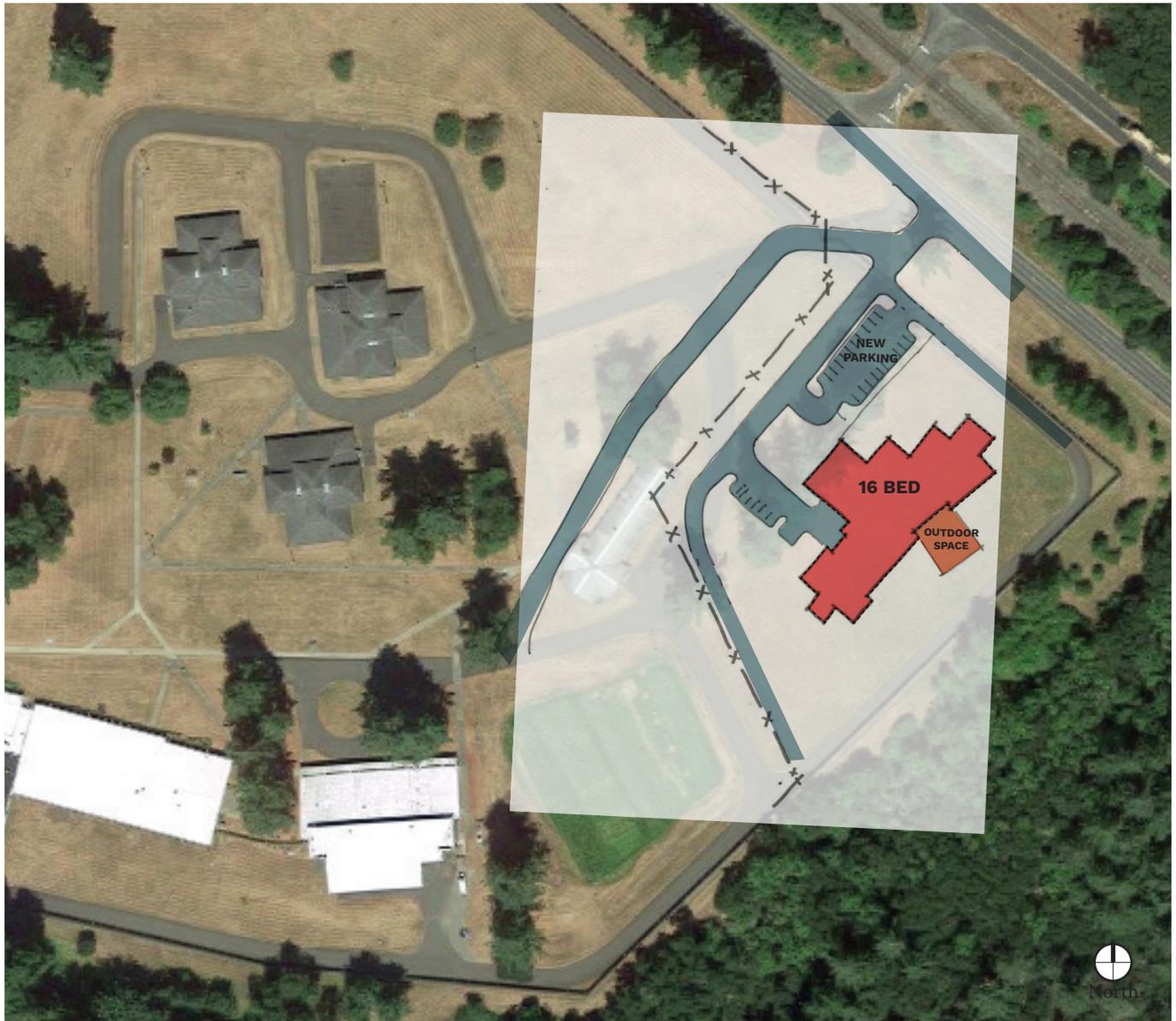
Aerial Photo

Map Data: Copyright 2019 Google

# Preliminary Site Layout - Maple Lane

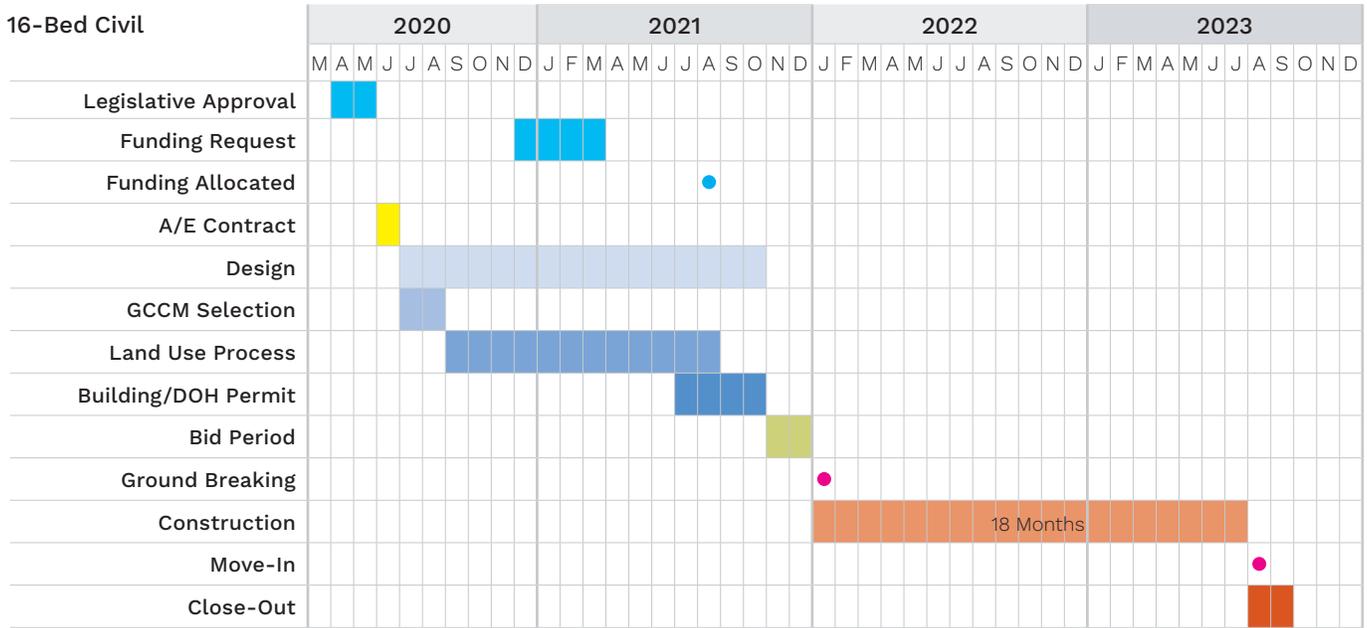
## Building Area 1:

Located on the northwest portion of campus adjacent to the neighboring dairy. Access to the facilities are shown from both James Rd SW and Old Hwy 9 SW. This area will encroach on an existing grove of mature fir trees. Relocation of the exterior perimeter fencing will be required.



Aerial Photo

Map Data: Copyright 2019 Google



### Cost Summary

The estimated construction cost for Preferred Alternate #5 Maple Lane: 16-bed, LEED Silver plus Net-Zero, in 2021 dollars, is approximately \$20 million depending on site.

## Engineering Narratives - Maple Lane

### Topography

The project site is within the former campus of the Maple Lane School Facility which is currently developed with several building and supporting infrastructure. Within the campus there are two possible locations to site the project.

#### Location 1:

The first location for the proposed project site is at the easternmost corner of the developed portion of the parcel. That portion of the campus is a grass lawn area with a row of trees running from northeast to south west. There are also some asphalt drive aisles that delineate the area.

The project area is bordered by Old Highway 9 SW to the north, the rest of the campus to the west, and an undeveloped portion of the parcel to the south and east. In general, the site is relatively flat. Thurston County GIS shows a minimal elevation change east to west and roughly a 2-foot elevation change north to south. It is anticipated that the proposed project would generally match the existing topography.

#### Location 2:

The second location for the proposed project site is at the northernmost portion of the parcel. That portion of the campus is a moderately wooded area with some grassy vegetation.

The project area is bordered by James Road SW to the north, Old Highway 9 SW to the east, the rest of the campus to the south, and the James Road Dairy to the west.

In general, the site is relatively flat. Thurston County GIS shows a minimal elevation change across the project area. It is anticipated that the proposed project would generally match the existing topography once the trees are removed.

### Storm Drainage

The existing storm drainage system consists of a network of pipes and catch basins. There are some above ground infiltration facilities as well as some pipe outfalls to the south to dispose of stormwater.

The project will comply with the applicable edition of the Thurston County Drainage Design and Erosion Control Manual. The National Resources Conservation Service (NRCS) classifies the onsite soils as Spanaway gravelly sandy loam (0-3% slopes) which are generally favorable to infiltration. Given this information as well as the presence of what appear to be existing infiltration facilities, it is assumed that the project will provide flow control through onsite infiltration. Water quality facilities to treat stormwater runoff from areas subject to vehicular traffic will be designed in accordance with the Drainage Design and Erosion Control Manual.

### Water Systems

There is at least one existing well onsite to serve the existing campus. Thurston County is the water utility purveyor for the site. Further investigation will be needed to determine if the existing water supply system has adequate capacity. If it doesn't, coordination with Thurston County will be required to determine the scope of infrastructure improvements that will be required.

### Sanitary Sewer

The existing site is served by sewer. Thurston County is the sewer purveyor for the site. The campus sewer is collected locally by gravity lines then conveyed north by a pressure main to the north. Further investigation will be needed to determine if the existing sewer system has adequate capacity. If it doesn't, coordination with Thurston County will be required to determine the scope of infrastructure upgrades that will be required.

**Power and Gas Availability**

The existing site electrical infrastructure will be extended to serve these new facilities, likely to come from an existing spare switch located in the campus main electric room. To our knowledge, gas service is not available to the site.

**Offsite Improvements**

It's likely that frontage improvements will be required for at least a portion of Old Highway 9. Thurston County classifies Old Highway 9 as a County Collector. Based on the 2017 Thurston County Road Standards, that classification would require half street improvements including a bike lane, curb, gutter, planter strip, sidewalk, and street lighting

**Electrical Systems**

Normal power electric service to each building will be served from a new 500 kVA indoor dry type transformer substation to match other installations on the campus. This transformer will be connected to the campus power system.

The Main Switch for the building will be contained in the substation.

The existing site electrical infrastructure will be extended to serve these new facilities. Utility power comes on to the campus at the Northeast corner of the campus near Old Highway 9 SW and Tea St. SW. Tie-ins to the existing utility power will be determined during building design but it is assumed campus primary power is sufficient to accommodate the new buildings. Refer to General Electrical Conditions for distribution inside each building.

Site supplied standby power will be supplied to this facility as it is assumed the existing site generator is large enough to accept the new loads. Refer to General Electrical Conditions for essential power distribution throughout each building.

Telecommunication fiber network and cable TV will be extended to these buildings from the existing campus facilities. Refer to General Electrical Conditions for telecommunications distribution inside each building.

Refer to General Electrical Conditions for lighting, power, equipment connections, fire alarm, security, nurse call, and solar power for each building.

## Review of Laws, Regulations, and Permitting - Maple Lane

### WAC State Requirements

The project will be required to be licensed as a Residential Treatment Facility by the Washington State Department of Health. The project will be secure and locked complying with WAC 246-337 Residential Treatment Facility code section.

Other codes the project will comply with include:

- 2018 International Building Code
- 2018 International Mechanical Code
- 2020 National Electric Code (NFPA 70)
- 2018 FGI Guidelines for Design and Construction of Residential Health Care, and Support Facilities.
- 2018 Washington State Energy Code
- 2015 Health Care Facilities Code (NFPA 99)
- 2012 Life Safety Code (NFPA 101)
- Behavioral Health Design Guide – Edition 9.0

### Energy Requirements

The Governor’s Office Executive order 18-01 states that “...all newly constructed state-owned buildings shall be designed to be zero energy or zero energy-capable, and include consideration of net- embodied carbon. In unique situations where a cost effective zero-energy building is not yet technically feasible, buildings shall be designed to exceed the current state building code for energy efficiency to the greatest extent possible.”

### Accessibility

Americans with Disabilities Act (ADA) accessibility for all spaces is critical not only for Behavioral Health patients, but for any staff, volunteers and visitors who require accessibility and all who are deaf, hard-of-hearing, blind, wheelchair users, people with mobility challenges, etc.

### Centers for Medicare and Medicaid Services

The Joint Commission’s Environment of Care Standard EC.02.06.05 states the Joint Commission expects organizations to assess building design and construction requirements based on local, state, and federal regulations and codes.

Typically, the state health department licensing entity is the authority having jurisdiction (AHJ), and health care organizations must comply with the AHJ’s licensing rules to obtain approvals to operate. When state regulations are silent on a specific design criterion, the Joint Commission recognizes the 2014 Facility Guidelines Institute (FGI) Guidelines for Design and Construction of Hospitals and Outpatient Facilities for new construction and renovation.

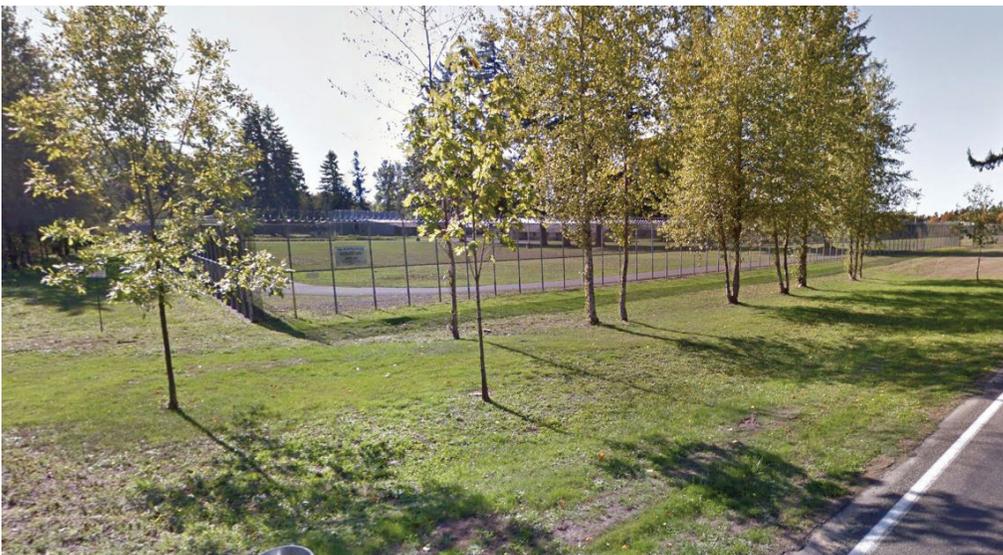
Participation in the Centers for Medicare and Medicaid (CMS) programs requires that the facility also be designed to comply with the requirements of the National Fire Protection Associations’ Life Safety Code 101 (2012 Edition) and all referenced codes. When a conflict exists between the Federal requirement and the State building code, the most restrictive provision of code shall be implemented. The design team will work with the various AHJ’s (planning, building, and fire) to proactively resolve code related conflicts in advance of completing the design.

### Permitting

The Maple Lane Campus is currently a Department of Corrections facility. In order to place a Behavioral Health facility at the site, a Special Use permit through Thurston county is likely required. We recommend allowing six to nine months for this use permit. It will likely require a hearing examiner decision.



View from SE



View from NE

Map Data: Copyright 2019 Google

## Pros and Cons

### Pros

- Large parcels
- Close to I-5
- Close to Olympia
- Closer to Clark County
- Property prices are lower

### Cons

- Staffing may be challenging as there are several private 90-180 facilities in Thurston County
- Need to develop staffing plan to provide maintenance, dietary, and laundry facilities
- Challenge to find vendors to provide services not completed within facility.

### Potential issues with the surrounding neighborhood, during construction and ongoing

The preferred site is on an existing correctional campus. The neighboring uses are inmate residences and support facilities. East of the campus is a currently undeveloped parcel. Pro-active outreach to the neighborhood community in advance of any land use process will be part of the project outreach strategy. Multiple forms of contact including public meetings and informational mailers will be considered.

**Site Development / Permitting**

Permit (Complexity and Duration)	3
Off-Site Development Requirements	3
Utilities Available	3
Land Size and Configuration	4

- A special-use permit appears to be required
- Half street frontage upgrades are required
- Utilities are available, but need to be extended from existing connections

**Site Amenities**

Shared Facilities	3
Transportation	3
Vocation / Recreation Space	3
Healing Environment	3

- Unlikely that facilities could be shared, especially with private operator
- Pleasant campus environment would support mental health treatment
- The department does not anticipate utilizing shared facilities or Department of Corrections staffing
- Maple Lane’s operational staffing is minimal as the facility is not fully occupied

**Community Assets**

Regional Need	5
Healthcare facilities nearby	3
Access to other Mental Health	4
Staff Availability	4
Community Receptiveness	4
<b>TOTAL SCORE:</b>	<b>45</b>

- Healthcare services nearby in Centralia
- One hour drive to Western State Hospital
- Olympia is nearby so we assume that staff is available
- There are several MH facilities in Thurston County providing services to a similar population.
- There is a concern that adding a 48 bed facility in Thurston County may affect other programs currently in operation.



# Clark County Alternative #6

## Summary of Approach

Clark County was selected as the preferred alternate due to the lack of local 90 to 180-day civil commitment beds and Evaluation and Treatment facilities. While other regions have projects planned, or are in the process of development, the Clark County region is still lacking adequate beds. The project will provide necessary resources to address that need. One item that should be addressed soon is the absence of local Evaluation and Treatment facilities in Clark County. Currently these patients are transported up the I-5 corridor to Kirkland to treatment. This creates a hardship for families wanting to visit their loved ones during the treatment. Research has shown that individuals that have access to their family members, have better outcomes following treatment.

## Land Acquisition

While DSHS owns a significant amount of property in the state, most of it is encumbered by the agencies currently operating on those sites. At Western State Hospital and Fircrest School, a complex and difficult Master Plan must be approved prior to the use being accepted by the local cities. DSHS is exploring the option of purchasing property as a method to expedite the construction and opening of facilities that offer this type of service.

DSHS has studied several sites that follow in this section. While the demand is high for 90-180 day civil commitment facilities and Evaluation and Treatment facilities, these developments are susceptible to unanticipated local community resistance so the property purchase must be approached strategically.

Once a suitable piece of property is found, a due diligence period is established with the land owner. It is ideal if a six-month period can be established so that land use approvals can be obtained prior to closing on the property. During the due diligence stage zoning is confirmed, environmental reports, Alta surveys, and a title report are completed. Often the land purchaser, DSHS in this case will have a backup property online as well. This helps insure a timeline can be maintained, if an issue comes up that blocks the approval for a specific site or land transaction.

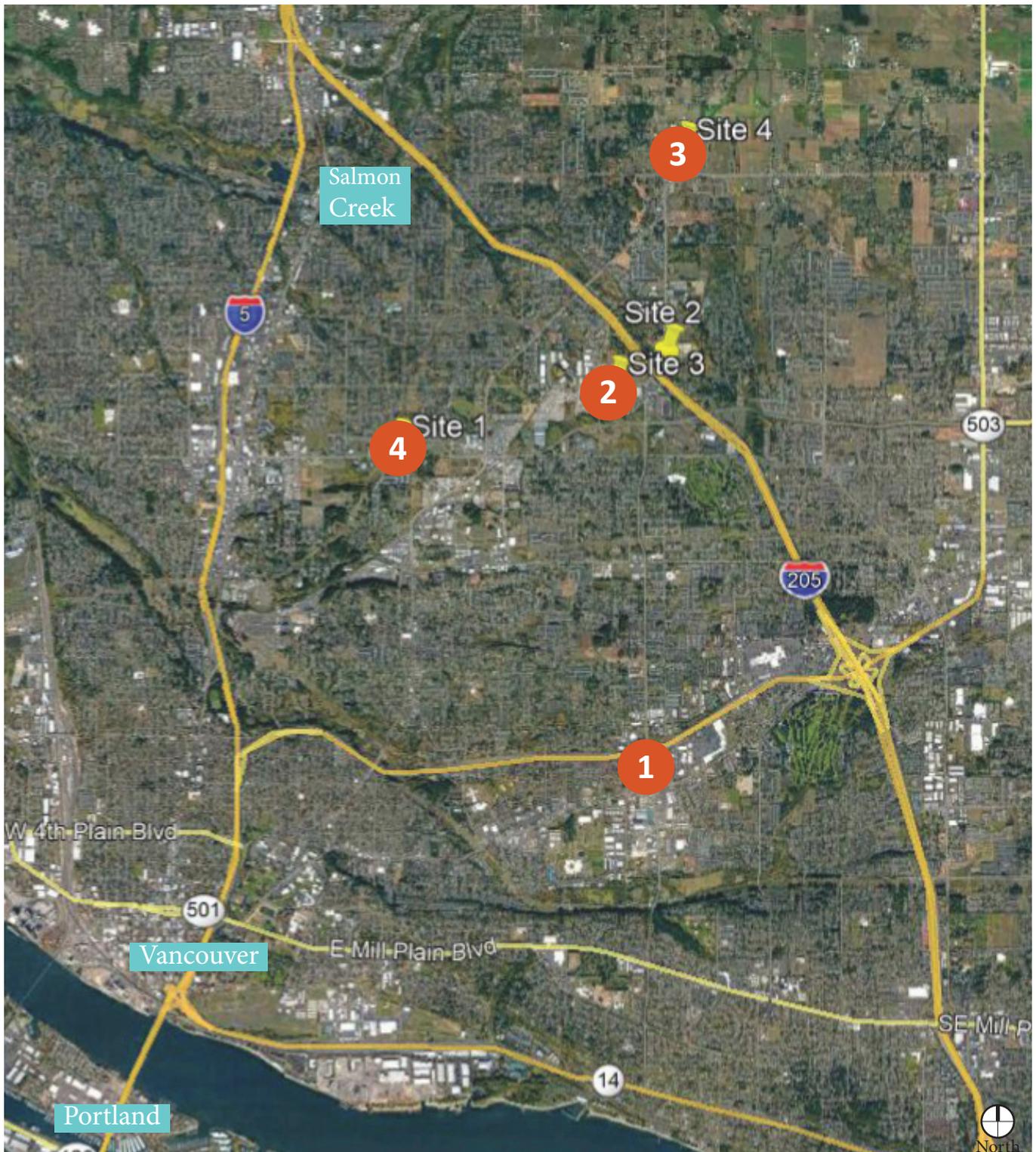
Community engagement is important as well with the land purchase option. It is recommended that a community meeting be held with local residents prior to land use submittals to identify and mitigate community concerns. The behavioral health services are not understood by the general public, and it is good to inform them of the actual services provided, and the profile of individuals who will be treated at these facilities. It is best if the city or county government leaders where the site is located are on board with the location as well.

Properties studied were prioritized that had good access to major transportation networks, such as freeways and major arterials and within a three-mile radius of local hospitals.

# Site Options - Clark County

## Overview:

The site shown below have been reviewed within the county for potential locations. See Appendix for full site specifications and additional photos.



Aerial Photo

Map Data: Copyright 2019 Google

**Site One: NE 4th Plain Blvd**

This layout assumes that Columbia River Mental Health subdivides their existing parcel and makes 2.7 acres available for DSHS to purchase. This is the west side of the site adjacent to NE 66th Avenue. Approximately 45 existing stalls would be re-purposed for the new facility. The building would be a 17,661 SF, 16 bed step-down facility. The existing topography is flat and utilities are obtainable from adjacent services.



Aerial Photo

Map Data: Copyright 2019 Google

**Pros and Cons**

**Pros**

- Opportunity to create a behavioral health campus
- Housing nearby creates a unique pathway for mental health patients to return to the community
- Ability to work with community partners
- Near Highway 500, which gives access to three area hospitals nearby

**Cons**

- Tight site requires potential new land acquisition
- Limited outdoor space
- Parcel split could be required

## Site Options - Clark County

### Site Two: NE 88th and NE 62nd

The site consists of approximately 5.71 Acres at an undisclosed price. The zoning is for General Commercial which includes uses such as Industrial, Retail, and Commercial. There is no on-site utility information listed in the public listing literature.

The size is good for a 16 bed facility and the location is good, however the property configuration is challenging, as it is split by a roadway. Also adjacent to a future Catholic High School is not desirable.



Aerial Photo

Map Data: Copyright 2019 Google

## Pros and Cons

### Pros

- Within minutes of I-205
- Approximately 4 miles to I-5 Freeway
- Sufficient acreage

### Cons

- Configuration of site is challenging; north parcel would likely only work for parking
- Existing road separating property is not desirable
- Close to Seton High School

**Site Three: NE 119th and 7nd Ave**

This site is listed at \$6,821,000 with approximately 8.71 Acres. The topography is flat and zoned for Community Commerical use. Available utilites on site include public water, sewer, stormwater, and power.

This is overall a great piece of property that seems well suited for the behavioral health use. The property is larger than needed. The property may be able to be subdivided, and the land that is not used can be resold or negotiated out of the purchase.



Aerial Photo

Map Data: Copyright 2019 Google

**Pros and Cons**

**Pros**

- 4-way intersection recently upgrades
- Recent pedestrian sidewalk and ramp improvements to East and South
- Close proximity to I-205 Freeway
- Ability to develop before adjacent neighbors could simplify the land-use process
- Flat site is well-suited for development

**Cons**

- Parcel is larger than needed
- Parcel seems expensive compared to other potential properties
- Furthest option from other healthcare facilities

## Site Options - Clark County

### Site Five: NE 78th St and NE 30th Ave

This site is listed at \$2,875,000 and consists of 6.71 Gross Acres with 5.5 Net Usable Acres. The topography is flat and is zoned for Community Commercial use. Available utilities were not listed on public literature.

This property is across the street from a school and has a large amount of single family residential directly adjacent, which makes this property challenging from a community-acceptance perspective.



Aerial Photo

Map Data: Copyright 2019 Google

### Pros and Cons

#### Pros

- Corner of a new, signalized intersection
- Recent sidewalk, signalization, and pedestrian improvements
- Close proximity to I-5 Freeway
- Flat site well-suited for development

#### Cons

- Community acceptance may be more difficult
- Extensive single-family homes directly located south of property

### Potential issues with the surrounding neighborhood, during construction and ongoing

The neighbors are behavioral health or commercial uses to the east and south. The West fronts on a multifamily neighborhood. The north borders a highway. Pro-active outreach to the neighbors in advance of any land use process will be part of the project outreach strategy. Multiple forms of contact including public meetings and informational mailers will be considered.



## Engineering Narratives - Clark County

### Site Topography

The project site is comprised of area that is undeveloped and currently developed. The western portion is undeveloped with several garden spaces, grassy areas and some trees. The southeastern portion is currently developed with commercial/retail uses.

The project area is bordered by Highway 500 and an associated storm drainage pond to the north, NE Andresen Rd to the east, existing commercial/retail to the south, and NE 66th Ave to the west.

In general, the site is relatively flat. Clark County GIS shows an elevation difference of roughly 10 feet from northwest to southeast with most of the change occurring within the western, undeveloped portion. It is anticipated that the proposed project would generally match the existing topography.

### Storm Drainage

Based on Google Earth and Street View images there are existing catch basins and/or drywells within the developed portion of the site. Clark County GIS doesn't show any storm drainage infrastructure within the site. There is an existing storm main in NE 66th Ave adjacent to the site.

The project will comply with the applicable edition of the City of Vancouver General Requirements and Details which amends the Department of Ecology Stormwater Management Manual for Western Washington. The National Resources Conservation Service (NRCS) classifies the onsite soils as Hillsboro loam which are generally favorable to infiltration, and Tisch silt loam, which are not generally favorable to infiltration.

A detention or infiltration facility will likely be required for the project. Further investigation and coordination with the City of Vancouver will be required to determine if infiltration is feasible and the exact storm drainage requirements for detention. Water quality facilities to treat stormwater runoff from areas subject to vehicular traffic will be designed in accordance with the City of Vancouver General Requirements and Details.

### Water Systems

Clark County GIS shows that there is an existing water main in NE 66th Ave as well as an existing water line that ties into a main in NE Fourth Plain Blvd that currently extends into the site. Coordination with City of Vancouver will be needed to determine if the existing infrastructure has adequate capacity and, what if any, upgrades may be required.

### Sanitary Sewer

Clark County GIS shows that there is an existing sewer main in NE 66th Ave as well as an existing sewer line that ties into a main in NE Fourth Plain Blvd that currently extends into the site. Coordination with City of Vancouver will be needed to determine if the existing infrastructure has adequate capacity and, what if any, upgrades may be required.

### Power and Gas Availability

The purveyor appears to be Clark Public Utilities. Based on Google Earth and Street View images there is power available at or near the site. The purveyor appears to be NW Natural.

### Offsite Improvements

It is likely that NE 66th Ave will require half street frontage improvements including curb, gutter, planter strip, sidewalk, and street lighting based on the City of Vancouver Standard Details. Based on the lack of adjacency to NE Fourth Plain Blvd as well as existing developed infrastructure in NE Andresen Rd, additional frontage improvements may not be required. Coordination with City of Vancouver will be required to determine exact requirements.

### WAC State Requirements

The project will be required to be licensed as a Residential Treatment Facility by the Washington State Department of Health. The project will be secure and locked complying with WAC 246-337 Residential Treatment Facility code section.

Other codes the project will comply with include:

- 2018 International Building Code
- 2018 International Mechanical Code
- 2020 National Electric Code (NFPA 70)
- 2018 FGI Guidelines for Design and Construction of Residential Health Care, and Support Facilities.
- 2018 Washington State Energy Code
- 2015 Health Care Facilities Code (NFPA 99)
- 2012 Life Safety Code (NFPA 101)
- Behavioral Health Design Guide – Edition 9.0

### Energy Requirements

The Governor’s Office Executive order 18-01 states that “...all newly constructed state-owned buildings shall be designed to be zero energy or zero energy-capable, and include consideration of net- embodied carbon. In unique situations where a cost effective zero-energy building is not yet technically feasible, buildings shall be designed to exceed the current state building code for energy efficiency to the greatest extent possible.”

### Accessibility

Americans with Disabilities Act (ADA) accessibility for all spaces is critical not only for Behavioral Health patients, but for any staff, volunteers and visitors who require accessibility and all who are deaf, hard-of-hearing, blind, wheelchair users, people with mobility challenges, etc.

### Centers for Medicare and Medicaid Services

The Joint Commission’s Environment of Care Standard EC.02.06.05 states the Joint Commission expects organizations to assess building design and construction requirements based on local, state, and federal regulations and codes.

Typically, the state health department licensing entity is the authority having jurisdiction (AHJ), and health care organizations must comply with the AHJ’s licensing rules to obtain approvals to operate. When state regulations are silent on a specific design criterion, the Joint Commission recognizes the 2014 Facility Guidelines

Institute (FGI) Guidelines for Design and Construction of Hospitals and Outpatient Facilities for new construction and renovation.

Participation in the Centers for Medicare and Medicaid (CMS) programs requires that the facility also be designed to comply with the requirements of the National Fire Protection Associations’ Life Safety Code 101 (2012 Edition) and all referenced codes. When a conflict exists between the Federal requirement and the State building code, the most restrictive provision of code shall be implemented. The design team will work with the various AHJ’s (planning, building, and fire) to proactively resolve code related conflicts in advance of completing the design.

### Permitting

In Vancouver, the use is to be classified as a Secure Community Transition Facility and subject to the criteria contained in VMC 20.855 Essential Public Facilities. The use classifications section (VMC 20.160) of the City’s Development Code does not contain the Secure Community Transition Facility use language so a determination has been made that the use would be most similar to a “Medical Center” use. A “Medical Center” use is classified in the City’s Development Code as the following: Facilities providing inpatient, outpatient, emergency, and related ancillary services to the sick and infirm, including drug and alcohol treatment. Usually developed in campus settings, accessory uses may include diagnostic and treatment facilities; laboratories; surgical suites; kitchen/food service facilities; laundry; housekeeping and maintenance facilities; administrative offices; and parking. Medical centers may also include free-standing offices for hospital-based and/or private-practice physicians and other allied health care professionals; these medical office buildings are regulated as offices. Such a facility that has regional or state-wide significance is classified as an Essential Public Facility by the provisions of the Growth Management Act.

Since the use is also considered an essential public facility it would require a conditional use permit in zones in which the medical center use was permitted or permitted through a conditional use permit. The use would be permitted by a conditional use permit in the following zones: R-18, R-22, R-30, R-35, CC, CG, CX and OCI.

# Scorecard - Clark County

## Site Development / Permitting

Permit (Complexity and Duration)	3
Off-Site Development Requirements	3
Utilities Available	4
Land Size and Configuration	4

- Conditional-use Permit should be a standard process and duration
- Off-site frontage will be required on NE 66th Avenue
- Utilities are available nearby
- The proposed land is tight, but adequate

## Site Amenities

Shared Facilities	3
Transportation	3
Vocation / Recreation Space	3
Healing Environment	3

- Unlikely shared facilities
- Public transit is nearby
- The surrounding neighborhood has a supportive environment for those recovering from mental health treatments

## Community Assets

Regional Need	1
Healthcare facilities nearby	2
Access to other Mental Health	4
Staff Availability	4
Community Receptiveness	4
<b>TOTAL SCORE:</b>	<b>41</b>

- Regional need is high in Clark County
- Community is receptive and having a community partner nearby is a tremendous asset
- There are nearby healthcare facilities
- Mental Health providers are close by with limited services
- Vancouver/Portland area provides an ample population to attract staff



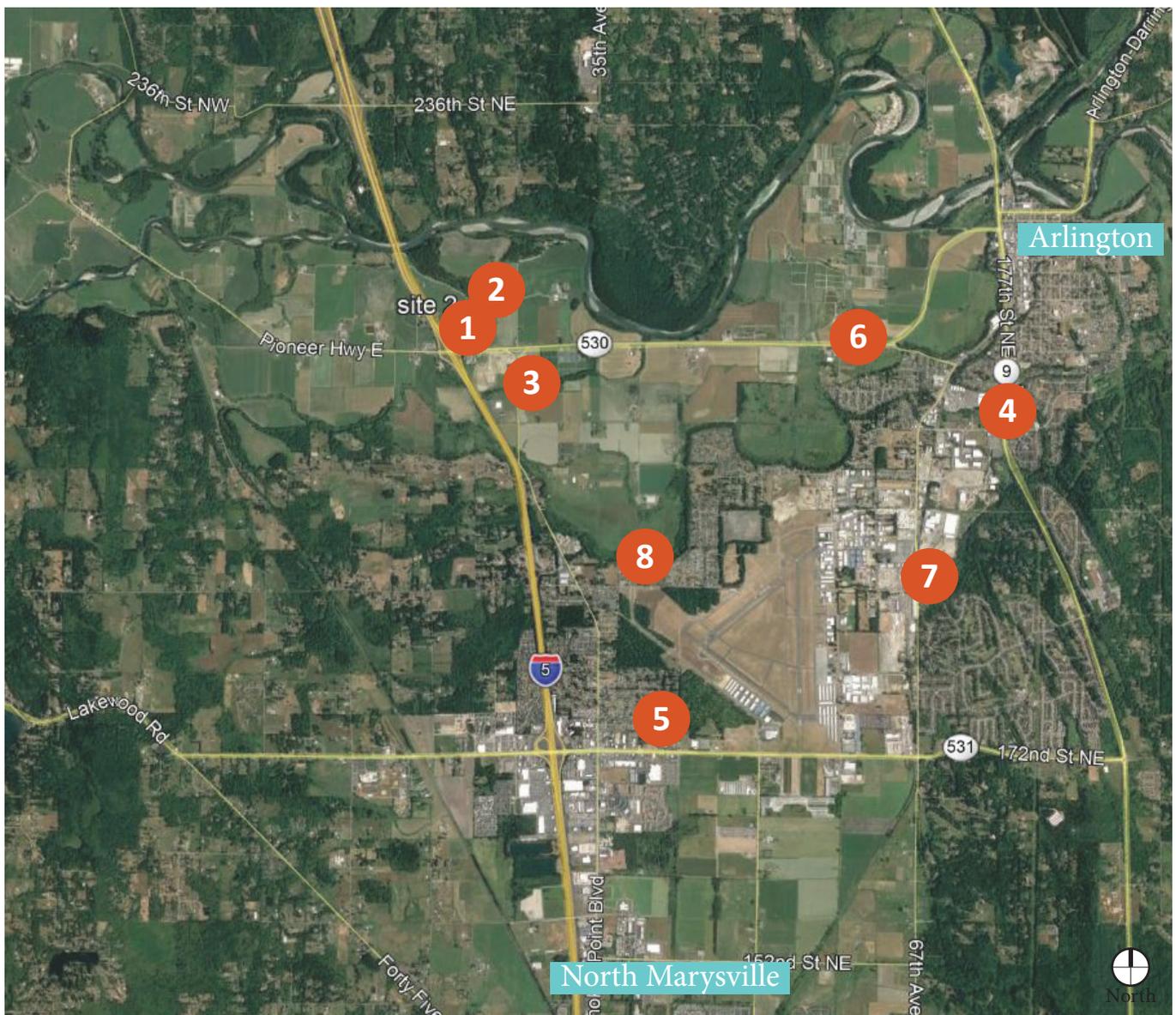
# Snohomish County Alternative #7

## Site Overview:

The Department of Social and Health Services (DSHS) met with several entities including the Cities of Arlington and Marysville, associated elected officials, and community partners. Generally, officials felt that there is a need for longer term mental health inpatient services. These officials provided great context and candid responses to the need for their community's at this moment in time.

Officials indicated that individuals presenting a mental health crisis are transported to Providence Hospital in Everett WA to be assessed in their Behavioral Health Urgent Care facility. Patients are transported to community based programs, Western State Hospital, or retained at the Hospital until an option is determined once assessed.

There are several projects opening shortly or are planned in the greater Everett area for short term mental health services. This leaves longer stay options limited.



Aerial Photo

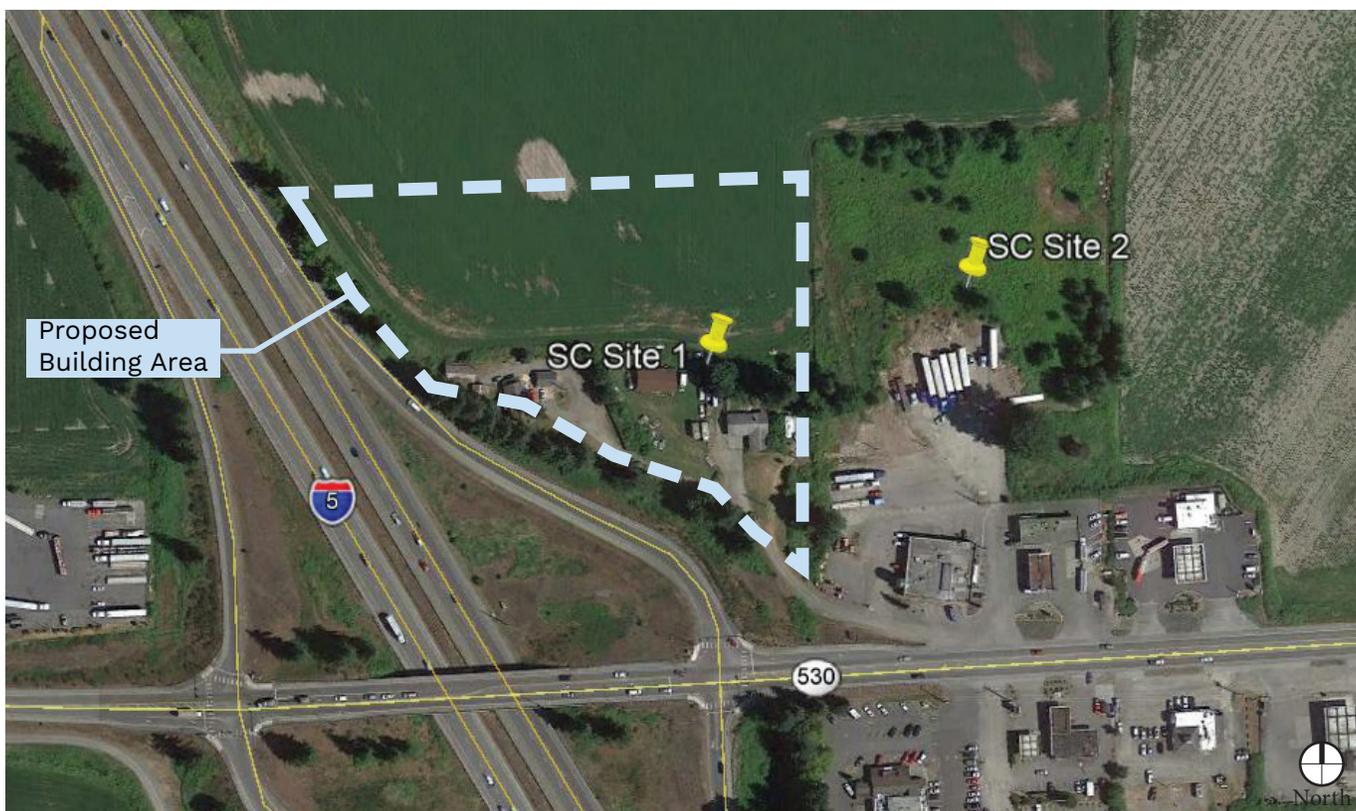
Map Data: Copyright 2020 Google

## Site Options - Snohomish County

The City Arlington provided several options of properties that were either for sale, may be for sale, or potentially could be for sale do to city action. Arlington officials acknowledge the need for mental health services. Arlington officials provided properties zoned for commercial or city development. Both zones will need a conditional use permit to allow a behavioral health facility to move forward. The City of Arlington is not unique in their desire to improve mental health services in their community. Additional outreach to surrounding communities is needed to ensure the solution meets the needs of the larger community.

### Site One: 2119 State Route 530 NE

This property is approximately 5.2 acres and listed at \$2,950,000. It has an existing residence to the south and a relatively flat topography. Water/irrigation rights are included. The zoning is Freeway Service (FS) which allows for commercial establishments that have some dependency on highway users. The intersection of I-5 and Route 530 makes this location appealing for transportation and access to services for both staff and visitors..



Aerial Photo

Map Data: Copyright 2019 Google

Site Two: 2127 State Route 530 NE

This property is approximately 5 acres and listed at \$337,300. Currently, the site is not listed for sale but could be a great option if available for purchase. The zoning is Freeway Service (FS) which allows for commercial establishments that have some dependency on highway users. The intersection of I-5 and Route 530 makes this location appealing for transportation and access to services for both staff and visitors..



Aerial Photo

Map Data: Copyright 2019 Google

# Site Options - Snohomish County

## Site 3: 20600 Smokey Point Blvd

This property is approximately 6 acres and listed at \$6,000,000. The land is relatively flat with good access to Route 530 and the I-5 Freeway. The zoning for this property is currently listed as Agricultural-10 Acre (A-10) which includes agricultural-related uses such as farming, production, and support services. A re-zoning of this property would need to occur.



Aerial Photo

Map Data: Copyright 2019 Google

Site 4: 7423 204th St NE

This site consists of two lots equaling 4.38 acres, listed at \$1,500,000. The site is relatively flat and has existing creek at the north side of the property. The zoning is General Commercial (GC) which allows for a variety of retail and non-retail commercial and business uses. A number of existing retail uses nearby is likely appealing to visitors and staff.



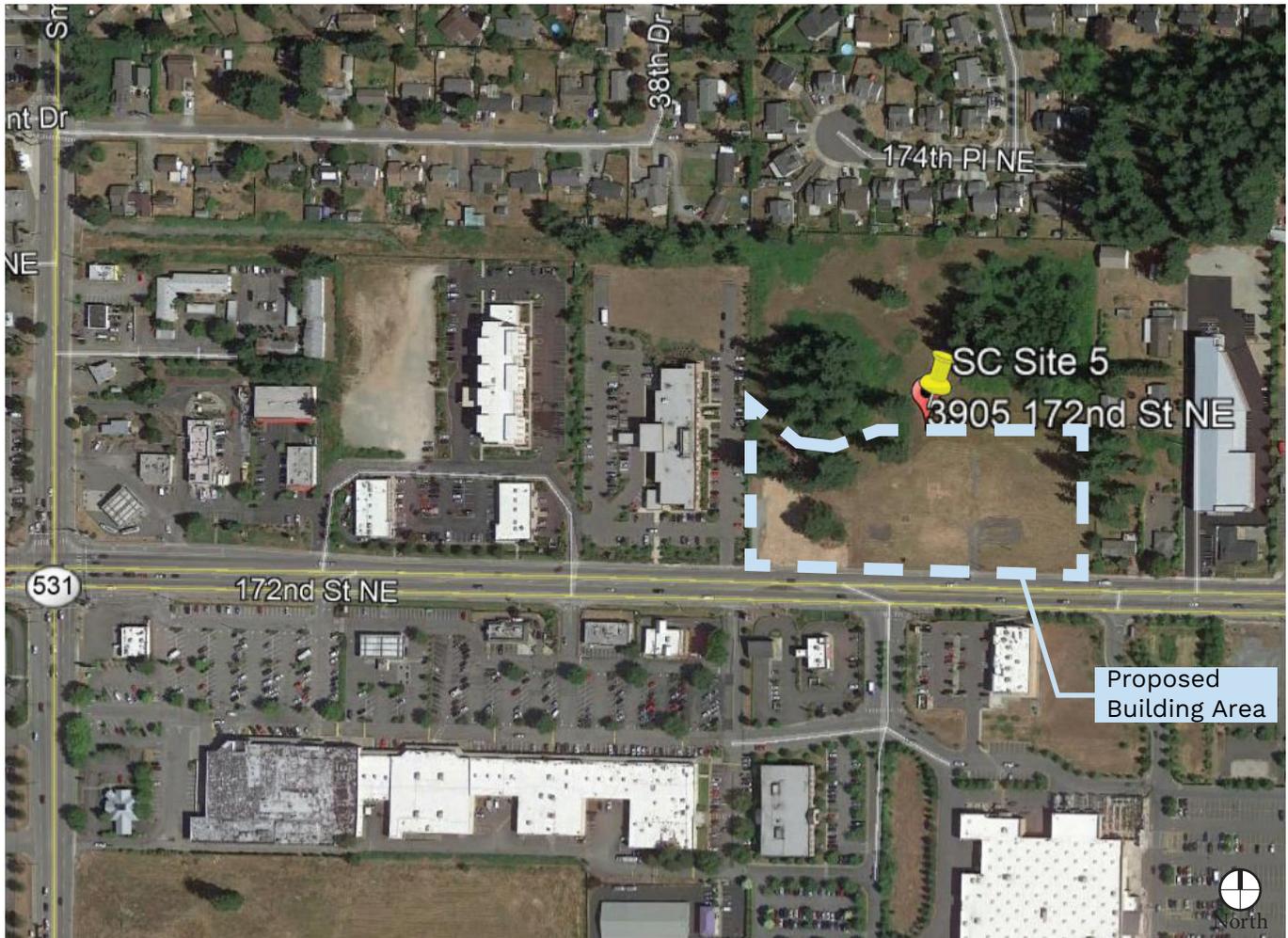
Aerial Photo

Map Data: Copyright 2019 Google

# Site Options - Snohomish County

## Site 5: 3905 172nd St NE

The site below is approximately 3.37 acres and listed at \$5,133,065. There is an existing adult care facility to the north, a UW Medical Facility to the west, and an existing church facility to the East. The zoning is listed as Highway Commercial (HC). Due to the smaller size of the lot, it may not allow for all facilities to be single story.



Aerial Photo

Map Data: Copyright 2019 Google

**WAC State Requirements**

The project will be required to be licensed as a Residential Treatment Facility by the Washington State Department of Health. The project will be secure and locked complying with WAC 246-337 Residential Treatment Facility code section.

Other codes the project will comply with include:

- 2018 International Building Code
- 2018 International Mechanical Code
- 2020 National Electric Code (NFPA 70)
- 2018 FGI Guidelines for Design and Construction of Residential Health Care, and Support Facilities.
- 2018 Washington State Energy Code
- 2015 Health Care Facilities Code (NFPA 99)
- 2012 Life Safety Code (NFPA 101)
- Behavioral Health Design Guide – Edition 9.0

**Energy Requirements**

The Governor’s Office Executive order 18-01 states that “...all newly constructed state-owned buildings shall be designed to be zero energy or zero energy-capable, and include consideration of net- embodied carbon. In unique situations where a cost effective zero-energy building is not yet technically feasible, buildings shall be designed to exceed the current state building code for energy efficiency to the greatest extent possible.”

**Accessibility**

Americans with Disabilities Act (ADA) accessibility for all spaces is critical not only for Behavioral Health patients, but for any staff, volunteers and visitors who require accessibility and all who are deaf, hard-of-hearing, blind, wheelchair users, people with mobility challenges, etc.

**Centers for Medicare and Medicaid Services**

The Joint Commission’s Environment of Care Standard EC.02.06.05 states the Joint Commission expects organizations to assess building design and construction requirements based on local, state, and federal regulations and codes.

Typically, the state health department licensing entity is the authority having jurisdiction (AHJ), and health care organizations must comply with the AHJ’s licensing rules to obtain approvals to operate. When state regulations are silent on a specific design criterion, the Joint Commission recognizes the 2014 Facility Guidelines Institute (FGI) Guidelines for Design and Construction of Hospitals and Outpatient Facilities for new construction and renovation.

Participation in the Centers for Medicare and Medicaid (CMS) programs requires that the facility also be designed to comply with the requirements of the National Fire Protection Associations’ Life Safety Code 101 (2012 Edition) and all referenced codes. When a conflict exists between the Federal requirement and the State building code, the most restrictive provision of code shall be implemented. The design team will work with the various AHJ’s (planning, building, and fire) to proactively resolve code related conflicts in advance of completing the design.

**Permitting**

To be determined.

**Site Development / Permitting**

Permit (Complexity and Duration)	3
Off-Site Development Requirements	3
Utilities Available	3
Land Size and Configuration	3

**Site Amenities**

Shared Facilities	3
Transportation	3
Vocation / Recreation Space	3
Healing Environment	3

**Community Assets**

Regional Need	1
Healthcare facilities nearby	3
Access to other Mental Health	3
Staff Availability	3
Community Receptiveness	3
<b>TOTAL SCORE:</b>	<b>37</b>

**Decision Matrix Overview**

Many sites in Snohomish County have been evaluated. There is resistance in some cities due to some issues at a local private hospital. However, there is a need in the area for mental health services. The Arlington area is very receptive and it appears that a facility will be able to be developed. Once a site is identified, a thorough analysis can be completed.



# 4

## Detail Analysis

16-BED STATE-OWNED COMMUNITY CIVIL FACILITY

## Design Innovation

Approaching Washington’s behavioral health programs with an innovative mindset is critical to the mission of transforming lives by supporting sustainable recovery, independence, and wellness. The new facilities explored in this pre-design effort will decentralize care and help patients recover in their communities at transitional, supportive campuses for healing. A hospitality sensibility rooted in calming, home-like spaces with ample daylighting, clear sightlines, and acoustical considerations will bring innovative environments tailored to the unique needs of the behavioral health population. These projects afford DSHS the opportunity to deliver care in a new way – in line with state-of-the-art care models that are delivering outcomes.



Pierce County’s Crisis Stabilization Center is approachable, intuitive, and welcoming for families and first responders



Telecare’s Milton location



Telecare’s Federal Way location matched the local neighborhood’s scale and character through residential-inspired exterior materials and roofline



In King County, Telecare’s great room features warm materials and abundant daylight



Positive messaging sets a supportive tone at Telecare King County

Research and applications have demonstrated that the care environment directly affects the health and healing of patients. Despite advances in the design of healthcare environments and our understanding of the relationship between mental and physical health, behavioral healthcare spaces lag behind that of other medical settings in terms of innovative design. Changing our approach to behavioral health design can improve outcomes for patients and satisfaction for staff while breaking some of the societal stigmas associated with mental illness.



The design for Skagit County’s nurse’s station balances hospitality with function. A low counter combined with glass partitions provides sheltered spaces for charting while promoting interactions.



The central gathering spaces at Pierce County's Crisis Stabilization Center creates comfortable zones while maintaining clear sight-lines from the nurse's station

Innovative spaces for healing encompass a holistic approach to the patient, the staff that supports them, and the environment itself. Improving the overall experience includes strategies such as:

- Locating the facility strategically in the community, close to family members. Blending the exterior into the surrounding environment aids in destigmatizing the facilities themselves.
- Beginning with the arrival sequence and intake experience, the patient's first impressions inform them that this facility lands somewhere on the spectrum from therapeutic to punitive. Use of color, warm materials, appropriate artwork, natural daylight, and carefully selected artificial light play an important role in creating a healing environment.
- Cues for wayfinding and areas for personalization at the entry to each patient bedroom remove stressors and create a sense of belonging.
- Use of residential/hospitality design elements, including an emphasis on nature and natural materials and color palettes and a focus on recovery and hope in graphics.
- Physical activity is critically important. Space for large muscle activity must be made available. Access to the outdoors, as well as views from inside, should be considered.



Warm and comforting materials and colors provide a calming atmosphere that promotes healing



Patient bedrooms incorporate warm finishes, natural light views plus safe private bathrooms





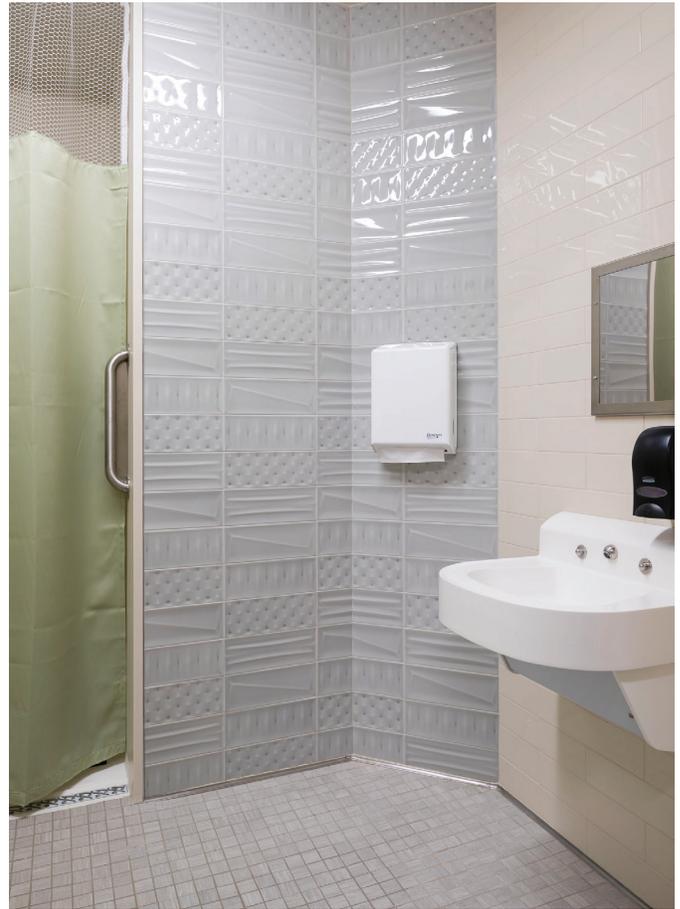
Sensory rooms provide an opportunity to self-soothe and deescalate, and are a preferred alternate to seclusion spaces

- To help offset significant adjustments made by patients, environmental controls can be offered, such as variable lighting or music systems in patient rooms. Choice in furnishings and activity zones, recessed seating nooks to create a perceived sense of privacy or transition, and dimmable lighting in common areas also can re-introduce aspects of control into the patient experience.
- Features that allow self-regulation, such as sensory rooms, can help patients learn how to respond to the onset of emotions.
- It is important not to underestimate the need for quality spaces for staff respite. Behavioral patients feed off the tone that
- is set by staff. Safer, happier staff inherently promote a safer patient environment.

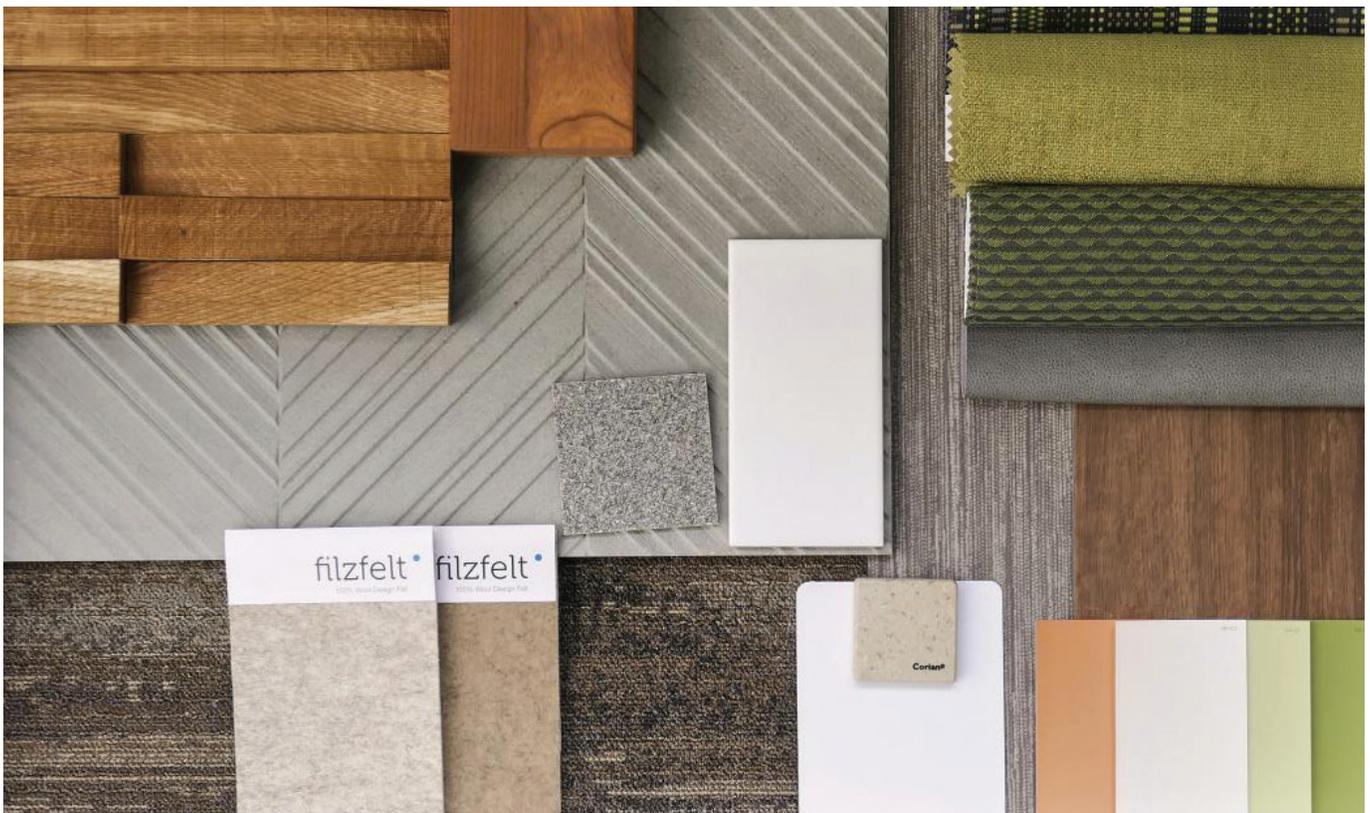


Skagit County's Crisis Stabilization Center highlights patient bedroom entries with color and pattern while also adding tackable wall panels for personalization

Not only do these considerations improve patient outcomes, they can impact recruitment and retention of critically important behavioral healthcare providers.



Durable, spa-like patient restroom finishes and fixtures at Telecare King County



The materials palette at Skagit County's Stabilization Center features warm, home-like, and natural materials, colors, and textures

# Delivery Method

The state of Washington is studying different delivery methods for this project. The following is a summary of options.

## **Design-Bid-Build Method**

This is the traditional delivery method for public works projects. The designers develop and estimate a project design and the project is bid to multiple contractors. This method usually achieves a lower first cost than other methods, but change orders are usually higher because the contractor has little time to familiarize themselves with the project. This creates a risk for the owner and tends to create opportunities for conflict over scope. There is also the risk that the low-bidder failed to account for a significant item, which can also put stress on the project. These challenges can be mitigated by high quality bidding documents.

## **General Contractor/Construction Manager (GC/CM) Alternative Method**

The GC/CM method selects the contractor during schematic design, which allows the owner to have a direct contract with the design team and a direct contract with the contractor. The owner selects both the architect and contractor directly. The contractor is selected based on qualifications and overhead pricing. The contractor has an extended time period to plan construction and provide input into the design on constructibility issues. This method promotes risk mitigation with active budget management by the contractor during the design phase. The contractor can provide feedback to design as it is being developed. CPARB (Capital Projects Advisory Review Board) approval is required for this method.

## **Design/Build Alternative Method**

This model creates a single contract for design and construction, as the design team is under contract to the contractor. Using the progressive design build model, the contractor/design team are selected together at the beginning of the project based on qualifications, overhead pricing, and experience. The Design/Builder responds to a Request for Qualifications and participates in proprietary meetings and interviews. This method inserts the contractor into the process from the beginning and gives the owner greater price certainty as the project develops. A MACC is set at design development and adhered to for the duration of the project. This method promotes teamwork between the owner, contractor and architect. CPARB (Capital Projects Advisory Review Board) approval is required for this method.

## **Recommendation**

The GC/CM delivery method is recommended for this project. This process improves cost control, enables the contractor to provide design input as the design is developing, and mitigates construction risk for the owner. GC/CM will enable DSHS to implement the 48-bed project quicker than Design-Bid-Build and Design-Build by utilizing the current design team and performing the contractor selection during schematic design. This would save **3-4 months from a design bid build method and 4-6 months from a design /build schedule.**

# Sustainability Approach - LEED Checklist

## Summary of goals:

- Attain a minimum LEED v4 Silver (50-59 credit points).
- Comply with Executive order 18-01 State Efficiency and Environmental Performance

## Summary of Executive Order:

- Site selection to reduce carbon impacts
- Use strategic technical consultants
- Durable envelope design, efficient HVAC system with submetering and graphic dashboards
- Target low-Embodied Carbon
- Design for renewables and energy storage

## Pre-Design Process to Comply with Executive Order:

- Include one Zero Net Energy (ZNE) requirement in budget packages
  - On-site solar generation
- Identify one team ZNE champion
  - Sazan Group, Jack Newman
- Develop and refine Owners Project Requirements (OPR) to reflect ZNE
- Review contract structures and include ZNE
- Include ZNE goal in architect advertisement. Select Qualified team
  - Completed
- Set building energy performance target (EUI)
  - Pending
- Hold design Charrettes
  - Charette – Nov 11, 2019
- Conduct early design phase energy modeling

## LEED v4 Executive Order 18-01 Alignment:

- Incorporate 'grid-optimized' building strategies with demand response capabilities
- Leverage energy resilience strategies for select, critical electrical loads
- Prioritize low energy use intensity (EUI) to minimize solar PV array capacity
  - Design solar PV array to maintain net energy metering, if feasible
  - Ensure solar Photo Voltaic (PV) array is optimized for project location

## Implement solar PV and energy efficiency strategies to align with LEED v4 requirements:

- EAp2 - Minimum Energy Performance
- EAp3 - Building Level Energy Metering
- EAc2 - Optimize Energy Performance
- EAc3 - Advanced Energy Metering
- EAc4 - Demand Response
- EAc5 - Renewable Energy Production
- Regional Priority (RP) - Demand Response
  - One additional point is available for projects that incorporate building and equipment for participation in demand response programs through load shedding or shifting. On-site electricity generation does not meet the intent of this credit.
  - Credit requirements vary for projects located in a utility's service territory based on a Demand Response program's availability.
- Regional Priority - Renewable Energy Production
  - One additional point is available under EAc5. For a LEED v4 BD+C project, this additional point is achieved by implementing a renewable energy generation system, such as a solar PV array, that offsets 10% of the total building's annual energy cost.



Image from first Sustainability Design Meeting

## Attendees at meeting:

- DSHS - Larry Covey, Aaron Martinez, Tim Byrne, Steve Hardy  
BCRA - Laura Jacobson, Jim Wolch, Lorraine Jack, Justin Goroch  
Lund Opsahl - Owen Bower  
Sazan - Neils Fallisgaard, Jack Newman  
BCE - Joe Snyder  
AHBL - Bill Fierst

# Sustainability Approach - LEED v4 Project Checklist

Resulting project table for intended point achievement:

## LEED v4 for BD+C: New Construction and Major Renovation Project Checklist



Project Name: SW-BH Community 16/48 Bed Capacity  
Date: Nov-19

Y	?	N	Credit	Integrative Process	1
5	10	1	Credit	LEED for Neighborhood Development Location	16
1			Credit	Sensitive Land Protection	1
1	1		Credit	High Priority Site	2
2	3		Credit	Surrounding Density and Diverse Uses	5
			Credit	Access to Quality Transit	5
1			Credit	Bicycle Facilities	1
			Credit	Reduced Parking Footprint	1
1			Credit	Green Vehicles	1
<b>3 6 1 Sustainable Sites</b>					
Y			Prereq	Construction Activity Pollution Prevention	Required
1			Credit	Site Assessment	1
			Credit	Site Development - Protect or Restore Habitat	2
1			Credit	Open Space	1
1	1		Credit	Rainwater Management	3
1	1		Credit	Heat Island Reduction	2
			Credit	Light Pollution Reduction	1
<b>6 0 5 Water Efficiency</b>					
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
2			Credit	Outdoor Water Use Reduction	2
3			Credit	Indoor Water Use Reduction	6
			Credit	Cooling Tower Water Use	2
1			Credit	Water Metering	1
<b>17 16 0 Energy and Atmosphere</b>					
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
4	2		Credit	Enhanced Commissioning	6
7	11		Credit	Optimize Energy Performance	18
1			Credit	Advanced Energy Metering	1
1	1		Credit	Demand Response	2
3			Credit	Renewable Energy Production	3
1			Credit	Enhanced Refrigerant Management	1
			Credit	Green Power and Carbon Offsets	2
<b>7 6 0 Materials and Resources</b>					
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
2	3		Credit	Building Life-Cycle Impact Reduction	5
1	1		Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
1	1		Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
1	1		Credit	Building Product Disclosure and Optimization - Material Ingredients	2
2			Credit	Construction and Demolition Waste Management	2
<b>11 3 2 Indoor Environmental Quality</b>					
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
			Credit	Enhanced Indoor Air Quality Strategies	2
3			Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
2			Credit	Indoor Air Quality Assessment	2
1			Credit	Thermal Comfort	1
2			Credit	Interior Lighting	2
1	2		Credit	Daylight	3
			Credit	Quality Views	1
			Credit	Acoustic Performance	1
<b>4 2 0 Innovation</b>					
3	2		Credit	Innovation	6
1			Credit	LEED Accredited Professional	5
1			Credit		1
<b>4 0 0 Regional Priority</b>					
1			Credit	Regional Priority: Demand Response	1
1			Credit	Regional Priority: Renewable Energy Production	1
1			Credit	Regional Priority: Building Product Disclosure - Environmental Product Declar.	1
1			Credit	Regional Priority: Building Product Disclosure - Sourcing of Raw Mtls.	1
<b>58</b>	<b>43</b>	<b>9</b>	<b>TOTALS</b>	<b>Possible Points: 110</b>	
Certified: 40 to 49 points, Silver: 50 to 59 points, Gold: 60 to 79 points, Platinum: 80 to 110					

# Sustainability Approach - Net-Zero Energy

## General Conditions for Net Zero Energy

Achieving net zero energy performance for the Department of Social & Health Services’ (DSHS) new Behavioral Health Unit (BHU) facilities is feasible, based on the results of this pre-design study phase. Through an evaluation of estimated energy use, renewable energy system capacity and associated rough order of magnitude costs for the proposed 51,462 square foot 48-bed facilities, the following concept solar PV array design is provided. This 186 kW solar PV system option produces an estimated 201,800 kWh/year to provide a 100% offset of anticipated energy use.



Figure 1: 186 kW Solar PV Array Concept for Maple Lane Site

While six sites are considered for the new facilities, the ability to achieve net zero energy will largely be dictated by building orientation, available roof area or adjacent space for siting solar PV arrays, the targeted energy use intensity (EUI), and potential shading. For the 186 kW array conceptualized in Figure 1, a high-cost estimate of \$650,050 is anticipated using a unit cost of \$3.50/Watt. This system option features an azimuth of 132°; solar energy production is anticipated to increase, thereby reducing the required capacity if the building and associated rooftop array can be oriented South with a 180° azimuth.

Actual costs may be driven by the specified project location, solar PV system layout, capacity, and products specified. Important considerations include the benefits of producing on-site renewable energy for risk mitigation, and in the case of significant rises in utility costs, to providing significant operational cost savings throughout the PV array’s 25-year warranted lifetime.

Additionally, occupant engagement and educational benefits using an energy dashboard are feasible with the incorporation of on-site renewable energy, as well as potential resiliency outcomes when supplementing the system with energy storage or microgrid infrastructure. Alternative strategies for achieving net zero energy include the development of ground-mount solar PV arrays, or participation in off-site procurement strategies such as Power Purchase Agreements (PPAs) or utility purchasing programs including the ‘Green Direct’ program with Puget Sound Energy. Based on the results of this pre-design study, investments in energy efficiency and conservation measures are anticipated to reduce the investment in renewable energy required to achieve net zero, increasing the feasibility of this leading energy performance goal.

## Site Specific Considerations for Alternatives

Each site identified in the pre-design study phase has been evaluated for solar potential and ranked for prioritization to achieve net zero energy:

Site	Solar	Notes
Fircrest	High	No southern shading, highest priority site for net zero energy
Maple Lane School	High	Partial shading to the South of proposed project location, although potential for adjacent solar PV and microgrid development with DOC
Western State Hospital	Medium	Limited or no shading at project site; prioritized for net zero energy
Echo Glen	Low	Shaded site not suitable for solar; requires tree removal to be coordinated with DNR
Snohomish County	TBD	To be determined
Clark County	TBD	To be determined

Figure 2: Site-Specific Assessment



# Cost Estimate Summary

Preferred Alternative - Clark County #6

## Major assumptions used in preparing the cost estimate:

- Assumes a construction start of August 2021 and an anticipated move-in date of December 2022. The construction duration is 19 months assuming an early site preparation contract.
- Cost Estimates assume a 3.12% inflation rate
- The Architecture and Engineering fee is Class B at 6.51%
- Assumed construction delivery method is GCCM

Table 1-1

Item	Description	Gross Square Feet	\$/GSF	Cost
1	Site Construction (includes frontage construction)			\$ 2,531,905
2	New Building construction	52,983	379	\$ 20,064,330
3	GCCM Risk Contingency			\$ 3,901,122
4	GCCM Costs			\$ 4,270,245
5	Contingencies			\$ 1,129,812
Total Construction Cost in Today's Dollars (Escalation and Sales Tax excluded. See C-100 for Sales Tax and Escalation)				<b>\$ 31,897,414</b>

STATE OF WASHINGTON		
AGENCY / INSTITUTION PROJECT COST SUMMARY		
Agency	Department of Social and Health Services	
Project Name	Behavioral Health Community Civil 16 Bed Capacity	
OFM Project Number	CBS #91000075	

Contact Information	
Name	BCRA/ ARC Cost
Phone Number	253-627-4367
Email	<a href="mailto:iwolch@bcradesign.com">iwolch@bcradesign.com</a>

Statistics			
Gross Square Feet	17,661	MACC per Square Foot	\$501
Usable Square Feet	12,180	Escalated MACC per Square Foot	\$559
Space Efficiency	69.0%	A/E Fee Class	A
Construction Type	Mental Institutions	A/E Fee Percentage	9.44%
Remodel	No	Projected Life of Asset (Years)	50
Additional Project Details			
Alternative Public Works Project	Yes	Art Requirement Applies	Yes
Inflation Rate	3.12%	Higher Ed Institution	No
<a href="#">Sales Tax Rate %</a>	7.90%	Location Used for Tax Rate	Thurston County
Contingency Rate	5%		
Base Month	June-18		
Project Administered By	Agency		

Schedule			
Predesign Start	September-19	Predesign End	October-18
Design Start	May-20	Design End	May-21
Construction Start	June-21	Construction End	December-22
Construction Duration	18 Months		

Green cells must be filled in by user

Project Cost Estimate			
Total Project	<b>\$17,647,686</b>	Total Project Escalated	<b>\$19,632,007</b>
		Rounded Escalated Total	<b>\$19,632,000</b>

**STATE OF WASHINGTON**  
**AGENCY / INSTITUTION PROJECT COST SUMMARY**

Agency	Department of Social and Health Services	
Project Name	Behavioral Health Community Civil 16 Bed Capacity	
OFM Project Number	CBS #91000075	

**Cost Estimate Summary**

Acquisition			
<b>Acquisition Subtotal</b>	<b>\$0</b>	<b>Acquisition Subtotal Escalated</b>	<b>\$0</b>

Consultant Services			
Predesign Services	\$195,826		
A/E Basic Design Services	\$766,847		
Extra Services	\$1,095,500		
Other Services	\$441,743		
Design Services Contingency	\$124,996		
<b>Consultant Services Subtotal</b>	<b>\$2,624,912</b>	<b>Consultant Services Subtotal Escalated</b>	<b>\$2,849,643</b>

Construction			
GC/CM Risk Contingency	\$1,380,183		
GC/CM or D/B Costs	\$1,486,825		
Construction Contingencies	\$442,186	Construction Contingencies Escalated	\$496,222
Maximum Allowable Construction Cost (MACC)	\$8,843,723	Maximum Allowable Construction Cost (MACC) Escalated	\$9,867,699
Sales Tax	\$960,080	Sales Tax Escalated	\$1,072,922
<b>Construction Subtotal</b>	<b>\$13,112,998</b>	<b>Construction Subtotal Escalated</b>	<b>\$14,654,201</b>

Equipment			
Equipment	\$550,000		
Sales Tax	\$43,450		
Non-Taxable Items	\$0		
<b>Equipment Subtotal</b>	<b>\$593,450</b>	<b>Equipment Subtotal Escalated</b>	<b>\$665,970</b>

Artwork			
<b>Artwork Subtotal</b>	<b>\$49,338</b>	<b>Artwork Subtotal Escalated</b>	<b>\$49,338</b>

Agency Project Administration			
Agency Project Administration Subtotal	\$666,989		
DES Additional Services Subtotal	\$0		
Other Project Admin Costs	\$0		
<b>Project Administration Subtotal</b>	<b>\$916,989</b>	<b>Project Administration Subtotal Escalated</b>	<b>\$1,029,045</b>

Other Costs			
<b>Other Costs Subtotal</b>	<b>\$350,000</b>	<b>Other Costs Subtotal Escalated</b>	<b>\$383,810</b>

Project Cost Estimate			
Total Project	<b>\$17,647,686</b>	Total Project Escalated	<b>\$19,632,007</b>
		Rounded Escalated Total	<b>\$19,632,000</b>

## Cost Estimate Details

Acquisition Costs				
Item	Base Amount	Escalation Factor	Escalated Cost	Notes
Purchase/Lease	\$0			
Appraisal and Closing				
Right of Way	\$0			
Demolition				
Pre-Site Development				
Other				
Insert Row Here				
<b>ACQUISITION TOTAL</b>	<b>\$0</b>	<b>NA</b>	<b>\$0</b>	

Green cells must be filled in by user

## Cost Estimate Details

Consultant Services				
Item	Base Amount	Escalation Factor	Escalated Cost	Notes
<b>1) Pre-Schematic Design Services</b>				
Programming/Site Analysis				
Environmental Analysis				
Predesign Study	\$195,826			
Other				
Insert Row Here				
<b>Sub TOTAL</b>	<b>\$195,826</b>	<b>1.0607</b>	<b>\$207,713</b>	Escalated to Design Start
<b>2) Construction Documents</b>				
A/E Basic Design Services	\$604,847			69% of A/E Basic Services
Other	\$162,000			adjustment to 7.62%
Insert Row Here				
<b>Sub TOTAL</b>	<b>\$766,847</b>	<b>1.0771</b>	<b>\$825,971</b>	Escalated to Mid-Design
<b>3) Extra Services</b>				
Civil Design (Above Basic Svcs)	\$100,000			
Geotechnical Investigation	\$30,000			
Commissioning	\$25,000			
Site Survey	\$25,000			
Testing	\$75,000			
LEED Services	\$65,000			
Voice/Data Consultant	\$35,000			
Value Engineering	\$40,000			
Constructability Review	\$40,000			
Environmental Mitigation (EIS)	\$55,000			
Landscape Consultant	\$40,000			
ELCCA	\$20,000			
LCCT	\$75,000			
Reimburseables incl	\$15,000			
Reprographics prior to bid				
Advertising	\$3,000			
Traffic analysis	\$10,000			
Envelope Consultant	\$20,000			
Interior Design	\$30,000			
Acoustic Design	\$25,000			
Security Consultant	\$20,000			
Audio Visual Consultant	\$25,000			
Cost and Scheduling	\$50,000			
Value Engineering Participation	\$25,000			
Constructability Review Participation	\$25,000			
Environmental Graphics/Signage	\$40,000			
Lighting Consultant	\$0			
Healthcare Services Consultant	\$0			
Door Hardware Consultant	\$7,500			
CUP/SEPA/Land Use	\$100,000			
Net Zero Energy Consultant	\$75,000			
Insert Row Here				
<b>Sub TOTAL</b>	<b>\$1,095,500</b>	<b>1.0771</b>	<b>\$1,179,964</b>	Escalated to Mid-Design

<b>4) Other Services</b>						
Bid/Construction/Closeout	\$271,743					31% of A/E Basic Services
HVAC Balancing						
Staffing						
Commissioning and Training	\$50,000					
Reimburseables/Reprographics for bid and construction	\$45,000					
Construction Materials Testing	\$75,000					
Insert Row Here						
<b>Sub TOTAL</b>	<b>\$441,743</b>	<b>1.1222</b>	<b>\$495,724</b>			Escalated to Mid-Const.
<b>5) Design Services Contingency</b>						
Design Services Contingency	\$124,996					
Other						
Insert Row Here						
<b>Sub TOTAL</b>	<b>\$124,996</b>	<b>1.1222</b>	<b>\$140,271</b>			Escalated to Mid-Const.
<b>CONSULTANT SERVICES TOTAL</b>			<b>\$2,624,912</b>		<b>\$2,849,643</b>	

Green cells must be filled in by user

## Cost Estimate Details

Construction Contracts				
Item	Base Amount	Escalation Factor	Escalated Cost	Notes
<b>1) Site Work</b>				
G10 - Site Preparation	\$185,486			
G20 - Site Improvements	\$350,467			
G30 - Site Mechanical Utilities	\$160,000			
G40 - Site Electrical Utilities	\$220,000			
G60 - Other Site Construction				
Frontage Improvements	\$500,000			Half street improvements on Old Hwy 9
Security Fence Revisions	\$250,000			
<b>Sub TOTAL</b>	<b>\$1,665,953</b>	<b>1.0966</b>	<b>\$1,826,885</b>	
<b>2) Related Project Costs</b>				
Offsite Improvements				
City Utilities Relocation	\$150,000			
Parking Mitigation				
Stormwater Retention/Detention	\$400,000			
Other				
Insert Row Here				
<b>Sub TOTAL</b>	<b>\$550,000</b>	<b>1.0966</b>	<b>\$603,130</b>	
<b>3) Facility Construction</b>				
A10 - Foundations	\$313,189			
A20 - Basement Construction	\$0			
B10 - Superstructure	\$523,375			
B20 - Exterior Closure	\$899,518			
B30 - Roofing	\$603,924			
C10 - Interior Construction	\$714,474			
C20 - Stairs	\$0			
C30 - Interior Finishes	\$521,928			
D10 - Conveying	\$0			
D20 - Plumbing Systems	\$339,974			
D30 - HVAC Systems	\$969,152			
D40 - Fire Protection Systems	\$105,966			
D50 - Electrical Systems	\$1,236,270			
F10 - Special Construction				
F20 - Selective Demolition	\$0			
General Conditions	\$0			
Building Related Site Improvements	\$0			
PV Panels	\$400,000			
Insert Row Here				
<b>Sub TOTAL</b>	<b>\$6,627,770</b>	<b>1.1222</b>	<b>\$7,437,684</b>	
<b>4) Maximum Allowable Construction Cost</b>				
<b>MACC Sub TOTAL</b>	<b>\$8,843,723</b>		<b>\$9,867,699</b>	

<b>5) GCCM Risk Contingency</b>				
GCCM Risk Contingency	\$1,380,183			
Other				
Insert Row Here				
<b>Sub TOTAL</b>	<b>\$1,380,183</b>	<b>1.1222</b>	<b>\$1,548,842</b>	
<b>6) GCCM or Design Build Costs</b>				
GCCM Fee	\$536,825			
Bid General Conditions	\$400,000			
GCCM Preconstruction Services	\$150,000			
NSS	\$400,000			
Insert Row Here				
<b>Sub TOTAL</b>	<b>\$1,486,825</b>	<b>1.1222</b>	<b>\$1,668,516</b>	
<b>7) Construction Contingency</b>				
Allowance for Change Orders	\$442,186			
Other				
Insert Row Here				
<b>Sub TOTAL</b>	<b>\$442,186</b>	<b>1.1222</b>	<b>\$496,222</b>	
<b>8) Non-Taxable Items</b>				
Other				
Insert Row Here				
<b>Sub TOTAL</b>	<b>\$0</b>	<b>1.1222</b>	<b>\$0</b>	
<b>Sales Tax</b>				
<b>Sub TOTAL</b>	<b>\$960,080</b>		<b>\$1,072,922</b>	
<b>CONSTRUCTION CONTRACTS TOTAL</b>	<b>\$13,112,998</b>		<b>\$14,654,201</b>	

Green cells must be filled in by user

## Cost Estimate Details

Equipment					
Item	Base Amount		Escalation Factor	Escalated Cost	Notes
E10 - Equipment	\$225,000				
E20 - Furnishings	\$225,000				
F10 - Special Construction					
IT Equip/computers/printers	\$100,000				
Insert Row Here					
<b>Sub TOTAL</b>	<b>\$550,000</b>		<b>1.1222</b>	<b>\$617,210</b>	
<b>1) Non Taxable Items</b>					
Other					
Insert Row Here					
<b>Sub TOTAL</b>	<b>\$0</b>		<b>1.1222</b>	<b>\$0</b>	
<b>Sales Tax</b>					
<b>Sub TOTAL</b>	<b>\$43,450</b>			<b>\$48,760</b>	
<b>EQUIPMENT TOTAL</b>					
<b>EQUIPMENT TOTAL</b>	<b>\$593,450</b>			<b>\$665,970</b>	

Green cells must be filled in by user

## Cost Estimate Details

Artwork					
Item	Base Amount		Escalation Factor	Escalated Cost	Notes
Project Artwork	\$49,338				0.5% of Escalated MACC for new construction
Higher Ed Artwork	\$0				0.5% of Escalated MACC for new and renewal construction
Other					
Insert Row Here					
<b>ARTWORK TOTAL</b>	<b>\$49,338</b>		<b>NA</b>	<b>\$49,338</b>	

Green cells must be filled in by user

### Cost Estimate Details

Project Management				
Item	Base Amount	Escalation Factor	Escalated Cost	Notes
Agency Project Management	\$666,989			
Additional Services				
Additional Management/Administration	\$250,000			
Insert Row Here				
<b>PROJECT MANAGEMENT TOTAL</b>	<b>\$916,989</b>	<b>1.1222</b>	<b>\$1,029,045</b>	

Green cells must be filled in by user

### Cost Estimate Details

Other Costs				
Item	Base Amount	Escalation Factor	Escalated Cost	Notes
Mitigation Costs				
Hazardous Material Remediation/Removal	\$100,000			
Historic and Archeological Mitigation				
Permit and Plan Review Fees	\$250,000			
Insert Row Here				
<b>OTHER COSTS TOTAL</b>	<b>\$350,000</b>	<b>1.0966</b>	<b>\$383,810</b>	

Green cells must be filled in by user

**C-100(2018)**  
**Additional Notes**

**Tab A. Acquisition**

*Insert Row Here*

**Tab B. Consultant Services**

*Insert Row Here*

**Tab C. Construction Contracts**

*Insert Row Here*

**Tab D. Equipment**

Covers owner provided/purchased furnishings and equipment

*Insert Row Here*

**Tab E. Artwork**

*Insert Row Here*

**Tab F. Project Management**

*Insert Row Here*

**Tab G. Other Costs**

*Insert Row Here*



# 6

## Appendices

- A. Pre-Design Checklist
- B. Life Cycle Cost Models - to be provided at later date
- C. Visioning Questionnaire Responses
- D. Meeting Notes
- E. Mechanical Narrative
- F. Net-Zero Pre-Design Study
- G. Letter from the Department of Archeology and Historic Preservation



# Pre-Design Checklist

A predesign should include the content detailed here. OFM will approve limited scope predesigns on a case-by-case basis.

## ❖ Executive summary

### ❖ Problem statement, opportunity or program requirement

- Identify the problem, opportunity or program requirement that the project addresses and how it will be accomplished.
- Identify and explain the statutory or other requirements that drive the project's operational programs and how these affect the need for space, location or physical accommodations. Include anticipated caseload projections (growth or decline) and assumptions, if applicable.
- Explain the connection between the agency's mission, goals and objectives; statutory requirements; and the problem, opportunity or program requirements.
- Describe in general terms what is needed to solve the problem.
- Include any relevant history of the project, including previous predesigns or budget funding requests that did not go forward to design or construction.

### ❖ Analysis of alternatives (including the preferred alternative)

- Describe all alternatives that were considered, including the preferred alternative. Include:
  - A no action alternative.
  - Advantages and disadvantages of each alternative. Please include a high-level summary table with your analysis that compares the alternatives, including the anticipated cost for each alternative.
  - Cost estimates for each alternative:
    - Provide enough information so decision makers have a general understanding of the costs.
    - Complete OFM's Life Cycle Cost [Model](#) (RCW [39.35B.050](#)).
  - Schedule estimates for each alternative. Estimate the start, midpoint and completion dates.

### ❖ Detailed analysis of preferred alternative

- Nature of space – how much of the proposed space will be used for what purpose (i.e., office, lab, conference, classroom, etc.)
- Occupancy numbers.
- Basic configuration of the building, including square footage and the number of floors.
- Space needs assessment. Identify the guidelines used.
- Site analysis:
  - Identify site studies that are completed or under way.
  - Location.

- Building footprint and its relationship to adjacent facilities and site features. Provide aerial view, sketches of the building site and basic floorplans.
- Stormwater requirements.
- Ownership of the site and any acquisition issues.
- Easements and setback requirements.
- Potential issues with the surrounding neighborhood, during construction and ongoing.
- Utility extension or relocation issues.
- Potential environmental impacts.
- Parking and access issues, including improvements required by local ordinances, local road impacts and parking demand.
- Impact on surroundings and existing development with construction lay-down areas and construction phasing.
- Consistency with applicable long-term plans (such as the Thurston County and Capitol campus master plans and agency or area master plans) as required by RCW [43.88.110](#).
- Consistency with other laws and regulations:
  - High-performance public buildings (Chapter [39.35D](#) RCW).
  - State efficiency and environmental performance, if applicable (Executive Order [18-01](#)).
  - Greenhouse gas emissions reduction policy (RCW [70.235.070](#)).
  - Archeological and cultural resources (Executive Order [05-05](#) and [Section 106](#) of the National Historic Preservation Act of 1966).
  - Americans with Disabilities Act (ADA) implementation (Executive Order [96-04](#)).
  - Compliance with planning under Chapter [36.70A](#) RCW, as required by RCW [43.88.0301](#).
  - Information required by RCW [43.88.0301](#)(1).
  - Other codes or regulations.
- Identify problems that require further study. Evaluate identified problems to establish probable costs and risk.
- Identify significant or distinguishable components, including major equipment and ADA requirements in excess of existing code.
- Identify planned technology infrastructure and other related IT investments that affect the building plans.
- Describe planned commissioning to ensure systems function as designed.
- Describe any future phases or other facilities that will affect this project.
- Identify and justify the proposed project delivery method. For GC/CM, link to the requirements in RCW [39.10.340](#).
- Describe how the project will be managed within the agency.
- Schedule.
  - Provide a high-level milestone schedule for the project, including key dates for budget approval, design, bid, acquisition, construction, equipment installation, testing, occupancy and full operation.
  - Incorporate value-engineering analysis and constructability review into the project schedule, as required by RCW [43.88.110](#)(5)(c).

- Describe factors that may delay the project schedule.
- Describe the permitting or local government ordinances or neighborhood issues (such as location or parking compatibility) that could affect the schedule.
- Identify when the local jurisdiction will be contacted and whether community stakeholder meetings are a part of the process.

❖ **Project budget analysis for the preferred alternative**

- Cost estimate.
  - Major assumptions used in preparing the cost estimate.
  - Summary table of Uniformat Level II cost estimates.
  - The [C-100](#).
- Proposed funding.
  - Identify the fund sources and expected receipt of the funds.
  - If alternatively financed, such as through a COP, provide the projected debt service and fund source. Include the assumptions used for calculating finance terms and interest rates.
- Facility operations and maintenance requirements.
  - Define the anticipated impact of the proposed project on the operating budget for the agency or institution. Include maintenance and operating assumptions (including FTEs).
  - Show five biennia of capital and operating costs from the time of occupancy, including an estimate of building repair, replacement and maintenance.
- Clarify whether furniture, fixtures and equipment are included in the project budget. If not included, explain why.

❖ **Pre-design appendices**

- Completed Life Cycle Cost [Model](#).
- A letter from DAHP.



# Life Cycle Cost Models

## Ownership Option 1 Information Sheet

\* **Requires a user input** Green Cell = Value can be entered by user. Yellow Cell = Calculated value.

<b>Project Description</b>	17,661 SF 16 bed Evaluation and Treatment facility located on the Maple Lane Campus in Centralia, Washington
----------------------------	--

<b>Construction or Purchase/Remodel</b>	Construction
---	--------------

<b>Project Location</b>	Centralia	Market Area = Southwest Counties
-------------------------	-----------	----------------------------------

Statistics	
Gross Sq Ft	17,661
Usable Sq Ft	12,180
Space Efficiency	69%
Estimated Acres Needed	2.00
MACC Cost per Sq Ft	\$500.75
Estimated Total Project Costs per Sq Ft	\$1,005.55
Escalated MACC Cost per Sq Ft	\$549.09
Escalated Total Project Costs per Sq Ft	\$1,102.64

<b>Move In Date</b>	2/1/2023
---------------------	----------

Interim Lease Information	Start Date
Lease Start Date	
Length of Lease (in months)	
Square Feet (holdover/temp lease)	
Lease Rate- Full Serviced (\$/SF/Year)	
One Time Costs (if double move)	

Construction Cost Estimates (See Capital Budget System For Detail)			
	Known Costs	Estimated Costs	Cost to Use
<b>Acquisition Costs Total</b>	\$ -	\$ 500,000	\$ 500,000
<b>Consultant Services</b>			
A & E Fee Percentage (if services not specified)	7.62%	7.98% Std	7.62%
Pre-Schematic Design services	\$ 195,826		
Construction Documents	\$ 766,847		
Extra Services	\$ 1,095,500		
Other Services	\$ 441,743		
Design Services Contingency	\$ 124,996		
<b>Consultant Services Total</b>	\$ 2,624,912	\$ 705,860	\$ 2,624,912
<b>Construction Contracts</b>			
Site Work	\$ 1,665,953		
Related Project Costs	\$ 550,000		
Facility Construction	\$ 6,627,720		
<b>MACC SubTotal</b>	\$ 8,843,673	\$ 8,124,060	\$ 8,843,673
Construction Contingency (5% default)	\$ 442,186	\$ 442,184	\$ 442,186
Non Taxable Items			\$ -
Sales Tax	\$ 960,080		\$ 960,080
<b>Construction Additional Items Total</b>	\$ 1,402,266	\$ 442,184	\$ 1,402,266
<b>Equipment</b>			
Equipment	\$ 450,000		
Non Taxable Items			
Sales Tax	\$ 40,000		
<b>Equipment Total</b>	\$ 490,000		\$ 490,000
<b>Art Work Total</b>		\$ 44,218	\$ 44,218
<b>Other Costs</b>			
GCCM Risk Contingency	\$ 1,380,183		
GCCM Costs	\$ 1,486,825		
<b>Other Costs Total</b>	\$ 2,867,008		\$ 2,867,008
<b>Project Management Total</b>	\$ 986,919		\$ 986,919
<b>Grand Total Project Cost</b>	\$ 17,214,778	\$ 9,816,322	\$ 17,758,996

Construction One Time Project Costs		
One Time Costs	Estimate	Calculated
Moving Vendor and Supplies		\$ -
Other (not covered in construction)		
<b>Total</b>	\$ -	\$ -

\$205 / Person in FY09

Ongoing Building Costs					
Added Services	New Building Operating Costs	Known Cost /GSF/ 2023	Estimated Cost /GSF/ 2023	Total Cost / Year	Cost / Month
<input checked="" type="checkbox"/>	Energy (Electricity, Natural Gas)	\$ -	\$ 1.24	\$ 21,873	\$ 1,823
<input checked="" type="checkbox"/>	Janitorial Services	\$ -	\$ 1.52	\$ 26,757	\$ 2,230
<input checked="" type="checkbox"/>	Utilities (Water, Sewer, & Garbage)	\$ -	\$ 0.42	\$ 7,433	\$ 619
<input checked="" type="checkbox"/>	Grounds	\$ -	\$ 0.07	\$ 1,274	\$ 106
<input checked="" type="checkbox"/>	Pest Control	\$ -	\$ 0.11	\$ 1,911	\$ 159
<input checked="" type="checkbox"/>	Security	\$ -	\$ 0.10	\$ 1,699	\$ 142
<input checked="" type="checkbox"/>	Maintenance and Repair	\$ -	\$ 6.44	\$ 113,825	\$ 9,485
<input checked="" type="checkbox"/>	Management	\$ -	\$ 0.48	\$ 8,494	\$ 708
<input checked="" type="checkbox"/>	Road Clearance	\$ -	\$ 0.05	\$ 849	\$ 71
<input checked="" type="checkbox"/>	Telecom	\$ 0.35	\$ -	\$ 6,181	\$ 515
	Additional Parking	\$ -	\$ -	\$ -	\$ -
	Other	\$ -	\$ -	\$ -	\$ -
	<b>Total Operating Costs</b>	\$ <b>0.35</b>	\$ <b>10.43</b>	\$ <b>190,297</b>	\$ <b>15,858</b>

## Ownership Option 2 Information Sheet

\* **Requires a user input** Green Cell = Value can be entered by user. Yellow Cell

\* **Project Description** Construction of a new 17,661 Evaluation and Treatment Facility on Purchase property in Vancouver, Wa

\* **Construction or Purchase/Remodel** Construction

\* **Project Location** Vancouver Market Area = Clark County

<b>Statistics</b>	
* Gross Sq Ft	17,661
* Usable Sq Ft	12,180
Space Efficiency	69%
Estimated Acres Needed	2.00
MACC Cost per Sq Ft	\$500.75
Estimated Total Project Costs per Sq Ft	\$1,029.78
Escalated MACC Cost per Sq Ft	\$549.09
Escalated Total Project Costs per Sq Ft	\$1,129.20

\* **Move In Date** 2/1/2023

<b>Interim Lease Information</b>	<b>Start Date</b>
Lease Start Date	
Length of Lease (in months)	
Square Feet (holdover/temp lease)	
Lease Rate- Full Serviced (\$/SF/Year)	
One Time Costs (if double move)	

<b>Construction Cost Estimates (See Capital Budget System For Detail)</b>				
	<b>Known Costs</b>	<b>Estimated Costs</b>	<b>Cost to Use</b>	
	<b>Acquisition Costs Total</b>	\$ 1,000,000	\$ 500,000	\$ 1,000,000
<b>A &amp; E</b>	<b>Consultant Services</b>			
	A & E Fee Percentage (if services not specified)	7.62%	7.98% Std	7.62%
	Pre-Schematic Design services	\$ 195,826		
	Construction Documents	\$ 766,847		
	Extra Services	\$ 1,095,500		
	Other Services	\$ 441,743		
	Design Services Contingency	\$ 124,996		
	<b>Consultant Services Total</b>	<b>\$ 2,624,912</b>	<b>\$ 705,860</b>	<b>\$ 2,624,912</b>
<b>MACC</b>	<b>Construction Contracts</b>			
	Site Work	\$ 1,665,953		
	Related Project Costs	\$ 550,000		
	Facility Construction	\$ 6,627,720		
	<b>MACC SubTotal</b>	<b>\$ 8,843,673</b>	<b>\$ 8,124,060</b>	<b>\$ 8,843,673</b>
	Construction Contingency (5% default)	\$ 442,186	\$ 442,186	\$ 442,186
	Non Taxable Items			\$ -
	Sales Tax	\$ 960,080		\$ 960,080
	<b>Construction Additional Items Total</b>	<b>\$ 1,402,266</b>	<b>\$ 1,402,266</b>	<b>\$ 1,402,266</b>
	<b>Equipment</b>			
Equipment	\$ 450,000			
Non Taxable Items				
Sales Tax	\$ 37,800			
<b>Equipment Total</b>	<b>\$ 487,800</b>		<b>\$ 487,800</b>	
<b>Art Work Total</b>		\$ 44,218	\$ 44,218	
<b>Other Costs</b>				
GC CM Risk contingency	\$ 1,380,183			
GC CM Costs	\$ 1,486,825			
<b>Other Costs Total</b>	<b>\$ 2,867,008</b>		<b>\$ 2,867,008</b>	
<b>Project Management Total</b>	<b>\$ 916,989</b>		<b>\$ 916,989</b>	
<b>Grand Total Project Cost</b>		<b>\$ 10,776,405</b>	<b>\$ 18,186,866</b>	

Construction One Time Project Costs		
One Time Costs	Estimate	Calculated
Moving Vendor and Supplies	\$ 76,800	\$ -
Other (not covered in construction)		
<b>Total</b>	<b>\$ 76,800</b>	<b>\$ 76,800</b>

\$205 / Person in FY09

Ongoing Building Costs					
Added Services	New Building Operating Costs	Known Cost /GSF/ 2023	Estimated Cost /GSF/ 2023	Total Cost / Year	Cost / Month
<input checked="" type="checkbox"/>	Energy (Electricity, Natural Gas)	\$ -	\$ 1.24	\$ 21,873	\$ 1,823
<input checked="" type="checkbox"/>	Janitorial Services	\$ -	\$ 1.52	\$ 26,757	\$ 2,230
<input checked="" type="checkbox"/>	Utilities (Water, Sewer, & Garbage)	\$ -	\$ 0.42	\$ 7,433	\$ 619
<input checked="" type="checkbox"/>	Grounds	\$ -	\$ 0.07	\$ 1,274	\$ 106
<input checked="" type="checkbox"/>	Pest Control	\$ -	\$ 0.11	\$ 1,911	\$ 159
<input checked="" type="checkbox"/>	Security	\$ -	\$ 0.10	\$ 1,699	\$ 142
<input checked="" type="checkbox"/>	Maintenance and Repair	\$ -	\$ 6.44	\$ 113,825	\$ 9,485
<input checked="" type="checkbox"/>	Management	\$ -	\$ 0.48	\$ 8,494	\$ 708
<input checked="" type="checkbox"/>	Road Clearance	\$ -	\$ 0.05	\$ 849	\$ 71
<input checked="" type="checkbox"/>	Telecom	\$ 0.35	\$ -	\$ 6,181	\$ 515
	Additional Parking	\$ -	\$ -	\$ -	\$ -
	Other	\$ -	\$ -	\$ -	\$ -
	<b>Total Operating Costs</b>	<b>\$ 0.35</b>	<b>\$ 10.43</b>	<b>\$ 190,297</b>	<b>\$ 15,858</b>

## Life Cycle Cost Analysis - Project Summary

<b>Agency</b>	DSHS Capital Programs
<b>Project Title</b>	16 Bed Community Civil Facility
<b>Existing Description</b>	N/A
<b>Lease Option 1 Description</b>	N/A
<b>Lease Option 2 Description</b>	N/A
<b>Ownership Option 1 Description</b>	17,661 SF 16 bed Evaluation and Treatment facility located on the Maple Lane Campus in Centralia, Washington
<b>Ownership Option 2 Description</b>	Construction of a new 17,661 Evaluation and Treatment Facility on Purchase property in Vancouver, Wa
<b>Ownership Option 3 Description</b>	

<b>Lease Options Information</b>	<b>Existing Lease</b>	<b>Lease Option 1</b>	<b>Lease Option 2</b>
Total Rentable Square Feet	-	-	-
Annual Lease Cost (Initial Term of Lease)	\$ -	\$ -	\$ -
Full Service Cost/SF (Initial Term of Lease)	\$ -	\$ -	\$ -
Occupancy Date	n/a		
Project Initial Costs	n/a	\$ -	\$ -
Persons Relocating	-	-	-
RSF/Person Calculated			

<b>Ownership Information</b>	<b>Ownership 1</b>	<b>Ownership 2</b>	<b>Ownership 3</b>
Total Gross Square Feet	17,661	17,661	-
Total Rentable Square Feet	12,180	12,180	-
Occupancy Date	2/1/2023	2/1/2023	
Initial Project Costs	\$ -	\$ 76,800	\$ -
Est Construction TPC (\$/GSF)	\$ 1,103	\$ 1,129	\$ -
RSF/Person Calculated	-	-	-

**Financial Analysis of Options**

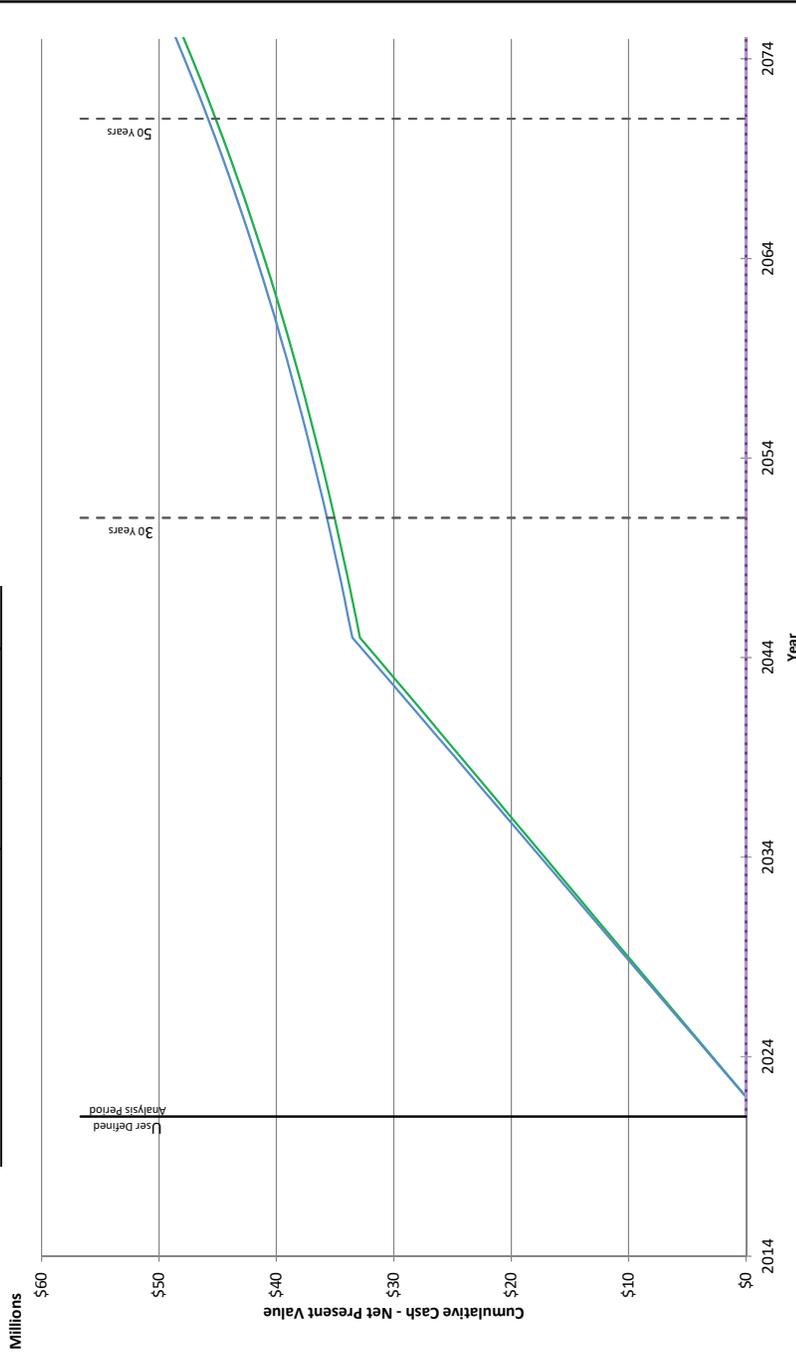
Years	Financial Comparisons	Display Option?	Yes		No		Yes		No		Yes		No		Yes		No	
			Existing Lease Current	Lease 1 Current	Lease 2 Current	GO Bond	COP	COP Deferred *	GO Bond	COP	COP Deferred	GO Bond	COP	COP Deferred	GO Bond	COP	COP Deferred	GO Bond
0	Financial Means		\$ -	\$ -	\$ -													
	0 Year Cumulative Cash		\$ -	\$ -	\$ -													
	0 Year Net Present Value		\$ -	\$ -	\$ -													
	Lowest Cost Option (Analysis Period)																	

Years	Financial Comparisons	Existing Lease Current	Lease 1 Current		Lease 2 Current		Ownership 1		Ownership 2		Ownership 3	
			GO Bond	COP	GO Bond	COP	GO Bond	COP	GO Bond	COP	GO Bond	COP
30	Financial Means	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	30 Year Cumulative Cash	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	30 Year Net Present Value	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	Lowest Cost Option (30 Years)											

Years	Financial Comparisons	Existing Lease Current	Lease 1 Current		Lease 2 Current		Ownership 1		Ownership 2		Ownership 3	
			GO Bond	COP	GO Bond	COP	GO Bond	COP	GO Bond	COP	GO Bond	COP
50	Financial Means	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	50 Year Cumulative Cash	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	50 Year Net Present Value	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	Lowest Cost Option (50 Years)											

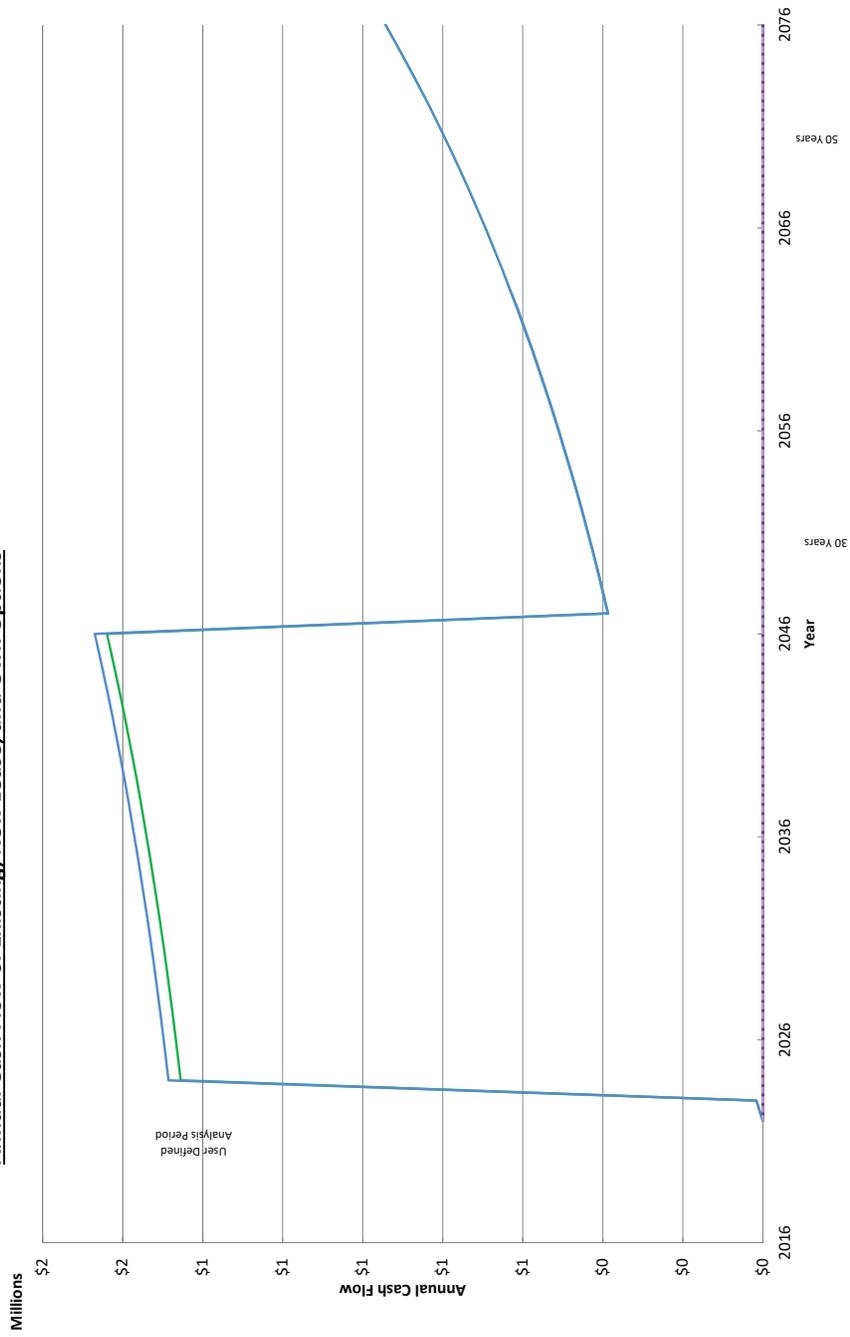
\* - Defers payment on principle for 2 years while the building is being constructed. See instructions on Capitalized Interest.

### Cumulative Cash - NPV of Exist, Lease, and Own Options



- No Existing Lease
- No Lease Option 1
- No Lease Option 2
- Ownership Option 1 GO Bond Not Shown
- Ownership Option 1 COP Not Shown
- NPV Ownership Option 1 - COP Deferred Principle
- Ownership Option 1 63-20 Not Shown
- Ownership Option 2 GO Bond Not Shown
- Ownership Option 2 COP Not Shown
- NPV Ownership Option 2 - COP Deferred Principle
- Ownership Option 2 63-20 Not Shown
- No Ownership Option 3
- 0 Year Analysis Period
- 30 Year Baseline
- 50 Year Baseline

### Annual Cash Flow of Existing, New Lease, and Own Options



- No Existing Lease
- No Lease Option 1
- No New Lease Option 2
- Ownership Option 1 GO Bond Not Shown
- Ownership Option 1 COP Not Shown
- Ownership Option 1 - COP Deferred Annual Cash
- Ownership Option 1 63-20 Not Shown
- Ownership Option 2 GO Bond Not Shown
- Ownership Option 2 COP Not Shown
- Ownership Option 2 - COP Deferred Annual Cash
- Ownership Option 2 63-20 Not Shown
- No Ownership Option 3
- 0 Year Analysis Period
- 30 Year Baseline
- 50 Year Baseline

**Financial Assumptions**

Date of Life Cycle Cost Analysis:	2/26/2020
Analysis Period Start Date	2/1/2021
User Input Years of Analysis	0

All assumptions subject to change to reflect updated costs and conditions.

	Lease Options			Ownership Option 1			Ownership Option 2			Ownership Option 3		
	Existing Lease	Lease Option 1	Lease Option 2	GO Bond	COP	63-20	GO Bond	COP	63-20	GO Bond	COP	63-20
Inflation / Interest Rate	3.120%	3.120%	3.120%	3.540%	3.720%	3.720%	3.540%	3.720%	3.720%	3.540%	3.720%	3.720%
Discount Rate	0.533%	0.533%	0.533%	0.533%	0.533%	0.533%	0.533%	0.533%	0.533%	0.533%	0.533%	0.533%
Length of Financing	N/A	N/A	N/A	25	25	25	25	25	25	25	25	25

See Financial Assumptions tab for more detailed information  
 COP Deferred and 63-20 Financing defer the payment on principle until construction completion.

**New Lease Assumptions**

Real Estate Transaction fees are 2.5% of the lease for the first 5 years and 1.25% for each year thereafter in the initial term of the lease.  
 Tenant Improvements are typically estimated at \$15 per rentable square foot.  
 IT Infrastructure is typically estimated at \$350 per person.  
 Furniture costs are typically estimated at \$500 per person and do not include new workstations.  
 Moving Vendor and Supplies are typically estimated at \$205 per person.

**Default Ownership Options Assumptions**

Assumes a 2 month lease to move-in overlap period for outfitting building and relocation.  
 Assumes surface parking.  
 The floor plate of the construction option office building is 25,000 gross square feet.  
 The estimated total project cost for construction is \$644.00 per square foot.  
 See the Capital Construction Defaults tab for more construction assumptions.



We are looking for some feedback on assessing the programmatic and functional needs of a new 16/48 bed facilities for DSHS. The following information will help inform our discussions that will be had on October 21<sup>st</sup>. To prepare for this meeting please fill out the following questionnaire.

**Note: Please return the questionnaire to Larry Covey by October 14<sup>th</sup>.**

1. <b>Name:</b>  Bryan Zolnikov	Title: Office of Forensic Mental Health Services Quality Manager
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2. **Briefly describe the unique patient population needs and length of stay for the following programs:**

E&T: My impression is very short-term stays (averaging 3-14 days) relative to other patient populations. Many patients will have acute psychiatric issues such as active psychosis and suicidal ideation and intent. The facility will need to be anti-ligature from top to bottom, have clear view of patient living areas (minimal to no "blind spots"), and be friendly to the staff when they are monitoring patients (e.g., line of sight, 1:1). Concur with Dr. Waiblinger regarding the need for a facility that supports recreational and vocational rehabilitation services. Discharge planning is done under a very short time frame.
90-180 day: Concur with Dr. Waiblinger regarding enhanced vocational training. The facility would need to be oriented toward supporting rehabilitation/teaching independent living skills.
Step Down: Concur with Dr. Waiblinger regarding skills-based training. I envision a facility that supports independent living skills (e.g., may have washer and drier for patients to use) and mirrors to the degree possible the type of living situation most residents will experience when in the community. A step-wise community reintegration focus.

3. **Describe any innovations that you would like to incorporate into a new program or design.**

Telemedicine, OT facility that mirrors to the degree possible a real-world work environment (e.g., a café that sells food to patients and staff), therapeutic yard space (e.g., mindfulness garden with soothing feature like a waterfall), high walls instead of chain link, warm residential feel (e.g., natural colors, ACROVYN doors, art work), where needed advanced security features that do not look "hardened" (e.g., windows that appear standard but have high attack-rated window panes, locked ceiling grids that appear standard but have grid locks in the above crawl space), comfort room, exercise/wellness space, plenty of windows for natural light, and plenty of functional program space for group and individual therapy.
---

For staff, individual offices with natural light, exercise room, adequate locker space for staff who do not have offices, large break room with adequate food storage space and something like an Avanti Market, a wellness room (e.g., for lactation practices, personal medication storage, room for yoga practices), and parking that is adequate and complies with ADA code standards.

4. **List group program spaces that would be needed/desired to support the programs. (i.e. - OT, Music Therapy, Vocational Training, etc.)**

We could look at the Bill Anthony "treatment mall" concept where each treatment room has a dedicated function (e.g., Music therapy room, illness management room) and is held off the living unit.

5. **List spaces/needs to support exercise and recreation programs.**

See above. Adequate exercise space and equipment for both patients and staff.

6. **Describe your philosophy on seclusion? What type of spaces besides a seclusion room could be used for de-escalation?**

Philosophy is to do everything we can to prevent seclusion and hopefully never use it. We could design space that could be used as areas for reduced stimulation for staff to utilize as an area to provide de-escalation. If a seclusion and restraint room is required, keeping it in an obscure area would be ideal so that patients are not constantly reminded of these coercive procedures (trauma-informed care principles).

7. **Please share your ideas for enhancing the patient and family visitation experience.**

A warm and spacious visitation area. Having an area within the visitation area that has a play area for visits that involve children. Having app-based video conferencing that is easily accessible to families.

8. **Describe the potential role that the community could play into the program and are there any spaces that could be co-utilized by the community.**

Large spacious meeting rooms that are accessible from on (for staff) and off (community members) unit. The meeting rooms would have tele-video equipment and televisions with internet capability.

*Please return the questionnaire to Larry Covey by October 14<sup>th</sup>, 2019.*

We are looking for some feedback on assessing the programmatic and functional needs of a new 16/48 bed facilities for DSHS. The following information will help inform our discussions that will be had on October 21<sup>st</sup>. To prepare for this meeting please fill out the following questionnaire.

*Note: Please return the questionnaire to Larry Covey by October 14<sup>th</sup>.*

1. **Name:** Melena Thompson **Title:** Director, Policy and Legislative Affairs BHA

2. **Briefly describe the unique patient population needs and length of stay for the following programs:**

<p><b>E&amp;T:</b> Assuming we are talking about an E&amp;T that is providing "short term stays" this would be limited to individuals who are committed for an initial 72 hour commitment and then potentially a 14 day commitment under RCW 71.05. This can be extended based on a court approval or become an "single bed certification" to provide services for a period longer than 72 hours.</p> <p>This population is the most acute population served. Must meet the following criteria  <b>Diagnosis of a psychiatric illness and a determination that one or more of the following:</b>              Danger to self or others              Serious harm to property              Grave disability due to cognitive impairment</p> <p>Often under or unmedicated with significant psychological distress.          Treatment program often limited to medication interventions, brief intervention counseling and social work to reconnect with community resources and discharge</p>
<p><b>90-180 day:</b> These individuals continue to meet the criteria above for civil commitment and are post the 14 day commitment.</p> <p>Due to the length of stay additional resources are needed for long term support including large movement and activity areas, treatment space including areas for group treatment. Outdoor space.</p> <p>Space for skill building and ADL training</p>
<p><b>Step Down:</b> Limited yet not secure egress, space for skill building, large movement activities and outdoor space. More of a "home like setting"</p>

**3. Describe any innovations that you would like to incorporate into a new program or design.**

Considerations for options if the population served is DD or Older Adult with specific space and design needs for accessibility, low stimulation, durability (wheel chairs, walkers, hand rails)

We are looking for some feedback on assessing the programmatic and functional needs of a new 16/48 bed facilities for DSHS. The following information will help inform our discussions that will be had on October 21<sup>st</sup>. To prepare for this meeting please fill out the following questionnaire.

**Note: Please return the questionnaire to Larry Covey by October 14<sup>th</sup>.**

- |   |                                   |
|---|-----------------------------------|
| <p>1. <b>Name:</b><br/>Brian Waiblinger</p> | <p><b>Title:</b><br/>DSHS-CMO</p> |
|---|-----------------------------------|
- 

2. **Briefly describe the unique patient population needs and length of stay for the following programs:**

<p><b>E&amp;T:</b> These individuals are often unmedicated in the community and may have significant psychiatrist symptoms and resulting behavioral problems. They may also have untreated medical needs and need for outpatient referral. They may not have current outpatient treatment and will need to have discharge planners to work on establishing care, restarting benefits if needed, etc. May require a larger personnel space zone in order to feel safe. Tend to be more aggressive in response to psychosis. Recreational therapy can be important as can distraction and relaxation modalities.</p>
<p><b>90-180 day:</b> These individuals have usually stabilized to some degree and are less likely to have significant violence/aggression in response to psychosis. They may have long-term medical issues secondary medications or poor self-care and will need access to outside appointments (dental, vision, PT, podiatry, etc). These individuals will likely benefit from intensified vocational training. Communication and collaboration with outside agencies is key and they may need to have visits for housing.</p>
<p><b>Step Down:</b> This tends to be more skills based and so will need more intensified occupational and vocational services. They may benefit from CBT and DBT and other skills based instruction but would likely be the least acute of the three.</p>

3. **Describe any innovations that you would like to incorporate into a new program or design.**

<p>Secure greenspace. Ensuring that all rooms look onto a greenspace and if possible not on chain link fencing, utilities, etc.          Dedicated telepsychiatry space.          Consider having clubhouse space          Additional family meeting rooms/activity rooms          Having a secure "office" where patients can have an appointment with their provider to practice.          OT facilities to help learn cooking skills, shopping etc.</p>
--

4. List group program spaces that would be needed/desired to support the programs. (i.e. - OT, Music Therapy, Vocational Training, etc.)

See above.  
OT/RT  
VT training space  
Secure green space for gardening/meditation  
Exercise room  
Outdoor exercise space

5. List spaces/needs to support exercise and recreation programs.

OT space  
VT space with stove, washer, dishwasher etc.  
Exercise room  
Covered outdoor as well as open outdoor area  
Mixed meditation/gardening space

6. Describe your philosophy on seclusion? What type of spaces besides a seclusion room could be used for de-escalation?

De-escalation techniques and time alone either in a separate area/hallway or their own room is usually sufficient rather than actual seclusion/restraint. Two rooms is optimal. Using the mobile bed technique at ESH/FSCRCP is preferable to fixed beds.

7. Please share your ideas for enhancing the patient and family visitation experience.

More private areas, green spaces, etc. as above.  
Access for secure skyping

8. Describe the potential role that the community could play into the program and are there any spaces that could be co-utilized by the community.

Clubhouse space  
Having community assigned case managers with office space in the same facility  
Medical clinic in same building or nearby

*Please return the questionnaire to Larry Covey by October 14<sup>th</sup>, 2019.*



# DSHS 16/48

## MEETING NOTES

Purpose of Meeting: Scope Discussion

Date: 09/05/19

Time: 1:00pm via In-person

### Discussion Items:

1. Stakeholder Group
  - a. Larry is working on this
    - i. Assistant Secretary DSHS
    - ii. Medical Director
    - iii. WSH Bldg 27 staff
    - iv. Larry Covey
    - v. Ken Taylor
    - vi. John Hieronymous
    - vii. Cheryl Strange (former CEO of WSH)
  
2. Facility Tours Possibilities
  - a. Telecare and Recovery Innovations (E and T)
  - b. Park Place Mental Health Facility – CLR operator
  - c. Building 27 at Western State Hospital
  - d. Lake Burien -Navos
  
3. Download from Larry/Ken
  - a. Visioning Session Dates set
  - b. Civil 90/180 discussion
    - i. Community based, better success if close to family
    - ii. Complicated cases
    - iii. Risk of elopement
    - iv. Combative
    - v. Some harmless, some are predators
    - vi. Need recreation spaces
    - vii. OT/PT spaces
    - viii. A typical 90/180 3 buildings, (1 E and t, 1 Step down, 1 higher acuity)
    - ix. Fair Start, Third runway, Industrial kitchen
    - x. Want to understand trends
    - xi. Community access to facility, bistro? Meeting spaces
    - xii. Need to look at staffing model, discharge path, long term care options
    - xiii. Demographics info- Larry is working with DSHS research department data team

4. Sites to Evaluate
  - a. WSH site- Lakewood
  - b. Fircrest Site-
  - c. Echo Glen
  - d. Arlington / Snohomish County
  - e. Clark County
  - f. Maple Lane (Lewis County)
5. Contract Development
  - a. Larry needs a proposal
6. Sustainability
  - a. LEED Silver base project
  - b. Upgrade to net zero thru PV

#### Meeting Schedule Rough Draft

- **Visioning Meeting Number 1 - Sept 30**
  - Ice Breaker/ Intro Stakeholders
  - All consultants attend Goal setting (MEP, Operator)
  - Goal Setting
  - Facility Tours?
- **Visioning Meeting Number 2 - Oct 21**
  - Visual Programming
  - Space Planning
- **Concept Development Meeting Number 3 – Oct 30**
  - Video Meeting for BWBR
  - Item 2
- **Concept Development Meeting Number 4 – Nov 6**
  - Video Meeting for BWBR
  - Sustainability
  - Systems
  - Estimate
- **Pre-Design Report Development 5 Nov 13**
  - Video Meeting for BWBR
  - Sustainability
  - Systems
  - Estimate

- **Pre-Design Report Development 6 – Nov 20**
  - Video Meeting option
  - Sustainability
  - Systems
  - Estimate

## SW-BH Community 16/48 Capacity

Visioning Meeting #1  
September 30, 2019

Meeting started out with an introduction by Larry Covey

- 48-bed Civil commitment/community treatment facilities consisting of three (3) 16-bed units. One of the facilities would be run by DSHS. The other two would be operated by private operators. Each unit will focus on a different aspect of the continuum of care.
  - Evaluation & Treatment (16-bed) – private operator
  - 90-180 day (16-bed) - DSHS
  - 'step-down' facility (16-bed)- private operator
- "The building should be built for the program, not the other way around"
- Pre-Design is a State requirement: A building over \$5mil or over 5k SF has to go through a pre-design process
- For this project the state allocated more money than what the pre-design cost which means that we can continue moving forward after they approve a potential site
- End of December timeline for the final report
- "This is a big deal! It's a brand-new project type"

Current state/Future State Exercise – refer to Attachment

- We have an opportunity to do something REALLY good
- The facilities are within the 0's, but the programs are stronger within the 2's. Existing does not have enough beds.
- Barriers to 5 – funding constraints – target 4s for pragmatic reasons

Group Comments from the "WHAT":

- Think about how the longer-term facilities support individuals' need to feel safe, restorative, expel energy, etc. (exercise versus yard work).
- May want to consider individual restrooms for long term facilities
- HMH – Habilitative Mental Health program – 2 years average involvement.
- ID (Intellectual Disability) and DD (Developmentally Disabled) populations would need private rooms space rather than double rooms, and more separate programming elements; vocational rehab space?
- Shared services:
  - Separate contracts for food services with each facility
  - May not need to provide the separate company but if it's a central kitchen/laundry, with separate contracts with each provider.
- Would like to incorporate ten strategies from Sweden Study that improve safety by 50%; single patient room, movable seating, low-social density, high spatial density, variety of acoustics, gardens accessible, nature window rooms, nature art, daylight, communal spaces, etc.

- Meeting spaces in existing facilities for private interactions are insufficient. Need to have safe/secure areas for perhaps 2 at a time
  - Family interactions as well
  - Up to 8 people
- Don't forget that our population may be somewhat larger (obesity) in size than most
- Residential feel as much as possible!
- Ease of maintaining these facilities
- "No force first" approach

How do we see the community partnering/engaging with these facilities?

- If we can address the early-onset of psychosis (typically after high school)
- How do we provide services to assist those individuals who need to learn the basics before they burn all their bridges?
- Is there a way to tell the success stories that occur within the facilities?
- What is the program within the facilities and how is that similar or different from the new hospital?
- Make sure to think about the staff as well!
  - Providing spaces of reprieve and restoration. Staff shortages and turn-over.

Policy Makers Success Measurables

1. Waitlist
  - a. Access to bed
2. Length of Stay (through put)
  - a. Delay to discharge, placement
3. Quality of Care
  - a. Outcomes
4. Safety
  - a. Restraint use
  - b. Assaults (patient-on-patient and patient-on-staff)
  - c. Reduced ligature risks

Public Success Measurables

1. Understand whole system
2. Anti-stigma campaign

Fears

- Siting – ability to build
- Moratorium
- Ability to get qualified staff, staff working multiple jobs
- Physical plant out of date quickly
- Through-put in these facilities
- Program – don't know what we want

- Value-engineering
- Decision making

### **Virtual Tour – Telecare E&T**

Average client path:

72 hour (7 days max) initial assessment at the hospital

Another 14 days if needing further detention

Referred to state hospital

Overall approximately 7-21 days

Floor plan:

- Building features – Visual access to nature, use of natural materials
- 12k SF is the standard for Telecare’s prototype (750 SF per patient)
- Administrative staff is essentially the clinical team – offices integrated on the unit
- Sequence of patient intake directly into unit
- Restrooms access from hallway for the shorter-term acute patients versus the longer term would prefer private
- 50% Double rooms – flexibility in the program approaches as well as any gender disparities
- Built ample office space, but still need more
- Staffing challenges? Not currently not an issue as long as it’s located within an urban
- There was some concern about sightlines.
- Open Nurse Station with an enclosed staff charting/work area. Telecare is considering elimination of Nurse Station on future facilities.
- Need to verify local requirements for tele-court. Often need office space for prosecuting and defense attorneys. Judge may also have special requirements.
- Small outdoor area, could use double for program – even more if longer stay

Group Discussion

- When we put them in an environment that is like a jail, they will behave like they’re in jail!

Hospitals tend to have more violence than at the facilities because of the designed environment.

- Sensory rooms versus seclusion rooms!
- Weighted chairs...cushioned but plastic

Design notes:

Bedrooms, not so much bathrooms tend to get more damage on the walls

Other locations that sees a lot of damage: walls with large expanses of no pictures/elements

### **Building 27 Site Tour**

HMH program guided by Dr Mark Cross

- ID/DD Patients typically have longer stays
- Has library / resource center
- Access occupational activities/resources on campus. Program also includes vocational training like wood shop, java café, lawn service and laundry services.

- Patients could use places in their rooms for personal items: TV, game console. Lockable cabs. Snacks
- Would like Sensory spaces
- Design for cleanability
- Mentioned wanting to have spaces for patients to hang out on the outskirts of a larger group setting.
- Need to have group spaces that can fit all patients on unit as well as staff – need to consider the larger furniture
- Ideally two dayrooms or much larger area
- Would like the ability to dim or switch off night light in patient rooms
- Floors should have coved base
- Would be nice to have computer area for patients

Attachments:

1. 9.30.19 Sign-In Sheet
2. Current-Future State Survey
3. Telecare Floor Plan



2106 Pacific Avenue, Suite 300  
Tacoma, WA 98402  
bcradesign.com



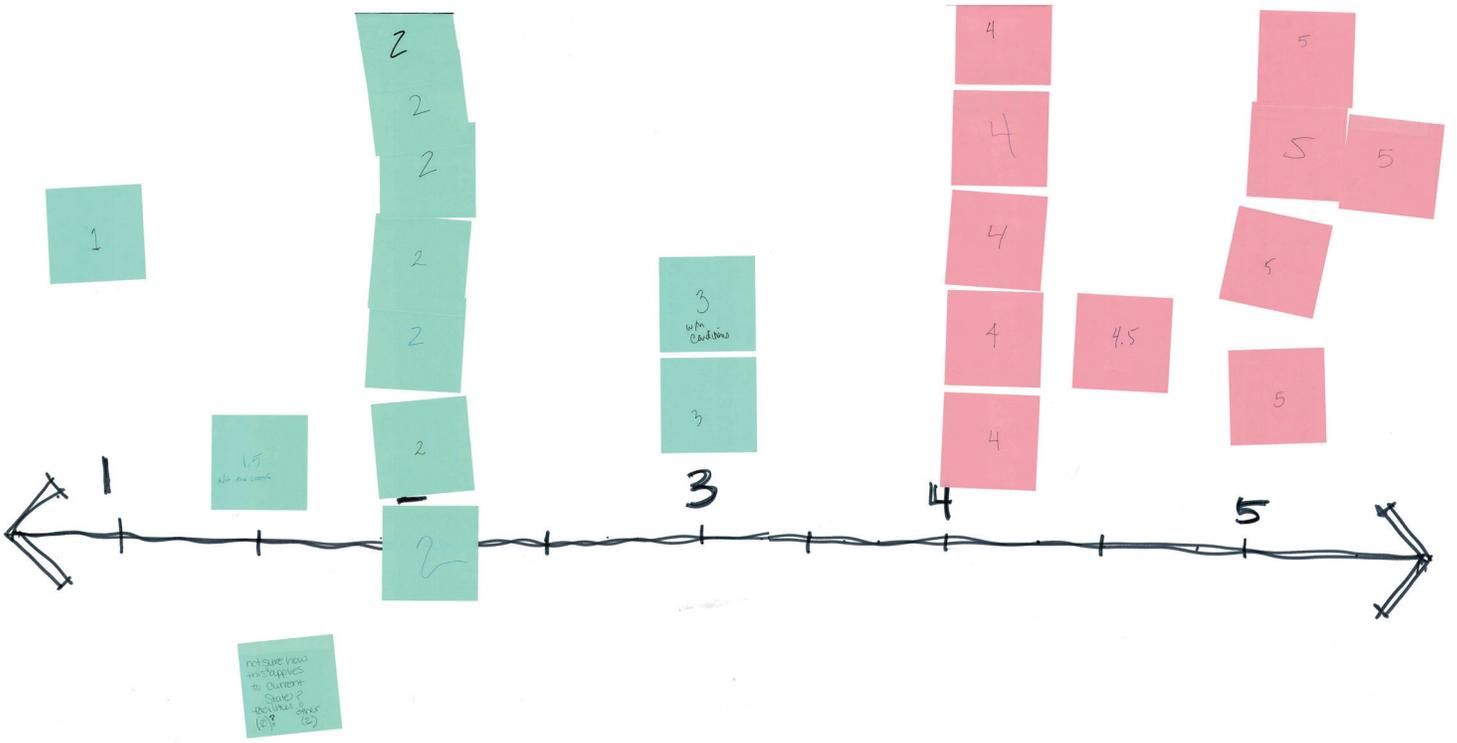
380 St. Peter Street, Ste. 600  
Saint Paul, MN 55102  
bwbr.com

DSHS Civil 16/48  
Project # 19093

Visioning Meeting #1  
Sign-In Sheet

Date / Time of Meeting: September 30, 2019

Mtg.	Attendees	Org.	Cell Number	E-Mail
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# TELECARE E&T - FLOOR PLAN



- Key:**
- Patient ■
  - Public ■
  - Staff ■
  - Support ■

VISIONING MEETING

## **SW-BH Community 16/48 Capacity**

Visioning Meeting #2

October 21, 2019, 9am-3pm

Recap Discussion – lead by Scott Holmes

- Feelings of safety and restoration (specifically with staff)
- Incorporation of strategies that reduce aggression and enhance safety (private rooms, density, nature, daylighting)
- Provide the facility with tools/approaches where restraint and isolation are last option (quiet rooms, nooks, sensory)

Group Comments:

- ID/DD patients typically have longer stays
- Keep in mind what can we do in the design to attract and retain staff
- Creating a platform that can adjust with ongoing changes in these facility programs/approaches
  - Setting the groundwork for flexibility and adjustment depending on the staff desires and work modes; even populations
- Restrooms desired to be off of a private room versus shared off the hallway
- Note made that the nurses tend to congregate around the station versus inside of it
- What is the desired space per person?
- Vocational training required by patients (ID/DD) can be up to 6 hours a day. Something to keep in mind for programming those services.
  - Wood shop, lawn maintenance, café
  - Another route is learning more career-path related options

Establish and discuss “Guiding Principles” – lead by Melanie Baumhover

Review of DSHS mission and values

- The group brainstormed characterizes that would be appropriate for guiding principles. See attachment
- Review
- Melanie crafted vision statement for the group to review and select those appropriate. See attachment of approved guiding principles.
- Can potentially do focus sessions with previous patients, family members, and staff.
  - Friends of Western State have reached out to offer some perspectives from former patients
  - May not necessarily have a staff-focused on as the culture shift is still in flux

Visual Programming

Melanie documented program space needs and will discuss at next meeting.

- The short-term facilities will be part of the 16-bed facility; medical/dental services would be in-house, not necessarily out; opt for the least amount of transportation
- Group-oriented recreational therapy with less of a “gym” and more outdoor space

- 90-180 day patients tend to be less aggressive/violent; need more outside medical care; focus on rehabilitation and teaching independent living; access to court operations; large movement spaces; OT could be a shared space; are there spaces on the unit for medical/dental care services
  - Would want to verify if OT is something that is provided in-house versus outside. Would want to look at frequency
- Step-down facility is similar to the 90-180 days; would have similar needs but have more access to the community; not in 'custody' or under a civil commitment; step-up from community and step-down from in-patient E&T facility; living skills; they have the ability to leave and attend medical appointments, community events, etc. on their own accord
  - Will want access to public transit?
    - If they are at a point of being able to work, then they likely don't need the step-down services
- Double beds: can assist with socialization with clients; can help with square footage costs; could assist with transitioning into another facility; recommendation of 2/3 single and 1/3 double;
  - Recovery-centered environment
    - How much is the MCO daily rate and how does that come into play
    - The ability to afford these facilities
- Cameron to provide contact for operations - Director of Health Services in San Mateo (example grouped facilities that avoided the IMD rule?)
- We have to make sure the E&T if co-located in a building with the other programs is not an "IMD"
- Step-down will be licensed differently and therefore can potentially be in the same building
- It would be good to have spaces to 'separate' from each other (ie: repetitive singing)
  - Think about their habits during recovery (pacing, needing quiet, sleeping)
- Offices desired to be located within audible connection of the center of the facility
- All of these facilities will be "re-thermed" food services.
- Restroom for seclusion area to be accessible off of ante-area versus directly off of seclusion room
- Need to confirm Court procedures/requirements in E&T
  - Court to be shared for all three programs but within the E&T facility due to ease of transporting patients

#### Massing:

- We set these up as three different cottages, how could they be interconnected in the future?
- Would like to try-out a multi-story with E&T on top (with outdoor patio)
  - IMD roofline requirement is not in the statute
- If we try to build in an urban area, then we will be 'encouraged' to use the land efficiently
- Programs will need Separate entrances and addresses
- Construction type would be needed to take into consideration
  - Fire separation requirements?
- Step-down would have an outdoor space as well that could be utilized with visitors, family, screened with landscaping
- Short-term E&T on its own and then the a two-story 90-180/step-down with a shared lobby and secured outdoor area

- Discussion to make the buildings/program all per the 90-180 model with the intent to provide more flexibility in how the programs may change
- Find the balance of fixtures/finishes (durability) with environments for healing

#### Site Review/Site Criteria

##### Current sites:

1. Snohomish County (near Arlington)
  2. Clark County, Peace Health
  3. Fircrest
  4. Western State
  5. Echo Glen
  6. Maple Lane
- Kirkland? Fairfax interested in a 90-180 bed facility
    - Providence partnership in Everett
  - Example criteria
    - Adjacency to metro area
    - Near major transit
    - Environment supports 'healing'
    - Reception from adjacent properties/entities/community
    - Site access to utilities
    - Site topography
    - Existing services
    - Ability to 'lay-out' on site
    - Adjacent community elements (staffing, health services, hospitals, etc)
    - Permitting requirements
    - Sustainable access
    - Building orientation/space available
    - Transportation/public transit
  - Looking at site numerical scoring criteria
    - Need to add some reasoning for the numerical criteria
  - Is there an existing map that shows all the existing programs within Washington?
    - Location could help with E&T distribution/feeders into the 90-180s
    - Community/Resource bucket



Scott leading the group during visual programming

Attachments:

1. 10.21.19 Sign-In Sheet
2. Guiding Principles – Raw Notes
3. Guiding Principles - Statement

DSHS Civil 16/48  
Project # 19093

Visioning Meeting #2  
Sign-In Sheet

Date / Time of Meeting: October 21, 2019

Mtg. Attendees	Org.	Cell Number	E-Mail
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Regionally distributed

Variety of needs – variety of resources

### Patient

- Residential like (not hospital like)
- Safe – zero injuries, harm to self, staff safety.
- Healing Environment
  - Access to nature – green space
  - Hopeful
  - Healing
  - Warm atmosphere
- Designed to encourage an environment of care – integrate staff and patients
- Recovery
- Rehabilitation – independent living in the community
- Progress
- Fosters self-choice, decisions for themselves
- Inviting – to both staff and patients, families

### Families

- safe & inviting.
- Feel loved one is safe.
- Space to be a family
- Inviting – to both staff and patients, families

### Staff

- Employer of Choice (from DSHS Strategic Priorities)
- Recruitment & retention.
- Amenities, parking, break, exercise. T
- Down time (exercise, breaks, respite/restorative spaces)
- Empowerment to do their best work
- Inspire and support staff
- Accountability
- Inviting – to both staff and patients, families
- Protect privacy of staff from patients

### Stewardship

- Intentional design
- Create operational efficiencies – staff process, financial operations
- Flexibility/adaptable for future use
- Environmental stewardship – net-zero/net-zero capable

### Community

- Community appropriate – fit into neighborhood, ‘northwest style’.
- Demonstration facility
- Community asset – invite the community.
- Break down barriers – less scary
- Partnerships
- Wellness Center – center of wellness
- Protect privacy of patients, staff from patients. Photographing not possible of patient areas

# A facility for mental wellness of staff, patients, family and community members.

## Patients

- A. **Warm, residential environment that supports patient recovery and progress** in their treatment. A healing environment with a goal of zero injuries, where patients and staff are integrated in partnership.

## Families

- B. **Families are welcomed and included.** They are comfortable with the safety of their loved ones and themselves.

## Staff

- C. **The Employer of choice** where staff are supported, empowered, high-performing and inspired. Staff are integrated with patients, are safe from harm and have staff privacy protected

## Community

- D. **A Community Asset** / Center of Wellness that invites community members into the facility to break down barriers and create partnerships while maintaining patient privacy.

## Stewardship

- E. **Flexible, adaptable facilities** that work today and into the future, where design decisions are intentional. Net-Zero energy capable for environmental stewardship

## DSHS Community 16/48 Meeting Agenda Nov 7, 2019

1. General Questions:
  - a. Should the building(s) be designed to keep people inside?
    - i. Windows are breakable, or windows are attack resistant to slow down people trying to break out, or break someone out
      1. Patient bedrooms have laminated glass and tempered. Step down from what is put in a jail. Regular window sill heights.
      2. Non-patient areas are basic commercial windows
        - a. In the report – have areas identified where there are high-abuse or damage-prone and what products would be used to help with this.
    - ii. Concern that patients might try to break through the walls or room? How long (in minutes) do we need to delay a patient?
      1. Will be answered with type of construction when chosen
      2. This could be a homework
    - iii. Concern that someone from the outside with power tools could/might break/cut someone out? How long (in minutes) do we need to delay someone from the outside with tools?
      1. This is not a concern.
  - Yes, they should all be designed to keep people ‘in’. Not all will utilize the system at time of occupation. This will depend on the provider and need.
  - Chart the differences between the different programs; identifying elements that would be universal versus specific to the program; write what may be cost impacts too.
  - b. Are there any patients/programs that you anticipate will NOT require ligature resistant spaces, even if they are alone? (any program types would not be an option for patients who may be identified as suicidal)
    - This is a program question but most, if not all areas will need to be anti-ligature; the Step-down facility may not need this...or there’s a zoned area within the design. May want to have all facilities be consistent with hardware/anti-ligature approaches. Allows for flexibility in the long-term.
  - c. What level of durability is preferred?
    - i. Standard gypsum walls
    - ii. Impact resistant gypsum walls
      1. Preferred option
    - iii. Concrete masonry units or Burnished block walls
      1. Do not want CMU at all
  - d. Will patients be locked in the building by staff?





- i. Ventilators, etc.? This is not foreseen as a requirement as that level of support needed would likely mean they're in a hospital.
  - b. Will the functional program allow for patients to be medicated to the point they are not ambulatory or incapable of egressing the building without assistance?
    - i. Likely not; this will need to be answered by program team.
  - c. Will piped medical gases be provided in the building?
    - i. Need to be answered by program needs; Would this be more of a portable solution versus a standard?
  - d. Will Interview rooms, court rooms, group rooms or multi-purpose rooms have any special needs such as specialized lighting, ambient audio/ video, room recording, panic buttons, remote shunting of power receptacles, security video, etc.?
    - i. Interview room – basic and not anything special;
    - ii. Court room (in E&T) – this will have special items such as AV equipment, microphones, monitors, security cameras; program team needs to confirm what they would require
    - iii. Group/Multi-purpose rooms – these should be basic rooms
    - iv. Larry will be asking about wearable, emergency lanyards/buttons for staff
    - v. Remote shunt could be an opportunity to have a switch at the nurse station to have control in case of an emergency
    - vi. Ambient audio? Bedrooms would not have music/speakers to help with socialization and encouragement to not be in there; conversation now is to try and provide opportunities for control/decisions for the patients and music could be a privilege
      - 1. Break this question down by rooms as homework
  - e. Will Seclusion rooms have specialized lighting (color change LED), external lighting control, audio/video needs, room recording, power receptacles in room (not advised), security video?
    - i. External lighting control, audio/video needs, no power
  - f. Will the facility have built in music system (in patient bedrooms, quiet/sensory rooms, staff respite, or multi purpose rooms)
    - i. Yes;
  - g. Will patient bedrooms, quiet/sensory rooms or staff respite have built in color change LED lighting?
    - i. Yes in the sensory rooms, the bedrooms may be on a different color index as a standard; the nightlight could be the amber spectrum to assist with the ability to check on the patient without disrupting their sleep.
  - h. Will the facility have electronic game rooms or other spaces requiring specialized electrical connections?
    - i. May want to keep something in there for the option
  - i. Should Courtrooms include setup for telecourt, or in person court only
    - i. Set up for telecourt
  - j. Is it desirable to have a “watch tour” system for staff? (key switch or card reader?)
    - i. System that records that staff is ‘checking’ certain places or rooms; this is likely not going to be part of the program

## 5. STANDBY POWER

- a. Are there Standby Power requirements required by the Owner above code minimum:
  - i. Lighting in addition to egress and exit lights? (additional task or safety lighting)
  - ii. Refrigeration equipment?
  - iii. Receptacles needed on emergency power?
  - iv. Mechanical Equipment and/or Owner's special equipment that cannot be off in a power outage?
    - Requirement is to keep operations for up to 72 hours; go for 96 hours for right now
    - 100% back up power
    - Diesel tank
- b. Is there uninterruptable power source (UPS) requirements needed by the Owner? These would be things that cannot see a power glitch, such as:
  - i. Medical Equipment?
  - ii. Security Systems?
  - iii. Other?
    - Yes to all

## 6. LIGHTING

- a. Will patient room lighting be controllable from outside the room?
  - i. From hallway via key?
  - ii. Nurse Station?
  - iii. Wirelessly?
    - Clients will have control of the light in their room with anti-ligature fixtures/switches; there should be an override for each room – homework question; the control would be located in the nurse station

## 7. TELECOMMUNICATIONS

- a. Data/Voice cabling requirements:
  - i. Will Patient rooms have telephone jacks or data jacks?
    - 1. No
  - ii. For public area patient phones, do you prefer
    - 1. Stainless steel fixed phones with staff override shut off?
    - 2. Cordless checked out from nurse station?
      - Will need to be homework question
  - iii. Wireless communication requirements:
    - 1. Will Patient rooms have wireless capability?
      - a. Yes
    - 2. Will Offices, Nurse Stations, and other staff areas have wireless capability?
      - a. Plus hard-wire
    - 3. Will Patient common areas have wireless capability?
      - a. Yes
    - 4. Will there be separated wireless networks for Visitors? Patients? Staff? Med Records? Other?
      - a. Yes; could require a secure, username/password log-in

- Look at providing a check-out space where video-guided therapy within a specific room
  - Homework – music in patient rooms or sound generators
8. Television requirements:
- a. Will Patient rooms have provisions for televisions?
    - i. No
  - b. Will Offices, Nurse Stations or other staff areas have televisions?
    - i. Break room only
  - c. Will Patient common areas have televisions? Will televisions be provided with override switches for staff control?
    - i. Yes; yes
  - d. Will television delivery be by cable, internet, OTA?
    - i. Yes, yes, maybe
9. Nurse Call System requirements:
- a. Traditional nurse call systems are not required by code. Is it desirable to have a Nurse Call system?
    - i. Yes
  - b. If so, does the Owner prefer a wired or wireless system?
    - i. No preference; nurses have call buttons on them
  - c. If a nurse call system is provided, where will the Owner want devices:
    - i. Patient Rooms - yes
    - ii. Patient Toilet Rooms - yes
    - iii. Common areas – no but in the therapy rooms
    - iv. Staff toilet rooms - no
  - d. Will the facility equip staff with wearable duress alarms?
    - i. Yes
10. FIRE ALARM
- a. Will exterior doors unlock in a fire alarm (This will be subject to AHJ approval)?
    - i. No, they will only unlock in a sprinkler-flow
11. SECURITY
- a. Will patient room windows be electronically monitored? Where will the alarm report to?
    - i. Windows will not be operable, so no
  - b. Will patient room doors be monitored? Where will the alarm report to?
    - i. No
  - c. Will patient room doors be electrically locked? Where will the lock/unlock station(s) be? If so, how will the patient communicate to staff?
    - i. No; but we should look at the ability to lock clients out of their room with a key lock
  - d. Will patients have tracking devices?
    - i. No
  - e. How will security be accomplished? DSHS Staff? Private Security?
    - i. DSHS Staff or provider staff
  - f. Where will Security video be provided:
    - i. Exterior Doors?

1. yes
    - ii. Exterior Perimeter?
      1. yes
    - iii. Interior public areas?
      1. yes
    - iv. Any Patient Rooms?
      1. no
    - v. Where will video be monitored?
      1. Yes
    - vi. Who has access to video?
      1. Whoever is on call
  - g. Where will the facility have wander control? Doors monitored to alert staff if patient breaches specific locations.
    - i. When traveling interior to exterior through doors?
      1. no
    - ii. When traveling interior to other interior locations?
      1. No
  - h. Will bath and toilet rooms lock electrically? If so, where will the overrides be located and who will have authority to override?
    - i. No
  - i. Will the facility use card readers for door opening? If so, Staff only or staff and patient?
    - i. Yes, exterior only; However, the patients needs to be able to come and go freely in the step-down freely (think about the design of these entries)
  - j. Will patient doors be locked to allow patient privacy, or passage function
    - i. No
12. NET ZERO
- a. Roofing system type and parapet wall height, if a low-slope roof is planned?
    - i. Low-slope roof
  - b. Considerations for rooftop or ground mount solar PV array, any preference?
    - i. Everything on the roof

**Other notes:**

- Adequate crawl space to maintain plumbing easily
  - How does this work with our prototypical slab on grade design?
- 7'-0" interstitial space above for ease of access for mechanical ducts



November 26, 2019

### **Heating Ventilation and Air Conditioning**

The mechanical system will be comprised of a Variable Refrigerant Flow (VRF) system with a Dedicated Outdoor Air System (DOAS) for ventilation air.

Ducted VRF fan coils will be utilized to provide space heating and cooling. Air from each fan coil will be ducted directly to each space served to ligature resistant supply and return grilles. All VRF fan coils will be remotely located on a mechanical platform for ease of access and serviceability. Each fan coil will be provided with a filter rack with a MERV-8 filter.

There will be three DOAS units serving the building. Each DOAS unit will be located inside the building on a mechanical platform. There will be one DOAS units serving the Staff/ Service area and two DOAS units serving the Patient areas. The DOAS unit construction will include an enthalpy to capture waste heat from the building to precondition the ventilation air, MERV-13 air filter on the outside air inlet and MERV-8 filter on the return inlet, electric heating coil, and supply and exhaust fans with Variable Frequency Drives (VFD).

The DOAS units will deliver tempered ventilation air to individual Variable Air Volume (VAV) dampers at each space. The VAV dampers will open and close based upon occupancy status in each space with exception to the Dining/ Dayrooms and Conference rooms. The VAV dampers serving the Dining/ Dayrooms and Conference rooms will modulate based upon CO2 levels in the space (demand control ventilation).

Building relief will be accomplished by using air transfer from the smaller patient rooms, offices, and conference spaces to the larger open Dayroom/ Dining areas. There will be one exhaust VAV damper in serving each Dayroom/ Dining area controlled to a common space pressure sensor to maintain a slightly positive space pressure. Relief for the Staff/ Service area will use air transfer to the Waiting Area. The Waiting Area will utilize one exhaust VAV damper and modulate based upon space pressure to maintain a slightly positive space pressure.

The Mechanical and Electrical spaces will be provided with electric unit heaters for space heating and exhaust for ventilation. Both the unit heater and exhaust fan will be thermostatically controlled.

A BACnet direct digital control (DDC) system as provided and installed by Reliable Controls (or Owner approved equivalent) to include connections required for all HVAC components. The building addition will have its own network controller and operator workstation. The system will be capable of optimal start/stop, time and holiday scheduling, and after-hours override. Each zoned area is to be individually controlled through tamper proof temperature sensors located within each zone. The BACnet control system will meter building power, and domestic water consumption.

The DDC system will incorporate monitoring and control points necessary for scheduling and control.

## **Plumbing**

Behavioral healthcare ligature resistant plumbing fixtures and floor drains are to be utilized for all areas throughout the building including Staff/ Service areas. Lavatories will be provided with low flow (0.5 gpm) aerator faucets. Water closets will be low flow 1.28 gallon per flush. Shower heads will utilize 1.5 gpm flow cartridges.

Sanitary waste and vent piping above and below ground will be cast iron. All bathrooms, mechanical room, and fire riser room will be provided with floor drains. All floor drains will have trap primers installed.

The domestic water piping will consist of Type L copper or PEX for all above ground pipe and PVC Type C-900 for below ground cold water pipe.



# Net Zero Energy Pre-Design Study

1648 - Behavioral Health Unit

December 2019 (Draft Report)



# Leading Energy Performance

## Net Zero Energy Pre-Design Study (Draft)

### Executive Summary

The Department of Social & Health Services (DSHS) is positioned to demonstrate leadership in net zero energy performance for the new Behavioral Health Unit (BHU), based on the results of this pre-design study phase. This study evaluates the estimated energy use, renewable energy system capacity and associated rough order of magnitude costs for achieving net zero energy in the proposed 17,154 square foot new 16-bed facility and 51,462 square foot 48-bed facility.

The goal of this study is to identify renewable energy system options using solar photovoltaics (PV) to offset annual operational energy use, achieving net zero energy. Cost estimates for the system options evaluated are provided for consideration, using a range of unit costs for solar PV of \$2.50 - \$3.50/Watt:

16-Bed Facility (Fircrest)			Solar PV Cost Estimates			
			System Cost (\$2.50/Watt)	System Cost (\$3.50/Watt)	Percentage Offset (Baseline EUI)	Percentage Offset (Target EUI)
Baseline EUI Option	332.6	363,100	\$ 831,500.00	\$ 1,164,100.00	100%	181%
Target EUI Option	186.3	201,800	\$ 465,750.00	\$ 652,050.00	56%	100%
Net Metering Option	99.4	113,500	\$ 248,500.00	\$ 347,900.00	31%	56%

48-Bed Facility (Fircrest)			Solar PV Cost Estimates			
			System Cost (\$2.50/Watt)	System Cost (\$3.00/Watt)	Percentage Offset (Baseline EUI)	Percentage Offset (Target EUI)
Baseline EUI Option	997.8	1,089,300	\$ 2,494,500.00	\$ 3,492,300.00	100%	181%
Target EUI Option	558.9	605,400	\$ 1,397,250.00	\$ 1,956,150.00	56%	100%

Figure 1: Cost Estimates for Net Zero Energy BHU Facilities

The approximate range for solar PV array installation costs is representative of current market trends and anticipated future reductions as the solar industry continues to scale. Based on this project’s proposed schedule, significant cost reductions may be feasible for installing solar PV. Therefore, a unit cost of \$2.50/Watt is used for the low-end cost analysis for each system option proposed. Additional variables, such as utility rate escalation and maintenance costs are factored into this assessment. The results of this analysis highlight renewable energy system options for achieving net zero energy for both the 16- and 48-bed BHU facilities, supporting operational cost savings, carbon emissions reductions, and alignment with Washington State’s Executive Order 18-01 for net zero energy facilities.

### Energy Use Intensity Analysis

The facility is intended to support occupant health and wellness, prioritizing sustainable design while balancing cost-effective operations and maintainability of all systems and equipment.

Net zero energy building performance is typically a result of maximizing passive, active and renewable energy solutions. This framework identifies passive strategies first, such as building orientation and energy conservation opportunities from glazing, a high-performance building envelope, natural ventilation and other site-specific design strategies to minimize energy demands. Active solutions target high-performance, energy-efficient equipment, including heat pump technology or alternative high-efficiency HVAC equipment, LED lighting, occupancy sensors and energy management systems.

These strategies are intended to result in ultra-low energy use and associated operational cost savings, which can then be offset with on-site renewable energy systems to achieve net zero energy performance. Ideally, the renewable energy system capacity is minimized based on the building’s energy efficiency, providing lower installation and maintenance costs. However, a cost premium of 5-10% is anticipated for net zero energy buildings:

	Energy Conservation Measures	Net Zero Energy (Renewables with ECMs)
Office New Construction	1-6%	5-10%
Multifamily New Construction	2-7%	7-12%
Office Renovation	7-12%	14-19%

Figure 2: Cost Premiums for Net Zero Energy Buildings (ILFI, 2013)

DSHS can shield the project from potential risks, safeguarding the ability to meet and expand program needs throughout the building’s lifecycle, by accounting for various market signals. Specifically, these signals include, but are not limited to:

- Implementing an all-electric HVAC system to maximize benefits of on-site renewable energy generation and mitigate financial risk in the scenario that a future carbon tax is imposed
- Obtaining net energy metering, ensuring on-site renewable energy generation is used in-building, providing compatibility for a battery energy storage system
- Deploying grid-interactive capabilities, including demand response, advanced energy metering, and energy monitoring system integration

Additionally, first costs for a net zero energy building are often prioritized for the longest lasting systems. In particular, the building envelope typically presents the greatest opportunity for energy efficiency, where increased R-value beyond code requirements or typical design standards may provide the longest enduring benefits.

Using a national energy consumption database for energy use in similar buildings, based on the square footage and use type, we can establish an energy use baseline and target Energy Use Intensity (EUI) for this project. The Commercial Building Energy Consumption Survey (CBECS) database is used as a resource to evaluate energy use for similar Medical Office buildings. While this is not an exact comparison to the DSHS Behavioral Health Unit facility, it does provide a comparative metric for a 'high-end' baseline and a targeted energy efficiency goal for the new project. Included in the comparison are assumptions for 24-hour operations, with 30 full-time staff anticipated. Building on these assumptions, the project team identified a target EUI of 40 kBtu/sf/year during the sustainability:

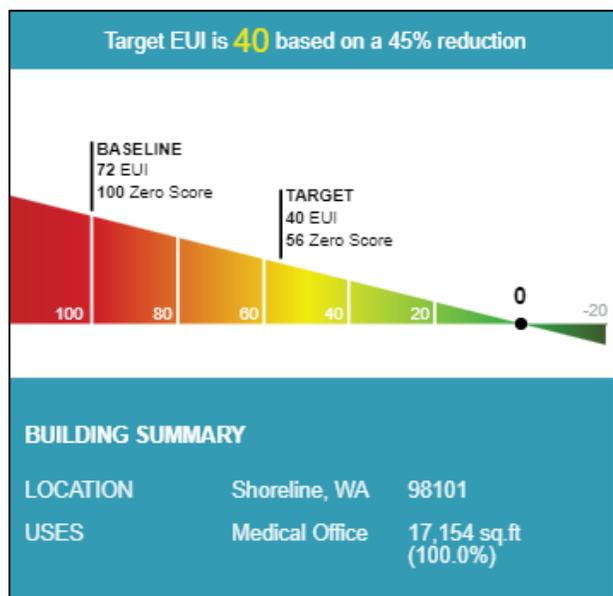


Figure 3: Energy Use Intensity (EUI) Baseline and Target

As shown in Figure 1 above, the baseline and target EUI are used for this study, to assess the approximate range of renewable energy capacity required for achieving net zero energy, where 100% of the building's net annual energy consumption is offset by renewable energy generation.

DSHS specified a target EUI for this project during the sustainability workshop, in order to achieve a level of energy efficiency that is aligned with net zero energy performance. However, both the energy use baseline and target EUI are used for this analysis to identify the optimized strategies for achieving net zero energy on this project.

## Renewables & Net Zero Energy

While a variety of renewable energy technologies are available for new construction projects, this report recommends using solar photovoltaics (PV) due to their cost effectiveness, ease of installation, maintenance and operation as an on-site, distributed energy resource.

As discussed in the sustainability charrette, the US solar PV industry has experienced tremendous growth in the past decade, which is fueled by the reduction in installed costs:

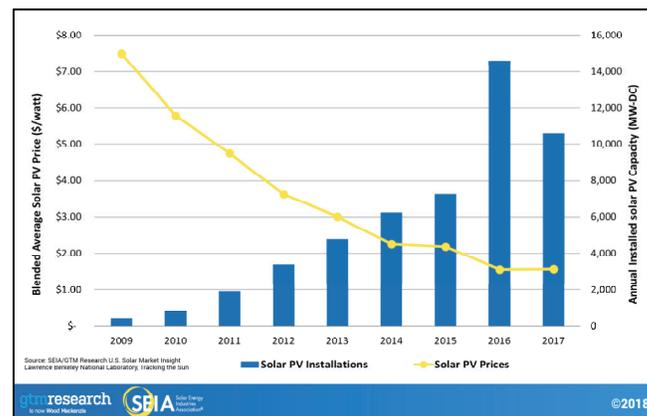


Figure 4: Solar PV Installation Cost & Installed Capacity (SEIA, 2018)

Solar PV array installation costs are typically described using the common denominator of installed cost per Watt of installed capacity (DC-nameplate). The average installation cost per Watt in the United States is now below \$2.00, as represented in Figure 2 above. However, this dataset includes utility-scale, multi-megawatt arrays, which benefit from economies of scale and can be implemented at a lower cost per Watt. Therefore, a unit cost of \$2.50/Watt is used for this analysis, which accounts for prevailing wages.

Solar irradiance, or available electromagnetic radiation from the sun (measured at earth), helps gauge the potential for installing solar at a given site. While the Pacific Northwest is known for overcast, rainy winter weather, long summer days and diffused light result in a higher irradiance (state-wide) than the country of Germany, which is a national leader in solar adoption. The solar potential varies across Washington State, but can be anticipated within a range of 1,000-1,500 kilowatt hours (kWh) per kilowatt (kW) of installed solar PV per year. The National Renewable Energy Laboratory (NREL) provides a solar irradiance calculator, called 'PV Watts', which can help gauge the solar potential for the Fircrest project location:

RESULTS			
Print Results			
1,027 kWh/Year*			
System output may range from 980 to 1,061 kWh per year near this location. Click <a href="#">HERE</a> for more information.			
Month	Solar Radiation (kWh / m <sup>2</sup> / day)	AC Energy (kWh)	Value (\$)
January	1.21	30	3
February	1.99	46	5
March	2.88	72	7
April	4.77	112	12
May	5.63	135	14
June	5.86	134	14
July	6.57	154	16
August	5.61	131	14
September	4.30	98	10
October	2.61	61	6
November	1.23	29	3
December	1.01	25	3
<b>Annual</b>	<b>3.63</b>	<b>1,027</b>	<b>\$ 107</b>

Figure 5: PVWatts Estimate for 1 kW of Solar PV in Shoreline, WA

Installation costs are also driven by the install type, which can be broken out into three distinct applications: rooftop, ground-mount, and carport. While the project team specified that a rooftop-mounted PV array is desired, there are proposed project locations which may be suitable for a ground-mount installation.

This option also supports a partnership approach, where adjacent facilities support the development of a larger PV array and potential microgrid infrastructure, promoting resiliency, safety and security. System options proposed in this study include ground-mount, to provide the project team with options for consideration. For a rooftop array, primary considerations include the roof type and proposed racking installation system. While a standing seam metal roof is likely to provide the lowest cost installation due to available seam clamp products that limit any roofing penetrations, a flat roof is proposed for this project. Therefore, a ballasted racking system is proposed for rooftop solar PV, to reduce the risk of water penetration from flashed-in, fixed footings.



Figure 6: Ballasted racking installation system on flat roof

A solar energy monitoring dashboard is also proposed to support occupant education while providing transparency into the system's daily and lifetime operations. Energy monitoring dashboards typically integrate with a solar PV array's inverter, using metering equipment relayed to a dedicated internet connection. The data provided by the

inverter can be shared to a website, a dashboard within the building, and integrated into a portfolio of DSHS solar installations over time. Energy performance equivalencies may also be integrated into the dashboard so as to display the equivalent number of homes powered, number of trees planted, or tons of carbon emissions saved:

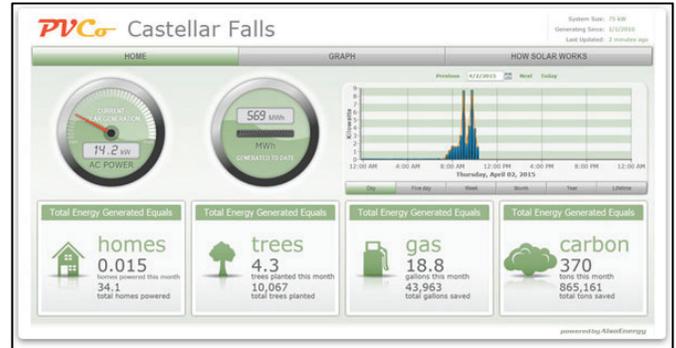


Figure 7: Solar Energy Monitoring Dashboard, Courtesy of AlsoEnergy

Solar energy monitoring is a resource for system maintenance, which can be supported through a production guarantee from the installation contractor. This contract arrangement ensures the system performs as designed, and is often supplemented by a workmanship warranty to cover any necessary repairs within a set time period. As an industry standard, solar PV modules are warranted for 25 years, meaning that the modules will operate within 80% of their original performance rating at year 25. Also stated, solar PV modules will experience no greater than 20% degradation over a 25-year period. Solar energy monitoring can help a system owner know if and how the array, and even individual modules, are performing. This empowers the owner to enforce the warranty if the array or individual modules are demonstrated to underperform within their warranted lifetime.

### Executive Order 18-01 for State Agencies

DSHS is a Washington State agency that falls under the Executive Order 18-01, which requires owned or leased facilities to be designed to be zero energy or zero energy capable. A zero energy ready building achieves ultra-low energy use while maintaining sufficient space for the future installation of renewable energy systems to achieve net zero energy. The goal of this mandate is to prioritize energy efficiency and renewable energy integration, as well as to achieve the following outcomes:

- Design the building to make as much energy as it uses annually
- Review green building considerations
- Incorporate monitoring-based commissioning

A zero energy, or net zero energy, building can be understood as a performance outcome. Meanwhile, a zero energy-capable building must incorporate prescriptive requirements to enable net zero energy retrofits after the building is constructed.

Specific checklist items for a zero energy-capable building are not available, though the following solar-ready requirements may provide a useful framework for design considerations:

Site Solar Readiness	Yes	No
All installed system components are new and mounted securely	<input type="checkbox"/>	<input type="checkbox"/>
Proposed system location with required setbacks is documented in plan set or roof diagram	<input type="checkbox"/>	<input type="checkbox"/>
Solar resource verification at or above 80% TSRF or by using prescriptive method.	<input type="checkbox"/>	<input type="checkbox"/>
Solar Ready Photovoltaic	Yes	No
Minimum of 200 square feet un-shaded, unobstructed roof reserved for solar	<input type="checkbox"/>	<input type="checkbox"/>
A 48" x 48" space reserved near electrical panel for inverter and equipment.	<input type="checkbox"/>	<input type="checkbox"/>
¾" or larger non-flexible metal conduit installed per requirements with j-box on both ends	<input type="checkbox"/>	<input type="checkbox"/>
Space for a double-pole breaker reserved in electrical panel opposite the main service feed	<input type="checkbox"/>	<input type="checkbox"/>
Required labeling is present including "Reserved for Solar," "Solar Ready" and code labels	<input type="checkbox"/>	<input type="checkbox"/>

Figure 8: Solar-ready requirements from the Energy Trust of Oregon (ETO)

In addition, the 'Zero Net Energy' (ZNE) project checklist for state buildings includes several requirements for the Pre-Design Process:

- Include ZNE requirement in budget packages
- Identify a team ZNE champion
- Develop and refine Owners Project Requirements (OPR) to reflect ZNE
- Review contract structures and include ZNE
- Include ZNE goal in architect advertisement. Select qualified ZNE team
- Set building energy performance target (EUI)
- Hold design charrettes
- Conduct early design phase energy modeling

This study responds to comments provided during the sustainable design charrette, includes early-phase solar PV modeling, sets an EUI performance target, and provides an understanding of ZNE requirements for the design-phase budget package. An added benefit of this analysis are the connections between net zero energy and LEED v4.

### LEED v4 BD+C – Energy & Atmosphere

The proposed Behavioral Health Unit will be required to achieve LEED Silver Certification. Provided the project registers in 2020, the project will remain eligible to pursue LEED Version 4 (v4) Building Design & Construction (BD+C), which has the greatest magnitude of points available in the Energy & Atmosphere (EA) credit category. The net zero energy performance goal for this project therefore has strong alignment with LEED v4 BD+C, including the following credit opportunities:

- EAp2 - Minimum Energy Performance
- EAp3 - Building-Level Energy Metering
- EAc2 - Optimize Energy Performance
- EAc3 - Advanced Energy Metering
- EAc4 - Demand Response
- EAc5 - Renewable Energy Production

Based upon the project's location, additional points are available under the Regional Priority (RP) credit category. The United States Green Building Council

(USGBC) outlines regionally specific opportunities that may align with recent initiatives or codes, providing 1 additional LEED point per RP credit when points thresholds are met in the associated credit category.

For example, if a sufficient number of points under EAc4 and EAc5 are achieved for this project, and the building is sited in Shoreline, Washington, then the following location-specific Regional Priority credits would be also achieved, for a total of 2 additional LEED points:

- RP - Demand Response
- RP - Renewable Energy Production

A preliminary LEED scorecard was developed during the sustainability charrette, which may be modified to address the outcomes of this study.

### Solar PV Options Analysis

This report presents solar PV array capacity and layout options that are sufficient to offset building energy use at the project's identified baseline EUI and target EUI, respectively, assuming all-electric building performance. These options are modeled, priced, and sized based upon kWh/year metrics that are calculated to be commensurate with the baseline and target EUI:

	Square Footage	EUI Baseline	EUI Target	kWh/Year Baseline	kWh/Year Target
16-Bed	17,154	72	40	361,969	201,094
48-Bed	51,462	72	40	1,085,906	603,281

Figure 9: Energy Use Intensity Analysis for Baseline and Target EUI

All solar PV array options presented are modeled to assess the associated net annual offset from the energy consumption estimates in Figure 9. These options are also vetted against current energy policy, including interconnection requirements with the utility serving the project location. In addition to the PV array capacities required for the baseline and target EUI scenarios, this report provides an array option that leverages net energy metering.

### Net Energy Metering in Washington State

Net metering is a key financial resource for recouping investments in the implementation of a renewable energy system. This option responds to RCW 80.60 for 'Net Metering of Electricity', where a renewable energy system such as a solar PV array can be directly interconnected with a building's electric service. In this scenario, the solar energy is first used within the building, and any surplus solar energy beyond the building's real-time needs is exported back onto the utility grid for a credit at the retail electricity rate. For the scope of this study, the Washington State average retail rate of \$0.09/kWh is used for electricity costs and associated savings.

Net metering is an important value stream for solar, although it is subject to change. Current net metering requirements allow solar PV arrays up to 100 kW in capacity. Systems that exceed this capacity threshold are still allowed, though a line-side connection may be mandated by the utility. In this scenario, solar energy is sent directly to the utility grid and with a billing credit applied below the retail rate. This interconnection process will typically require a power purchase agreement (PPA) between the project Owner and utility company, which establishes the buy-back rate and term length.

### Option 1 – Net Metering Option

- System capacity: 99.4 kW (DC-Nameplate)
- Annual Production Estimate: 113,500 kWh/year
- Cost Estimate Range: \$248,500 - \$347,900

Starting with a solar PV array that leverages net metering benefits while consolidating the system on the rooftop area of a 17,154 SF footprint, the following concept design is proposed for a 99.4 kW array:



Figure 10: 99.4 kW Solar PV Array Designed for Net Metering

This system option does not achieve net zero energy under either the baseline or target EUI scenario. However, the array design takes into consideration commercial setback requirements for solar PV arrays, as well as inter-row shading constraints from the 10-degree tilt angle of all module rows. While the array layout is subject to change, it is recommended that this system incorporates access walkways for annual maintenance. The array may utilize a ballasted racking installation to limit roofing penetrations. Using the low-end unit cost of \$2.50/Watt for this system, a total installation cost of \$248,500 is estimated, resulting in a simple payback of 95% of the installation cost over 25

years:

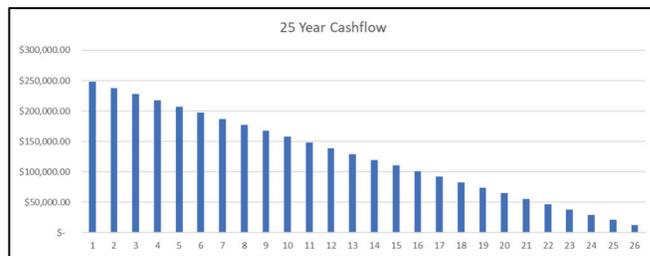


Figure 11: 25 Year Cashflow for 99.4 kW Solar PV Array

This solar PV array option nearly results in the simple payback within the modules' warranted lifetime, particularly by leveraging net energy metering at the retail utility rate. This simple payback calculation assumes annual maintenance costs of \$5/kW-dc and annual utility cost increases of 4%. Additionally, the payback incorporates solar PV module degradation of 20% over 25-years to account for anticipated reduction in output over time. While utility costs will rise on average of 4% annually in Washington State, utility providers reserve the right to increase this rate, as evidenced by PSE's 14% rate increase in 2019. Significant rate increases may be implemented throughout Washington State in coming years, particularly as utility companies transition to carbon-free energy resources under the Clean Energy Transition Act (CETA). On-site solar PV will shield the owner from this volatility, perhaps improving the payback outlook over time.

In order to achieve net zero energy using on-site renewable energy under the target EUI scenario, solar capacity beyond the available roof area may be required.

### Option 2 – Net Zero Option for Target EUI

- System capacity: 186.3 kW (DC-Nameplate)
- Annual Production Estimate: 201,800 kWh/year
- Cost Estimate Range: \$465,750 - \$652,050

DSHS expressed interest in pursuing a 100% rooftop mounted solar PV array to achieve net zero energy in the 16-bed facility's target EUI scenario. This option is hypothetical and unrealistic, as it does not account for maintenance access or installation challenges. Regardless, this option is included to demonstrate the magnitude of solar PV required for a rooftop installation to achieve net zero energy:



Figure 12: 186.3 kW Rooftop Solar PV Array for Net Zero Energy

This 186.3 kW array uses 540 modules to produce 201,800 kWh per year, providing a 100% net annual offset of all energy consumed in the 16-bed facility’s target EUI scenario. While this option does meet commercial setback requirements, this array layout is not feasible for installation, maintenance, or providing adequate space for rooftop HVAC equipment. Therefore, an alternative system layout of the same capacity is considered with the inclusion of ground-mounted solar PV arrays.

Ground-mount solar PV arrays may provide the lowest-cost option for any solar array installation type. Due to the solar PV capacity required to offset this project’s anticipated energy demand, ground-mounted arrays, in lieu of substantial building overhangs, may be the most cost-effective option, and the most feasible for installation. However, site preparation costs, including grading, trenching for conduit runs, and security provisions such as fencing, remain unknown and must be taken into consideration when comparing options. Using the target EUI of 40 kBtu/SF/year, net zero energy performance may be achieved for the 16-bed facility with a combination of rooftop and ground-mount solar PV:

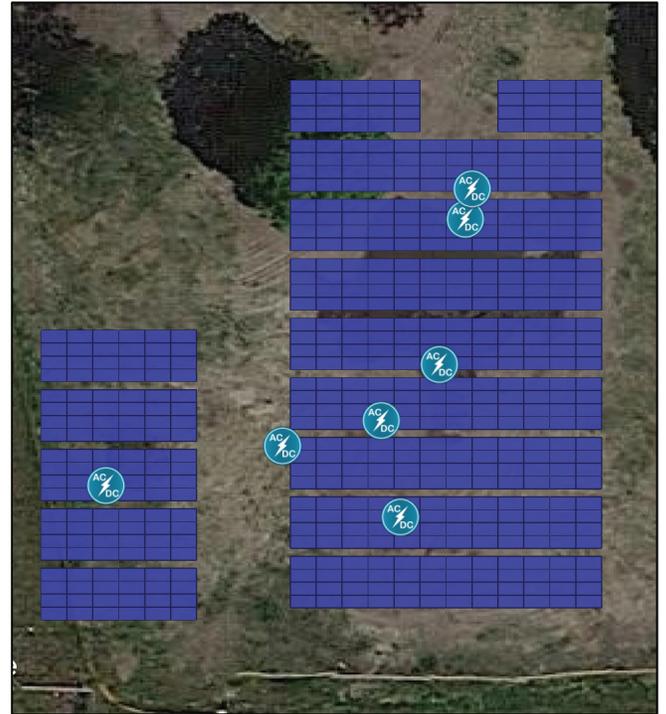


Figure 13: 186.3 kW Rooftop & Ground-mount Solar PV Array

This system configuration includes rows of solar PV stacked with 4-modules per frame at a 10-degree tilt angle, and sufficient space between rows to account for inter-row shading. Using a rough order of magnitude, low-end installation cost of \$2.50/Watt and discounted buy-back rate of \$0.045/kWh for solar PV arrays that are not receiving net metering at the retail rate, a 25-year cashflow analysis identifies no simple payback within the modules’ warranted lifetime:



Figure 14: 25 Year Cashflow for 186.3 kW Solar PV Array

The 186.3 kW array anticipates a total installation cost of \$465,750, producing an estimated 201,800 kWh/year. While the baseline EUI scenario is not anticipated for this project, primarily due to LEED v4 Silver Certification and associated energy efficiency requirements under Washington State Energy Code, achieving net zero energy under this scenario is still evaluated to demonstrate the first cost benefits of efficient building performance when pursuing net zero energy.

#### Option 3 – Net Zero Option for Baseline EUI

- System capacity: 332.6.3 kW (DC-Nameplate)
- Annual Production Estimate: 363,100 kWh/year
- Cost Estimate Range: \$831,500 - \$1,164,100

Providing a 100% net annual offset of all building energy use in baseline EUI scenario, requires a combination of rooftop and ground-mount arrays. A 332.6 kW array, producing 363,100 kWh annually is estimated to achieve net zero energy for a 16-bed facility at the Fircrest site:

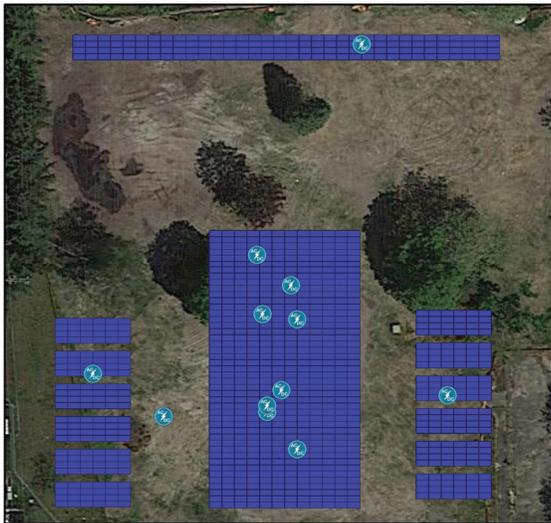


Figure 15: 332.6 kW Solar PV Array

While it may not be feasible to install this magnitude of solar PV capacity at other proposed sites for this project, a 332.6 kW solar PV installation is anticipated to achieve net zero energy under the baseline EUI scenario at the Fircrest site. However, to help gauge the installation cost of a system of this capacity and simple payback analysis from operational cost savings, a 25-year cashflow analysis is provided for consideration using the low-end unit cost of \$2.50/Watt:



Figure 16: Cashflow Analysis for 332.6 kW Solar PV Array

This system option does not qualify for net energy metering and is anticipated to receive a discounted buy-back rate for all solar energy generated.

A typical rate structuring for power purchase agreements in Washington State is roughly half the retail rate. Using the average state-wide electric utility retail rate of \$0.09/kWh, a buy-back rate of \$0.045/kWh is applied, which results in a 50% simple payback by year 25.

Each solar PV array option for the 16-bed Behavioral Health Unit located at the Fircrest location, including solar capacity, production, cost and percentage offsets from each scenario, is evaluated for the recommended option:

16-Bed Facility (Fircrest)	PV Capacity (kW)	Annual Production (kWh)	Percentage Offset (Baseline EUI)	Percentage Offset (Target EUI)
Baseline EUI Option	332.6	363,100	100%	181%
Target EUI Option	186.3	201,800	56%	100%
Net Metering Option	99.4	113,500	31%	56%

Figure 17: Solar PV Array Options, Estimated Cost & Performance

Based on these results, the 'Option 1 - Net Metering Option' for a 99.4 kW rooftop-mounted solar PV array is anticipated to achieve a simple payback within the solar modules' 25-year warranted lifetime. While future expansion of the system is still feasible, this option does not achieve net zero energy. However, if the project is able to achieve a lower EUI, net zero energy performance is attainable for this solar PV array capacity. For example, if an EUI of 23 kBtu/SF/year is achieved for the 16-bed facility, it is feasible that the 99.4 kW array option may provide a 100% offset of annual energy use, resulting in net zero energy performance.

#### 48-Bed Facility Considerations

DSHS may opt to proceed with a 48-bed facility, which is anticipated to be three separately metered 16-bed facilities. At this early stage in the pre-design process, the 48-bed cost estimates and solar PV array capacities to achieve net zero energy are developed using the preceding analysis for a 16-bed facility.

Site constraints for the ground-mounted solar PV array options may limit the feasibility for achieving net zero energy for the 48-bed facility, especially when considering the baseline EUI. However, potential installation cost savings may be realized for the larger solar PV array capacities required to achieve net zero energy for the 48-bed facility, due to economies of scale.

Net zero energy is feasible for DSHS Behavioral Health Units in Washington State, especially with increases in solar PV module power density, decreased installation costs, and the potential for increasing utility rates. Additional programmatic opportunities may be available for DSHS to claim the benefits of off-site renewable energy systems, such as participation in the Green Direct program with Puget Sound Energy:



Figure 19: Puget Sound Energy's Green Direct Program (pse.com)

Looking holistically at the program, function and goal of the Behavioral Health Units and DSHS mission, as well as Executive Order 18-01's mandate, there is strong alignment with net zero energy for these facilities, regardless of the renewable energy procurement method. On-site renewable energy installations provide increased potential for resiliency benefits,

when considering the inclusion of battery storage and microgrid system implementation. However, participating in a program such as Green Direct offers a low risk strategy to save utility costs over time, while achieving net zero energy from a remote installation.

### Site Selection & Optimization

The sites identified for the 16- and 48-bed facilities will play an important role in these projects' ability to achieve net zero energy. In particular, the buildings' massing and orientation may dictate the required capacity and system performance of on-site solar PV array. For example, orienting the facility to optimize solar potential includes considerations of current and future shading, as well as the azimuth, where a south-facing roof area provides for optimal solar PV performance. Additional coordination of rooftop equipment, such as HVAC systems may limit the available roof area for solar PV. As the building design, orientation and site selection is finalized, solar PV array capacity, location and system performance may be evaluated to achieve net zero energy. Evaluating the 16-bed facility at the proposed Maple Lane site option, net zero energy is anticipated to be feasible with a 186 kW rooftop solar PV array:



Figure 19: Maple Lane Site Option for 16-Bed Facility

The 48-bed facility is anticipated to replicate the massing and available roof area for the 16-bed facility. Therefore, net zero energy is anticipated to be feasible for both the 16- and 48-bed facilities.

### Conclusion

The Washington State Department of Commerce provides a Zero Net Energy Toolkit for state agencies pursuing this performance outcome from the pre-design, design, construction and occupancy phases of a project. Tools and resources are provided to educate and empower project teams to design and develop net zero energy buildings,

understand requirements, and prepare materials for funding and compliance:

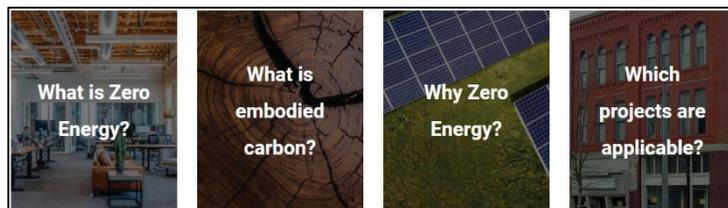


Figure 20: ZNE Toolkit Resources from WA Dept. of Commerce

Pre-design project meetings highlighted potential sites proposed for the Behavioral Health Unit facility. Each site is evaluated for solar potential below:

Site Name	Solar Potential	Notes
Fircrest	High	No southern shading, highest priority site for net zero energy
Maple Lane School	High	Partial shading to the South of proposed project location, although potential for adjacent solar PV and microgrid development with DOC
Western State Hospital	Medium	Limited or no shading at project site, prioritized for net zero energy
Echo Glen	Low	Shaded site not suitable for solar, requires tree removal is coordinated with DNR
Snohomish County Site	TBD	To be determined
Clark County Site	TBD	To be determined

Figure 21: Site Assessment Matrix Ranking Net Zero Energy Potential

Additional analysis is required for each specific site to understand potential shading or space constraints for installing solar PV. The primary focus for solar site assessment is potential shading to the south of the project location, which may obstruct solar access.

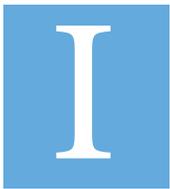
The south-west area of the Fircrest site presents no solar obstructions, resulting in 100% of the Total Solar Resource Fraction (TSRF) available for solar PV energy generation at this location. As an industry standard, solar PV installations are not recommended for project locations that present less than 75% of the TSRF at a given site. While site improvements may improve the TSRF at all proposed locations for the new facilities, the Fircrest site is evaluated for net zero energy.

The next steps for this analysis will be to finalize the roof plan during later stages of the design, coordinate HVAC equipment location, and update the solar PV array layout. Net zero energy is presumed to be achievable at the locations identified to have medium or high solar potential, pending an energy model with all specified equipment, solar PV array layout, cost estimates and bid procurement language.

Emerging technologies such as Vehicle-to-Grid (V2G) applications for 2-way electric vehicle charging, battery energy storage systems (BESS) and demand management applications may further support the achievement of net zero energy performance.



DSHS will contact Department of Archeology and Historic Preservation and obtain Executive 05-05 conformance once the final site selection has been established for the project.



# Energy Life Cycle Cost Analysis

## **BEHAVIORAL HEALTH BUILDINGS**

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### ENERGY LIFE CYCLE COST ANALYSIS

**Department Social Health Services**

January 2020

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Tacoma, Washington 98424  
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# BEHAVIORAL HEALTH

## Energy Life Cycle Cost Analysis

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### 1.0 EXECUTIVE SUMMARY

This Energy Life Cycle Cost Analysis (ELCCA) is an effort to document, plan, and make decisions regarding the energy-related components of this facility. The energy analyst and architectural team have listed, discussed, and analyzed the envelope for this building. They have made decisions and assumptions about the roof, walls, floor, glazing and doors, and how these interact with the heating, ventilation, and air conditioning (HVAC) system, and lighting systems. Decisions were made about the practicality, budget, and function of these items and the components chosen best fit this facility and its constraints.

Three different building design options were examined using the eQuest 3.65.7175 / DOE-2.3 energy simulation computer program. All options meet the constraints of the ELCCA Guidelines and this analysis offers a conclusion of the best of these systems.

This analysis concentrates on the HVAC and energy source options. The prescriptive guidelines and the proposed systems are described in their respective sections of this report.

#### 1.1 Envelope Analysis

The recommended new building wall envelope consists of 2" x 6" wood stud walls at 16" o.c. with R-21 batt, vapor barrier and gypsum board. The new roof has R-38 rigid above deck. All glazing will be double-pane in metal frames with at least  $U=0.38$  and  $SHGC=0.4$  per WSEC. The building envelope is discussed in Section 3.0

#### 1.2 HVAC Analysis and Recommendations

Alternative #1 uses a Variable Refrigerant Flow system to control temperature in the building zones except for IT closets which have small, independent DX cooling units. Ventilation air is provided by dedicated outside air variable volume air handling unit with an enthalpy wheel. Alternative #2 uses a ground-coupled water source heat pump system. Individual heat pumps serve each zone. A DOA with a heat exchanger provides ventilation air. Alternative #3 uses the same Variable Refrigerant Flow system as Alternate #1 and includes a roof mounted PV system. The WSEC baseline model utilizes cycling two stage heat pump units and a heat recovery DOA.

##### 1.2.1 System Type Recommendation

The modeled building designs were discussed with the district and the design team, and the Variable Refrigerant Flow system with DOA analyzed in Alternative #1 was determined to be the system of choice and is recommended for the facility. The proposed energy model shows an overall energy savings of 9.9% when compared to the WSEC baseline energy model. All proposed energy model building area envelope values comply with current WSEC code. Alternative #1 has the lowest 50 year life cycle cost. See the HVAC System Discussion in Section 4.0 for more information about this system.

**BEHAVIORAL HEALTH**  
**Energy Life Cycle Cost Analysis**

**1.3 Lighting System Description**

The interior lighting density values used for the baseline energy model is 0.66 watts/square foot. The value was obtained from the WSEC, Table C405.4.2(1) Office. The proposed interior lighting value is assumed to be 0.59 watts/square foot, a 10% reduction.

**1.4 Domestic Hot Water Description**

Values of typical occupancy and hot water usage were determined using DOE-2.3 standard values. DHW heaters are modeled as electric heaters for all energy models.

**1.5 Estimated Annual Costs for Systems**

The estimated annual cost for the recommended Variable Refrigerant Flow system includes total building energy use and maintenance. The estimated building energy consumption is obtained from the eQuest 3.657175 / DOE-2.3 energy cost output. The annual maintenance cost is estimated from 2015 RS Means Facilities Maintenance and Repair and Cost Data and RS Means Mechanical cost data 2017.

**Table 1-1 Summary of Costs per Building**

<b>System Alternative</b>	<b>First Costs</b>	<b>Annual Electric Fuel Costs</b>	<b>Annual Maintenance Costs</b>	<b>Total Life Cycle Costs</b>	<b>Energy Usage Index (KBTU /s.f.-yr.)</b>
Variable Refrigerant Flow, DOA, Electric DHW	\$399,305	\$15,920	\$6,279	\$1,466,218	30.2
Ground Loop Heat Pumps, DOA, Gas Boiler, Electric DHW	\$699,000	\$15,652	\$15,162	\$2,075,408	29.5
Variable Refrigerant Flow, DOA, Electric DHW, PV System	\$451,805	\$11,602	\$6,944	\$1,477,685	22.0
WSEC Cycling Heat Pump with DOA, Electric DHW					33.5

# BEHAVIORAL HEALTH

## Energy Life Cycle Cost Analysis

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### 2.0 PROJECT DESCRIPTION

#### 2.1 Construction Project

The three Behavior Health Buildings will be new buildings located in Clark County, Washington. Building areas include bedrooms, commons, kitchen, and offices. The total building floor area for each building is approximately 17,000 sq ft. There are no exceptional shading systems, or special considerations for this project. The buildings will be occupied during the day, primarily between the hours of 6 am and 11 pm. There is night occupancy that is assumed to be minimal.

#### 2.2 Summary of Utility Assistance

Puget Sound Energy supplies electrical power. Puget Sound Energy does offer energy conservation measures. However energy conservation measure need to preapproved by Puget Sound Energy prior to construction. Contact Puget Sound Energy at 1-888-225-5773 for more information.

### 3.0 BUILDING DESCRIPTION

#### 3.1 Building Components

##### 3.1.1 Envelope

The new wall and roof will meet current WSEC envelope new construction requirements. The baseline and proposed energy model building envelopes meet the WSEC prescriptive values shown in Table 3-1. Table 3-1 also compares the prescriptive baseline building components to the proposed building components.

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**Table 3-1**  
**Prescriptive vs. Proposed Building Components**

<b>Component</b>	<b>Prescriptive</b>	<b>Proposed</b>	<b>Result</b>
Roof	R-38 rigid, U=0.027 (WSEC 2015 prescriptive Roof)	R-38 rigid or R-49 batt attic type, U = 0.027	Meets Prescriptive
Walls	U=0.055 maximum (Steel Frame) (WSEC 2015 Prescriptive) U=0.054	2x6 wood stud, R-21 batt, U=0.054 U=0.054	Meets Prescriptive
Glazing	Windows, U=0.38, SHGC=0.4 (WSEC 2015 prescriptive Window)	U=0.38, SHGC=0.4	Meets Prescriptive
Doors	Metal U=0.37	Metal U=0.37	Meets Prescriptive
Crawl space	R-30 Rigid insulation	R-30 Rigid insulation	Meets Prescriptive

### 3.2 Energy Simulation Assumptions

For this analysis, the building was divided into 28 zones that group together spaces of similar heating and cooling loads within the building.

The computer program used for energy simulation is eQuest 3.657517 / DOE-2.3 provided by the state of California and the federal government.

The building occupancy schedule is 6:00 a.m. to 11:00 p.m. at nearly full occupancy. There is minimal occupancy at night. The heating and ventilation schedule follows the occupancy schedule, with the heating and ventilation system starting up approximately one hour before building occupancy and shutting down approximately one hour after the end of the occupied day.

Heating set point is 70°F, and cooling set point is 76°F. During unoccupied/minimal occupancy hours, the HVAC system reverts to a "setback" mode and the heating set point drops to 66°F; the cooling "setback" temperature is 76°F.

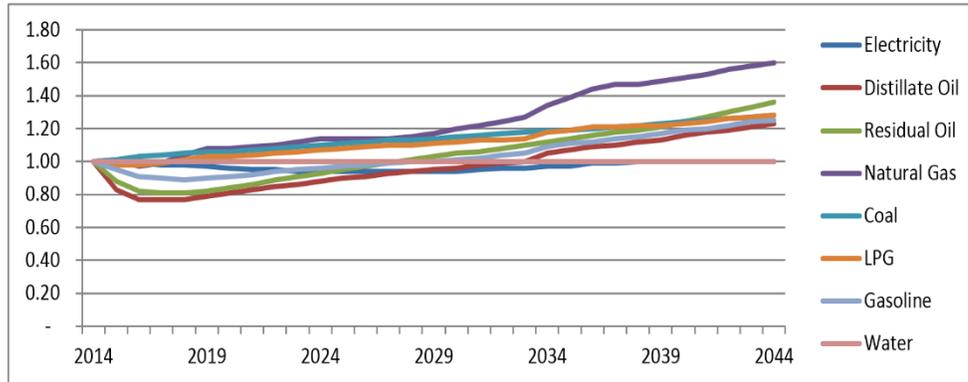
### 3.3 Economic Assumptions

The economic assumptions made in this analysis are based on the ELCCA Guidelines published by the Washington State Energy Office. The data used to produce the graph below is from the ELCCAT spreadsheet available from the Washington state department of enterprise services. "Real" escalation rates for various fuel types are as shown in Figure 3-1 below.

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**Figure 3-1**  
**“Real” Escalation Rates**



"Real" analysis does not account for general inflation.

### 3.4 Utility Rates

The electric rate used for the economic analysis is Puget Sound Energy Electric Schedule 31. The electric energy charge is \$0.0617 per kWh, the demand charges are \$9.77 per kW, and the basic monthly charge is \$353.17. See the rate schedules on the following pages.



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**4.0 HVAC SYSTEMS**

**4.1 HVAC Costs**

Three HVAC building designs were analyzed using the ELCCA spreadsheet calculations. Table 4-1 summarizes the costs that were estimated and used in the spreadsheets.

**Table 4-1**  
**Detailed Breakdown of Life Cycle Costs**

Category	Variable Refrigerant Flow system	GLHP System	Variable Refrigerant Flow system with PV
HVAC	<b>\$399,305</b>	<b>\$699,000</b>	<b>\$451,805</b>
Materials	\$170,357	\$241,675	\$196,607
Labor	\$228,948	\$456,837	\$228,948
Annual Maintenance	<b>\$6,279</b>	<b>\$15,162</b>	<b>\$6,944</b>
Controls	\$237	\$237	\$237
Maintenance of Units (filter, belt, clean coils)	\$6,042	\$12,890	\$6,042
Pumps		\$260	
Boiler		\$1775	
PV Array			\$665
Replacement Costs @ 50yr	<b>\$656,800</b>	<b>\$932,740</b>	<b>\$796,928</b>
Total First Year Energy Cost	<b>\$15,920</b>	<b>\$15,652</b>	<b>\$11,602</b>
Total 50 yr. LCC	<b>\$1,466,218</b>	<b>\$2,075,408</b>	<b>\$1,477,685</b>

A detailed breakdown of the replacement costs is shown in Table 4-2. The replacement years are obtained from the ELCCA Guidelines for Public Agencies (January 2016) unless otherwise discussed in this report. The PV system maintenance and replacement years were obtained from US Solar Photovoltaic System Cost Benchmark report. The detailed breakdown of replacement costs shown in table 4-2 are present value costs.

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**Table 4-2  
Detailed Breakdown of Replacement Costs per Building**

<b>Equipment Type</b>	<b>Replacement (Years)</b>	<b>Cost (\$)</b>
<b>Variable Refrigerant Flow system (Alt. 1- Proposed)</b>		
DOA with HX	20	\$ 24,700
Variable Refrigerant Flow Units	19	\$108,780
Controls	15	\$ 62,000
<b>Ground Loop Heat Pump (Alt. 2)</b>		
DOA with HX	20	\$ 24,700
Ground Loop Heat Pumps	19	\$ 78,400
Pumps	20	\$ 7,900
Boiler	25	\$ 4,675
Controls	15	\$ 62,000
<b>Variable Refrigerant Flow system and PV (Alt. 3)</b>		
DOA with HX	20	\$ 24,700
Variable Refrigerant Flow Units	19	\$108,780
Controls	15	\$ 62,000
PV System	15	\$ 52,500

## 4.2 HVAC System Descriptions

Three systems were analyzed for this project.

### 4.2.1 Variable Refrigerant Flow System (Alternative #1-Proposed)

This system uses Variable Refrigerant Flow units to control temperature in the building zones except for IT closets which have small, independent DX cooling units. Multiple separate VRF indoor units are piped to at least 2 separate outdoor units. Building ventilation is provided by a variable volume DOA unit with heat exchanger that runs continuously during occupied hours. All new equipment meets the WSEC energy efficiency requirements.

This alternative system is recommended for DSHS Behavior Health Building. The actual first cost estimate is given in Table 4-1 above.

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### 4.2.2 Ground Source Heat Pump System (Alternative #2)

This system uses dual compressor/dual fan speed Ground Source Heat Pump units to serve all zones. Heat pumps operate intermittently during occupied hours. Building ventilation is provided by a constant volume DOA unit with heat exchanger that runs continuously during occupied hours. The condenser water is provided by a ground loop hydronic system. This system rejects or obtains heat through the ground loop piping system. Ground source heat pumps have a very high coefficient of performance due to the relatively constant and mild temperature of the earth at depths greater than twenty feet. All equipment meets the WSEC energy efficiency requirements.

This alternative system is not recommended for DSHS Behavior Health Building. The first cost estimate is given in Table 4-1 above. The life cycle summary is also given in Table 4-1.

### 4.2.3 Variable Refrigerant Flow with PV System (Alternative #3)

This system uses that same Variable Refrigerant Flow system described in Section 6.2.1. This building design also includes a roof top 35 kW PV system comprised of a 2,400 square foot standard, fixed, open rack solar array with a 14% system loss.

This alternative system is not recommended for DSHS Behavior Health Building. It is suggested that the building be designed with a pathway to the roof so that a PV system can be easily added at a later date. The actual first cost estimate is given in Table 4-1 above. The life cycle summary is also given in Table 4-1.

### 4.2.4 Cycling Heat pump units with Continuous DOA (WSEC Baseline)

This system uses dual compressor heat pumps for each zone and a dedicated outdoor air unit that provides ventilation to the entire building. The units cycle during occupied and unoccupied business hours to provide heating and cooling for each associated space. Ventilation air for each zone is provided by a dedicated outdoor air handling unit with an enthalpy wheel that runs continuously during occupied hours. All equipment meets the WSEC energy efficiency requirements.

See Table 1-1 for a comparison of WSEC compliant building energy consumption versus Alternative 1 through 3 building design energy consumption.